



Verification Report for

Project : Renewable Biomass Based Thermal Energy
Generation By Bhani Agro India Pvt Ltd, Wazirpur, UP.
UCR Project ID : 187

Name of Verifier	SQAC Certification Pvt. Ltd.
Date of Issue	November 30, 2022
Project Proponent	M/s Bhani Agro India Pvt. Ltd., Wazirpur, UP, India (BAIPL)
UCR Project Aggregator	M/s Ozone Envirotech Private limited
Work carried by	Mr. Santosh Nair
Work reviewed by	Mr. Praful Shinganapurkar

Summary:

SQAC Certification Pvt. Ltd. has performed verification of the “Renewable Biomass Based Thermal Energy Generation by Bhani Agro India Pvt. Ltd., Wazirpur, UP, India”. The project activity is thermal energy generation project using a biomass (rice husk) 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 rice husk for the generation of Thermal energy by displacing fossil fuel (coal), it meets the primary applicability criteria of the methodology.

Verification for the period : : **18/01/2021 to 31/12/2021**

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). Owing to the Covid pandemic, the verification was done remotely by way of video calls / verification, phone calls and submission of documents for verification through emails.

SQAC is able to certify that the emission reductions from Renewable Biomass Based Thermal Energy Generation By Bhani Agro India Pvt. Ltd., Wazirpur, UP, India, (UCR ID – 187) for the period **18/01/2021 to 31/12/2021** amounts to **26,624 CoUs (26,624 tCO₂eq)**



Detailed Verification Report:

Purpose:

The project activity by Bhani Agro India Pvt Ltd (BAIPL) is a rice mill manufacturing facility, involving the installation of a 14 TPH biomass (rice husk) based boiler. The primary technology for the project activity involves direct combustion of carbon neutral biomass fuel 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 boiler of 14 TPH capacity has outlet parameters of 10.54 kg/cm² (pressure) and 180 °C (temperature). The boiler was first steam tested on 09/11/2020 which is taken as the commissioning date of the project activity. However, actual production at the project activity began on 18/01/2021.

The project activity is 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.



The technical specifications of biomass (rice husk) based boiler are as follows:

Specification	Value
Capacity of Boiler	14 TPH
Temperature	180 °C
Number of Boilers	1
Pressure	10.54 kg/cm ²
Feed Material	Rice Husk approx 81 TPD
Enthalpy of Steam*	2.777 MJ/kg
Operation days/annum	330 days/yr, 24hrs/day
Enthalpy of water @80 °C*	0.335 MJ/kg
Boiler Rating	$14 \times (2.777 - 0.335) / 3.6 = 9.50 \text{ MW}_{\text{thermal}}$
NCV Rice Husk	3314 kcal/kg
Moisture Content Rice Husk	7.03%
NCV Coal	6823 kcal/kg
Feed Water Temp	80 °C

Location of project activity:

Country: India

Site: Malhipur Road,

Village: Wazirpur

District: Bahraich

State: Uttar Pradesh (U.P.)

Latitude: 27° 37' 23.88" N

Longitude: 81° 39' 13.968" E



Start Date of Crediting Period	: 18/01/2021
Project Commissioned	: 09/11/2020
Commissioning date of boiler	: 09/11/2020

Scope:

The scope covers verification of emission reductions from the project - Renewable Biomass Based Thermal Energy Generation by Bhani Agro India Pvt. Ltd., Wazirpur, UP, India, (UCR ID – 187).

Criteria:

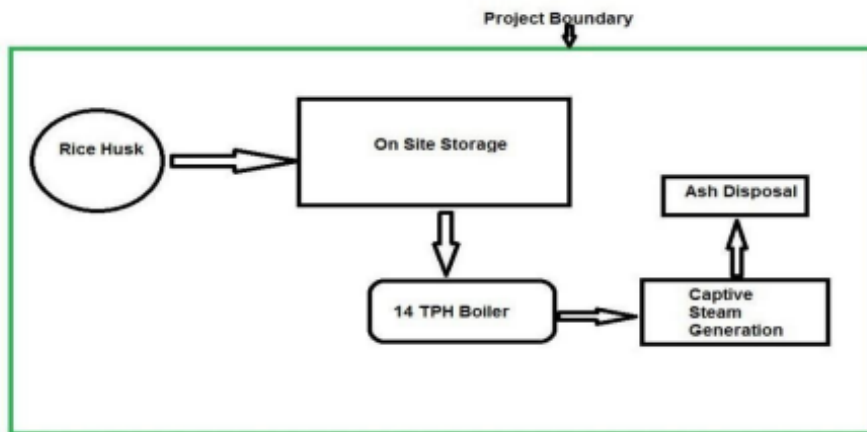
Verification criteria is as per the requirements of UCR Standard.

