



PROJECT CONCEPT NOTE



Title: 26 MW Bagasse based Co-generation by M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd. Dist. Ahmednagar, Maharashtra.

Version 1.0

Date 15-06-2024

First CoU Issuance Period: 28/08/2019 to 31-12-2023 (04 Years 4 months 3day)

Crediting Period: 28/08/2019 to 31-12-2023 (04 Years and 4 months 3day)

7 AFFORDABLE AND
CLEAN ENERGY



8 DECENT WORK AND
ECONOMIC GROWTH



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



13 CLIMATE
ACTION




PROJECT CONCEPT NOTE

BASIC INFORMATION	
Title of the Project activity	26 MW Bagasse based Co-generation by M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd. Dist. Ahmednagar, Maharashtra.
Scale of the project activity	Large Scale
Completion date of the PCN	15-06-2024
Project Participants	<p>Project Proponent: M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd. A/P Shrigonda Factory Tal. Shrigonda, Dist. Ahmednagar - 413726</p> <p>Aggregator: Climekare Sustainability Pvt Ltd.</p> <p>UCR ID: 336812961</p>
Host Party	India
Applied methodologies and standardized baselines	<p>CDMUNFCCC Methodology</p> <p>ACM0006: Electricity and heat generation from biomass(Ver.16) & UCR Standard for Emission Factor</p>
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated total amount of average GHG emission reductions per year	15,336 tCO ₂ eq/yr or (15,336 CoU/yr)

SECTION A. Description of Project Activity

A.1.Purpose and general description of Carbon offset Unit (CoU) project activity >>

The Project Titled “26 MW Bagasse based Co-generation by “M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd.” is a bagasse-based Co-Generation (co- gen) Power Project successfully commissioned by Maharashtra State Electricity Transmission Company Limited (MSETCL) and operational since 28/08/2019. The Project is owned by M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd. (hereby to be called as Project Proponent, PP).


MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

(A Govt. of Maharashtra undertaking)
CIN: U40109MH2005SGC153645

Phone no:02412353645
Fax no: 0241 2344585
Email: seahmednagar@gmail.com
Website: www.mahadiscom.in

Office of the, Superintending Engineer,
O&M Circle, Ahmednagar.
Old Power House, New Admn.Bldg,
Station Road, Ahmednagar - 414 001.

No.SE/ANRC/TECH/HT/DYEEAMR/15083 Date: 19 SEP 2019

CERTIFICATE
TO WHOM SO EVER IT MAY CONCERN

This is to certify that 132 KV Line Bay, 132 KV LILO line erected & commissioned for 26 MW bagasse based co-generation power project in r/o M/s. Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd, Shrigonda Factory, Tal-Shrigonda Dist. Ahmednagar. Cons.No.153209014050. Start up power connection released on 10.08.2019.

Co-generation power project synchronised with the grid on date 28.08.2019 at 23.50HRs as per MOM on dtd 28.08.2019.

This certificate is issued on request letter dated 30.08.2019 from M/s. Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd, Shrigonda Factory, Tal-Shrigonda Dist. Ahmednagar. Cons.No.153209014050.

(Santosh Sangale),
Superintending Engineer
Ahmednagar

To,
M/s. M/s. Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd,
Shrigonda Factory, Tal-Shrigonda
Dist. Ahmednagar. Cons.No.153209014050

Copy S.w.rs.to:

- 1) The Chief Engineer (Comm), MSEDCL, Prakashgad, Mumbai 400051.
- 2) The Chief Engineer, MSEDCL, Nashik Zone, Nashik.
- 3) The Chief Engineer, MSETCL, EHV O & M zone, Nashik.

Purpose of the project activity:

The PP has set up an integrated new sugar mill with sugar crushing capacity of 5000 TCD and installs 26 MW commissioning on 28/08/2019 Bagasse based Cogeneration power plant. This will remove the dependency of the sugar mill on the power supplied from the state grid. Power generated from this project activity will be used for meeting plant requirement. After fulfilling its captive energy requirement, remaining power will be sold to the state grid as per

the Power Purchase Agreement.

The Co-gen power project of 26 MW capacity will operate on bagasse only for 120 to 140 days during season days. Actual number of mill operation days will be mentioned in the monitoring period. At designed level, the project will generate clean energy and after meeting the captive requirement export the surplus energy to Maharashtra State Electricity Transmission Company Limited (MSEDCL). All the steam and power requirements of the sugar mill and co-gen power plant will be met internally from the project itself.

The purpose of the project activity is to generate electricity using renewable biomass (i.e. Bagasse) and thereby reduce GHG emissions by displacing the fossil fuel dominated grid based electricity with biomass based renewable electricity. The electricity produced by the project is directly contributing to climate change mitigation by reducing the anthropogenic emissions of greenhouse gases (GHGs) into the atmosphere by displacing an equivalent amount of fossil power at grid. Hence, project activity is displacing the estimated annual net electricity generation i.e., **19,000 MWh/yr** from the Indian grid system, which otherwise would have been generated by the operation of fossil fuel-based grid-connected power plants. The project activity doesn't involve any GHG emission sources. The estimated annual CO₂e emission reductions by the project activity are expected to be **15,336 tCO₂e/yr**, whereas actual emission reductions achieved during the first CoU period shall be submitted as a part of first monitoring and verification

The project activity employs 26 MW aggregated generator along with a boiler of 140 TPH with high pressure and temperature configuration (87Kg/Cm², 515°C).





Site Photos

The project activity is the construction and operation of a power-plant/unit that uses renewable energy sources and supplies electricity to the grid as well as generate heat for the captive consumption at 5000 TCD sugar mill. The 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.

A.2 Do no harm or Impact test of the project activity >>

There are social, environmental, economic and technological benefits which contribute to sustainable development.

Social benefits:

- The project activity contributes to employment generation in the local area for both skilled & unskilled people for operation and maintenance of the equipment. The project creates several permanent jobs.
- It has created steady higher value jobs and skilled workers at the facility. The project activity is contributing to the national energy security by reducing consumption of fossil fuels.
- The technology being used in the project is proven and safe for power generation. An increase in such kind of projects shall enable all the technology suppliers to continuously innovate and modernize on the technology front. The local people will know the technological advancement and will help in capacity building.

