



Verification Report for

Project : Renewable Biomass Based Thermal Energy Generation
By SIPL, Manjri, Pune, Maharashtra.

UCR Project ID : 279

Name of Verifier	SQAC Certification Pvt. Ltd.
Date of Issue	March 16, 2023
Project Proponent	M/s Serum Institute of India Pvt Ltd. (SIPL), Pune, Maharashtra
UCR Project Aggregator	Egis India Consulting Engineers Pvt Ltd.
Work carried by	Mr. Santosh Nair & Ms. Sheetal Wader
Work reviewed by	Mr. Praful Shinganapurkar

Summary:

SQAC Certification Pvt. Ltd. has performed verification of the “Renewable Biomass Based Thermal Energy Generation by SIPL, Manjri, Pune, Maharashtra, India”. The project activity is thermal energy generation using a biomass (bagasse and crop residues i.e., soya bean waste & groundnut shell) based boiler that displaces equivalent amount of thermal energy that would have been generated by a fossil fuel based boiler. Since the project activity utilises biomass for the generation of thermal energy by displacing fossil fuel (coal), it meets the primary applicability criteria of the methodology.

The project activity meets the following UN SDG’s:



Verification for the period: **01/12/2018 to 31/12/2022**

The GHG emission reductions were calculated on the basis of UCR Protocols which draws reference from, UCR Protocol Standard Baseline, CDM UNFCCC Methodology, AMS-I.C.: Thermal energy production with or without electricity (Ver.21.0). The verification was done onsite by way of

Accredited by 5 Jupiter House, Callera Park, Aldermaston, Reading Berkshire RG7 8NN, United Kingdom (UK).

India Office: Off. No. 4, Fifth Floor, Buildmore Business Park, New Canca Bypass Road, Khorlim, Mapusa, Goa – 403 507

Web: www.sqac.in

Email: info@sqac.in Tel: 7219716786 / 87





interviews, onsite document verification and submission of documents for verification through emails.

SQAC is able to certify that the emission reductions Renewable Biomass Based Thermal Energy Generation by SIPL, Manjri, Pune, Maharashtra, India, (UCR ID – 279) for the period **01/12/2018 to 31/12/2022** amounts to **30,614 CoUs (30,614 tCO₂eq)**

Detailed Verification Report:

Purpose:

The UCR project activity consists of the generation of thermal energy by utilizing renewable biomass (Briquettes) boilers of total installed capacity of 19 TPH at the Manjri campus site (Pune) biotechnology plant owned and operated by the Project Proponent. The project activity currently involves the installation of one biomass briquette fired steam boiler with a steam output capacity of 15 TPH.

15 TPH (Manjri)	1.5 TPH (Manjri)	1.5 TPH (Manjri)	1.0 TPH (Manjri)
Type			
Combipac (Water + Smoke Tube)	Smoke Tube	Smoke Tube	Smoke Tube
Commissioning Date			
14/06/2021	01/12/2018	01/02/2019	01/12/2018
In Operation since installation	Not in-operation Since August-21		

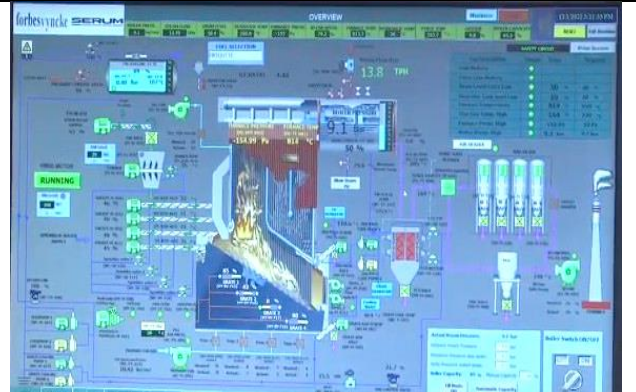
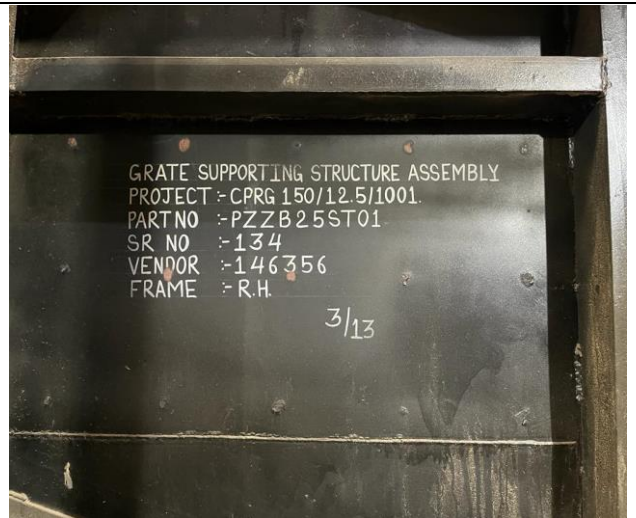