Description of project:

The project activity is the installation of a biomass (rice husk) fired boiler for steam generation. The generated steam is utilized for meeting the process requirement. In the baseline scenario the steam was generated through a coal-based boiler, to meet BAIPL's process requirement. The project activity would have installed a coal-based boiler instead of a (husk) biomass-based boiler for steam generation thus the project activity is environment friendly and leads to GHG emission reduction.

Prior to implementation of the project, the steam demand of BAIPL, would have been satisfied by fossil fuel (coal) based boilers. The installed biomass boiler generates steam to meet the demand of recipient plant and displaces 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. 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 thus reduces Greenhouse gas (GHG) emissions associated with the combustion of coal in baseline boilers. The project activity promotes 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.

The CO₂ emission due to the combustion of husk is neutralized by the photosynthesis process of paddy crops. Hence, it "recycles" atmospheric carbon and does not add to the greenhouse effect. And also the husk contains negligible quantities of nitrogen and sulphur, hence the other greenhouse gas (GHG) from the combustion of husk can be neglected for estimating carbon credits/offsets (CoUs). 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 technology is available within India from reputed manufactures.




During paddy/rice processing activities, rice husk is generated as a waste by-product and is stored in the husk yard within the project boundary. A conveyor belt continuously feeds the rice husk into the boiler. BAIPL consumes approximately 241 kg of rice husk for each ton of steam produced for the captive steam requirements, hence about 3.374 tonnes of rice husk is required per hour, and 81 tonnes of rice husk is consumed per day.

Year 2021	Rice Husk (Biomass) tonnes consumed/month
January	1010
February	1840
March	2096
April	2093
May	1545
June	1512
July	1597
August	1330
September	1995
October	2113
November	2090
December	2102

The total GHG emission reductions achieved in this monitoring period is as follows:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	18/01/2021
Carbon credits claimed up to	31/12/2021
Total ERs generated in this crediting period (tCO _{2eq})	26,624 tCO _{2eq}
Leakage	NA



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Sector-6, Dwarka, New Delhi-110075

10-Jan-2022 Calibration Report

Model No. ATD 720-EIHS4AS-1-C-AHD-11C-B-11A0-F1-0000
Customer: BHANI AGRO INDIA PRIVATE LIMITED
Serial Number: 22W16 (C4000041106956)

Result: Passed

Custom Cal Range: 0.000 to 4000.000 Pa Tolerance: 0.0128 mA

Applied Pressure	Output	Error	Expected	Actual	Error	Pass/Fail
%Span	Pa	Pa	Output (mA)	Output (mA)	(mA)	
100.00	4000.00	3999.700	-0.3000	20.0000	19.9963	-0.0012 Pass
75.00	3000.00	3001.100	1.1000	16.0000	16.0044	0.0044 Pass
50.00	2000.00	2001.000	1.0000	12.0000	12.0040	0.0040 Pass
25.00	1000.00	1001.400	1.4000	8.0000	8.0056	0.0056 Pass
0	0.00	0.000	0.0000	4.0000	4.0000	0.0000 Pass

Transmitter Configuration: LRV to URV: 0.000 to 4000.000 Pa

Pressure: 9 kg/cm²
Temp: 135 to 170 °C

Comm Mode: Analog/HART Damping: 0.50 Sec
Fail-safe Mode: High Conformity: Linear

Standards: Traceability and calibration Due Dates
08-Sep-22
Transmitter Calibrated by: Ashwini Kr Singh

Click to show one page at a time

302859

सत्यापन प्रमाण-पत्र

मानव-उत्पन्न सिद्ध

अनुसूची-आठ
(विधिम 16 (3) देखिये)
उत्तर प्रदेश सरकार
बिधिक माप विज्ञान, नियन्त्रण का कार्यलय
सत्यापन प्रमाण-पत्र

बिधिक माप विज्ञान अधिकारी का नाम **मानव-उत्पन्न सिद्ध**

मे सत्यापन प्रमाण-पत्र प्रस्तुत है कि मेरे आज दिनांक 23.1.2022 को **श्री. अश्विनी कृ. सिंग** द्वारा **मानव-उत्पन्न सिद्ध** के विद्युतीय से सम्बन्धित योके उपकरणों का सत्यापन और सत्यापन/अनुमोदन कर दिया है।