Environmental benefits:

- The project activity is a renewable energy project, which utilizes biomass as a fuel for power generation and heat, a move that is voluntary and not mandated under current environmental laws of India. Since this project activity generates green energy in the form of power and heat, it has positively contributed towards the reduction in (demand) use of finite natural resources like coal, gas and oil, minimizing depletion and in turn increasing its availability to other important purposes. Therefore, this project activity helps to environment sustainability by reducing GHG emission in the atmosphere.
- Indirect capacity building by providing a case example to other sugar mills in the region for switching to high capacity cogeneration configuration, for electricity generation. In addition to the reduction in carbon dioxide (CO₂) emissions the project implementation will result in reduction of other harmful gases (NO_x and SO_x) that arise from the combustion of coal used in power generation. The project activity also leads to reduce ash generation since the ash content in bagasse is lower than that of Indian coal.
- The bagasse generated in sugar mills in the region is generally in excess and hence get disposed in unplanned ways including dumping into nearby land or rivers. This will be reduced.
- A case was filed in the National Green Tribunal (NGT) concerning an explosion at a sugar factory. The incident involved the rupture of a molasses tank, leading to the release of untreated sewage into the Ghod River. Following the accident, the factory management promptly reported the incident to regulatory authorities, including the Maharashtra Pollution Control Board (MPCB). On the same day, February 10, 2022, MPCB officials visited the site and prepared an onsite observation report. The report link is provided below.

[https://greentribunal.gov.in/sites/default/files/news_updates/Joint%20Committee%20Report%20in%20OA%20No.85-2022%20\(page%20nos.91-124\).pdf](https://greentribunal.gov.in/sites/default/files/news_updates/Joint%20Committee%20Report%20in%20OA%20No.85-2022%20(page%20nos.91-124).pdf)

- Subsequently, following the NGT application no. 85/2022 (WZ) and caveat no. 12/2022, the state pollution control board issued directives to the factory to prepare a damage assessment report. In response, the factory management engaged Vasantdada Sugar Institute (VSI), Pune, to conduct the damage assessment. VSI is an NABET-accredited Environment Impact Assessment (EIA) consultant. The detail link of damage assessment report (DAR) is given below,

<https://drive.google.com/file/d/14CmzuMY076EpseKBG2MwavHPliR3mGaS/view?usp=sharing>

Some highlights of remedies taken by project proponent are as follow, same also mentioned in DAR.

- The factory management took immediate action to control and remove the molasses from outside premises. In the control action, the management took following steps:
- Stopped the flow of molasses in the natural drainage (nalla) by constructing temporary bunds.
- Deployed tankers to collect the molasses from the nalla

- Used vehicle mount diesel engine pumps to collect the molasses in tankers.
- Brought the tankers to the factory premises and stored the molasses from tankers into spent wash storage constructed lagoons of distillery unit.
- Used scraping material such as bagasse to prevent spread of molasses in the surrounding field.
- The management could able to control and restrict the flow of molasses within 800 m (aerial distance) from the distillery premises.
- Prevented the spread molasses in the surrounding agriculture and/ or open land to maximum extent.
- Closed the distillery operation till the action of molasses removal from natural environment gets completed.

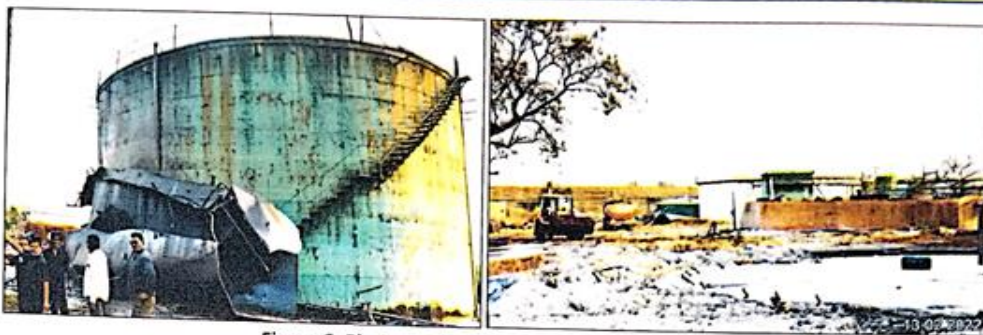


Figure 6: Photographs of the damaged area

- Immediate control measures implemented by the factory management after the incident:





Figure 7: Removal of contaminated soil



Figure 8: Construction of temporary bunds on natural drain to restrict the flow of molasses

Image: Photograph's taken during remedial action.

- Reply on behalf of respondent (Project proponent) in this case,
([https://greentribunal.gov.in/sites/default/files/news_updates/Reply%20by%20R-1%20in%20OA%20No.85-2022%20\(page%20nos.160-243\).pdf](https://greentribunal.gov.in/sites/default/files/news_updates/Reply%20by%20R-1%20in%20OA%20No.85-2022%20(page%20nos.160-243).pdf))
- After reviewing all the damage assessment reports and responses from the respondents (Project proponent), the Maharashtra Pollution Control Board (MPCB) granted consent to operate to the project proponent. The letter as follows,