The start date of the project activity is 01/12/2018. This project activity uses renewable biomass briquettes as fuel and supplies the process steam throughout the plant for an important process of sterilization and clean steam generation for advanced procedures within the project boundary at the Manjri campus. The one boiler installed is “Combipac Reciprocating” grate type that ensures 100% firing of biomass briquettes. Thus, the project activity helps in reduction of GHG emissions. The primary technology for the project activity involves direct combustion of biomass in the boiler to generate thermal energy. During combustion chemical energy contained in the biomass is converted into thermal energy, which is utilized for steam/hot air generation.



COMBIPAC

MODEL CPRG-150/12.5/1801	FUEL BIOMASS BRIQUETTE/ IMP. COAL
YEAR 2017	230 V 1 PH 50 Hz
EVAPORATION 15000 Kg/hr	W. PR. 12.25 bar
OUTPUT 9.418 MW	CONN. LOAD 2 kW

THERMAX LIMITED
D-13, MIDC,
R. D. AGA ROAD,
CHINCHWAD, PUNE - 411 019. INDIA



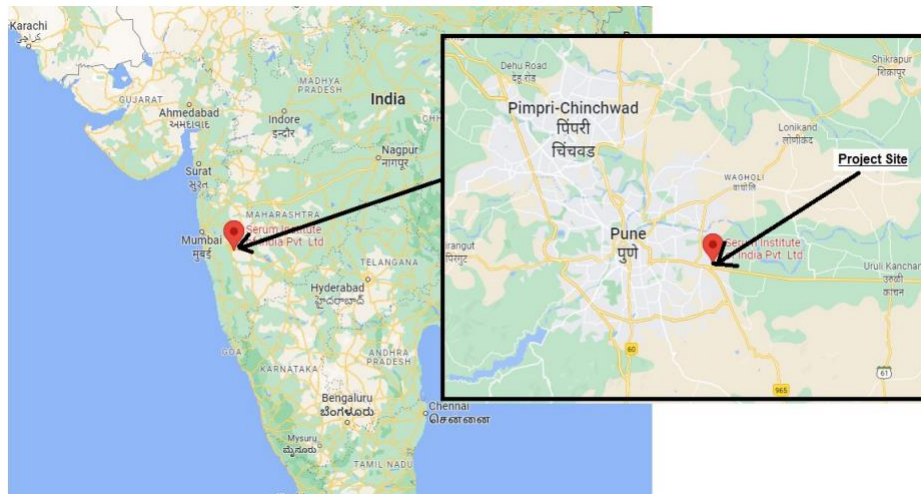


The briquettes, used in all the installed boilers within the project activity, are composed of mainly agro based industrial residues (bagasse) and crop residues (soya bean waste and groundnut shells) based on their availability from the surrounding region outside the project boundary (the PP is not the producer of the processed solid biomass fuel as specified in the requirements of the UCR CoU Standard for inclusion in the updated eligibility conditions specified in the UCR biomass program).

The project activity is thus the thermal energy production using renewable energy sources that displaces fossil fuel use and avoids GHG emissions (CO₂). In the pre-project scenario, the process demand of steam would have been met by a coal fired boiler. The project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

Location of project activity:

Country : India
Village : Manjri
District : Pune
State : Maharashtra (Pin code 412307)
Latitude : 18°30'56.1"N
Longitude : 73° 57'47.2"E





Scope:

The scope covers verification of emission reductions from the project - Renewable Biomass Based Thermal Energy Generation by SIPL, Manjri, Pune, Maharashtra, India, (UCR ID – 279).

Criteria:

Verification criteria is as per the requirements of UCR Standard.