क्र.सं.	उपकरण	अधिकारी का नाम	रीडिंग के उपकरण			माप के उपकरण	सत्यापन योके	वहन प्रमाण	
			माप	अज्ञात	पूर्ण				विशेषता
1	2	3	4	5	6	7	8	9	10
			Weigh Bridge Cap 150 capacity 150kg e 150kg (11)				24	500	
			Tare Bin Cap 150kg capacity 150kg (11)				29	500	

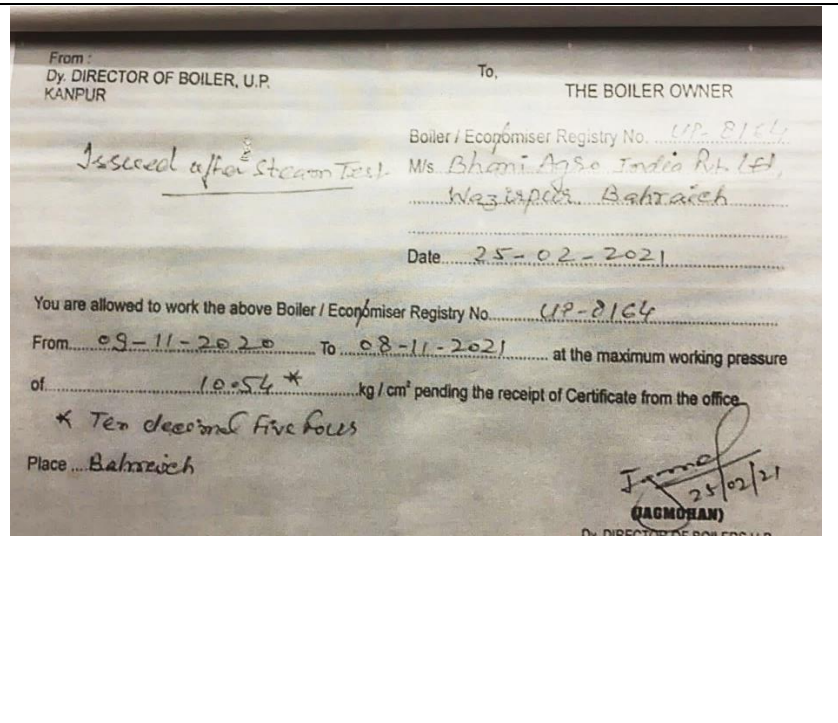
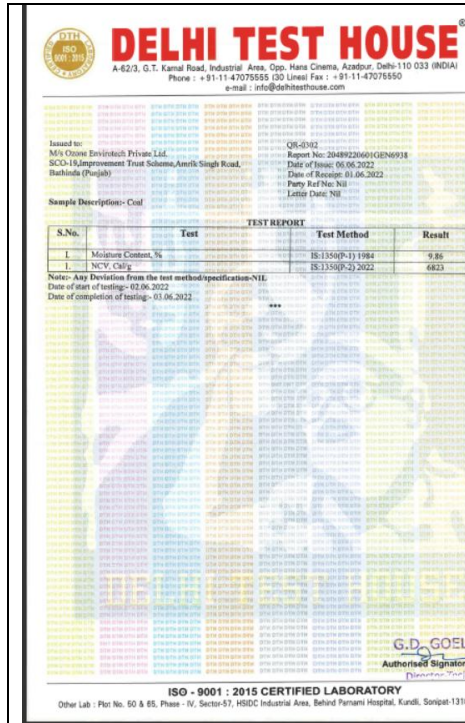
उपरोक्त उपकरणों के गुणवत्ता की जांच के लिए **श्री. अश्विनी कृ. सिंग** द्वारा सत्यापन प्रमाण-पत्र प्रस्तुत किया गया है।
उपरोक्त उपकरणों का सत्यापन प्रमाण-पत्र प्रस्तुत किया गया है।
माप विज्ञान (उत्तर प्रदेश) अधिनियम, 2011 के
विधिम 23 (1) के अन्तर्गत जारी है।

अपने सत्यापन का दिनांक 23.1.2022

दिये गये - अवकीर्णकारी, मापों और के सम्बन्ध में बिधिक माप विज्ञान अधिकारी प्रत्येक माप के सिद्ध अवकीर्णकारी सिद्ध करने का कारण उपरोक्त करने के लिए बिधिक माप विज्ञान का प्रमाण-पत्र प्रस्तुत किया है।

