



Verification Report for

Project : TEIL Biomass Grid Supply Power Project, Deoband,
Uttar Pradesh

UCR Project ID : 328

Name of Verifier	SQAC Certification Pvt. Ltd.
Date of Issue	October 10, 2023
Project Proponent	Triveni Engineering and Industries Ltd. (TEIL)
UCR Project Aggregator	Carbon Equalizers, Katni
Work carried by	Mr. Santosh Nair
Work reviewed by	Mr. Praful Shinganapurkar

Summary:

SQAC Certification Pvt. Ltd. has performed verification of the “TEIL Biomass Grid Supply Power Project, Deoband, Uttar Pradesh, India”. The purpose of the project activity is to generate electricity using renewable biomass and thereby reduce GHG emissions by displacing fossil fuel dominated grid based electricity with biomass based renewable electricity.

Verification for the period: **01/01/2013 to 31/12/2022** (10 Years, 00 Months)

The GHG emission reductions were calculated on the basis of UCR Standard for Baseline Grid Emission Factor, CDM UNFCCC Methodology, ACM0006: Grid connected renewable electricity generation (Ver.16.0). 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 TEIL Biomass Grid Supply Power Project,

Deoband, Uttar Pradesh, India, (UCR ID – 328) for the period **01/01/2013 to 31/12/2022** amounts to **4,54,456 tCO₂ (4,54,456 CoUs)**

Detailed Verification Report:

Purpose:

The project activity is a 22.0 MW totalled installed capacity cogeneration project activity and displaces the carbon intensive grid energy mix with a renewable, carbon neutral energy source, the project activity reduces carbon dioxide emissions over the project life.

The commissioning date or start date of this UCR project activity is 04/12/2004 (the date on which power export and grid synchronization to the 132 KV substation was started as per UCR guidelines). The project activity uses bagasse as fuel in its cogeneration power unit, which is a renewable bio-mass fuel and does not add any net carbon-dioxide to the atmosphere because of the carbon recycling during growth of sugar cane. Therefore, the project activity leads to zero CO₂ on site emissions associated with bagasse combustion.

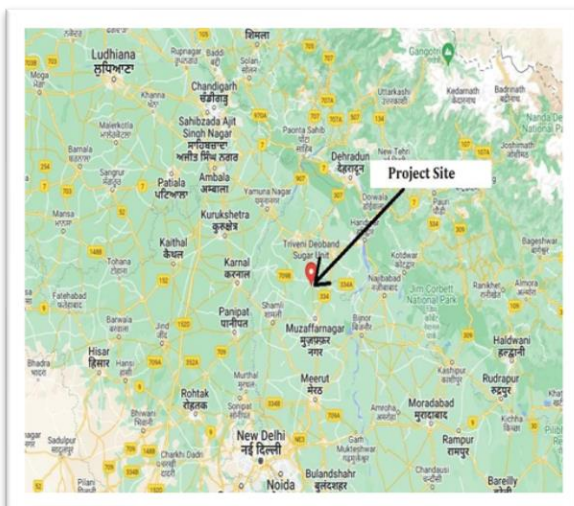
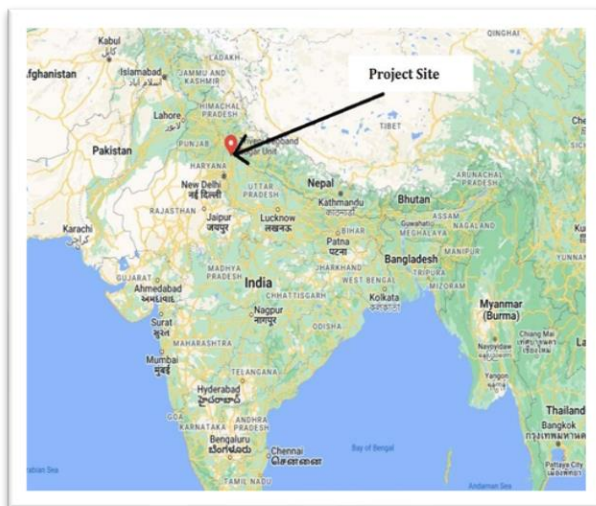
The project activity is a grid-connected biomass (bagasse based) cogeneration power plant with a high pressure steam-turbine configuration. The high-pressure boilers are fired by bagasse, a biomass by-product from the sugar manufacturing process, to generate steam which in turn is fed to the steam turbine to generate power. The overall business is integrated with alcohol distillation and power generation. The power co-generation units generate biomass-based power for captive consumption of the sugar plant and the sale of surplus power to the state grid. The project plant exports power to the Uttar Pradesh Power Corporation Limited (UPPCL), in absence of the project activity, UPPCL would have withdrawn electricity from northern regional grid.