Description of project:

The project activity is the installation of biomass fired boilers for steam generation. The generated steam is utilized for meeting the process requirement. The project activity has replaced coal based boiler with biomass based boiler for steam generation thus the project activity is environment friendly and leads to GHG emission reduction. The CO₂ emission due to the combustion of biomass is neutralized by the photosynthesis process of agricultural crops. Hence, it "recycles" atmospheric carbon and does not add to the greenhouse effect. And also the biomasses contains negligible quantities of nitrogen and sulphur, hence the other green house gas from the combustion of biomass can be neglected. The coal being a carbon intensive fuel leads to GHG emissions hence implementation of the project activity leads to GHG emission reductions.

No transfer of technology is involved to host country because biomass boiler technology is available within India from reputed manufacturers.



Description	Data
Capacity of Current Boilers	15 TPH (4.1 kg/sec)
Number of Boilers	1
Pressure	10.5 kg/cm ²
Model	CPRG 150/12.5/1001
Enthalpy of Steam (Boiler outlet temp 280 °C)*	3.00 MJ/kg
Operation days/annum	330 days/yr (24hrs/day)
Enthalpy of water @100 °C	0.418 MJ/kg
Boiler Rating	15*(3.0-0.418)/3.6 = 10.75 MW _{thermal}
NCV of Biomass	4000 kcal/kg

Sr. No.	Description	UOM	SPECIFICATION			
			15 TPH (Manjri)	1.5 TPH (Manjri)	1.5 TPH (Manjri)	1.0 TPH (Manjri)
1	Type	-	Combipac (Water + Smoke Tube)	Smoke Tube	Smoke Tube	Smoke Tube
2	Boiler Design Capacity - F & A 100 Deg C, Maximum continuous rating (MCR)	Kg/hr	15000 @ F&A 100°C	1500 @ F&A 100°C	1500 @ F&A 100°C	1000 @ F&A 100°C
3	Design Pressure	KG/CM2	10.54 bar (g)	10.54 bar (g)	10.54 bar (g)	10.54 bar (g)
4	Operating Pressure	KG/CM2	9 bar (g)	9 bar (g)	9 bar (g)	9 bar (g)
5	Codes & Standards for Boiler Design	-	IBR 1950 with Latest Ammendments	IBR 1950 with Latest Ammendments	IBR 1950 with Latest Ammendments	IBR 1950 with Latest Ammendments
6	Overall Boiler Efficiency on NCV at Full Load	%	Briquette: 84 +/- 2% measured as per BS 845 Part-I	Pallet: 84 +/- 2% measured as per BS 845 Part-I	Pallet: 84 +/- 2% measured as per BS 845 Part-I	Pallet: 84 +/- 2% measured as per BS 845 Part-I
7	Method of efficiency measurement / Performance Test	-	As Per BS 845 Part I: 1987	As Per BS 845 Part I: 1987	As Per BS 845 Part I: 1987	As Per BS 845 Part I: 1987
8	Type of Steam	-	Dry Saturated	Dry Saturated	Dry Saturated	Dry Saturated
9	Dryness Fraction	%	98	98	98	98
10	Boiler Test Pressure (HYDRO TEST)	KG/CM2	15.9	15.9	15.9	15.9
11	Feed water temperature to Boiler (From Deaerator)	°C	102 - 105	102 - 105	102 - 105	102 - 105



Description	Data
Total Capacity of Replaced Boiler/s	4 TPH (1.1 kg/sec)
Number of Boilers	3 (Discontinued)
Pressure	10.5 kg/cm ²
Enthalpy of Steam (Boiler outlet temp 280 °C)*	3.00 MJ/kg
Operation days/annum	330days/yr (2018-2021)
Enthalpy of water @100 °C	0.418 MJ/kg
Boiler Rating	$4*(3.0-0.418)/3.6 = 2.86 \text{ MW}_{\text{thermal}}$

*<https://www.spiraxsarco.com/resources-and-design-tools/steam-tables/superheated-steam-region>

Year	Year wise Boiler Operating Days			
	15 TPH	1.5 TPH	1.5 TPH	1.0 TPH
2013	0	0	0	0
2014	0	0	0	0
2015	0	0	0	0
2016	0	0	0	0
2017	0	0	0	0
2018	0	15	0	13
2019	0	285	265	162
2020	0	323	316	186
2021	167	192	192	191
2022	269	0	0	0

Level of Assurance:

The verification report is based on the information collected through interviews conducted onsite, supporting documents provided during the verification, Project Concept Note (PCN) / Monitoring Report (MR), submitted to SQAC. The verification opinion is assured provided the credibility of all the above.