MAHARASHTRA POLLUTION CONTROL BOARD																											
Tel: 24010706/24010437 Fax: 24023516 Website: http://mpcb.gov.in Email: cac-cell@mpcb.gov.in		Kalpataru Point, 2nd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022																									
No:- Format1.0/CAC/UAN No.MPCB-CONSENT-0000113835/CR-2112001256		Date: 23/12/2021																									
To, Sahakar Maharshi Shivajirao Narayanrao Nagawade SSK Ltd., Plot No 52/2, Limpangaon Village, Tal- Shrigonda, Dist. - Ahmednagar.																											
Sub: Renewal of Consent for 3500 TCD with amalgamation of 26 MW Co-generation unit, under RED category.																											
Ref: <ol style="list-style-type: none"> 1. Earlier consent granted vide no. Format1.0/CAC-CELL/UAN NO.0000022957-17/R/CAC-1709000637 dated 16.09.2017. 2. Earlier consent granted vide no. Format1.0/CAC/UAN No.MPCB-CONSENT-0000069715/CO-2101001161 dated 28.01.2021 3. Minutes of 7th CAC meeting held on 13.10.2021 & 29.10.2021. 																											
Your application No.MPCB-CONSENT-0000113835 Dated 04.08.2021																											
For: grant of Consent to Renewal under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:																											
<ol style="list-style-type: none"> 1. The Consent to Renewal is granted upto: 31.07.2022 2. The capital investment of the industry is Rs.89.6793 (Sugar unit) + 130.4350 (Co-generation unit) Total - 220.1143 Crs. Crs. (As per C.A Certificate submitted by industry). 3. Consent is valid for the manufacture of: 																											
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 10%;">Sr No</th> <th style="width: 40%;">Product</th> <th style="width: 30%;">Maximum Quantity</th> <th style="width: 20%;">UOM</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Sugar</td> <td>15840</td> <td>MT/M</td> </tr> <tr> <td>2</td> <td>MOLASSES</td> <td>5760</td> <td>MT/M</td> </tr> <tr> <td>3</td> <td>PRESS MUD</td> <td>5760</td> <td>MT/M</td> </tr> <tr> <td>4</td> <td>BAGASSE</td> <td>40320</td> <td>MT/M</td> </tr> <tr> <td>5</td> <td>Co-generation</td> <td>26</td> <td>MW</td> </tr> </tbody> </table>				Sr No	Product	Maximum Quantity	UOM	1	Sugar	15840	MT/M	2	MOLASSES	5760	MT/M	3	PRESS MUD	5760	MT/M	4	BAGASSE	40320	MT/M	5	Co-generation	26	MW
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Pollution Board Consent to Operate for the period upto 31/07/2022

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010706/24010437
Fax: 24023516
Website: <http://mpcb.gov.in>
Email: cac-cell@mpcb.gov.in



Kalpataru Point, 2nd and 4th
floor, Opp. Cine Planet Cinema,
Near Sion Circle, Sion (E),
Mumbai-400022

No:- Format1.0/CAC/UAN No.MPCB-
CONSENT-0000139366/CR/2211000908

Date: 11/11/2022

To,
Sahakar Maharshi Shivajirao Narayanrao Nagawade
SSK Ltd.,
Plot No 52/2, Limpangaon Village,
Tal- Shrigonda, Dist. - Ahmednagar.



Your Service is Our Duty

Sub: Renewal of Consent for 3500 TCD sugar and 26 MW Co-generation unit, under RED category.

Ref: 1. Earlier consent granted vide no. Format1.0/CAC-CELL/UAN No. MPCB-CONSENT-0000113835/CR-2112001256 dated 23.12.2021.
2. Minutes of 6th CAC meeting held on 30.08.2022.

Your application No.MPCB-CONSENT-0000139366 Dated 15.06.2022

For: grant of Consent to Renewal under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

- The Consent to Renewal is granted upto: 31.07.2023**
- The capital investment of the industry is Rs.Existing - 220.1143 Crs. + Expansion - 6.6896 Crs. Total - 226.8039 Crs. Crs. (As per C.A Certificate submitted by industry).**
- Consent is valid for the manufacture of:**

Sr No	Product	Maximum Quantity	UOM
1	Sugar	15840	MT/M
2	Molasses	5760	MT/M
3	Press mud	5760	MT/M
4	Bagasse	40320	MT/M
5	Co-generation	26	MW

-
-
-
- Conditions under Water (P&CP) Act, 1974 for discharge of effluent:**

Sr No	Description	Permitted in CMD	Standards to	Disposal
1.	Trade effluent	398	As per Schedule -I	48 CMD shall be 100 % recycle & 350 CMD shall be used on land for irrigation.

Pollution Board Consent to Operate for the period upto 31/07/2023

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010706/24010437
Fax: 24023516
Website: <http://mpcb.gov.in>
Email: cac-cell@mpcb.gov.in



Kalpataru Point, 2nd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

No:- Format1.0/CAC/UAN No.MPCB-
CONSENT-0000174430/CR/2310001612

Date: 22/10/2023

To,
Sahakar Maharshi Shivajirao Narayanrao Nagawade
SSK Ltd.,
Plot No 52/2, Limpangaon Village,
Tal- Shrigonda, Dist. - Ahmednagar. Maharashtra



Sub: **Renewal of consent to operate**

- Ref:
1. Earlier consent granted vide no. Format1.0/CAC/UAN No.MPCBCONSENT-0000139366/CR/2211000908 dated 11.11.2022.
 2. Minutes of 11th CAC meeting held on 30.08.2023.
 3. Application submitted by Industry vide UAN no. MPCB-CONSENT-0000174430 for consent to operate

Your application No.MPCB-CONSENT-0000174430 Dated 30.06.2023

For: Grant of Consent to Renewal under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 and Rule 18(7) of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. **The Consent to Renewal is granted upto: 31.07.2024**
2. **The capital investment of the industry is Rs.Existing - Rs. 226.8039 Crs. + Expansion - Rs. 79.152 Crs. Total - Rs. 305.9559 Crs. Crs. (As per C.A Certificate submitted by industry).**
3. **Consent is valid for the manufacture of:**

Sr No	Product	Maximum Quantity	UOM
1	Sugar	15840	MT/M
2	Molasses	5760	MT/M
3	Press mud	5760	MT/M
4	Bagasse	40320	MT/M
5	Co-generation	26	MW

Pollution Board Consent to Operate for the period upto 31/07/2024



STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY

सत्यमेव जयते

Environment department,
Room No. 217, 2nd floor,
Mantralaya, Annexe,
Mumbai- 400 032.
Date: September 11, 2019

To,
M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade SSK Ltd.
at Gat. No. 52/2

Subject: Environment Clearance for Proposed 26 MW bagasse based Co-generation unit
Sir,

This has reference to your communication on the above mentioned subject. The proposal was considered as per the EIA Notification - 2006, by the State Level Expert Appraisal Committee-I, Maharashtra in its 161st meeting and recommend the project for prior environmental clearance to SEIAA. Information submitted by you has been considered by State Level Environment Impact Assessment Authority in its 174th meetings.

2. It is noted that the proposal is considered by SEAC-I under screening category Category B, Sr. No. 1 (d) as per EIA Notification 2006.