Location of project activity:

Country : India
Village : Deoband,
District : Saharanpur,
State : Uttar Pradesh,
Country : India
Longitude : 77°40' 6" E
Latitude : 29°40' 30" N





Scope:

The scope covers verification of emission reductions from the project - TEIL Biomass Grid Supply Power Project, Deoband, Uttar Pradesh, India, (UCR ID – 328).

Criteria:

Verification criteria is as per the requirements of UCR Standard.

Description of project:

The project activity involves the renewable biomass (bagasse) based electricity generation within the Triveni Engineering & Industries Ltd (TEIL) plant located at Village: Deoband, District: Saharanpur, State: Uttar Pradesh. The purpose of the UCR project activity is to utilize the available sugar mill generated bagasse to generate steam and electricity for internal use and to export the surplus electricity to the Uttar Pradesh Power Corporation Limited (UPPCL) grid (part of Northern regional grid). UCR carbon credits are being claimed on the emission reductions due to power exported to the grid only.

The majority of the total electricity produced, is exported to the Uttar Pradesh Power Corporation Limited (UPPCL), with 16.17 MW being exported from the plant during the cane crushing season and 19.16 MW during the off-season period. The emission reductions from the project activity come from the avoidance of carbon dioxide emissions from fossil fuel use in Northern grid. The project activity supplied approximately 561065 MWh of renewable power to the grid during this monitored period.



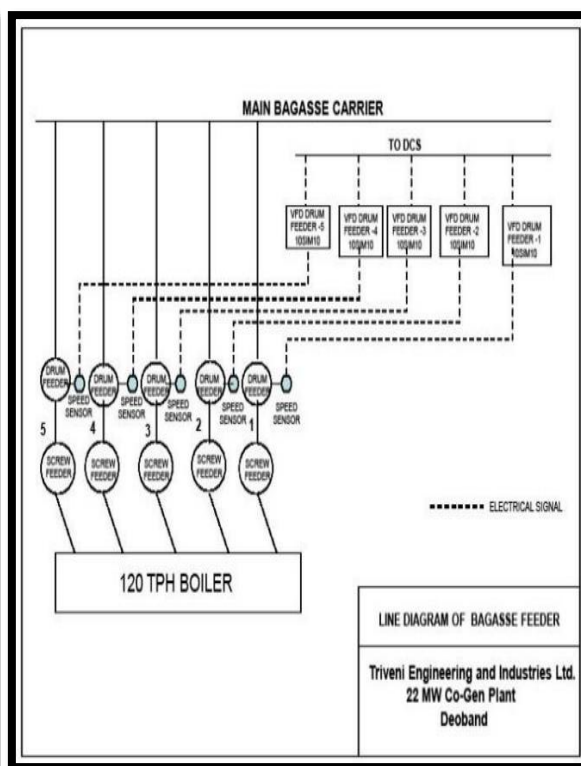
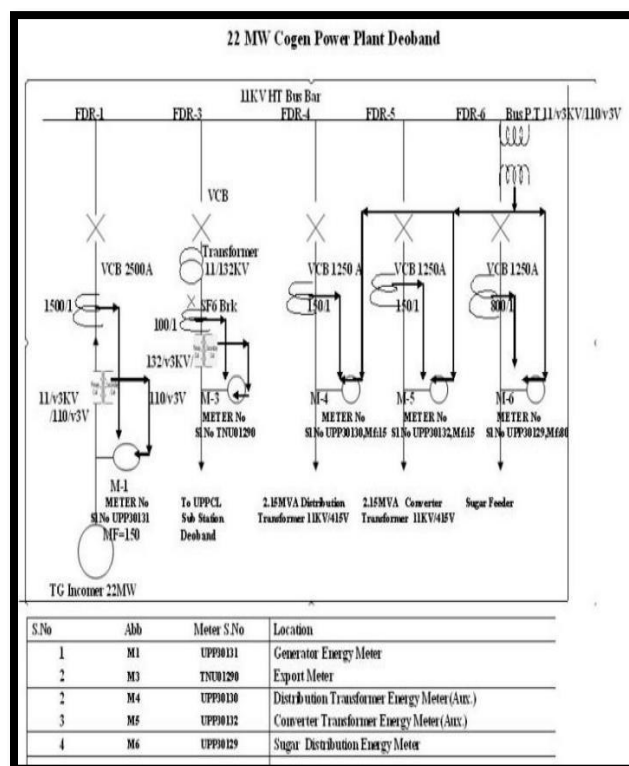
The UCR project activity is the construction and operation of a power plant/unit that uses renewable energy sources and supplies renewable electricity to the grid. The UCR project activity is thus the displacement of electricity that would be provided to the grid by more-GHG-intensive means and provides long-term benefits to the mitigation of climate change. The UCR project activity qualifies under the environmental additional positive list of pre-approved project types under the UCR carbon incentive model for issuance of voluntary carbon credits.

