Verification Report for

Project : Renewable Biomass Based Thermal Energy Generation By SIIPL, Hadapsar, Pune, Maharashtra.

UCR Project ID : 273

Name of Verifier	SQAC Certification Pvt. Ltd.
Date of Issue	March 14, 2023
Project Proponent	M/s Serum Institute of India Pvt Ltd. (SIIPL), 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 SIIPL, Hadapsar, Pune, Maharashtra, India". The project activity is the installation of two biomass briquette fired boilers for steam generation. The thermal energy generated in the project activity uses biomass (bagasse and crop residues i.e., soya bean waste & groundnut shell) that displaces equivalent amount of thermal energy that would have been generated by a fossil fuel based boiler. The generated steam is utilized for meeting an important process of sterilization and clean steam generation for advanced procedures within the project boundary at Hadapsar. 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: **01/01/2013 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 interviews, onsite document verification and submission of documents through emails.

SQAC is able to certify that the emission reductions Renewable Biomass Based Thermal Energy Generation by SIIPL, Hadapsar, Pune, Maharashtra, India, (UCR ID – 273) for the period **01/01/2013 to 31/12/2022** amounts to **2,61,741 CoUs** (**2,61,741** tCO_2eq)

Detailed Verification Report:

Purpose:

The UCR project activity consists of the generation of thermal energy by utilizing renewable biomass (Briquettes) boilers of total installed current capacity of 37 TPH at the Hadapsar (Pune) vaccine plant owned and operated by the Project Proponent. The project activity currently involves the installation of two (2) biomass briquette fired steam boilers ranging in steam output capacities of 15 TPH and 22 TPH. 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 Hadapsar. The two boilers installed are "Combipac Reciprocating" grate types that ensure 100% firing of biomass briquettes.

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. The first boiler (8 TPH) in the project activity was commissioned in 2011 and was upgraded to the current capacity of 22 TPH in 2013. The latest 15 TPH biomass boiler was commissioned in 2021 within the project activity. Hence the start date of the current project activity is 2011 and the total installed capacity from the start date is 45 TPH. However, since the 8 TPH boiler only operated for 82 days in 2013 (prior to being upgraded and replaced with the current 22 TPH boiler), the current installed capacity of the project activity is 37 TPH.

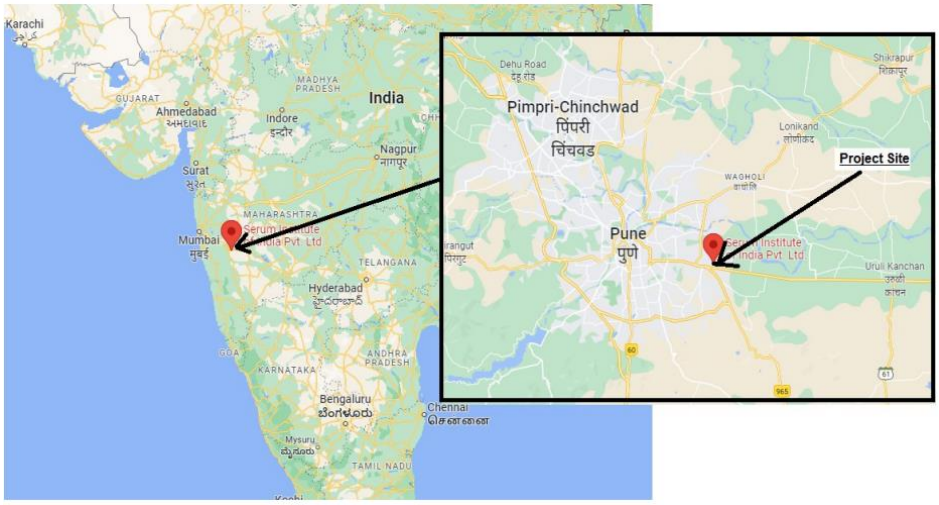
The briquettes, used in all the installed boilers within the project activity, are composed of mainly agro based industrial residues (bagasse) and crop residues (soya bean waste and groundnut shells) based on their availability from the surrounding region outside the project boundary (the PP is not the 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 consumes about 32000 tonnes of biomass per year.

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 : Hadapsar
District : Pune
State : Maharashtra
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 SIIPL, Hadapsar, Pune, Maharashtra, India, (UCR ID – 273).

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. In the baseline scenario the steam was to be generated through a coal based boiler, to meet SIIPL's process requirement. The project activity has hence replaced coal based boiler with biomass based boiler for steam generation thus the project activity is environment friendly and leads to GHG emission reduction.

Description	Data	Data
Capacity of Current Boilers	22 TPH (6.1 kg/sec)	15 TPH (4.1 kg/sec)
Number of Boilers	1	1
Pressure	10.5 kg/cm^2	10.5 kg/cm^2
Feed Material	Agro based industrial residues (bagasse) and crop residues (soya bean waste and groundnut shells)	
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	22*(3.0-0.418)/3.6 = 15.77 $MW_{thermal}$	15*(3.0-0.418)/3.6 = 6.5 $MW_{thermal}$
NCV of Biomass	4000 kcal/kg	

Description	Data
Capacity of Replaced Boiler	8 TPH (2.2 kg/sec)
Number of Boilers	1 (Discontinued)
Pressure	10.5 kg/cm^2
Enthalpy of Steam (Boiler outlet temp 280 °C)*	3.00 MJ/kg
Operation days/annum	82 days/yr (2013)
Enthalpy of water @100 °C	0.418 MJ/kg
Boiler Rating	8*(3.0-0.418)/3.6 = 5.73 $MW_{thermal}$

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

The CO_2 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.