बिधिक माप विज्ञान अधिकारी का कार्यलय
उत्तर प्रदेश सरकार
बिधिक माप विज्ञान
वाराणसी

वीथिका माप विज्ञान-20-11-2021-(1716)-0000 पुराने (80/80/अवकीर्णकारी)
3 Vialika Map 2021 Data 40



Level of Assurance:

The verification report is based on the information collected through interviews conducted over video calls / phone calls, 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 Verifier, Mr. Santosh Nair, who is 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. Naman Agarwal : M/s Bhani Agro India Pvt. Ltd.
2. Mr. Pradeep Bansal : M/s Ozone Envirotech Private limited

Documentation Verified:

- Project Concept Note (PCN)
- Monitoring Report (MR)
- Calibration Reports
- Coal Test Report
- Commissioning Certificate
- Monthly steam chart records

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 (rice husk) 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 rice husk 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 9.5MW thermal which is less than the threshold of 45MW thermal as per the applied methodology.
- The biomass used by the project plant is not stored for more than one year.

- The project activity is neither a co-generation nor co-firing system, therefore this condition is not applicable in the case of BA IPL project activity.
- Biomass generated steam is used for captive use.
- The project activity replaces the fossil fuel based thermal energy generation. There was no renewable energy-based system prior to the project activity.
- Thermal energy generation capacity is 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 project is not registered with any other voluntary market (National or International). Agreement for Double Counting Avoidance from Proponent has been provided duly signed on 12/10/2022

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 Coal co-fired in the Project Activity	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.

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.

This is a new installation and the energy generating equipment is not transferred from another activity or the existing equipment was not transferred to another activity. So, no leakage is considered.

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.

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

Technology of the energy generation system		new coal fired boiler
Default efficiency		85%
Enthalpy – Extracted Steam	663.4	Kcal/kg
Enthalpy of boiler feed water	80	Kcal/kg
Energy – Extracted Steam	235	TJ/annum
Days of operation	287	

Baseline emission for coal-based cogeneration plant

Efficiency of Cogen	Values	UoM
Thermal output	235.5	TJ/annum
Electrical Output	0.0	MWh/annum
Total energy produced (thermal + electrical)	235.5	TJ/annum
Thermal energy of the Coal at 85% boiler efficiency	0	TJ/annum
Emission factor of Coal	96.10	tCO ₂ / TJ
Efficiency of the baseline cogeneration plant	85.00%	%
Emission reductions	26624	tCO ₂ / TJ

Year - 2021	Steam	Rice Husk	Temp	Pressure	Boiler inlet temp	Shutdown days
Jan 18 to 31	4060	1010	180	9.5	74	17 days - production started on Jan 18
Feb	7728	1840	179	10	78	3 days
Mar	8834	2096	180	10	80	4 days
Apr	8708	2093	180	10	82	3 days
May	6348	1545	180	9	80	10 days
Jun	6232	1512	180	9	80	9 days
Jul	6770	1597	179	9	82	8 days
Aug	5590	1330	179	9	80	12 days
Sep	8386	1995	180	10	80	3 days
Oct	8876	2113	180	10	80	3 days
Nov	8760	2090	180	9	78	3 days
Dec	8834	2102	180	9	76	3 days
	89126	21323				

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:

$$BE_y = (HG_y * EFCO_2) / \eta_{th}$$

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.

EFCO₂ = The CO₂ emission factor per unit of energy of the fuel that would have been used in the baseline plant in (tCO₂/TJ), obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used.

EFCO₂ = 96.1 tCO₂/TJ IPCC - 2006 guidelines for National Greenhouse Gas inventories got stationary combustion

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 = 0 since quantity of coal consumed during the monitoring period (18/01/2021 to 31/12/2021) = 0

LE_y = 0. Leakage emissions. There is no transfer of energy generating equipment or existing equipment to another activity. Further, emissions arising during the transportation of husk to the site is nil.

Issuance Period: 18/01/2021 to 31/12/2021

$$\begin{aligned} E_{Ry} &= BE_y - (PE_y + LE_y) \\ &= (HG_y * EFCO_2) / \eta_{th} - (PE_y + LE_y) \\ &= [(235.5 \times 96.10) / 85\%] - (0 + 0) \\ &= 26624 \end{aligned}$$

Total Emission Reductions for the current crediting period (2021) = **26,624 tCO₂eq (26,624 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 documents 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 Bhani Agro India Pvt Ltd, Wazirpur, UP - (UCR ID – 187) for the period **18/01/2021 to 31/12/2021** amounts to **26,624 CoUs (26,624 tCO₂eq)**