Brief Information of the project submitted by you is as below :-

1.Name of Project	Proposed 26 MW bagasse based co-generation unit by M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade SSK Ltd, Plot No 52/2, Limpangaon Village, Tal- Shrigonda, Dist- Ahmednagar, Maharashtra
2.Type of institution	Private
3.Name of Project Proponent	M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade SSK Ltd.
4.Name of Consultant	M/s SGM Corporate Consultants Pvt. Ltd.
5.Type of project	Industrial Project
6.New project/expansion in existing project/modernization/diversification in existing project	It is a Proposed New Project of 26 MW bagasse based Co-generation Plant with 180 Operational days.
7.If expansion/diversification, whether environmental clearance has been obtained for existing project	Not Applicable
8.Location of the project	Gat. No. 52/2
9.Taluka	Shrigonda
10.Village	Limpangaon
Correspondence Name:	Mr. R.S.Naik
Room Number:	Gat. No. 52/2
Floor:	Not Applicable
Building Name:	M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade SSK Ltd.
Road/Street Name:	Not Applicable
Locality:	Village- Limpangaon, Tal- Shrigonda, District- Ahmednagar
City:	Shrigonda
11.Whether in Corporation / Municipal / other area	Grampanchayat Limpangaon
12.IOD/IOA/Concession/Plan Approval Number	Not Applicable IOD/IOA/Concession/Plan Approval Number: Not Applicable Approved Built-up Area: 5545
13.Note on the initiated work (If applicable)	Not Applicable
14.LOI / NOC / IOD from MHADA/ Other approvals (If applicable)	Not Applicable
15.Total Plot Area (sq. m.)	331800
16.Deductions	Not applicable

SEIAA Meeting No: 174 Meeting Date: August 28, 2019 (SEIAA-STATEMENT-0000001083)
SEIAA-MINUTES-0000002445
SEIAA-EC-0000001975

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Shri. Anil Diggikar (Member Secretary SEIAA)

Explanation of release of untreated sewage into the Ghod river of the case on behalf of PP,

Water and effluent management – sugar industry Main source of water is Ghod Left Bank Canal and the industry has obtained permission from Irrigation Dept., Pune for withdrawal of water. As per the records, the average daily consumption of fresh water is 800 m³/day and mainly used for process (cooling water & machinery cleaning water) @ 240 m³/day, utilities i.e. sugar industry boiler feed @ 600 m³/day, cooling tower make-up & ancillary activities @ 220 m³/day and domestic purpose @ 25 m³/day respectively.

The main sources of effluent generation from process are; mill house section, boiling house section (multiple effect evaporators), vacuum pans, centrifugal section, process condensate contaminated with concentrated juice, ancillary activities (rotary vacuum filter cleaning & gland leakages from pumps, pipelines etc.) and fresh water RO reject & boiler blowdown streams. The management of process effluent & condensate and condensate/blowdown streams from utilities are briefed as follows: —

Process effluent management: Effluent generating from mill house section, centrifugal section & boiling house section is collected separately and channelized into ETP for treatment. The industry has provided ETP of reported designed capacity of 1,000 m³/day and the reported effluent generation from the process is about 850 m³/day (at full cane crushing capacity), out of which fresh water RO reject & utility boiler blowdown @ 250 m³/day is recycled in the process. Hence, the actual effluent generation from the process is 600 m³/day.

The various unit operations & processes of ETP are; Process effluent ◇ V Notch chamber ◇ Bar screen chamber ◇ Grit chamber ◇ O&G skimmer ◇ Surge tank ◇ Equalization tank with sparge aeration (lime addition) ◇ Primary clarifier ◇ Anaerobic holding tank-1 & 2 ◇ Anaerobic filter ◇ Bio tower ◇ Tube settler ◇ Activated sludge process ◇ Secondary clarifier (with RAS recycling) ◇ Supernatant collection tank ◇ Pressure sand filter ◇ Activated Sand filter ◇ Treated effluent collection tank ◇ Treated effluent discharge to unlined lagoon (15 day storage capacity) for irrigation as per CTO conditions.

Primary & secondary sludge from tube settler & clarifiers ◇ Sludge holding tank ◇ Sludge drying beds (02 nos., 20x5x2 m each) ◇ Soil conditioner.

Process condensate management: As informed, excess condensate from multiple effect evaporators & pan evaporators are collected separately and treated in newly commissioned ETP – condensate polishing unit (CPU). The industry has provided separate ETP (CPU) of reported designed capacity of 1,200 m³/day.

The various unit operations & processes of ETP (CPU) are; Excess condensate ◇ Two stage cooling tower ◇ Equalization tank with diffused aeration ◇ Anaerobic filter ◇ Activated sludge process ◇ Secondary clarifier ◇ Flash mixer (with addition of alum & poly electrolyte) ◇ Filter feed tank ◇ Chlorination ◇ Multi grade filter ◇ Activated Sand filter ◇ Treated condensate collection tank ◇ Treated condensate is reused in recirculation pump cooling & its accessories and spray pond make-up. Also, treated condensate is reused in utilities (cooling tower make-up) after treatment through softner. Excess treated condensate is channelized to fresh water reservoir for reuse in process (sugar & distillery unit).

Secondary sludge from clarifiers of CPU of sugar & distillery industry is handled in a common

sludge drying bed of ETP of sugar industry.