Year	Year wise Boiler Operating Days		
	8 TPH	22 TPH	15 TPH
2013	**82**	**253**	0
2014	0	**338**	0
2015	0	**348**	0
2016	0	**317**	0
2017	0	**336**	0
2018	0	**293**	0
2019	0	**329**	0
2020	0	**272**	0
2021	0	**310**	**229**
2022	0	**290**	**291**

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

Level of Assurance:

The verification report is based on the onsite audit, information collected through interviews, 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
- Fuel incoming and Quality Data

FORM VI

Directorate of Steam Boilers

CERTIFICATE FOR USE OF A BOILER

(Regulation 389)

NO.: 2231005310019677

Registry Number of Boiler - MR/15691	Type of Boiler - Smoke Tube
Boiler Rating - 590 sq.mtr.	
Maximum Continuous Evaporation - 22000.00 kg. Per hr.	Place and year of manufacture - Pune-2012
Name of Owner - Serum Insititute of India Ltd.,	
Situation of Boiler - S. No. 212/2, Soli Poonawala Road,Hadapsar PUNE 411028	
Repairs - NIL	
Remark - BOILER ENTIRELY BARED NI THE YEAR 2022..CW'S F=28.5mm,R=33.7mm thk.	
Hydraulically Tested on 02/11/2022 to **15.81** kg. per sq. cm.	

I hereby certify that the above described Boiler is permitted by me / the Director under the provisions of Section 7/8 of the Boilers Act, No. V of 1923, to be worked at a maximum pressure of 10.54 kg. per sq. cm. for the period from 02/11/2022 to 01/11/2023

The loding on 0.00mm 0.00mm 0.00mm mm diameter SLSVs not to exceed 10.54 kg/cm2 , CWS F/L=28.50mm, R=33.70 mm thick.

Form V

[Regulation 381 (c)]

Provisional Order under section 9 of the Boilers Act of 1923

No.:**222PUN2020**

SEZ BIOTECH SERVICES PRIVATE LIMITED, ,212/2, SOLI POONAWALLA ROAD ,HADAPSAR,NEAR AKSAHWANI,Haveli,Pune,Hadapsar Maharashtra-411028 are hereby permitted to use the Boiler MR-17970 Boiler Rating 785 Made by **Forbes Vyncke Pvt Ltd** and bearing Makers number **FV17095** at a maximum pressure of **10.54** 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 **12/02/2020** to **11/08/2020**

Dated:**19/05/2020**

Yours faithfully,

UMESH SHANKARRAO MADANE
Joint Director,
Maharashtra State

Digitally signed by Umesh Shankarrao Madane
(Government of Maharashtra)
Date: 19-May-2020 14:17:29 IST

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

CUSTOMER : SERUM INSTITUTE OF INDIA LTD.

BOILER MODEL : CPRG220/10.54

BOILER Sr.No. : 1

THERMAX

COMMISSIONING & HANDING OVER REPORT

MAKE : THERMAX INDIA LTD.

Member Presents -:

FOR Serum Institute Of India Ltd. Babaji Chandhani

THERMAX INDIA LTD. Abhishek Singh

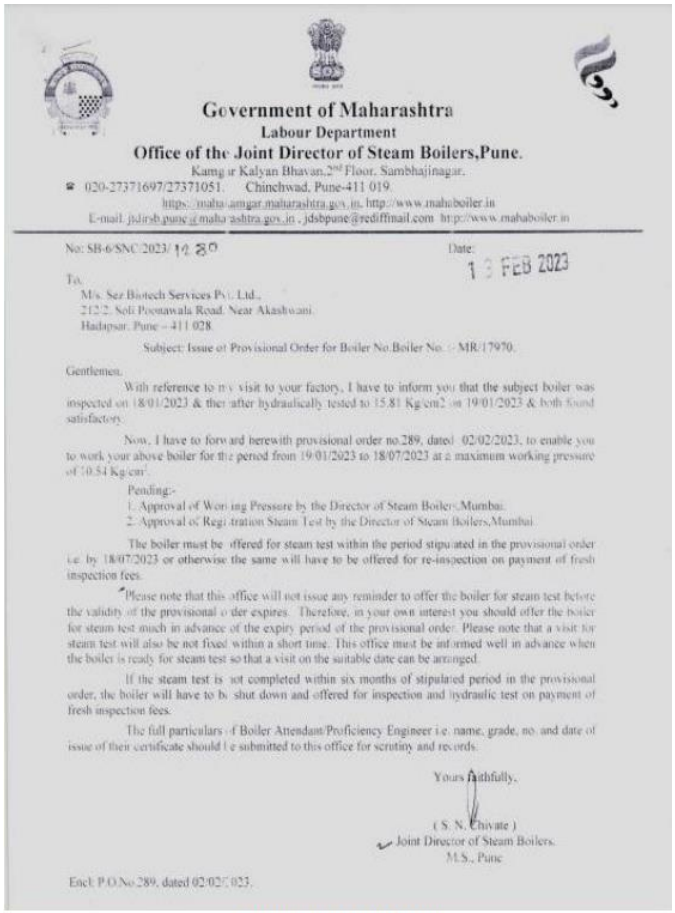
The Boiler was successfully commissioned and handed over to the customer for Commercial use & regular operation & Maintenance. All the control and safety circuit was checked and working satisfactorily. The Boiler was given on load from 9 March 2013

The details list of activities carried out during the commissioning visit are listed in Attachment – 1. The details commissioning parameters details are Enclosed in Attachment – 2.