Verification Methodology:

Review of the following documentation was done by SQAC Lead Verifier, Mr. Santosh Nair and Verifier Ms. Sheetal Wader, who are experienced in such projects.



- Project Concept Note (PCN)
- Monitoring Report (MR)
- Commissioning Report
- Calibration report
- Data provided upon request of all the documents of the related projects

Sampling:

Not applicable


Persons interviewed:

1. Mr. Santosh Arankalle : Sr. General Manager, M/s Serum Institute of India Pvt Ltd.
2. Mr. Baban Chaudhari : Sr. Manager – Engineering, M/s Serum Institute of India Pvt Ltd.
3. Mr. Saurabh Sainger : Sr. Project Manager, M/s. Egis India Consulting Engineers Pvt Ltd.

Documentation Verified:

- Project Concept Note (PCN)
- Monitoring Report (MR)
- Calibration Reports
- Commissioning Certificate
- Monthly steam chart records
- Boiler Log Book
- Biomass Briquette Tax Invoice




Form V
 [Regulation 381 (c)]
Provisional Order under section 9 of the Boilers Act of 1923

No.-249PUN2021

SEZ BIOTECH SERVICES PRIVATE LIMITED, SEZ UNIT NO PBP I, POONAWALA BIOTECHNOLOGY PARK, MANJARI BUDRUK, IN FROM TO BHARAT PETROL PUMP, HAVELI, PUNE, MANJARI BI. Maharashtra-412202. I am hereby permitted to use the Boiler MF-18087 Boiler Rating 650 Made by THERMAX LIMITED bearing Makers number CPRG150/12-5/1001 at a maximum pressure of 12.5 kg per square cm pending the issue or refusal of a certificate within six months from the date hereof after which period this order will become void.

Period from 23/09/2020 to 22/03/2021

Dated 04/01/2021

Yours faithfully,

UMESH SHANKARRAO MADANE
 Joint Director,
 Maharashtra (Government of Maharashtra)
 Date: 04-01-2021 12:27:01

N.B. This order must be produced on demand by any authorised person and surrendered to the Director in receipt of orders.

COMMISSIONING REPORT


Date: 09/07/2021


Make : M/s Thermax Limited, Chinchwad, Pune, India. -411019.
 Model : CPRG 150/12-5/1001
 Year : 2016
 Capacity : 15,000 kg/hr
 Fuel : Biomass Briquette
 Voltage : 415 V, 3 Phase
 Frequency : 50 Hz
 Customer : M/s Serum Institute of India
 Address : Manjari, Pune Maharashtra

The above mentioned "Reciprocating Grate Type" is commissioned by M/s Thermax Limited on 14th June 2021 and handed over for operation & commercial use of steam has been started.

For, M/s Serum Institute of India. *S. N. Chivate* 10-07-2021
 For, M/s Thermax Limited. *Umesh Shankarrao Madane* 10/07/2021
System kept under observation.

CPRG-150/12-5/1001 Page 1 of 1

ISTPH Boiler Commissioning Certificate from Thermax


Government of Maharashtra
 Labour Department
Office of the Joint Director of Steam Boilers, Pune.
 Komarpal Kalyan Bhawan, 2nd Floor, Sambhijirnagar,
 020-27371697/27371051, Chinchwad, Pune-411 019
<https://mahlabour.gov.in>
 E-mail: pune@mahlabour.gov.in, labour@mahlabour.gov.in, labour@mahlabour.gov.in

No: SB 65NC/2021 7373 Date: 31/07/2021

To: SEZ BIOTECH SERVICES PVT LTD., JASWARI BUDRUK, TAL. HAVELI, DIST. PUNE-412 107

Subject: Issue of Provisional Order for Boiler No/Boiler No. - A102/18087.

Gentlemen,
 With reference to my visit to your factory, I have to inform you that the subject boiler was inspected on 21/09/2021 & thereafter hydraulically tested to 18.75 kg/cm² on 29/09/2021 & both found satisfactory.

Now, I have to forward herewith provisional order no 144 dated 03/10/2021, to enable you to work your above boiler for the period from 29/09/2021 to 28/03/2023 at a maximum working pressure of 12.50 Kg/cm².