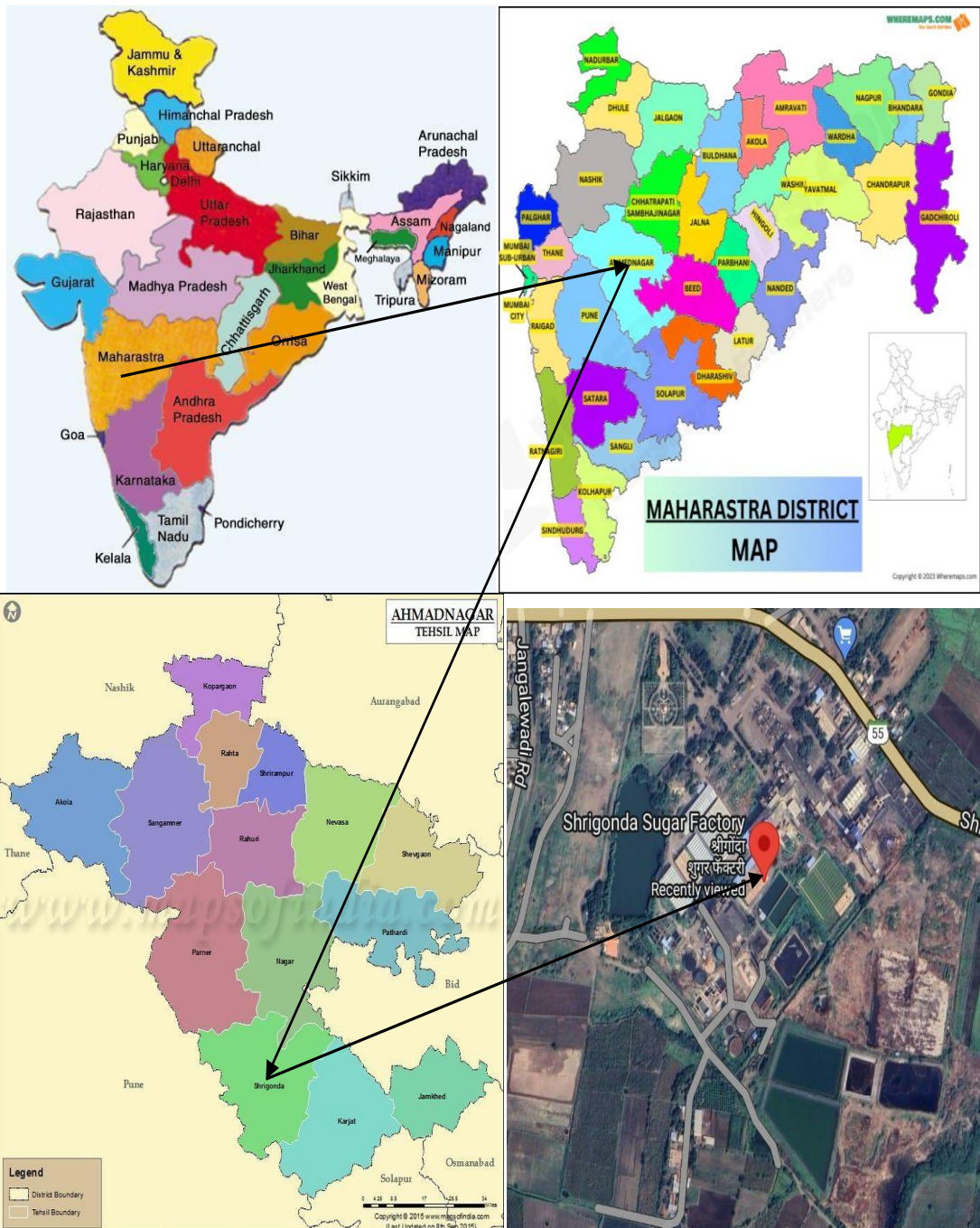
All this treated water is used for agricultural purposes. To facilitate this, the sugar factory has signed agreements with individual farmers, specifying that the water is strictly for agricultural use. Each farmer ensures that the water is used exclusively for this purpose.

Economic benefits:

- The project activity creates employment opportunities during the project stage and operation and maintenance of the Co-gen power plant.
- The project activity helps in conservation of fast depleting natural resources like coal and oil thereby contributing to the economic wellbeing of country as a whole.
- The increase in demand of bagasse exerted by the project has had a local effect on its price and generates additional revenue for the sugarcane farmers. The project activity results in saving the coal and allowing it to be diverted to other needy section of the economy.
- The various other benefits due to the project activity ensure that the project is contributing to the sustainable development of the region by bringing in green technologies and processes to a backward region. The technology is indigenous and by implementing such projects the country is showcasing its GHG mitigation actions in its efforts to combat climate change.

A.3. Location of project activity >>

Country	:	India
Village	:	Shrigonda
State	:	Maharashtra
Latitude	:	18°35'26"N
Longitude	:	74°37'08"E



A.4. Technologies/measures >>

The UCR project activity is a grid-connected bagasse based cogeneration power plant with a high pressure steam-turbine configuration. The UCR project activity is the electricity generation capacity and the installation of facilities for allowing captive use and export of electricity to the electricity grid.

The technology of biomass residue based high steam pressure power generation itself is known and in use in India. The use of high pressure system allows for increased efficiency levels for electricity generation.

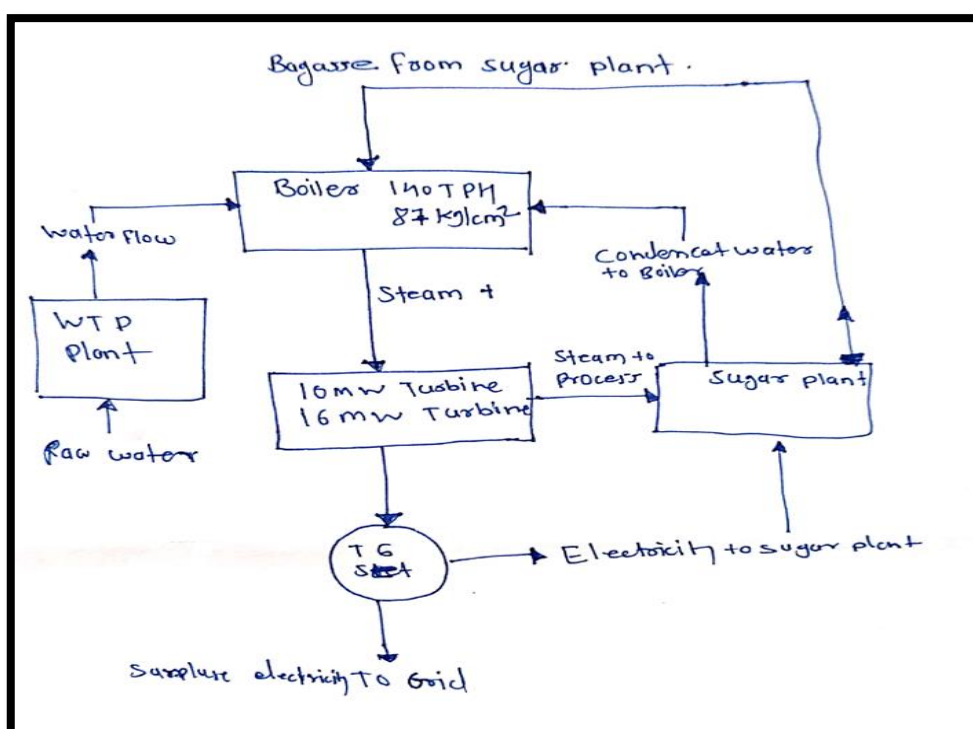
The main elements of the power plant are as follows.