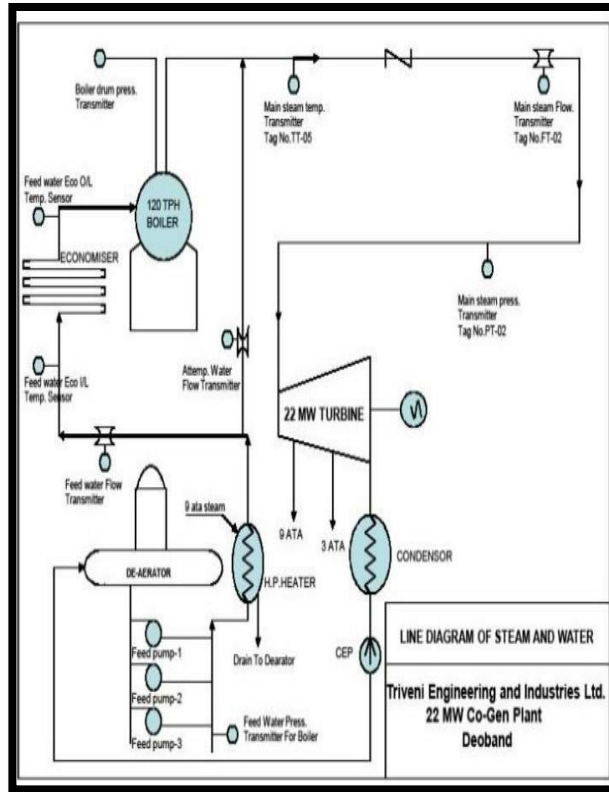
Boiler Details:

Description	1 number of water tube
Steam generating capacity (tons per hour)	120
Steam pressure (kg/cm ²)	87
Steam temperature (°C)	515

Turbine Details:

Description	1 number of extractions cum condensing turbine
Power (Kw)	22000
Steam inlet pressure (Kg/cm ²)	84





INSTRUMENT DETAILS	
Steam Flow:	
Make	Emerson
Sr. No	S 0196056
Steam Pressure:	
Make	Emerson
Sr. No	S 0196038
Steam Temperature	
Make	Emerson
Sr. No	S-196303
ENERGY INSTRUMENT DETAILS	
ENERGY METERS	
Make	SECURE
Sr. No	APM04100
Model	APEX
Class	0.2S for active and reactive
Make	SECURE
Sr. No	APM04101
Model	APEX
Class	0.2S for active and reactive
Auxiliary Consumption Meters	
Serial no.	UPP30130
Serial no.	UPP30132
Accuracy class	0.2s
Gross Generation Meter	
Serial No.	UPP30131
Accuracy class:	0.2s

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.

Review of the following documentation was done by SQAC Verifier, Mr. Santosh Nair, who is experienced in such projects.

Documentation Verified:

- Project Concept Note (PCN)
- Monitoring Report (MR)
- JMR's
- Month wise Quantity of biomass residue combusted in the project plant.
- Commissioning Certificate
- Calibration Certificates
- Data provided upon request of all the documents of the related project.