The operation & Maintenance manual for boiler and electrical circuit drawing and its Wiring diagram is handed over to customer.

Customer is requested to please take care of the points mentioned in Attachment –1.

22 TPH Boiler Commissioning Certificate from Thermax dated 09/03/2013



Government of Maharashtra

Labour Department

Office of the Joint Director of Steam Boilers,Pune.

Kamgar Kalyan Bhavan,2nd Floor, Sambhajinagar,
☎ 020-27371697/27371051. Chinchwad, Pune-411 019.
https://maha-amgar.maharashtra.gov.in, http://www.mahaboiler.in
E-mail: jdirsb.pune@maha-ashtra.gov.in , jdsbpune@rediffmail.com http://www.mahaboiler.in

No: SB-6/SNC/2023/ 1428 Date: 13 FEB 2023

To,
M/s. Sez Biotech Services Pvt. Ltd.,
212/2, Soli Poonawala Road, Near Akashwani,
Hadapsar, Pune – 411 028.

Subject: Issue of Provisional Order for Boiler No.Boiler No. :- MR/17970.

Gentlemen,

With reference to my visit to your factory, I have to inform you that the subject boiler was inspected on 18/01/2023 & thereafter hydraulically tested to 15.81 Kg/cm2 on 19/01/2023 & both found satisfactory.

Now, I have to forward herewith provisional order no.289, dated 02/02/2023, to enable you to work your above boiler for the period from 19/01/2023 to 18/07/2023 at a maximum working pressure of 10.54 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 18/07/2023 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.

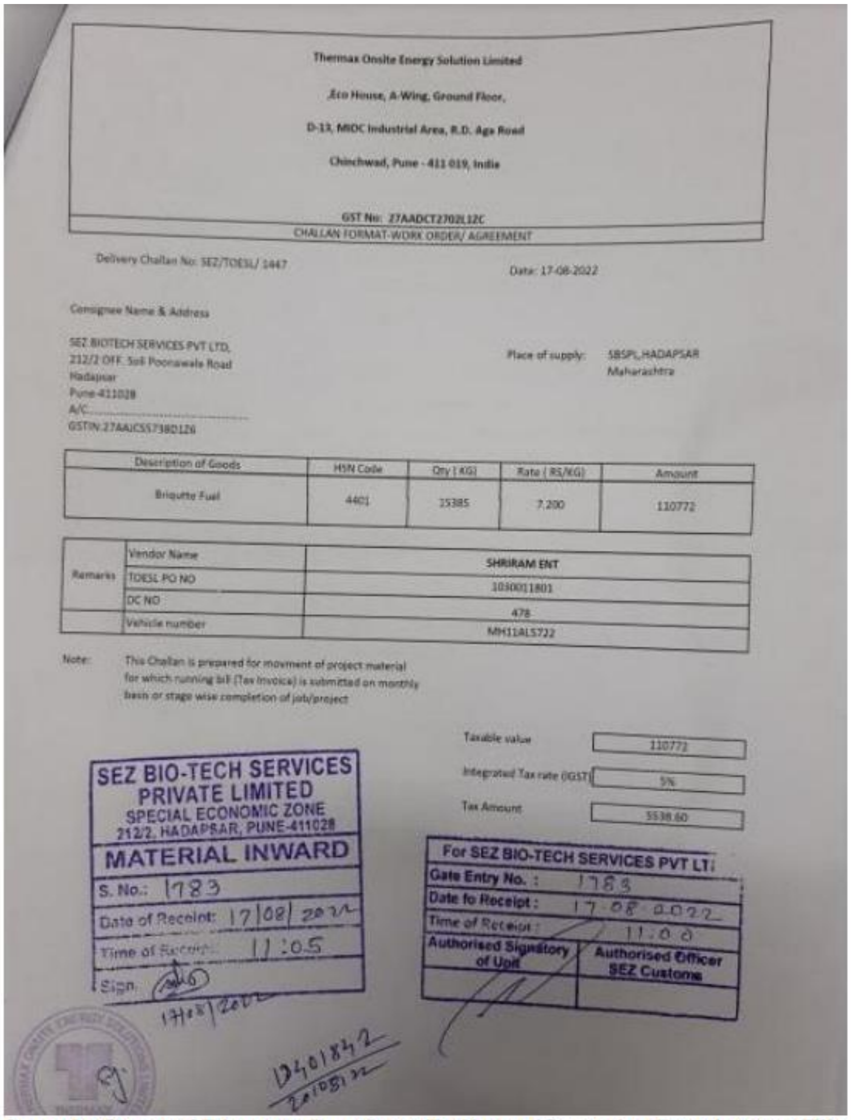
The full particulars of Boiler Attendant/Proficiency Engineer i.e. name, grade, no. and date of issue of their certificate should be submitted to this office for scrutiny and records.

Yours faithfully,

(S. N. Chivate)
Joint Director of Steam Boilers,
M.S., Pune

Encl: P.O.No.289, dated 02/02/2023.