Pending:-
 1. Approval of Working Pressure by the Director of Steam Boilers, Mumbai.
 2. Approval of Registration Steam Test by the Director of Steam Boilers, Mumbai.

The boiler must be offered for steam test within the period stipulated in the provisional order i.e. by 28/03/2023 or otherwise the same will have to be offered for re-inspection on payment of fresh inspection fees.

Please note that this office will not issue any reminder to offer the boiler for steam test, before the validity of the provisional order expires. Therefore, in your own interest you should offer the boiler for steam test much in advance of the expiry period of the provisional order. Please note that a visit for steam test will also be not fixed within a short time. This office must be informed well in advance when the boiler is ready for steam test so that a visit on the suitable date can be arranged.

If the steam test is not completed within six months of stipulated period in the provisional order, the boiler will have to be shut down and offered for inspection and hydraulic test on payment of fresh inspection fees.

The full particulars of Boiler Attendance/Efficiency Engineer i.e. name, grade, no. and date of issue of their certificate should be submitted to this office for scrutiny and records.

Yours faithfully,
 (S. N. Chivate)
 Joint Director of Steam Boilers.

Current Boiler ISTPH Permit

OM BIO ENERGY
 305, Omkar Apartment, Tirumalanagar, Kabranagar,
 Nanded-431605
 Cell :- 8806888811
 E-mail :- vishvabs@rediffmail.com
GSTIN: 27BUAP8113B1ZV

Tax Invoice

Invoice No. : 143	Invoice date : 11/08/2022
D. C. No. : 143	D. C. Date : 10/08/2022
P. O. No. : 1030011979	P. O. Date : 26/07/2022
Vehicle No. : MH 14 KA 0870	State : MAHARASHTRA

Bill to Party

Name : Thermax On Site Energy Solution LTD.
 Address : C/O. SEZ Biotech Services Pvt. Ltd. Swapnil tupe patil road, Manjari, PUNE
 GSTIN : 27AADCT2702L1ZC
 State : MAHARASHTRA

Sr. No.	NAME OF GOODS	HSN CODE	QTY. (IN KG)	RATE (per Kg)	TOTAL
1	BIOMASS BRIQUETTE	4401	8840	11.500	101660.00
Sub Total					101660.00
SGST 2.5%					2541.50
CGST 2.5%					2541.50
Total					106743.00
Amount in words :					Grand Total
One Lakh Six Thousand Seven Hundred Forty Three Only					106743.00

Declaration :

- I/We declare that this invoice shows actual price of the goods and/or services described and that all particulars are true and correct.
- Error and Omission expected.
- Subject to Standard Jurisdiction.

For: **OM BIO ENERGY**
 Authorised signatory
(Signature)

Bank Details: AXIS BANK LTD. Taroda Naka, Nanded-431605
 Bank Account No. : 920020044533284
 Bank IFSC : UTIB0001371

Save Trees. Save Paper. Save Environment.

13600833
 18/08/2022

Sample Copy of Biomass Purchase Invoice/Delivery/Quantity Receipts on File



CATEGORY - AMS-I.C.: Thermal energy production with or without electricity (Ver.21.0)

This methodology comprises renewable energy technologies that supply users i.e., residential, industrial or commercial facilities with thermal energy that displaces fossil fuel use. These units include technologies such as energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.

Applicability of methodologies and standardized baselines

- ❖ The project activity is thermal energy generation project using a biomass (bagasse and crop residues i.e. soya bean waste, groundnut shell etc) based boiler that displaces equivalent amount of thermal energy that would have been generated by a fossil fuel based boiler. Since the project activity utilises biomass for the generation of thermal energy by displacing fossil fuel (coal), it meets the primary applicability criteria of the methodology.
- ❖ The thermal generation capacity of project activity is currently 10.75 MW_{thermal} which is less than the threshold of 45MW_{thermal} as per the applied methodology. The capacity limits specified in the methodologies apply to both discontinued/existing and additional units within the project activity. In the present case of the project activity, a 15 TPH boiler was added to the already 4 TPH (combined capacities) boilers, however, the total capacity of the units added within the project activity (since 2021), is 19 TPH, and this results in a thermal capacity generation of 13.61 MW_{thermal} which also complies with capacity limits of the methodology. All boilers were physically distinct from each other prior to discontinuation
- ❖ The biomass used by the project plant is not stored for more than one year.
- ❖ The project activity does not involve recovery and utilization of biogas for power/heat production.
- ❖ The project activity is neither a co-generation nor co-firing system, therefore this condition is not applicable in the case of current project activity.
- ❖ Biomass generated steam is used for captive use. The steam produced in the project activity is utilized in the process of SILL. It is not delivered to any third party.
- ❖ The project activity does not involve the use of any refrigerant within its boundaries and hence the given applicability clause in the methodology is not fulfilled here.
- ❖ The Project Proponent is not the producer of the processed solid biomass fuel. The Project Proponent has a contract with the biomass briquette supplier for the supply of the same which will ensure that there is no double counting of emission reductions by the supplier.
- ❖ Thermal energy generation capacity are determined by taking the difference between