- A boiler unit which converts the energy available in the fuels into thermal energy;
- A steam turbine unit which converts thermal energy into mechanical energy;
- An alternator unit, which converts mechanical energy into electrical power.

A number of other equipment components, as listed below, also form part of the biomass power plant.

- Fuel and ash handling equipment © Universal CO2 Emission and Offset Registry Private Ltd
- Water cooled condenser system for cooling the exhaust steam - DM Water system and Air Compressor Plant
- Electrical systems and Automation system

The project activity involves 140 TPH boiler with high pressure and temperature configuration (88kg/cm²ata and 515 °C). The Project activity in a process flow diagram can be expressed as below:



Some of the salient features of the project equipment can be found in the below mentioned table:

Boiler	No. 1
Manufacturer	SS Engineers, Pune
Registration No.	MR/ 17782
Capacity	140TPH
Type	Water Tube
Steam Temperature	515°C +-5°C
Design Pressure	100Kg/Cm ²
Main Fuel	Bagasse

Turbine	No. 1	No. 2
Power Rated (KW)	10000	14800
Turbine Speed (RPM)	8303	7034
Gear Box Type	Double Helical	Double Helical
Steam Exhaust Pressure	1.5(Kg/cm ² g)	2.48(BARA)
Oil Cooler Type	Shell & Tube	Shell & Tube

A.5. Parties and Project Participants >>

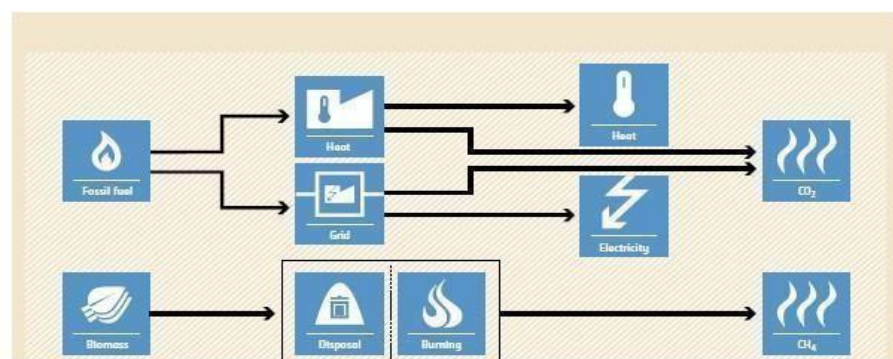
Project activity does not involve any public funding from Annex I Party, which leads to the diversion of the official development assistance.

Party (Host)	Participants/Aggregator
India	<p>Project Owner: M/s Sahakar Maharshi Shivajirao Narayanrao Nagawade Sahakari Sakhar Karkhana Ltd. Dist. Ahmednagar Maharashtra.</p> <p>Project Aggregator: Climekare sustainability Pvt. Ltd. UCR ID: 336812961</p>

A.6. Baseline Emissions >>

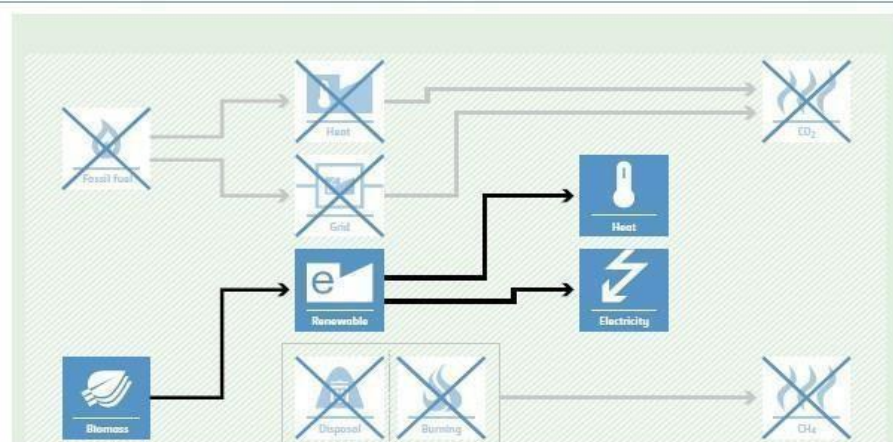
BASELINE SCENARIO

Electricity and heat would be produced by more-carbon-intensive technologies based on fossil fuel or less-efficient biomass power and heat plants. Biomass could partly decay under anaerobic conditions, bringing about methane emissions.



PROJECT SCENARIO

Use of biomass for power and heat generation instead of fossil fuel or increase of the efficiency of biomass-fuelled power and heat plants. Biomass is used as fuel and decay of biomass is avoided.



The proposed project activity uses bagasse as fuel for cogeneration unit. The bagasse being a renewable bio- mass fuel does not add any net carbon-dioxide to the atmosphere because of the carbon recycling during growth of sugar cane. Therefore, the project activity will lead to zero CO₂ on-site emissions associated with bagasse combustion.

The operation during crushing season is of 140 days during season days. Actual number of mill operation days will be mentioned in the monitoring period. Without the project activity, total energy supplied from the boiler would have been taken-up by coal fired boiler, and energy transferred to the grid would have been imported from grid mix and emission of CO₂ would have occurred due to combustion of conventional fossil fuels. Considering the export of clean electricity to the fossil fuel dominated grid by the project activity there will be continuous GHG reductions, as it would avoid equivalent GHG emissions.

A.7. Debundling >>

This project is not a debundled component of a larger registered carbon offset project activity. There is no registered large-scale UCR project activity or a request for registration by another small-scale project activity:

- By the same project participants;

- In the same project category and technology/measure; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines >>

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

TYPE I- Renewable Energy Projects

CATEGORY-ACM0006: “Electricity and heat generation from biomass” Version 16.0

B.1. Applicability of methodologies and standardized baselines >>

This methodology is applicable to project activities that operate biomass (co-gen) fired power and heat plants.

<p>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.</p> <p>Since the project activity utilizes 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.</p>
<p>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 26 MW which is acceptable as per the applied large scale methodology.</p>
<p>The installation of a new biomass residue fired power generation unit, which are places existing power generation capacity fired with fossil fuel as in the project plant (power capacity expansion projects) is also included in this methodology.</p>
<p>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, heating flue gas, heat transferred to cooling towers or any other heat losses.</p>
<p>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.</p>
<p>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</p>

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.
Bio-mass 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 all owing the export of electricity to the regional grid.
Bio-mass is not sourced from dedicated plantations. The existing installed turbo-generators 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.