- MIS Report
- Boiler Log Sheet
- Invoice

Sampling:

Not applicable

Person interviewed:

1. Mr. Ashish Awasti : Triveni Engineering and Industries Ltd.
Group General Manager - Technical & Coordination
2. Mr. Manish Saxena - Corporate Planning : Triveni Engineering and Industries Ltd.
3. Mr. Vipin Jindal - Addl. GM : Triveni Engineering and Industries Ltd.
4. Mr. Nani Gopal Gope - Addl. G. M (P.P) : Triveni Engineering and Industries Ltd.
5. Mr. Sanu Chaudhary - Asst. G. M (E & I) : Triveni Engineering and Industries Ltd.

Corrective Action Requests (CARs)

Corrective Action Requests (CARs) and their resolutions are listed below:

There is only 1 CAR:

CAR 1:

The Net quantity of electricity supplied to the grid as per JMR & Invoice is not matching with the ER statement.

Response from Project Participant

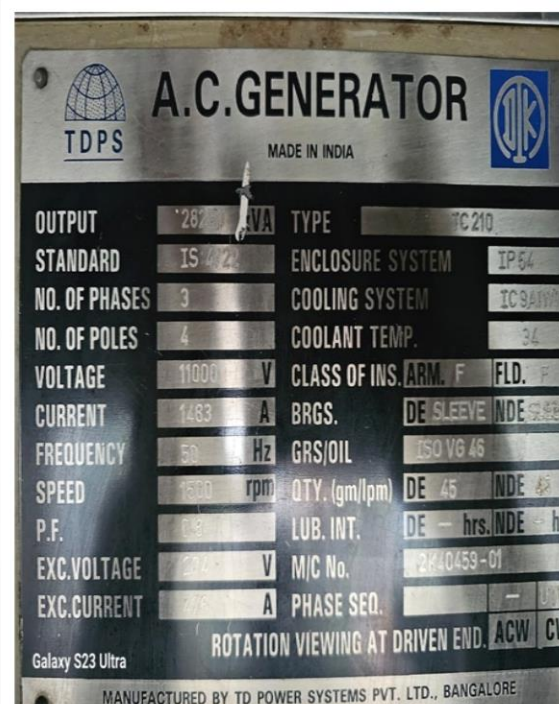
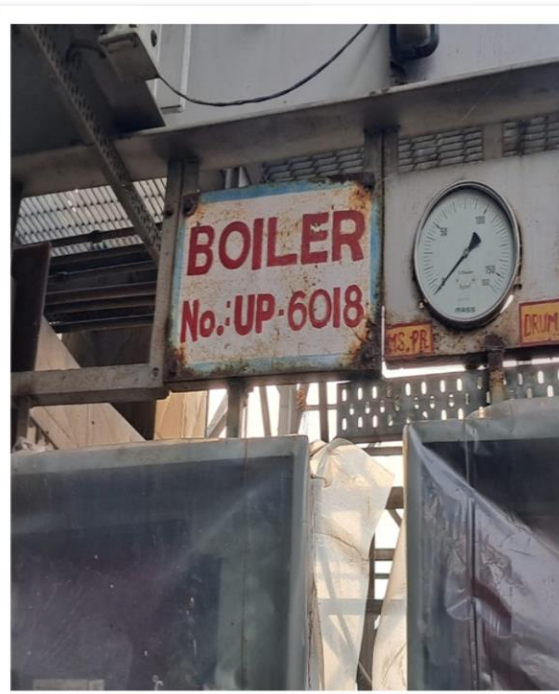
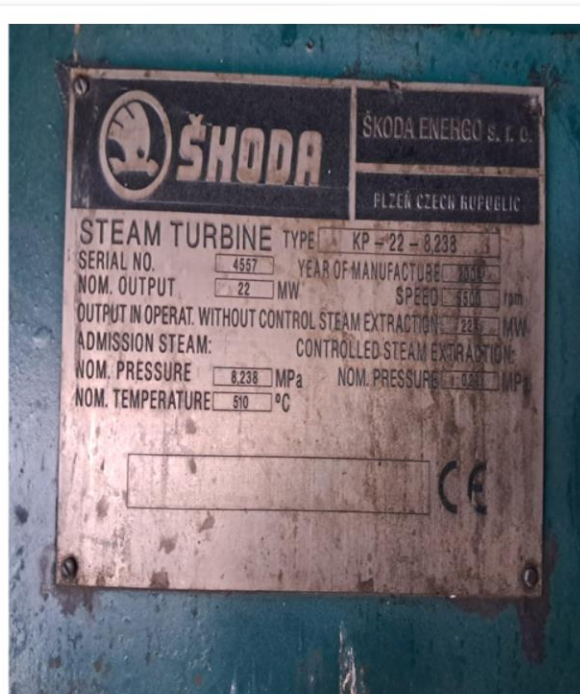
The correction has been made in the ER sheet and accordingly Monitoring Report (V02) has been released after incorporating the related corrections.