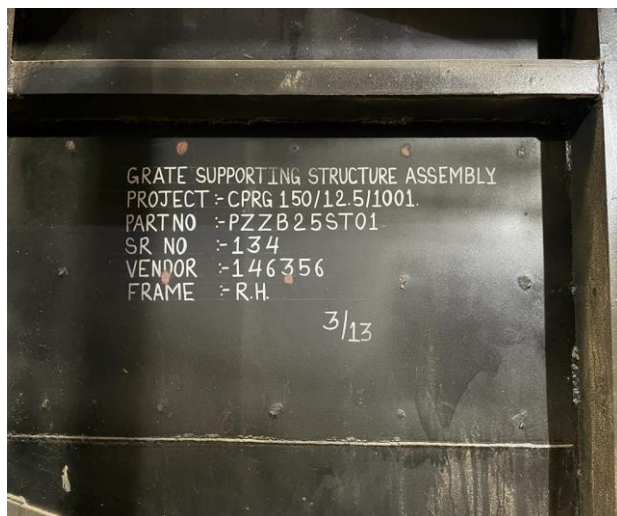
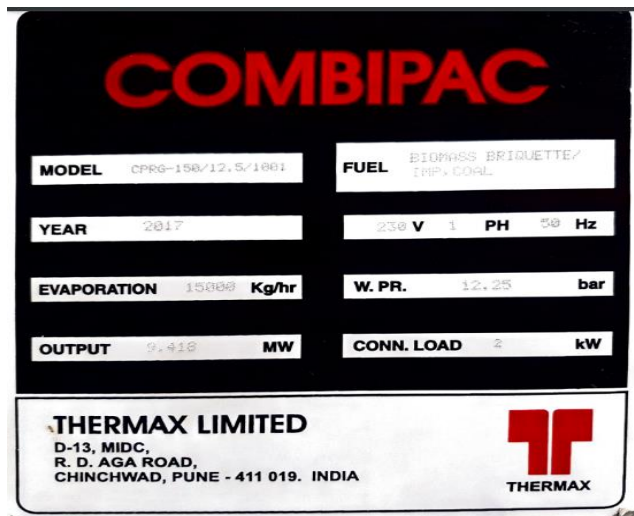


enthalpy of total output leaving the project equipment and the total enthalpy of input entering the project equipment.

- ❖ The installed biomass boiler generates steam to meet the demand of steam recipient plant and displace fully the use of fossil fuel-based boilers. The project technology utilizes appropriate treatment systems to ensure exhaust gas and discharged water in compliance with national environmental regulations. Note that fossil fuel (i.e., furnace oil, coal, gas, etc) cannot be used for biomass fired boilers due to its specialized design of combustion chamber. The service level (e.g., temperature, pressure) of supplied steam in case of utilizing different types of renewable biomass residues is ensured by qualified boiler operators and is monitored by steam flow meter at recipient plant. The project activity will thus reduce Greenhouse gas (GHG) emissions associated with the combustion of fuel oil in baseline boilers. The project activity claims emission reduction for the thermal energy production by renewable energy technologies (biomass boilers) that displace the use of fossil fuel-based boilers. This is in line with the applied methodology AMS I.C requirements.

Applicability of double counting emission reductions

The biomass boiler is constructed by the PP within the boundary. The biomass boiler has a unique ID (MR/18087), which is visible on the unit. The project is not registered with any other voluntary market (National or International).