Current Boiler 15 TPH Permit



Thermax Onsite Energy Solution Limited

Eco House, A-Wing, Ground Floor,

D-13, MIDC Industrial Area, R.D. Aga Road

Chinchwad, Pune - 411 019, India

GST No: 27AADCT2702L1ZC

CHALLAN FORMAT-WORK ORDER/ AGREEMENT

Delivery Challan No: SEZ/TOESL/ 1447

Date: 17-08-2022

Consignee Name & Address

SEZ BIOTECH SERVICES PVT LTD,
212/2 OFF. Soli Poonawala Road
Hadapsar
Pune-411028
A/C...
GSTIN:27AAJCS5738D1Z6

Place of supply: SBSPL,HADAPSAR Maharashtra

Description of Goods	HSN Code	Qty (KG)	Rate (RS/KG)	Amount
Briqutte Fuel	4401	15385	7.200	110772

Remarks	Vendor Name	SHRIRAM ENT
	TOESL PO NO	1030011801
	DC NO	478
	Vehicle number	MH11AL5722

Note: This Challan is prepared for movment of project material for which running bill (Tax Invoice) is submitted on monthly basis or stage wise completion of job/project

Taxable value	110772
Integrated Tax rate (IGST)	5%
Tax Amount	5538.60

SEZ BIO-TECH SERVICES PRIVATE LIMITED
SPECIAL ECONOMIC ZONE
212/2, HADAPSAR, PUNE-411028
MATERIAL INWARD
S. No.: 1783
Date of Receipt: 17/08/2022
Time of Receipt: 11:05
Sign.
17/08/2022

For SEZ BIO-TECH SERVICES PVT LTD
Gate Entry No. : 1783
Date fo Receipt : 17-08-2022
Time of Receipt : 11:00

Authorised Signatory of Unit	Authorised Officer SEZ Customs

1240184 2
20/08/22

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

GRN No. : MH001646847202223M

ReceiptNo : 221382101

Date: 13-05-2022

Legal Metrology Officer

DHUMAL BHARAT PRALHADRAO

Identification No

MH 378

महाराष्ट्र शासन

Government of Maharashtra
Food, Civil Supply and Consumer Protection Department Legal Metrology

पडताळणी प्रमाणपत्र / CERTIFICATE OF VERIFICATION

See Rule 14(3) Schedule IX

The Legal Metology Act, 2009 & The Maharashtra Legal Metrology (Enforcement)

LCR NO : CLM17383128
Sr.No: 91202213812760
Date: 13/05/2022
Place: (Trader Premises)

I hereby certify that I have this day verified and stamped the under mentioned weights,measures,etc., belonging to Shri/M/s SERUM INSTITUTE OF INDIA PVT LTD (SEZ / EOU UNIT), Trade - , Locality - 212/2 HADAPSAR PUNE

Quantity	Capacity, Class, Make, Machine no., and type of Weight or Measure etc.	Verification Fee Rs.	Carriage, Conveyance adjusting
1	NAWI-Electronics Scale: (1) Max.Capacity:50000kg, Make:ESSAE TEROKA, Model No:NA, Class III, Minimum Capacity:100kg, EValue:5kg , D-Value:, Sr.No:950073145 / 1 (Rs-4000)	4000	200
	Grand Total ₹	4200.00	

₹ (words): Rupees Four Thousand Two Hundred only

Repaired By S M Enterprises/.

Next Verification Due On / Before : 12-05-2023

Inspector of Legal Metrology, Haveli-2 Division

Digitally signed By BHARAT PRALHADRAO DHUMAL.
Date: 13/05/2022

Weigh Bridge Calibration Report

TESTCAL COMBUSTION SYSTEMS

HEAD OFFICE :- 637/2B OMKAR NAGER BIBAWADHIPUNE 411037
MOBIL Ph :- + 91- 8010395439 /9881396861/ 9307742092
Office Email ID:- Testcalpune@gmail.com / Tcssales@gmail.com /
Tcsservice@gmail.com Tcspurchase@gmail.com / TcsAccount@gmail.com
Website-www.testcal.com

Job Number: 221220 **Certificate Number : TCCS37/22-23/29-07-2023**

Customer Name and Address	*M/s.*	**SERUM INSTITUTE OF INDIA** 212/2, Hadapsar, Off, Pune 411028
Customer Reference	Verbal Order	
Details of the Instrument		
Location	STEAM BOILER METER EOU	
Description	FLOW Meter	
Make	ENDRESS HAUSER	
Model TM	-200°C TO 400°C	
Serial number	F6023A20000	
Size	DN 65	
Resolution	0.01 TON/PER HOURS	
Accuracy	± 2%	
Condition of the equipment on receipt	Good	
Date of calibration	29.07.2022	
Date of next calibration suggested	29.07.2025	
Calibration environments		
Temperature	25.5°C	
Relative humidity	58% RH	
Standard Instrument Details	**Master - I**	
Description	Digital Thermometer	
Make	Mextech	
Type / Model	ST-9264	
Identification number	Tccs/EQ-T--06	
Report Number	2021-22/CFC/2141/1	
Calibration valid till	30.12.2022	
Standard Instrument Details	**Master - II**	
Description	Ultrasonic Flowmeter	
Make	Manas	
Type / Model	UF-HH-10/TS-2	
Serial number	Indicator 6970/Sensor TM 00126912 /TS 0002479	
Report Number	2021-22/CFC/2141/1	
Calibration valid till	04.11.2023/03.11.2023	
The Standards used are traceable to National / International Standards		

Testcal Combustion Systems Pune

Flow Meter Calibration Certificate for 22 TPH Boiler

TESTCAL COMBUSTION SYSTEMS

HEAD OFFICE:- 637/2B OMKAR NAGER BIBAWADHIPUNE 411037
MOBIL Ph :- + 91- 8010395439 /9881396861/ 9307742092
Office Email ID:- Testcalpune@gmail.com / Tcssales@gmail.com /Tcsservice@gmail.com
Tcspurchase@gmail.com / TcsAccount@gmail.com
Website-www.testcal.com

Job Number: 221219 **Certificate Number : TCCS36/22-23/29-07-2023**

Customer Name and Address	M/s.	**SERUM INSTITUTE OF INDIA** 212/2, Hadapsar, Off, Pune 411028
Customer Reference	Verbal Order	
Details of the Instrument		
Location	STEAM BOILER METER SEZ-10	
Description	FLOW Meter	
Make	KROHNE	
Model	280T	
Serial number	192000000004049	
Size	DN 65	
Resolution	0.01 TON/PER HOURS	
Accuracy	± 2%	
Condition of the equipment on receipt	Good	
Date of calibration	29.07.2022	
Date of next calibration suggested	29.07.2025	
Calibration environments		
Temperature	25.5°C	
Relative humidity	58% RH	
Standard Instrument Details	**Master - I**	
Description	Digital Thermometer	
Make	Mextech	
Type / Model	ST-9264	
Identification number	Tccs/EQ-T--06	
Report Number	2021-22/CFC/2141/1	
Calibration valid till	30.12.2022	
Standard Instrument Details	**Master - II**	
Description	Ultrasonic Flowmeter	
Make	Manas	
Type / Model	UF-HH-10/TS-2	
Serial number	Indicator 6970/Sensor TM 00126912 /TS 0002479	
Report Number	2021-22/CFC/2141/1	
Calibration valid till	04.11.2023/03.11.2023	
The Standards used are traceable to National / International Standards		

Testcal Combustion Systems Pune

Flow Meter Calibration Certificate for 15 TPH Boiler

SERUM INSTITUTE OF INDIA PVT. LTD.
Cyrus Poonawalla Group

Thermax Onsite Energy Solutions Limited

SITE NAME : SEZ BIOTECH SERVICES PVT LTD, HADAPSAR, PUNE

A THERMAX GROUP COMPANY – THERMAX

BOILER LOG BOOK-MR/18087

OPERATOR NAME: G. C. Gaikwad OPE RATOR CERTIFICATE NO: 387 DATE: 7/2/23 SHIFT: IInd

DESCRIPTION	UNITS	1	2	3	4	5	6	7	8
TIME	AM/PM	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00
CRITICAL PARAMETERS									
LOAD	%	48.6 %	61.5 %	52.5 %	48.8 %	57.0 %	58.5 %	52.0 %	56.5 %
STEAM FLOW	KG/HR	9505	9188	10099	7688	9297	8587	9798	7391
STEAM PRESSURE	KG/CM²	9.35	9.61	9.63	9.67	8.99	9.03	9.88	9.48
WATER FLOW	KG/HR	—	—	—	—	—	—	—	—
WATER LEVEL	%	51.2	47.0	46.3	41.6	58.0	51.2	46.5	53.9
FURNACE TEMP	°C	563.2	605.2	603.2	585.1	600.7	562.5	612.5	539.9
FURNACE DRAUGHT	MMWC	−6.54	−7.31	−6.32	−8.70	−5.32	−6.31	−7.67	−5.30
OXYGEN	%	10.2	10.5	8.8	10.7	10.6	10.7	9.7	10.9
DEAERATOR LEVEL	%	51.7	51.6	53.2	53.4	54.3	70.0	50.5	50.2
DEAERATOR PRESSURE	KG/CM²	0.12	0.11	0.22	0.18	0.12	0.15	0.09	0.14
ECO I/L WATER TEMP	°C	97.5	95.7	90.9	92.6	91.1	88.3	101.3	96.9
ECO O/L WATER TEMP	°C	132.3	134.1	131.2	135.0	124.5	123.6	137.1	133.3
ID FAN OUTPUT	%	68.8 %	62.8 %	60.6 %	60.2 %	58.2 %	61.4 %	58.2 %	65.2 %
FLUE GAS TEMPERATURE									
FURNACE TEMP	°C	—	—	—	—	—	—	—	—
BOILER OUTLET FLUE GAS TEMP	°C	259.8	262.0	271.3	249.9	256.2	259.6	277.4	249.6
ECO OUTLET FLUE GAS TEMP	°C	181.2	183.2	186.5	173.6	177.8	178.7	192.2	176.5
BAGFILTER INLET FLUE GAS TEMP	°C	179.1	184.7	184.8	183.8	178.9	176.5	190.9	175.0
ID FAN INLET FLUE GAS TEMP	°C	152.2	154.7	156.5	153.3	150.9	148.7	155.5	149.5
HYDRAULIC POWER PACK									
HYDRAULIC PACK OIL TEMP-BOILER	°C	40.4	39.7	39.2	38.7	37.5	36.9	36.2	36.1
HYDRAULIC PACK OIL TEMP 1-FHS	°C	39.9	39.6	38.5	37.6	35.4	34.5	33.6	33.3
HYDRAULIC PACK OIL TEMP 2-FHS	°C	35.7	36.5	36.9	37.1	37.0	36.6	35.5	35.3
HYDRAULIC PACK OIL TEMP 3-FHS	°C	35.5	35.1	35.0	34.8	34.2	34.3	34.2	34.2
BAG FILTER									
BAG FILTER 1 TEMP	°C	117.8	117.1	116.5	115.6	114.7	114.6	114.5	115.0
BAG FILTER 2 TEMP	°C	90.5	89.7	89.0	88.6	87.3	86.9	86.5	86.9
BAG FILTER 3 TEMP	°C	123.2	122.1	121.9	121.7	121.8	121.0	120.7	121.4
BAG FILTER DIFFERENTIAL PRESSURE	MMWC	ok	ok	ok	ok	ok	ok	ok	ok