Conclusion by Verification Team

Verified Monitoring Report (V02) for correction and found to be matching as per requirement.

Hence

Corrective Action Request CAR-1 is closed.





Applied methodologies and standardized baselines:

UCR Protocol Standard Baseline

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

TYPE I - Renewable Energy Projects (Large Scale)
UCR Positive List Environmental Additionality

SCALE - Large Scale

CATEGORY - ***ACM0006 Large-scale Consolidated Methodology
Electricity and heat generation from biomass, Version 16.0***

This methodology is applicable to project activities that operate biomass (co-) fired power and-heat plants. The project activity includes the installation of new plants at a site where currently power or heat generation occurs. The new plant replaces or is operated next to existing plants (capacity expansion projects). Project types included under this methodology are co-generation of power and heat using biomass. Typical activities include capacity expansions, as is the the current UCR project activity.

UCR CoU Standard is used to determine the baseline grid emission factor for the 2013-2022 period.

Application of methodologies and standardized baselines

- The project activity is a power generation project using a biomass (bagasse) and displaces CO₂ emissions from electricity generation in power plants that are displaced due to the project activity. Since the project activity utilises biomass (bagasse) for the generation of power and supplies it to the local grid, it displaces fossil fuel (coal), and hence it meets the primary applicability criteria of the methodology. In the absence of the project activity TEIL would be generating and consuming the power produced in-house and no export of electricity to grid would take place; the grid-based power plants would have to generate similar quantum of power in the absence of the project activity.
- The project activity is a power-and-heat plant that encompasses cogeneration plants, i.e., power-and-heat plant in which at least one heat engine simultaneously generates both process heat and power. The total installed capacity of project



activity is 22 MW which is acceptable as per the applied large-scale methodology.

- The installation of a new biomass residue fired power generation unit, which replaces or is operated next to existing power generation capacity fired with either fossil fuels or the same type of biomass residue as in the project plant (power capacity expansion projects) is also included in this methodology.
- For the purposes of this methodology, heat does not include waste heat, i.e., heat that is transferred to the environment without utilization, for example, heat in flue gas, heat transferred to cooling towers or any other heat losses.
- The biomass used by the project plant is not stored for more than one year. 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.
- The Project Activity uses biomass residues from a production process (e.g., production of sugar), and 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) or in other substantial changes (e.g., product change) in this process.
- The project activity unit does not co-fire fossil fuel and/or does not exceed the limit of 25% co-firing fossil fuel criteria as per the UCR Protocol for such projects. Implementation of the project activity has no direct/ indirect effect on the bagasse production in the facility. The bagasse production is guided by the sugar cane availability and sugar demand in the market. The sugar manufacturing process is driven by market demand and implementation of a Cogeneration power unit has no direct or indirect impact on raw processing.
- Biomass generated power is used for direct grid supply and for meeting the captive needs at the facility. The project activity involves the grid-connected bagasse-based electricity generation capacity involving the installation of facilities for allowing the export of electricity to the regional grid.
- Biomass is not sourced from dedicated plantations. The existing installed turbogenerators are fired by bagasse, a by-product of the sugarcane processing and a biomass residue.



- Bagasse is burnt in boilers as generated from the sugar mill and does not require any specific technology for its preparation before combustion. No fuel preparation equipment has been installed at site for preparation of bagasse. Hence no significant energy quantities are required to prepare the biomass residues for fuel combustion.
- The project activity also does not include any GHG emissions related to the decomposition or burning of biomass. The baseline heat emissions for the project activity are not included in the project boundary nor does it claim for emission reductions from heat.