The project activity has never applied for registration under any GHG mechanism for carbon credits. Hence there is no double counting of the credits anticipated for the current project activity

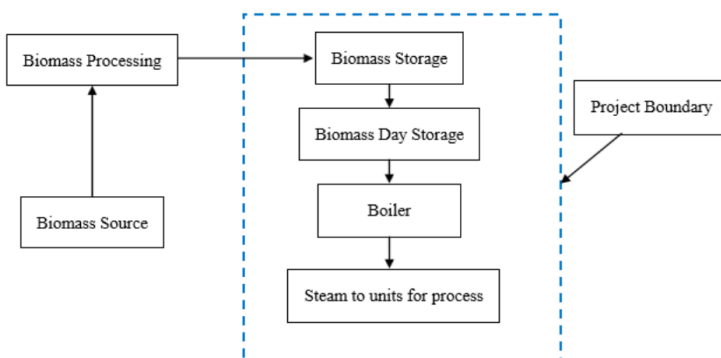
Agreement for Double Counting Avoidance from Proponent has been provided duly signed on 28/02/2023.



Project boundary, sources and greenhouse gases (GHGs)

The project boundary includes the physical, geographical site(s) of:

- Site of the renewable energy generation.
- Biomass based boiler, which starts from the biomass storage to the point of steam supply
- Biomass storage facility



	Source	GHG	Included?	Justification/Explanation
Baseline	CO ₂ emissions from fossil fuel in boilers for heat	CO ₂	Included	Major source of GHG emissions
		CH ₄	Excluded	Excluded for simplification. This is conservative.
		N ₂ O	Excluded	Excluded for simplification. This is conservative.
Project Activity	Emissions from Biomass Project Activity	CO ₂	Excluded	Excluded for simplification. This is conservative.
		CH ₄	Excluded	Excluded for simplification. This is conservative.
		N ₂ O	Excluded	Excluded for simplification. This is conservative.

Leakage Emissions is not applicable as the project activity does not use technology or equipment transferred from another activity.

There is no registered or an application to register another small-scale carbon project activity with



the same project participants in the same project category within 1 km of the project boundary, hence the project activity is not a debundled component of a large-scale project.

By using locally sourced GHG-neutral biomass, the Project Proponent is successfully able to avoid the fossil fuel emissions and thereby GHG emissions due to in-house cogeneration energy requirements and also vehicular emissions avoiding sourcing of biomass fuel from a large distance.

Establishment and description of baseline scenario

The baseline scenario identified of the project activity is:

Renewable energy technologies that displace technologies using fossil fuels, wherein the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced.

Project Activity Emissions

Emission Reductions (ER_y) The emission reduction due to the project activity is calculated as the difference between the baseline emissions and the sum of the project emissions and the leakage:

$$ER_y = BE_y - (PE_y + LE_y)$$

BE_y = Baseline emissions in year y (t CO₂e)

As mentioned in the methodology AMS I.C, for steam produced using fossil fuels the baseline emissions are calculated as follows:

$$BE_y = (HG_y * EF_{CO_2}) / \eta_{th}$$

Where:

HG_y = The net quantity of heat supplied by the project activity during the year in TJ. It is calculated as product of quantity of steam generated and net enthalpy of steam. The net enthalpy of steam is calculated as difference of enthalpy of steam and enthalpy of feedwater. The enthalpy of steam is calculated from steam pressure and steam temperature.



EF_{CO_2} = The CO_2 emission factor per unit of energy of the fuel that would have been used in the baseline plant in (tCO_2/TJ), obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used.

η_{th} – The efficiency of the boiler using fossil fuel that would have been used in the absence of the project activity.

PE_y = Project activity emissions. The GHG emissions due to the combustion of biomass is neutralized by the sequestration done during the growth of the biomass, thereby making it a carbon neutral fuel. Further the rice husk and bagasse contains negligible quantities of nitrogen and sulphur, the other green house gas from the combustion of biomass can be considered as negligible. Therefore essentially there would not be any GHG emissions due to the project activity within the project boundary.

However, as per paragraph 31 under Section 5.2 of the given methodology, the Project Proponent must “For microscale and small-scale project activities, apply a default emission factor of 0.0142 tCO_2 /tonne of biomass”.

LE_y = Leakage emissions. Leakages is to be considered if the energy generating equipment is transferred from another activity or if the existing is transferred to another activity. There is no transfer of energy generating equipment or existing equipment to another activity. Further, emissions arising during the transportation of husk and biomass to the site, is negligible since the biomass is sourced locally within a radius of less than 200 kms, hence considered as negligible.