FIELD READING	UNIT	AM/PM	AM/PM	FIELD READING	UNIT	AM/PM	AM/PM
WATER JACKET SC WATER TEMP O/L	°C	—	—	MOVING FLOOR FUEL LEVEL	%	20 %.	20 %.
WATER JACKET SC WATER PRESS AT I/L	KG/CM²	1.8kg	1.8kg	BUNKER FUEL LEVEL	%	80 %	75 %.
FEED WATER DISCHARGE PRESS AT I/L	KG/CM²	17.5kg	17.5kg	ID FAN CURRENT	AMPS	—	—
COMPRESSOR OIL LEVEL	%	ok	ok	MANOMETER READING AT SHELL O/L	MMWC	—	—
COMPRESSOR AIR TEMP	°C	92°c	90°c	MANOMETER READING AT ECO O/L	MMWC	—	—
COMPRESSOR AIR PRESS	KG/CM²	6.7kg	6.9kg	MANOMETER READING AT ID I/L	MMWC	—	—

SHIFT WATER ANALYSIS

DESCRIPTION	UNITS	FEED WATER	BOILER WATER
Total hardness	PPM	—	—
pH value	—	—	—
TDS (max)ppm	PPM	—	2500 conductivity

SHIFT CONSUMPTION

DESCRIPTION	UNITS	ACTUAL	REMARKS
STEAM	KGS	72820	—
FEED WATER	KGS	78646	—
FUEL	KGS	14784	—
SFR	KG/KG	4.93	—
RUN HRS	HOURS	8	—
BED ASH WEIGHT	KGS	—	—
FLY ASH WEIGHT	KGS	—	—

TOTALISER READING

DESCRIPTION	UNIT	INITIAL	CLOSING
STEAM FLOW	KGS	24322.310	24395.130
FEED WATER FLOW	KGS	—	—
FUEL FLOW	KGS	5054.267	5069.051

OTHER POINTS IF ANY:
① (M20-7) Twin screw conveyor Tripar 15:16PM, 16.15PM, 19.52PM, 22.42.
② Rest all normal

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http://tmsapp...OCyROQ0VEQ... | Oracle E-Business Suite R12 | http://tmsapps..._id=3180994177

...thermaxindia.com:8000/OA_CGI/FNDWRR.exe?temp_id=3180994177

...Transaction Report

Date : 22-FEB-23
Page : 1of 7

	Sales Order Description	Transaction PO No. Reciept Type	Move From Sub No.	To SubInv	Trans Date No.	Trans Qty Order No	Balance On Hand Qty	Source Type	Source Name	Project	Job
...00001	BIOMASS BRIQUETTE Purchase	PO Receipt	504-		01-AUG-22	11425	16161				
						1030011848		13600779 order			
2 M1BBQ00001	BIOMASS BRIQUETTE Purchase	PO Receipt	Compo 504-		01-AUG-22	11990	28151				
						1030011848		13600780 order			
3 M1BBQ00001	BIOMASS BRIQUETTE Purchase	PO Receipt	Compo 504-		01-AUG-22	11060	39211				
						1030011980		13600781 order			
4 M1BBQ00001	BIOMASS BRIQUETTE Purchase	PO Receipt	Compo 504-		01-AUG-22	12045	51256				
						1030011848		13600782 order			
5 M1BBQ00001	BIOMASS BRIQUETTE Purchase	PO Receipt	Compo 504-		01-AUG-22	10025	61281				
						1030011848		13600784 order			
6 M1BBQ00001	BIOMASS BRIQUETTE Purchase	PO Receipt	Compo 504-		01-AUG-22	8560	69841				
						1030011979		13600786 order			
7 M1BBQ00001	BIOMASS BRIQUETTE Purchase	PO Receipt	Compo 504-		01-AUG-22	10360	80201				
						1030011980		13600787 order			
8 M1BBQ00001	BIOMASS BRIQUETTE Purchase	PO Receipt	Compo 504-		01-AUG-22	9975	90176				
						1030011848		13600788 order			
9 M1BBQ00001	BIOMASS BRIQUETTE TOESL#9179312	WIP component issue	Compo 504- Compo	54276824	01-AUG-22	-33066	22389	Job or Schedule			

SERUM INSTITUTE OF INDIA PVT. LTD.
Cyrus Poonawalla Group

Thermax Onsite Energy Solutions Limited

SITE NAME : SEZ BIOTECH SERVICES PVT LTD, HADAPSAR, PUNE

A THERMAX GROUP – THERMAX

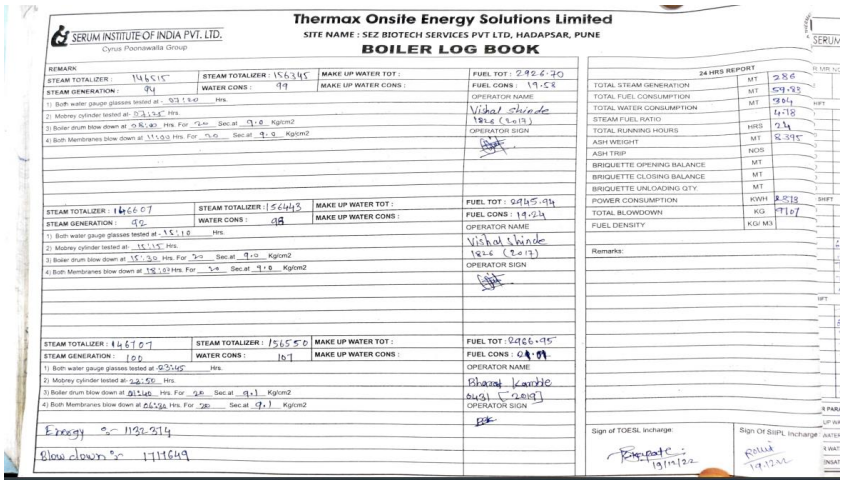
BOILER LOG BOOK

...ER MR NO : MR/ 17970 DATE :- 18/12/2022

...E	BOILER LOAD %	O2 %	ID O/P %	PRESSURE (Kg/cm2/MMWC) STEAM	FURNACE DP	BAG FILTER DP	TEMPERATURE (Deg. C) FURNACE	ECON. FLUE GAS INLET	ECON. FLUE GAS OUTLET	ID FLUE GAS INLET	DEARATOR	ECON. WATER OUTLET	LEVELS % DA TANK	DRUM	FLOW (TPH) STEAM FLOW	PUMP SELECTION FEED PUMP	GRATE...
SHIFT																	SP
...00	61.8	9.0	78.3	9.1	240	-128	784	274	163	146	106	139	70	53	12.5	01	01
...00	70	9.0	78	9.0	-146	240	784	275	164	145	102	133	75	52	11.7	01	01
...00	51	9.0	75	9.1	-169	240	825	275	162	146	102	144	78	48	13.6	01	01
...00	69	9.0	79	9.0	-158	240	829	280	163	146	101	140	76	48	13.0	01	01
...00	63	9.0	76	9.2	-156	240	761	268	162	145	105	139	81	46	11.3	01	01
...00	48	9.0	72	9.2	-200	240	788	271	162	145	108	142	80	49	11.9	01	01
...00	41	9.0	66	9.1	-129	240	789	265	160	145	102	135	80	51	11.7	01	01
...00	39	9.0	70	9.2	-199	240	811	270	160	144	102	142	79	48	12.0	01	01
...D SHIFT																	
...0	39	9.0	71	9.1	-154	240	785	268	160	144	102	135	80	52	11.5	01	01
...0	39	9.0	72	9.1	-157	240	760	272	162	146	101	139	75	49	11.0	01	01
...0	50	9.0	74	9.1	-142	240	799	270	160	145	102	138	82	51	12.8	01	01
...0	50	9.0	71	9.0	-138	240	801	272	161	145	102	140	85	49	13.0	01	01
...	70.0	9.0	79	9.1	-159	240	818	280	163	145	102	141	73	48	12.6	01	01
...	56.4	9.0	76	9.1	-142	240	804	276	163	145	104	139	74	45	12.4	01	01
...	68.6	9.0	77	8.9	-174	240	790	276	160	145	104	135	80	52	12.6	01	01
...	48.6	9.0	75	9.1	-151	240	825	275	160	145	103	135	82	52	12.8	01	01
...HIFT																	
...	55.7	9.0	77	9.2	-162	240	813	277	162	146	106	138	71	48	13.0	01	01
...	59.3	9.0	76	9.1	-149	240	815	276	163	145	104	141	84	52	12.7	01	01
...	48.6	9.0	78	9.0	-170	240	809	276	160	145	106	139	80	49	13.1	01	01
...	49.7	9.0	74	8.9	-122	240	799	274	161	146	105	137	74	48	12.8	01	01
...	70.0	9.0	81	8.8	-98	250	771	276	163	145	105	143	78	50	11.3	01	01
...	56.7	9.0	76	9.1	-146	240	832	280	164	146	106	140	82	53	13.2	01	01
...	70.0	9.0	78	8.8	-163	240	817	284	165	147	105	141	74	49	13.5	01	01
...	70.0	9.0	79	8.6	-136	240	819	281	162	145	104	139	69	54	12.8	01	01

...ER PARAMETER	pH	TDS (PPM)	HARDNESS (PPM)
...E UP WATER	7.0	30	02
...WATER	8.0	50	01
...ER WATER	11.0	1420	01
...DENSATE WATER	7.0	10	Nil

CHEMICAL STOCK	OPENING (KG)	CONSUMPTION (KG)
MAXTREAT 3222	84.5	0.5+0.5+0.5
MAXTREAT 3200	47.6	0.2+0.2+0.2
MAXTREAT 3311	17.5	0.5+0.5+0.5



Thermax Onsite Energy Solutions Limited

SITE NAME : SEZ BIOTECH SERVICES PVT LTD, HADAPSAR, PUNE

BOILER LOG BOOK

SERUM INSTITUTE OF INDIA PVT. LTD.

Cyrus Poonawalla Group

Applied methodologies and standardized baselines:

UCR Protocol Standard Baseline

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

TYPE I - Renewable Energy Projects

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 22.27 MWthermal which is less than the threshold of 45MWthermal as per the applied methodology. The capacity limits specified in the methodologies apply to both 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 installed 22 TPH boiler, however, the total capacity of the units added within the project activity (since 2011, is 45 TPH), and this results in a thermal capacity generation of 28 MWthermal which also complies with capacity limits of the methodology. All boilers are physically distinct from each other.

- 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 SIIL. 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 Green house 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 boilers are constructed by the PP within the boundary. The biomass boilers have unique IDs (MR/15691 and MR/17970), which are visible on the units.

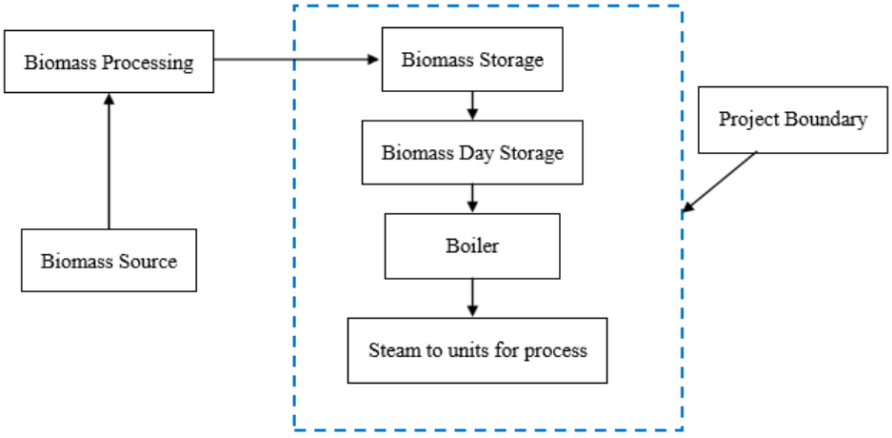
The project activity has earlier applied for registration under the UNFCCC CDM mechanism (link: https://cdm.unfccc.int/Projects/Validation/DB/3KIQ1IZ8MPMHT4GR9N1RKIFYLWNKLD/view.html), however, the Project Proponent has not completed the validation process, nor has generated a CDM registration number or generated carbon credits under the CDM or any other GHG mechanism for the current UCR monitoring and crediting period. 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



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.

	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_2O	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_2O	Excluded	Excluded for simplification. This is conservative.

By using locally sourced GHG-neutral biomass, the PP 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 (ERy) 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:

ERy = BEy - (PEy + LEy)

BEy = Baseline emissions in year y (t CO_2e)

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

$BEy = (HGy * EF_{CO2}) / \eta_{th}$

Where:

HGy = 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.

$EFCO_2$ = 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.

ηth – The efficiency of the boiler using fossil fuel that would have been used in the absence of the project activity

PEy = 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 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 PP must “For microscale and small-scale project activities, apply a default emission factor of 0.0142 tCO2/tonne of biomass”.

LEy = 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. Since biomass residues are not procured from (transported) over a distance of more than 200 kilometres due to the implementation of the project activity, leakage can be neglected.

Hence LEy = 0

	22 TPH Boiler			8TPH Boiler			15 TPH Boiler	
Year	Steam Generation (Ton)	Briquette consumption (Ton)		Steam Generation (Ton)	Briquette consumption (Ton)		Steam Generation (Ton)	Briquette consumption (Ton)
2013	54624.8	13162.5	Jan to Mar	11.1843	2393.394		-	-
2014	81468.6	19532.8		-	-		-	-
2015	94263.9	21577.2		-	-		-	-
2016	90840.1	21551.8		-	-		-	-
2017	87819.8	22307.9		-	-		-	-
2018	91710.4	22554.5		-	-		-	-
2019	93126.8	22726.2		-	-		-	-
2020	83373.3	19396.3		-	-		-	-
2021	80396.1	18683.9		-	-	Jun to Dec	48649	10429
2022	75525.7	19063.7		-	-		98714	20747
Total	**833149.3**	**200556.9**		**11.1843**	**2393.394**		**1,47,363**	**31,176**

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

Year	Baseline Emissions (tCO_2eq)	Project Emissions (tCo_2eq)	Emission Reductions (tCO_2eq)
2013	17271	221	17050
2014	21801	277	21524
2015	25225	306	24919
2016	24309	306	24003
2017	23501	317	23184
2018	24542	320	24222
2019	24921	323	24598
2020	22311	275	22035
2021	34541	413	34128
2022	46644	565	46078
		TOTAL	**261741**

Total Emission Reductions for the current crediting period =**2,61,741** tCO_2eq (**2,61,741** 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 SIIPL, Hadapsar, Pune, Maharashtra - (UCR ID – 273) for the period **01/01/2013 to 31/12/2022** amounts to **2,61,741 CoUs (2,61,741 tCO_2eq)**

SQAC Certification Pvt. Ltd. Mapusa-Goa.

Santosh Nair Lead Verifier (Signature)	Sheetal Wader Verifier (Signature)	Praful Shinganapurkar Senior Internal Reviewer (Signature)

Date: 14/03/2023