Applicability of double counting emission reductions

The biomass boilers and turbines are constructed by the project proponent within the project boundary. The biomass boilers, turbines and energy meters have unique IDs, which is visible on the units.

The UCR project activity had been registered as a CDM project activity under the title: Deoband Bagasse based Co-generation Power Project (CDM Project ID 0578) by the PP.

CDM Registration Date	03/11/2006
CDM Crediting Period	01/11/2004 - 31/10/2014 (Fixed)
CERs Issued (MR Period 1)	190404 CERs (Period 01/11/2004 – 31/03/2007)
CERs Issued (MR Period 2)	82917 CERs (Period 01/04/2007 – 31/03/2008)
CERs Issued (MR Period 3)	87860 CERs (Period 01/04/2008 – 31/05/2010)
CERs Issued (MR Period 4)	34385 CERs (Period 01/06/2010-31/05/2011)
CERs Issued (MR Period 5)	25632 CERs (Period 01/06/2011-29/02/2012)

Hence the UCR project activity has never been issued voluntary carbon credits for the current 2013 2022 vintage years and hence there is no double counting of the credits envisioned. Additionally, the same has been stated in the undertaking provided in the Double Counting Avoidance Assurance Document (DAA) by TEIL. This last CDM (fifth) monitoring report associated with TEIL project activity covered the period from 01/06/2011 to 29/02/2012 (both days included). This UCR monitoring report does not cover any period of time which was part of the previous monitoring report, since the PP has decided not to claim any further credits under the CDM program (i.e., post 29/02/2012) and is seeking CoUs under the UCR program. Additionally, the same has been stated in the undertaking provided in the Double Counting Avoidance Assurance Document (DAA) by TEIL dated 25.09.2023.



Project boundary, sources and greenhouse gases (GHGs)

The project boundary includes the physical, geographical site(s) of the project power plant and all power plants connected physically to the electricity system that the project activity is connected to.

Leakage Emissions (LE_y)

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

Hence **LE_y = 0**

	Source	GHG	Included?	Justification/Explanation
B a s e l i n e	GHG Emissions from fossil fuel in Grid Baseline Power Generation	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.
	Uncontrolled burning or decay of surplus biomass residue	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.
p r o j e c t A c t i v i t y	Emissions from Biomass Project Activity	CO ₂	Included	No fossil fuel / electricity is consumed at the project site due to the project activity. Biomass residue transportation using default values are applied.
	On-site fossil fuel and electricity consumption due to the project activity (stationary or mobile)			This is conservative.
	Transportation of biomass residue	CH ₄	Excluded	Excluded for simplification. This is conservative.
	Combustion of biomass residue for electricity and / or heat generation	N ₂ O	Excluded	Excluded for simplification. This is conservative.
	Storage of biomass residue			



Project Emissions (PE_y)

The project emissions (PE_y) under the methodology may include:

- CO_2 emissions from transportation of biomass residue to the project site,
- CO_2 emissions from on-site consumption of fossil fuels due to project activity,
- CO_2 emissions from electricity consumption at the project site that is attributable to the project activity and
- CH_4 emissions from combustion of biomass.

where

PET_y = Default project emissions resulting from transport of biomass residues as determined by following the provisions from the TOOL12, taking into account the following transport routes:

- For biomass residues:
 - (i) If the biomass residues are consumed without further processing, the route shall include only the transport of the biomass residues between the biomass processing facility or the biomass generation site and the biomass residues utilization facility;
 - (ii) As an alternative to the monitoring of the parameters needed to calculate the emissions from the transportation, project proponents may apply the following options:
- For large-scale project activities, apply a net-to-gross adjustment of 10%, i.e., multiply the emission reductions determined based on the applied methodology by 0.9 to determine the final amount of emission reductions that can be claimed.

PEFF_{CO₂, y} = are the CO_2 emissions during the year y due to fossil fuels co-fired by the generation facility in tons of CO_2 ,

PE_{EC, y} = are the CO_2 emissions during the year y due to electricity consumption at the project site that is attributable to the project activity in tons of CO_2 ,

GWP_{CH₄} = is the Global Warming Potential for methane valid for the relevant commitment period and,

PE_{Biomass, CH₄, y} = are the CH_4 emissions from the combustion of biomass during the year y.