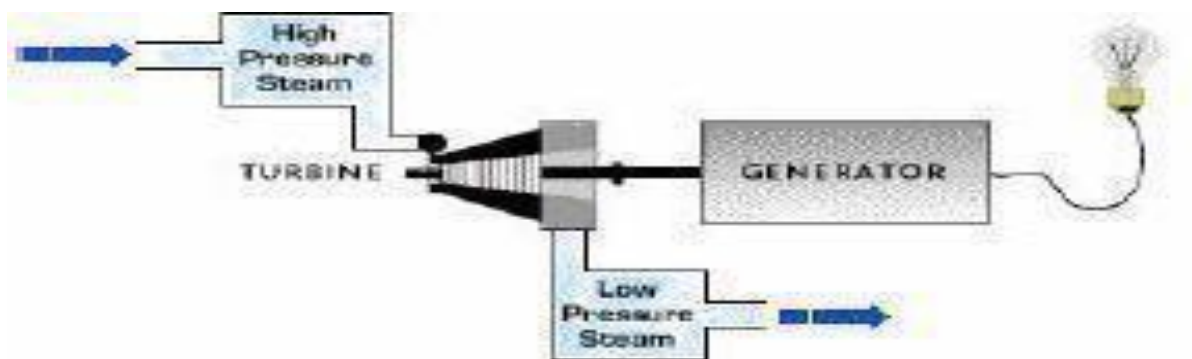
B.2. Applicability of double counting emission reductions >>

The project is not registered in any other GHG mechanism. Hence, there will not be any double counting possibility.

B.3. Project boundary, sources and green house gases (GHGs) >>

The spatial extent of the project boundary encompasses:

- All plants generating power and/or heat located at the project site, whether fired with biomass, fossil fuels or a combination of both.
- All power plants connected physically to the electricity system (grid) that the project plant is connected to.
- The means of transportation of biomass to the project site.
- If the feedstock is biomass residues, the site where the biomass residues would have been left for or dumped.



	Source	GHG	Included?	Justification/Explanation
Baseline	GHG Emissions from fossil fuel in Grid Baseline Power Generation	CO2	Included	Major source of GHG emissions
		CH4	Excluded	Excluded for simplification. This is conservative
		NO2	Excluded	Excluded for simplification. This is conservative
	Uncontrolled burning or decay of surplus biomass residue	CO2	Excluded	Excluded for simplification. This is conservative
		CH4	Excluded	Excluded for simplification. This is conservative
		No2	Excluded	Excluded for simplification. This is conservative

Project Activity	<p>Emissions from Biomass Project Activity</p> <p>On-site fossil fuel and electricity consumption due to the project activity (stationary or mobile)</p>	CO2	Included	Small amount of fossil fuel (wood) co-fired with biomass (in the beginning of season to fire the boiler) is included as a project emission source and electricity import during the turbine tripping.
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	Off-site transportation of biomass residue Combustion of biomass residue for electricity and / or heat generation	CH4	Excluded	No fossil fuel / electricity is consumed at the project site due to the project activity. No biomass residue from off-site will be used for the project activity Excluded for simplification. This is conservative
	Storage of biomass residue	NO2	Excluded	Excluded for simplification. This is conservative

B.4. Establishment and description of baseline scenario >>

❖ Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y - LE_y$ (Eq.1) Where,

ER_y =Emissions reductions in year y (tCO₂)

BE_y =Baseline emissions in year y (tCO₂)

PE_y =Project emissions in year y (tCO₂)

LE_y =Leakage emissions in year y (tCO₂)

The baseline scenario identified at the PCN stage 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. 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 base line scenario is the emission of GHG from the present energy grid. 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:

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

(1)

Equation-

BE_y= Baseline emissions in year y (tCO₂e)

As mentioned in the methodology the baseline emissions are calculated as follows:

$$\mathbf{BE_y = EG_{pj, y} * EF_{grid, y}} \quad \text{Equation (2)}$$

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).

$$\mathbf{BE_y = 19000 * 0.9 = 17,100.}$$

❖ Project Emissions is calculated as follow:

$$\mathbf{PE_y = PE_{Biomass,y} + PE_{FF,y} + PE_{GR1,y} + PE_{GR2,y} + PE_{CBR,y} + PE_{BG2,y}} \quad \text{Eq3}$$

Where,

PE_y	=	Project emissions in year y (tCO ₂)
$PE_{Biomass,y}$	=	Project emissions associated with the biomass and biomass residues in year y (t CO ₂)
$PE_{FF,y}$	=	Emissions during the year y due to fossil fuel consumption at the project site (t CO ₂)
$PE_{GR1,y}$	=	Emissions during the year y due to grid electricity imports to the project site (t CO ₂)
$PE_{GR2,y}$	=	Emissions due to reduction in electricity generation at the project site in year y (t CO ₂)
$PE_{CBR,y}$	=	Emissions from the combustion of biomass during the year y (t CO ₂ e)
$PE_{BG2,y}$	=	Emissions from the production of biogas in year y (tCO ₂ e)

In this project activity electricity is imported from the grid (PEGR1, y) which will count as project emissions. This amount will be deducted from the total value of emission reduction post-ante.

CO₂ emissions from fossil fuel combustion in process j are calculated based on the quantity of fuels combusted and the CO₂ emission coefficient of those fuels, as follows:

$$\mathbf{PE_{FC,j,y} = \sum F_{Ci,j,y} \times COEF_{i,y}}$$

Where:

$PEFC_{j,y}$ = Are the CO₂ emissions from fossil fuel combustion in process j during the year y (tCO₂/yr)

$FCi_{j,y}$ = Is the quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)

$COEFi_{j,y}$ = Is the CO₂ emission coefficient of fuel type i in year y (tCO₂/mass or volume unit)

i = Are the fuel types combusted in process j during the year y

$$COEFi_{j,y} = NCVi_{j,y} \times EFCO2_{j,y}$$

Where:

$COEFi_{j,y}$ = Is the CO₂ emission coefficient of fuel type i in year y (tCO₂/mass or volume unit)