Hence $LE_y = 0$

STEAM GENERATION DETAILS (1.5 + 1.5 + 1.0) TPH PALLET BOILER (Manjri)					
Sr. No.	Month	Briquette Consumption (in Tons)	Steam Generation (in Tons)	Yearly Steam Generation (in Tons)	Boiler Operating Days in Year
1	Dec-18	72	284	284	15
2	Jan-19	210	979	11138	285
3	Feb-19	227	767		
4	Mar-19	243	873		
5	Apr-19	231	952		
6	May-19	212	933		
7	Jun-19	222	1027		
8	Jul-19	282	1037		
9	Aug-19	255	912		
10	Sep-19	262	967		



11	Oct-19	248	1021	16239	323
12	Nov-19	230	857		
13	Dec-19	183	813		
14	Jan-20	263	1258		
15	Feb-20	265	1307		
16	Mar-20	263	1424		
17	Apr-20	251	1163		
18	May-20	304	1404		
19	Jun-20	256	1221		
20	Jul-20	293	1364		
21	Aug-20	290	1258		
22	Sep-20	311	1411		
23	Oct-20	343	1562		
24	Nov-20	275	1162		
25	Dec-20	399	1704		
26	Jan-21	463	2091	12596	191
27	Feb-21	449	2007		
28	Mar-21	527	2233		
29	Apr-21	501	2109		
30	May-21	513	2122		
31	Jun-21	378	1490		
32	Jul-21	148	507		
33	Aug-21	14	37		

Steam Generated	Tons	40257	814
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Monthly Data of 15 TPH Boiler (MR-18087) at Manjri						
Sr. No	Year	Month	Briquette Consumption (Tons)	Steam Generation (Tons)	Yearly Steam Generation (Tons)	Boiler Operating Days in Year
1	2021	Jun-21	163.2802564	636.793	21103.98	167
		Jul-21	649.1477329	2674.35		
		Aug-21	3947.12028	3654.741		
		Sep-21	710.385	3239.351		
		Oct-21	839.124	3356.367		
		Nov-21	793.322	3746.664		
		Dec-21	831.912	3795.714		



2	2022	Jan-22	710.453	3303.835	51348.935	269
		Feb-22	712.676	3436.764		
		Mar-22	707.635	3446.306		
		Apr-22	689.057	3350.296		
		May-22	730.731	3385.561		
		Jun-22	876.737	4216.317		
		Jul-22	959.357	4640.486		
		Aug-22	1045.101	5043.903		
		Sep-22	833.399	4002.207		
		Oct-22	1159.816	5566.343		
		Nov-22	1071.226	5159.797		
		Dec-22	1202.239	5797.12		
Steam Generated			Tons	72452.915	436	

Default baseline efficiency values for different technologies as per AMS IC Methodology

Technology of the energy generation system	Default efficiency
New natural gas fired boiler (w/o condenser)	92%
New oil fired boiler	90%
Old natural gas fired boiler (w/o condenser)	87%
New coal fired boiler	85%
Old oil fired boiler	85%
Old coal fired boiler	80%

Issuance Period: 01/12/2018 to 31/12/2022

Year	Baseline Emissions (tCO ₂ eq)	Project Emissions (tCO ₂ eq)	Emission Reductions (tCO ₂ eq)
2018	76	1	75
2019	2970	40	2930
2020	4330	50	4280
2021	9953	155	9798
2022	13683	152	13531
		TOTAL	30614

Total Emission Reductions for the current crediting period = **30,614** tCO₂eq (**30,614** CoUs)



Conclusions:

Based on the audit conducted on the basis of UCR Protocol, which draws reference from UCR Protocol Standard Baseline, AMS-I.C.: Thermal energy production with or without electricity (Ver.21.0), the audit conducted onsite and the documents verified and submitted during the verification including the Data, Project Concept Note (PCN) / Monitoring Report (MR), SQAC is able to certify that the emission reductions from the project - Renewable Biomass Based Thermal Energy Generation By SIPL, Manjri, Pune, Maharashtra - (UCR ID – 279) for the period **01/12/2018 to 31/12/2022** amounts to **30,614 CoUs (30,614 tCO₂eq)**

Santosh Nair
Lead Verifier (Signature)



Sheetal Wader
Verifier (Signature)

Praful Shinganapurkar
Senior Internal Reviewer
(Signature)

Date: 16/03/2023