The proposed project activity does not have any CO_2 emissions due to fossil fuel co-firing and from electricity consumption at site. The project activity also doesn't include the CH_4 emissions from the combustion of biomass.

Hence,

PEFF_{CO₂, y} = 0,

PE_{EC, y} = 0 and,

PE_{Biomass, CH₄, y} = 0.



Establishment and description of baseline scenario (UCR Protocol)

The baseline scenario identified 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.

The baseline emissions due to displacement of electricity are determined by net quantity of electricity generation as a result of the project activity (incremental to baseline generation) during the year y in MWh times the CO₂ emission factor for the electricity displaced due to the project activity during the year y in tons CO₂/MWh

Given that steam and electric power generation for internal consumption is part of the present project activity, emission reductions are only claimed from on-site incremental power generation that is injected to the grid. Therefore, the baseline scenario is the emission of GHG from the present electricity generation mix of the UPPCL grid in the northern region.

Emission Reductions (ER_y) is 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 CO_{2e})

$$BE_y = EG_{pj,y} * EF_{grid,y}$$

Where:

EG_{grid,y}= Quantity of net electricity generation that is fed into the local grid as a result of the implementation of the project activity in year y (MWh)

EF_{grid,y} = The CO₂ emission factor for grid connected power generation in year y calculated using UCR Standard emission factor (0.9 tCO₂/MWh).

PE_y = Project activity emissions are calculated by applying a net-to-gross adjustment of 10%, i.e., multiply the emission reductions determined based on the applied methodology by 0.9 to



determine the final amount of emission reductions that can be claimed.

LE_y = Leakage emissions = 0

For this methodology, it is assumed that transmission and distribution losses in the electricity grid are not influenced significantly by the project activity and are therefore not accounted for and also the UCR grid emission factor results in conservative estimates of the carbon credits.

Direct off-site emissions in the project activity arise from the biomass residue transport. The same type of CO₂ emission occurs during transportation of coal from coal mines to thermal power plants (supplying power to state grid). The biomass is collected from the nearby sources and is transported by trucks to the project site. Each truck laden with biomass is weighed on the electronic weighbridge and the corresponding readings are noted in the plant log books. For the current monitoring period transport project emissions are calculated by applying a net-to-gross adjustment of 10%, i.e., multiply the emission reductions determined based on the applied methodology by 0.9 to determine the final amount of emission reductions. The reported values of the quantity of biomass transported can be verified against the plant records.

Year	Power Export in MWh	Bagasse Cons. in MT
2013	49125.6	160830
2014	45136.2	150487
2015	45953.8	157857
2016	53242.7	174372
2017	69941.3	216112
2018	67828.7	221571
2019	54273.6	210654
2020	61817	237291
2021	56129.1	214985
2022	57617	235003
Total	561065	1979162



Emission Reductions:

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Total Exported (MWh)	49125.60	45136.20	45953.76	53242.68	69941.28	67828.68	54273.60	61817.04	56129.11	57617.88	561065.83
Baseline Emissions BEy (tCO ₂)	44213	40622	41358	47918	62947	61045	48846	55635	50516	51856	504956.00
Project Emissions PEy (tCO ₂)	4422	4063	4136	4792	6295	6105	4885	5564	5052	5186	50500.00
Emission Reductions ERy (tCO ₂) (BEy - PEy)	39791	36559	37222	43126	56652	54940	43961	50071	45464	46670	454456.00

Total Emission Reductions (ER_y) = 4,54,456 tCO₂ (4,54,456 CoUs)

Conclusions:

Based on the audit conducted on the basis of UCR Protocol, which draws reference from UCR Standard for Baseline Grid Emission Factor, CDM UNFCCC Methodology ACM0006: Grid connected renewable electricity generation (Ver.16.0), 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 - TEIL Biomass Grid Supply Power Project, Deoband, Uttar Pradesh, India (UCR ID – 328) for the period **01/01/2013 to 31/12/2022** amounts to **4,54,456 tCO₂ (4,54,456 CoUs)**

Santosh Nair
Lead Verifier (Signature)



Praful Shinganapurkar
Senior Internal Reviewer (Signature)

Date: 10/10/2023