$NCVi_{j,y}$ = Is the weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)

$$= \text{NCV of wood is } 15.3 \text{ TJ/kg (15.3 GJ/tCO}_2\text{)}$$

$EFCO2_{j,y}$ = Is the weighted average CO₂ emission factor of fuel type i in year y (tCO₂/GJ)

$$= \text{Co}_2 \text{ emission coefficient For wood is } 100500 \text{ kg/TJ (0.1005 tCO}_2\text{/GJ)}$$

(Confirmed from IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG)

i = Are the fuel types combusted in process j during the year y

= fuel type combusted in process is wood.

$$COEFi_{j,y} = NCVi_{j,y} \times EFCO2_{j,y}$$

$$= 0.1005 \times 15.3$$

$$= 1.537$$

$$PEFC_{j,y} = \sum FCi_{j,y} \times COEFi_{j,y}$$

$$= 35 \times 1.537 = 54 \text{ tCO}_2\text{/yr}$$

For large-scale project activities, a net-to-gross adjustment of 10%, i.e. the emission reductions determined based on the applied methodology by 0.9 to determine the final amount of emission reductions that can be claimed per vintage.

Therefore,

$$PE_y = 17100 * 10\%$$

$$PE_y = 1710. \quad (\text{Eq.4})$$

❖ Leakage

It is an integrated Co-gen plant. The biomass is the output of the sugar mill, which is being consumed by the power plant as a source of fuel. Therefore, there is no leakage due to cultivation of biomass in a dedicated plantation. As it is integrated Co-gen power plant, there is no leakage due to transportation of biomass from outside of project activity.

Also, biomass is not processed outside of project boundary hence there are no leakage emissions being generated.

$$LE_y = 0 \quad (\text{Eq.5})$$

Estimated yearly MWh grid supply = 17100 MWh

Estimated yearly ERs = BE_y - (PE_y + LE_y)

$$= 17100 - (1710 + 54 + 0)$$

$$= 15,336 \text{ CoU/yr}$$

Prior History >>

The project has never applied for the GHG mechanism in the past.

B.5. Changes to start date of crediting period >>

The start date of crediting period is 28/08/2019.

B.6. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

There are no permanent changes from registered PCN monitoring plan and applied methodology.

B.7. Monitoring period number and duration >>

First Issuance Period	:	28/08/2019 to 31-12-2023
Crediting Period	:	28/08/2019 to 31-12-2023
Monitoring Period	:	28/08/2019 to 31-12-2023

(Note: The project activity was commissioned on 28/08/2019 and operational upto Sept 2019. After that, the project activity was closed till December 2020 due to the unavailability of sugarcane.)

B.8. Monitoring Plan

Data and Parameters to be monitored

Data/Parameter	EFGridy
Data unit	tCO2/MWh
Description	A "grid emission factor" refers to a CO2 emission factor (tCO2/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO2/MWh for the 2013 - 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Source of data	https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com/Documents/UCRC_oUStandardAug2022updatedVer6_090822220127104470.pdf
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid
Additional Comment	The combined margin emission factor as per CEA database (current version16, Year2021) results into higher emission factor. Hence for 2021 vintage UCR default emission factor remains conservative.

Data/Parameter	EGy
Data unit	MWh/year
Description	Quantity of net electricity supplied to the grid as a result of the implementation of the project activity in year y (MWh)
Source of data	Energy Bills/invoices

Measurement procedures (if any):	<p>Data Type: Measured</p> <p>Monitoring equipment: Energy Meters are used for monitoring</p> <p>Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually</p> <p>Archiving Policy: Paper & Electronic</p> <p>Calibration frequency: 5 years (as per CEA provision)</p> <p>Generally, the calculation is done by the Authority/Discom and the project proponent has no control over the authority for the calculation. Therefore, based on the joint meter reading certificates/credit notes, the project shall raise the invoice for monthly payments.</p>
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	$EL = E(\text{export}) - E(\text{import})$
Measurement Frequency:	Monthly
Value applied:	To be applied as per actual data
QA/QC procedures applied:	<p>Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement.</p> <p>Cross Checking:</p> <p>Quantity of net electricity supplied to the grid will be cross checked from the invoices raised by the project participant to the grid.</p>
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.

Data/Parameter	Qbiomass, yr
Data unit	MT/yr
Description	The quantity of bagasse used to generate steam in the boilers each year
Source of data Value(s) applied	Plant records and log books receipts. Weigh bridge purchase order and installation certificate is provided to the verifier.
Monitoring frequency	monthly

QA/QC	The amount of Bagasse used can be crosschecked by the log books and by documents. Quantity of Bagasse has been monitored.
Data/Parameter	NCV_k
Data unit	The Net calorific value of the bagasse (“as received” basis) is measured monthly in the internal plant lab and annually by the third party in an accredited lab. The NCV values specified fall in range as per IPCC2006 Guidelines (1,409,191 to 5,493,456 kCal/Ton). NCVI [Net calorific value of biomass, {MWh/ton}] ranges between 2.56-2.60 MWh/ton.
Description	Net Calorific Value of Biomass Residue Type <i>K</i>
Source of data Value(s) applied	Measurements are carried out by reputed labs and reported in dry biomass basis.
Measurement methods and procedures	On site and in labs
Monitoring frequency	Every 6 months
Purpose of data	Quality control

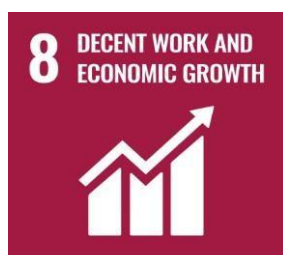
United Nations Sustainable Development Goals:

The project activity generates electrical power using Biomass, thereby displacing non-renewable fossil resources resulting in sustainable, economic and environmental development. In the absence of the project activity, an equivalent amount of power generation would have taken place through fossil fuel dominated power generating stations. Thus, the renewable energy generation from project activity will result in reduction of the greenhouse gas emissions.

Positive contribution of the project to the following Sustainable Development Goals:



SDG 7: Climate Action: Affordable and Clean Energy: The project would lead to reduction of CO₂ due to implementation of project activity.



SDG 8: Decent Work and Economic Growth: The project is generating clean energy.



SDG 13: The project is providing direct employment. The project leads to Trainings & workshops which are conducted for the O&M staff of the PP.



SDG 09 Promote inclusive and sustainable industrialization and, by2030, significantly raise industry’s share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries