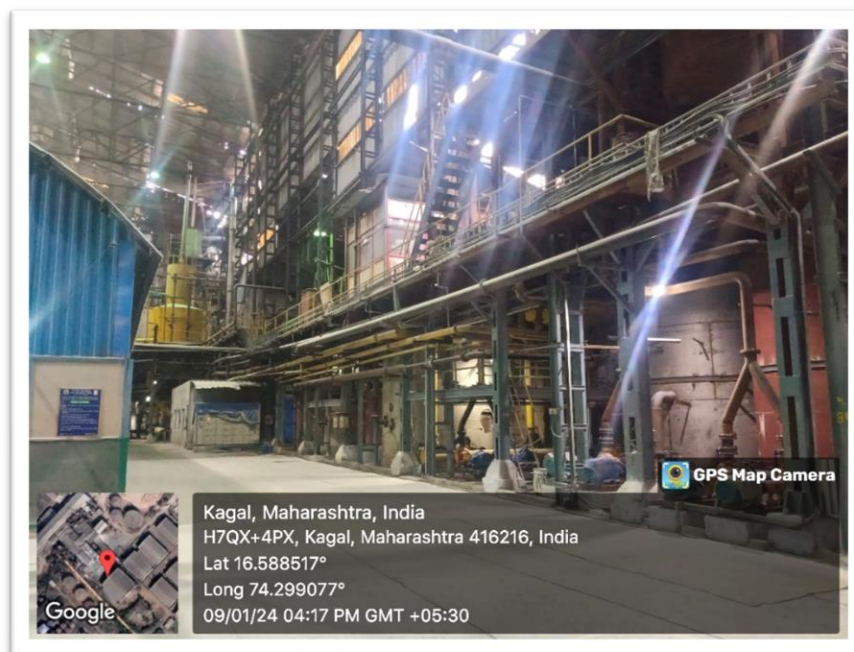




MONITORING REPORT

CARBON OFFSET UNIT (CoU) PROJECT



Title: 28 MW Biomass Based Grid Supply Power Project by Shree Chhatrapati Shahu SSK Ltd.

UCR PROJECT ID: 452

MR Version 1

MR Date: 10/07/2024

UCR Monitored Period: 01 (Monitored Period Duration: 08 Years, 00 Months)

1st UCR Monitoring Period: 01/01/2016 to 31/12/2023

1st UCR Crediting Period: 01/01/2016 to 31/12/2023





Monitoring Report (MR)
CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION

Title of the project activity	28 MW Biomass Based Grid Supply Power Project by Shree Chhatrapati Shahu SSK Ltd.
Scale of the project activity	Large Scale
UCR PROJECT ID	452
Completion date of the MR	17/07/2024
Project participants	Project Proponent: M/s. Shree Chhatrapati Shahu Sahakari Sakhar Karkhana Ltd., Kagal, Maharashtra, India. Aggregator Progressive Management Consultants. UCR ID: 110736904
Host Party	India
Applied methodologies and standardized baselines	CDM UNFCCC Methodology ACM0006: Electricity and heat generation from biomass --- Version 16.0 UCR Standard for Baseline Grid Emission Factor
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated total amount of GHG emission reductions per year (Year: Quantity)	01/01/2016 - 31/12/2016: 35,024 tCO ₂ (35,024 CoUs)
	01/01/2017 - 31/12/2017: 20,763 tCO ₂ (20,763 CoUs)
	01/01/2018 - 31/12/2018: 25,735 tCO ₂ (25,735 CoUs)
	01/01/2019 - 31/12/2019: 27,283 tCO ₂ (27,283 CoUs)
	01/01/2020 - 31/12/2020: 29,811 tCO ₂ (29,811 CoUs)
	01/01/2021 - 31/12/2021: 35,267 tCO ₂ (35,267 CoUs)
	01/01/2022 - 31/12/2022: 31,731 tCO ₂ (31,731 CoUs)
01/01/2023 - 31/12/2023: 27,246 tCO ₂ (27,246 CoUs)	
Estimated total amount of GHG emission reductions for the entire monitoring period (2016 - 2023)	2,32,860 tCO₂ (2,32,860 CoUs)

SECTION A. Description of project activity

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

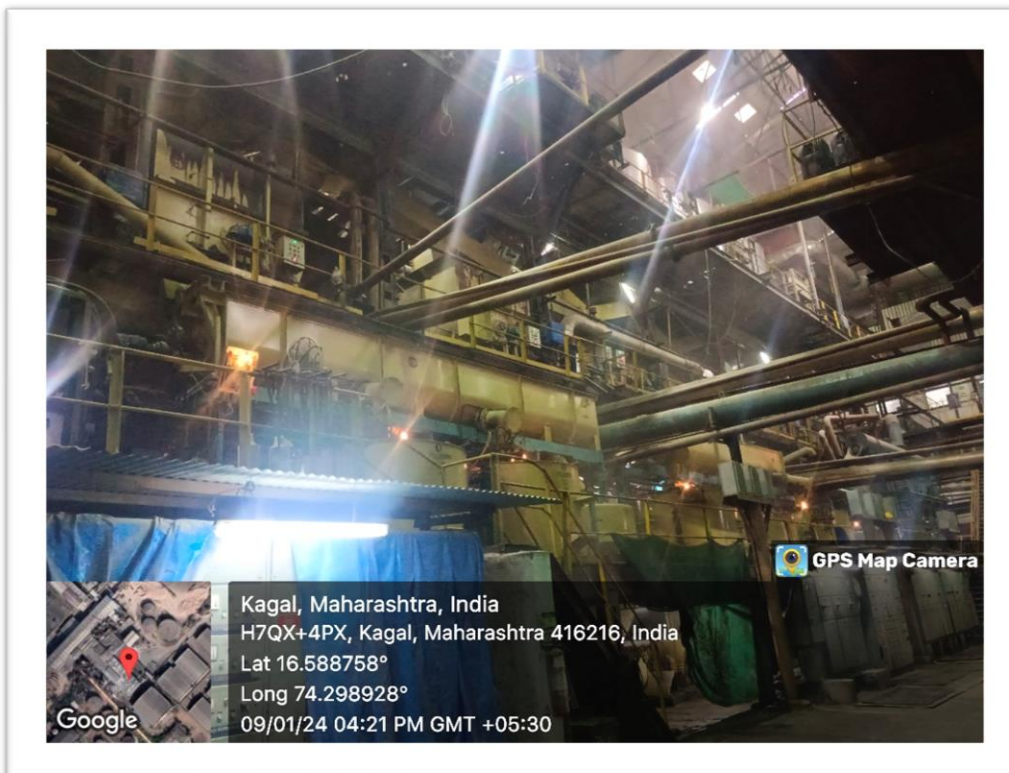
The project 28 MW Biomass-Based Grid Supply Power Project by M/s. Shree Chhatrapati Shahu SSK Ltd. is located in Kagal village, Kolhapur district, Maharashtra, India, Pin: 416216.

The details of the UCR project activity are as follows:

Purpose of the UCR project activity:

The Purpose of the Project is to generate electricity using renewable biomass (bagasse) and thereby reduce greenhouse gas (GHG) emissions by replacing fossil fuel-dominated grid electricity with biomass-based renewable electricity.

The project activity is a 28 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. Replicable technology, environmental, and sustainable development benefits also result from the project activity. These include introducing efficient high pressure cogeneration technology to the Indian sugar industry; reducing power shortages in the state of Maharashtra India; and, fostering sustainable economic growth through promoting energy self-sufficiency and resource conservation in India's sugarcane industry.



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

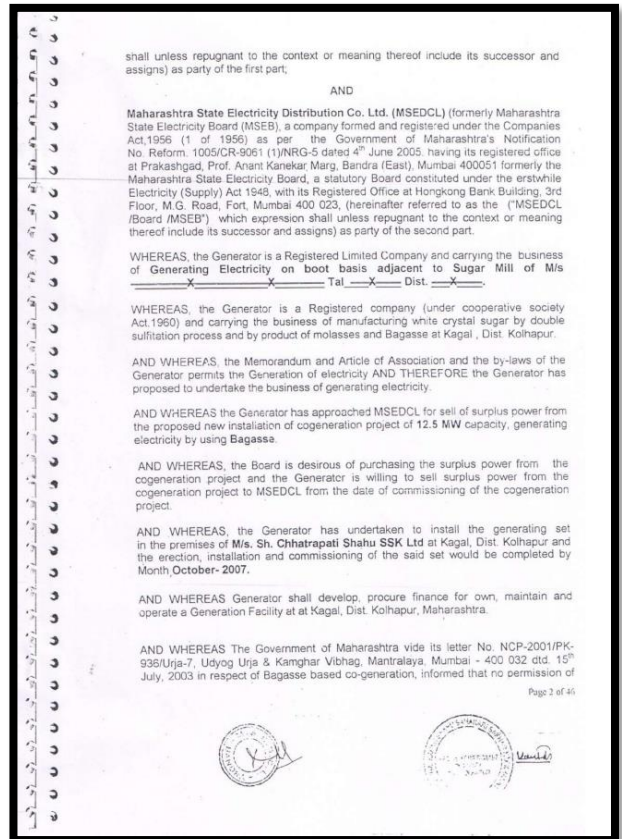
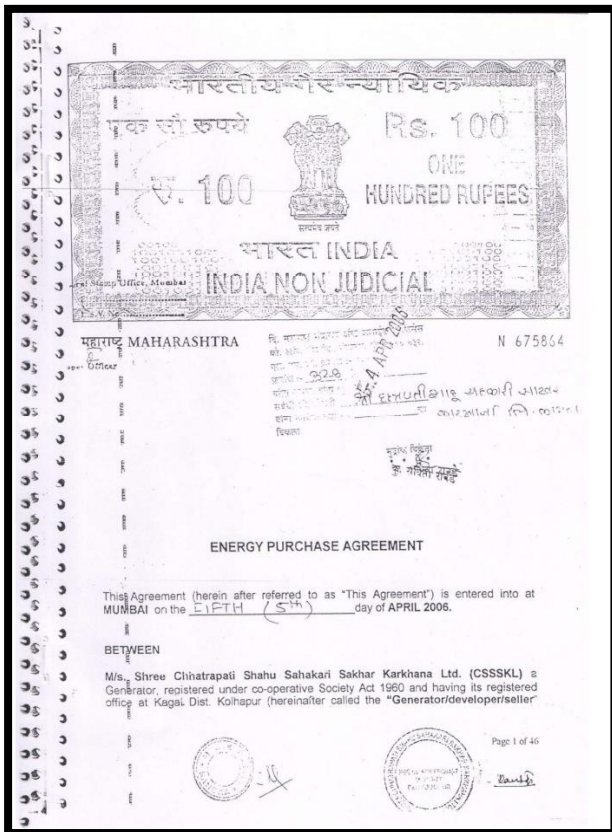
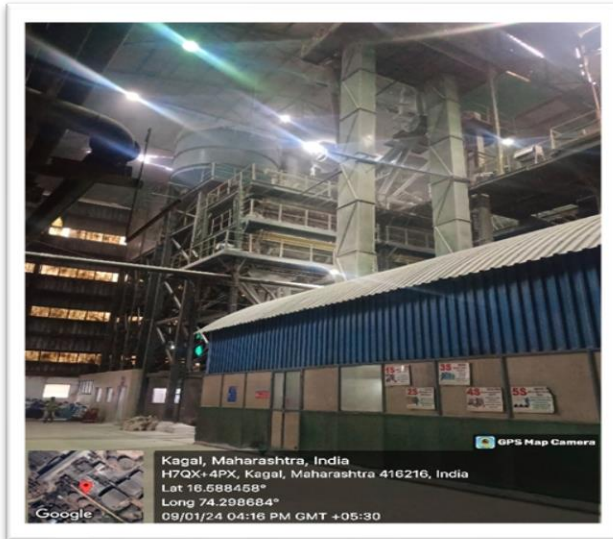
bagasse, a biomass by-product from the sugar manufacturing process, to generate steam which in turn is fed to the steam turbine to generate power. The overall business is integrated with alcohol distillation and power generation. The power co-generation units generate biomass-based power for captive consumption of the sugar plant and the sale of surplus power to the state grid. The project plant exports power to the Maharashtra State Electricity Distribution Co. Ltd., grid (MSEDCL) in absence of the project activity, MSEDCL would have withdrawn electricity from western regional grid. Unlike other carbon offset projects using biomass for cogeneration of power/heat, in this project activity the precise mix of power generation and export to the grid can be measured directly with meters installed within the project boundary.

The project activity involves the renewable biomass (bagasse) based electricity generation within the M/s. Shree Chhatrapati Shahu Sahakari Sakhar Karkhana Ltd. plant located in Taluka Kagal, District Kolhapur, Maharashtra, India. 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 MSEDCL grid. **UCR carbon credits are being claimed on the emission reductions due to power exported to the grid only.**

The project activity employs 28 MW aggregated generators along with two boilers of 60 TPH and 70 TPH with high pressure and temperature configuration.

Boiler	70 TPH	60 TPH
Commissioning date	15/03/2008	25/11/2012
Turbine	12.5 MW	9 MW
Commissioning date	15/03/2008	25/11/2012

The Power Purchase Agreement with Maharashtra State Electricity Distribution Co. Ltd. was made in 5th April 2006. **However, the crediting period of this UCR project activity is from 01/01/2016 to 31/12/2023.**



भारतीय नैऋत्यायिक
भारत INDIA

रु. 500 **FIVE HUNDRED RUPEES**
पाँच सौ रुपये **Rs. 500**

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA 2022 BS 113830

कुठ्या कोठेचे वरून "उपस्थित" काढी
मु. नि. सं. - १७२/२०२३
पत्रांक - २३४२ तारीख - २४/११/२०२३

24 NOV 2023
Sub Treasury Officer
Kajal

महाराष्ट्र राज्य शासन
महाराष्ट्र राज्य शासन
महाराष्ट्र राज्य शासन

Power Purchase Agreement

This agreement is executed at Mumbai on 13th of February 2024

Between:

M/s. Shree Chhatrapati Shahu Sahakar Sakhar Karidhans Ltd i.e. a Co-operative Sugar Factory registered under the Co-operative Societies Act, 1960 and Amended as per Act 39 of 2002, and having factory & its registered office at Shrinant Jaysingrao Chhatge Bhawan, Kajal, Kolhapur (Maharashtra State), represented by its Managing Director hereinafter referred to as "Generator" (which expression shall unless repugnant to the subject or context or meaning thereof deemed to include its successors, representatives and permitted assigns as party of the FIRST PART,

AND

For MSEDCL
Director (Commercial) Page 1

Maharashtra State Electricity Distribution Company Limited, a company registered with the Registrar of Companies, Mumbai on 31st May 2005, having its registered office at "Prakashgad", 5th Floor, Plot No. G-9, A.K. Marg, Bandra (East), Mumbai - 400051. MSEDCL is a Company incorporated under the Companies Act, 1956 and Distribution Licensee as per provision of the Electricity Act, 2003 (hereinafter referred to as "MSEDCL", which expressions shall unless repugnant to the context or meaning thereof include its successors in business and permitted assigns) as of the Second Part.

WHEREAS, the Generator is a Registered company/Co-operative Societies which carries the business of manufacturing sugar and by products of molasses, Bagasse and simultaneously proposed / commissioned generation project at Shrinant Jaysingrao Chhatge Bhawan, Kajal, Kolhapur

AND WHEREAS any generating company may establish, operate and maintain a generating station without obtaining a license under EA 2003, if it complies with the technical standards relating to connectivity with the grid referred to in clause (b) of section 73 of EA 2003.

AND WHEREAS, the Generator has undertaken to install the generating set and the erection, installation and commissioning of the said co-generation plant is planned to be completed by April 2024.

AND WHEREAS Government of Maharashtra vide its State Renewable Energy Policy 2020 dated 31.12.2020 has stated that MSEDCL shall procure power from bagasse base co-generation projects by executing PPAs on MoU basis at a rate fixed and the terms and conditions laid down by the Maharashtra Electricity Regulatory Commission without any tender process.

AND WHEREAS MERC vide its order dated 21.01.2021 in MERC Case No. 02 of 2021 has accorded approval to MoU route for procurement of power from new bagasse based co-generation plant.

AND WHEREAS, in pursuance to the MERC order dated 21.01.2021, the Parties have agreed to enter into this Agreement for hereinafter for sale and supply of electricity to MSEDCL as an Aggregate Exportable Contracted Capacity (as described hereunder) from the Bagasse based Cogeneration Power Generating Station in accordance with the terms and condition to be set forth in an agreement for purchase of power to be entered into under and in accordance with the provisions of the EA 2003 of this Agreement.

AND WHEREAS, on State Renewable Energy Policy 2020 & MERC order dated 21.01.2021, MSEDCL is desirous of purchasing the power from the co-generation power project and the Generator is willing to sell surplus power from the co-generation power project to MSEDCL from the date of commercial operation as declared by the Generator.

AND WHEREAS MSETCL/MSEDCL, has checked and approved the feasibility for evacuation of power & grid connectivity is issued vide letter No. MSETCL/CO/STU/CO-CEN/3681 dated 31.05.2023 and thereby the power will be evacuated at 110 KV level at 220/110 KV Mudshingi Substation.

AND WHEREAS the Generator has proposed to sell the surplus power as an exportable capacity from the said Bagasse based Co generation Power Generation plant to MSEDCL to the tune of 9 MW in season and 3.5 MW in Off-season against the installed capacity of 12.5 MW. The electricity, will be produced by using bagasse as fuel. The supply of the surplus power available for export will be made after meeting the consumption of the sugar mill and the auxiliary consumption of the co-generation power plant.

For MSEDCL
Director (Commercial)

Reg. No. MSEDCL/238/2008
DL 582008
KOLHAPUR
KAJAL

Shree Chhatrapati Shahu SSKL, 12.5 MW Page 2

AND WHEREAS the Generator has proposed to sell surplus power generated from the said plant to MSEDCL as under :

Sr.N	Items	Value in MW	
		Season	Off-Season
1	Gross Power Generation Capacity	12.5 MW	7.0 MW
2	I. Power consumption (For Sugar Mill Cane Crushing & Boiler Auxiliary)	1.0 MW	1.0 MW
	II. Distilleries & Colonies	2.5 MW	2.5 MW
3	Total consumption	3.5 MW	3.5 MW
4	Exportable Power at Interconnection point	9.0 MW	3.5 MW

Season means sugar cane crushing period during the year (150 days)
Off season means period other than sugar cane crushing during the year (90 days)

AND WHEREAS the Generator shall abide by the terms and conditions laid down by the Maharashtra Electricity Regulatory Commission (MERC) Regulations, Order and the subsequent Clarificatory Orders, issued by MERC or any Judicial / Quasi-judicial authorities from time to time.

AND WHEREAS as per MERC (Terms & Conditions for determination of RE Tariff) Regulations 2019, this co-generation plant shall be subjected to "Merit Order Dispatch" principles and shall be subjected to scheduling and dispatch code as specified under the State Grid Code (SGC) including amendments thereto.

The Generator shall be fully responsible for obtaining and maintaining the validity of any and all Licenses and permits required by the law and shall abide by Law, the Rules, Regulations or any notification or order issued there under by the Central Govt. or State Govt. or Local Authority or any other Authority prescribed under any Law connected with the Generation Facility of the Generator.

NOW THEREFORE IN VIEW OF THE FOREGOING PREMISES AND IN CONSIDERATION OF THE MUTUAL COVENANTS AND CONDITIONS HERINAFTER SET FORTH, MSEDCL AND THE GENERATOR EACH TOGETHER WITH THEIR RESPECTIVE SUCCESSORS AND PERMITTED ASSIGNS, A PARTY AND COLLECTIVELY THE PARTIES, HEREBY AGREE AS FOLLOWS:

For MSEDCL
Director (Commercial)

Reg. No. MSEDCL/238/2008
DL 582008
KOLHAPUR
KAJAL

Shree Chhatrapati Shahu SSKL, 12.5 MW Page 3

The project activity uses a portion of the steam-electricity to run its own cane crushing facility and cogeneration plant. The majority of the total electricity produced, is exported to the Maharashtra State Electricity Distribution Co. Ltd., grid (MSEDCL), with 9 MW being exported from the plant during the cane crushing season and 3.5 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 Western grid. The project activity supplies approximately **3,04,467 MWh** of renewable power to the grid during this monitored period.

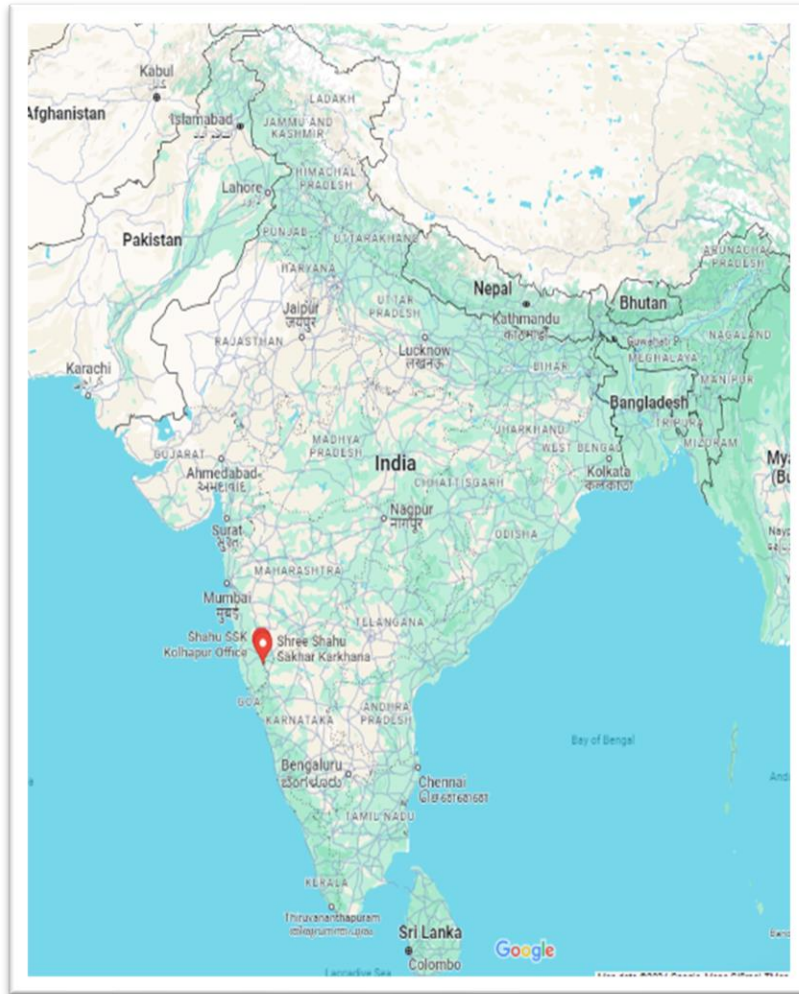
The UCR project activity is the construction and operation of a power plant/unit that uses renewable energy sources and supplies renewable electricity to the grid. The UCR project activity is thus the displacement of electricity that would be provided to the grid by more-GHG-intensive means and provides 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.

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	
UCR Monitoring Period Number	01
Start Date (DD/MM/YYYY)	01/01/2016
End Date (DD/MM/YYYY)	31/12/2023
Total Emission Reductions over the monitoring period (CoUs)	2,32,860 tCO₂

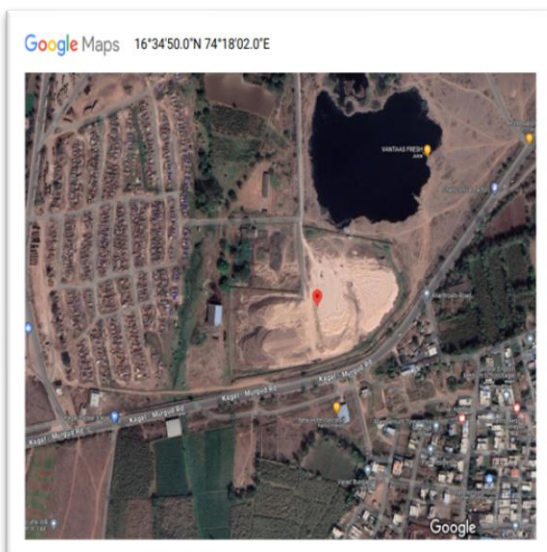
A.2. Location of project activity >>

Village	Kagal
District	Kolhapur
State	Maharashtra
Country	India
Pin	416216
Latitude	16.5833N
Longitude	74.316E



Bagasse Depot

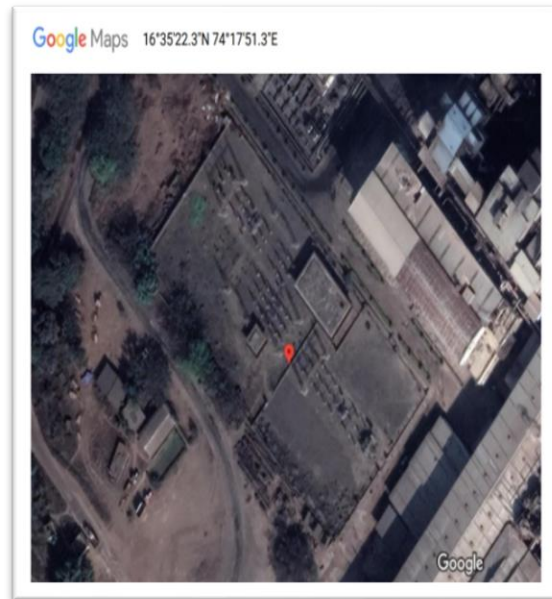
Cogen Plant



Sugar Godown



Switch yard



A.3. Technologies/measures>>

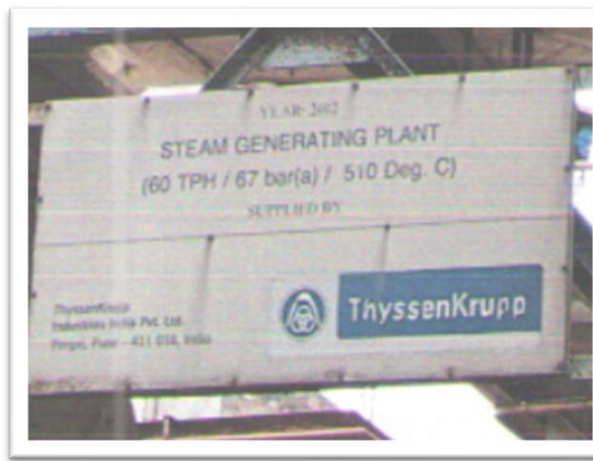
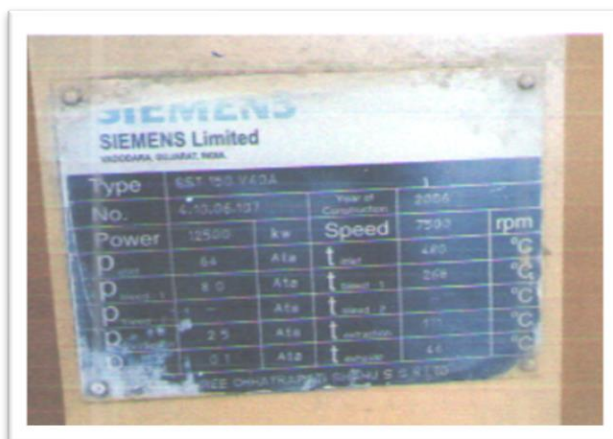
The UCR project activity is a grid-connected cogeneration power plant powered by bagasse, utilizing a high-pressure steam-turbine setup. This Project involves generating electricity and installing facilities to export electricity to the regional grid. It includes a boiler, turbo-generator, auxiliary systems, and a switchyard, all located next to the sugar plant. Additionally, the necessary water supply and infrastructure facilities are available on-site.

The technology for the boilers and turbines is well established and the project activity does not involve any transfer of technology. The technology being used is environmentally safe and sound. 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 the export of electricity to the regional grid. The other requirements of the project activity including water requirement, infrastructure facilities etc. are also available at site

Technical details of the project activity

BOILER CAPACITY	60TPH	70TPH
Manufacture	Thyssenkrup Industries Ltd, Pune	S.S. Engineers, Pune
Boiler ID	MR-15404	MR-14170
Boiler MCR (steam generation capacity)	60000 kg/hr	70000 kg/hr
Steam temperature at superheater outlet (Deg C)	510± Deg C	485 ± Deg C
Super heater control Pressure at main steam	67 kg/cm ²	67 kg/cm ²

stopvalue (kg/cm ²)		
Peak Capacity of Boiler (Kg/hr)	66000 kg/hr	77000kg/hr
Minimum possible duration for peakcapacity/Shift (8 hrs)	30 minutes	30 minutes
TURBINE	12.5 MW	9 MW
Make	Siemens Ltd.	Triveni Turbine India Ltd.
Type	DECR	Back Pressure
Speed	7500 RPM	8300 RPM
Inlet Steam Condition	64 ATA / 480 Deg C	64 ATA / 480 Deg C





Do no harm or Impact test of the project activity>>

Host party regulations require M/s. Shree Chhatrapati Shahu SSK Ltd. to obtain environmental clearance in the form of “No objection Certificate” from Maharashtra Pollution Control Board. The Site of the project is approved from the environmental angle and that the Environmental Management Plans are prepared and submitted to the pollution control board.

Environmental Impact Assessment has been conducted for the project activity to understand if there are any significant environmental impacts and the study indicates that the impacts are not significant.

The **Social, Environmental, Economic, And Technological** benefits that contribute to the sustainable development are as follows:

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. M/s. Shree Chhatrapati Shahu SSK Ltd., has focused on continuing to work closely with the thousands of farmers who rely on M/s. Shree Chhatrapati Shahu SSK Ltd., for their sustenance and livelihoods. M/s. Shree Chhatrapati Shahu SSK Ltd., has further stepped-up efforts towards better cane development and farm management, through adoption of techniques such as intercropping, conservation of energy and water resources through drip irrigation, waste-water management, and rain-water harvesting. By generating employment for both skilled and unskilled workers, the project contributes significantly to the local economy while ensuring the efficient operation and

maintenance of its equipment.

- 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 grid power generation, 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, it has positively contributed towards the reduction in (demand) use of finite natural resources like coal 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.
- Avoids global and local environmental pollution, leading to reduction of GHG emissions.
- Enabling regional grid to divert the electricity displaced by the project activity to the nearby needy areas.
- Indirect capacity building by providing a case example to other sugar mills in the region for switching to high-capacity cogeneration configuration, for exporting electricity to grid. 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.

Economic benefits:

- The Project activity creates employment opportunities during the project stage and operation and maintenance of the boiler and turbines.
- The project activity helps in conservation of fast depleting natural resources like coal and oil thereby contributing to the economic well-being of country as a whole.
- 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

Maharashtra Pollution Control Board NOC

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-0000138934/CR/2207001671 Date: 30/07/2022

To,
 Shree Chhatrapati Shahu S.S.K. LTD., Kagal,
 144/1/B,144/2, 148-151, 153-157, 159-161, 164-172,
 186, 24/B, 247/2/3, 61/32,
 Kagal, Kolhapur.

Sub: Renewal of Consent for the 10,000 TCD and 28 MW Co-generation Power Plant.

Ref: 1. Consent granted by the Board vide Format 1.0/CAC/UAN No. MPCB- CONSENT-0000115893/CR-2112001151 DTD. 22.12.2021
 2. Minutes of CAC Meeting dtd. 24.06.2022.

Your application No.MPCB-CONSENT-0000138934 Dated 18.05.2022
 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: 31.07.2024
- The capital investment of the industry is Rs.323.55 (Existing 319.3665 Crs+ increase by 4.1876 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	39000	MT/M
2	Electricity	28	MW
3	Molasses	12260	MT/M
4	Bagasse	87935	MT/M
5	Pressmud	12060	MT/M

(The cane crushing capacity of Sugar Industry shall not exceed 10000 TCD.)

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

Sr No	Description	Permitted in CMD	Standards to	Disposal
1.	Trade effluent	867.9	As per Schedule -I	68.9 CMD recycle & 790 CMD on land for irrigation.
2.	Domestic effluent	15	As per Schedule - I	On land for gardening

Shree Chhatrapati Shahu S.S.K. Ltd., Kagal/CAC/UAN No.MPCB-CONSENT-0000138934 (30-07-2022) 03/08/22

5. Conditions under the Air (P&CP) Act, 1981 for air emissions:

Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
1	Boiler (70 TPH & 60 TPH)	1	As per Schedule -II
2	Boiler (20 TPH)	1	As per Schedule -II
3	DG Set (500 KVA)	1	As per Schedule -II
4	DG Set (300 KVA)	1	As per Schedule -II
5	DG Set (100 KVA)	1	As per Schedule -II

(As per previous consent of existing unit)

6. Conditions about Non Hazardous Wastes:

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
1	Boiler Ash	32	MT/Day	-	Partially mixed in the composting process and rest is given to brick manufacturers free of cost
2	ETP Sludge	5.2	MT/M	-	Used as manure in own farm

7. Conditions under Hazardous & Other Wastes (M & T M) Rules 2008 for treatment and disposal of hazardous waste:

Sr No	Type of Waste	HW Category	Quantity & UoM	Treatment	Disposal
1	5.1 Used or spent oil	5.1	0.5 MT/M	Recycle	Sale to Authorized recycler.

The applicant shall ensure disposal to the Actual user having permissions under Rule 9 of Hazardous and other Waste (M & TM) Rules, 2016.

- The applicant shall properly collect, transport & regularly dispose of the hazardous waste to CHWTSDF, in compliance of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016 and keep proper manifest thereof.
- The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
- This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
- The applicant shall comply with the conditions of the EC granted on 18.12.2019.
- Industry shall connect online CMS data as per CPCB guidelines to CPCB & MPCB Servers.
- This consent is issued as per the Consent Appraisal Committee meeting dated 24.06.2022.
- The applicant shall make an application for renewal of the consent at least 60 days before the date of the expiry of the consent.

Shree Chhatrapati Shahu S.S.K. Ltd., Kagal/CAC/UAN No.MPCB-CONSENT-0000138934 (30-07-2022) 03/08/22

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

RED/L.S.I (R60) Date: 15/12/2022

No:- Format1.0/CAC/UAN No.MPCB-CONSENT-0000149844 & MPCB-CONSENT-0000148466/CE/2212001086

To,
 Shree Chhatrapati Shahu S.S.K.
 Ltd., 144,148,149,150,151,155,156,Kagal, Tal. Kagal,
 Dist. Kolhapur

Sub: Consent to Establish of Expansion for Distillery unit from 60 KLPD to 340 KLPD and installation of dryer.

Ref: 1. Existing renewal of consent granted by Board vide No. Format1.0/CAC/UAN No. MPCBCONSENT-139003/CR/2208001590, dated 31.08.2022 which is valid up to 31.08.2027.
 2. Environmental Clearance granted vide J-11011/225/2015-IA II (I) dated 06.12.2022.
 3. Minutes of CAC Meeting dtd. 23.11.2022.

Your application No.MPCB-CONSENT-0000149844 Dated 04.10.2022
 For: Consent to Establish under Section 25 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 establish is granted for a period up to commissioning of the unit or up to 5 year whichever is earlier.
- The capital investment of the project is Rs.159 Crs. (As per undertaking submitted by pp (Distillery Expansion-150 Crs. + Dryer 9 Crs = 159 Crs))
- Consent is valid for the manufacture of:

Sr No	Product	Maximum Quantity	UOM
1	Ethanol	250	KL/D
2	Fusel Oil	4.1	MT/M
3	Carbon Dioxide Bottling	7650	MT/M
4	Spentwash Powder (Granules)	8160	MT/M
5	Bio-CNG	1000	MT/M
6	Electricity	6.5	MW

Expansion by 250 KLPD of Distillery and Cane crushing 2000 TCD for Ethanol only.

Shree Chhatrapati Shahu S.S.K. Ltd., Kagal/CAC/UAN No.MPCB-CONSENT-0000149844/15/12/22

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

Sr No	Description	Permitted (in CMD)	Standards to	Disposal Path
1.	Trade effluent	2120	As per Schedule-I	methanation- MEE & dryer to achieve ZLD
2.	Domestic effluent	5	As per Schedule-I	On land for irrigation.

5. Conditions under Air (P&CP) Act, 1981 for air emissions:

Sr No.	Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
1	3	Boiler No.4 (70 TPH)	1	As per Schedule -II

6. Non-Hazardous Wastes:

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
1	Yeast Sludge	500	MT/M	-	Drying & use as manure
2	CPU Sludge	3.0	MT/M	-	Drying & use as manure

7. Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for treatment and disposal of hazardous waste:

Sr No	Category No./Type	Quantity	UoM	Treatment	Disposal
	NA				

- The Board reserves the right to review, amend, suspend, revoke this consent and the same shall be binding on the industry.
- This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
- Industry shall comply all the conditions stipulated in Environmental Clearance granted vide J-11011/225/2015-IA II (I) dated 06.12.2022.
- This consent is issued pursuant to the decision of the Consent Appraisal Committee Meeting held on 23.11.2022.
- Industry shall install online continuous monitoring system as per CPCB guidelines & data to be transmitted directly from Data Logger to Board server.
- PP shall submit BG of Rs. 25 Lakh towards compliance of consent & EC conditions.
- The applicant shall obtain Consent to Operate from Maharashtra Pollution Control Board before actual commencement of the Unit/Activity. (Establish)
- This consent is issued as per communication letter dated 03/11/2022 which is approved by competent authority of the board.


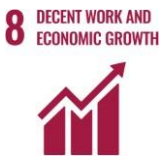

Shree Chhatrapati Shahu S.S.K. Ltd., Kagal/CAC/UAN No.MPCB-CONSENT-0000149844/15/12/22


United Nations Sustainable Development Goals:

The Project activity generates electrical power using Biomass (Bagasse), 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) outcomes:**

Development Goals Targeted	SDG Target	Indicator (SDG Indicator)
SDG 7: Affordable and Clean Energy 	7.2: By 2030, increase substantially the share of renewable energy in the global energy mix Target: Renewable Power supplied to the grid in the monitored period = 3,04,467 MWh	7.2.1: Renewable energy share in the total final energy consumption
SDG 8: Decent Work and Economic Growth 	8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value. Target: <ul style="list-style-type: none"> • Training staff annually • Employment of staff 	8.5.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities.
SDG 09: Industries, Infrastructure and Innovation 	9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	The project activity provides employment to people 115 villages in the area. 9.1.1: It measures the proportion of the rural population who live within 2 km of an all-season road. This indicator helps assess access to infrastructure and connectivity.

<p>SDG 13: Climate Action</p> 	<p>13.2: Integrate climate change measures into national policies, strategies and planning Target: 2,32,860 quantity of tCO₂ reduced in this monitored period.</p>	<p>13.2.1: Number of countries that have communicated the establishment or operationalization of an integrated policy/ strategy</p>
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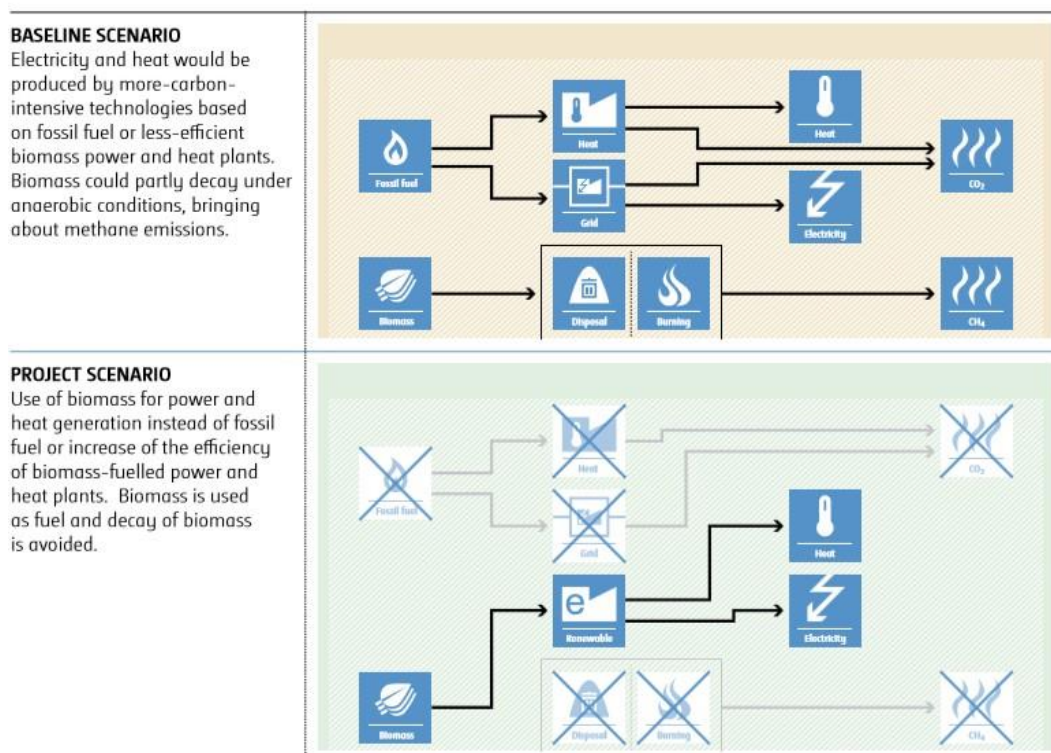
A.4. Parties and project participants>>

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. Shree Chhatrapati Shahu SSK Ltd.</p> <p>Aggregator: Progressive Management Consultants</p> <p>UCR ID: 110736904</p> <p>Email: info@progressive-iso.com</p>

A.5. Baseline Emissions>>

ACM0006 Electricity and heat generation from biomass



The approved baseline methodology has been referred from the indicative simplified baseline and monitoring methodologies for selected large scale UNFCCC CDM project activities that involve generation of power and heat in thermal power plants, including cogeneration plants using biomass.

Typical activities under ACM 0006 are new plants, capacity expansions, energy efficiency improvements or fuel switch projects.

The applicable methodology and simplified modalities and procedures for small scale CDM project activities is *“the baseline scenario is displacement of more-GHG-intensive electricity generation in grid.”*

Emission coefficient of fuel used in the baseline scenario

The CO₂ emission factor for grid connected power generation in year y calculated using UCR Standard emission factor is 0.9 tCO₂/MWh for the period 2013-2023.

A.6. Debundling>>

This Project is not a debundled component of a larger registered carbon offset project activity.

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 (Large Scale)

UCR Positive List Environmental Additionality

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 in the current UCR project activity.

UCR CoU Standard is used to determine the baseline grid emission factor for the 2013- 2023 period.

B.2. Applicability of methodologies and standardized baselines>>

The Project activity is a power generation project using 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 UCR and UNFCCC CDM methodology project eligibility parameters. In the absence of the project activity M/s. Shree Chhatrapati Shahu Sahakari Sakhar Karkhana Ltd., 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 is also included in the positive list of approved types of activities of the UCR CoU Standard.

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 28 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 15% co-firing fossil fuel criteria as per the UCR Protocol for such projects.

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 turbo-generators are fired by bagasse, a by-product of the sugarcane processing and a biomass residue.

Biomass used by the project plant is limited to biomass residue (bagasse).

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.

B.3. 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: Shree Chhatrapati Shahu RE Project ([CDM Project ID 1297](#)) by the PP.

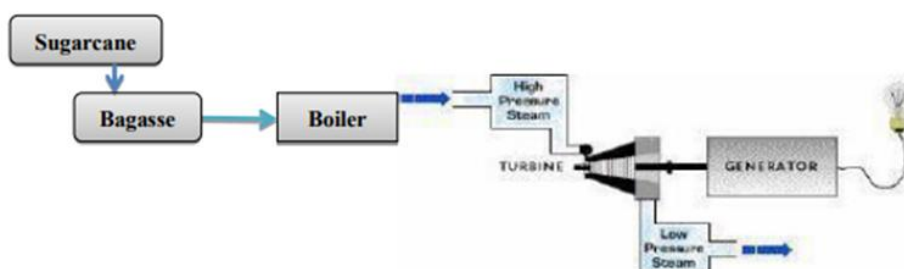
CDM Registration Date	22/12/2006
CDM Crediting Period	01/04/2007 - 31/03/2014 (Fixed)
CERs Issued (MR Period 1)	n/a (Project was rejected)

Hence the UCR project activity has never been issued voluntary carbon credits for the current 2016- 2023 vintage years and there is no double counting of the credits envisioned. Additionally, the same will be stated in the undertaking provided in the Double Counting Avoidance Assurance Document (DAA) by M/s. Shree Chhatrapati Shahu Sahakari Sakhar Karkhana Ltd.

B.4. Project boundary, sources and greenhouse 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 projects 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.



Leakage Emissions (LEy)

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

Hence LEy = 0

	Source	GHG	Included?	Justification/Explanation
Baseline	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.
Project Activity	Emissions from Biomass Project Activity On-site fossil fuel and electricity consumption due to the project activity (stationary or mobile) Transportation of biomass residue Combustion of biomass residue for electricity and / or heat generation	CO ₂	Included	No fossil fuel / electricity is consumed at the project site due to the project activity. Biomass residue transportation using default values is applied. This is conservative.
		CH ₄	Excluded	Excluded for simplification. This is conservative.
		N ₂ O	Excluded	Excluded for simplification. This is conservative.

	Storage of biomass residue			
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Project Emissions (PE_y)

The Project emissions (PE_y) under the methodology may include

- CO₂ emissions from transportation of biomass residue to the project site,
- CO₂ emissions from on-site consumption of fossil fuels due to project activity,
- CO₂ emissions from electricity consumption at the project site that is attributable to the project activity and
- CH₄ emissions from combustion of biomass.

where

PET_y = are the CO₂ emissions during the year y due to transport of the biomass to the project plant in tons of CO₂,

PET_y = Default project emissions as per [UCR notification dated 04/10/2023](#) has been applied following the provisions from the TOOL12,

- *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.*

PE_{FFCO₂,y} = are the CO₂ emissions during the year y due to fossil fuels co-fired by the generation facility in tons of CO₂,

PE_{EC,y} = are the CO₂ emissions during the year y due to electricity consumption at the project site that is attributable to the project activity in tons of CO₂,

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

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

When the project activity exceeds the co-firing limit of 15% for any month during the monitored period, the emission reductions have not been considered, in keeping with the principle of conservativeness. Also the project emissions have been included for the said month on account of coal usage being a major source of emissions for the same. The emission reduction calculations sheet has been updated for the same.

The Proposed project activity does not have any CO₂ emissions due to fossil fuel co-firing and from electricity consumption at site. The project activity also doesn't include the CH₄ emissions from the combustion of biomass.

Hence,

PE_{FFCO₂,y} = **PE_{FC,i,y}** = are the CO₂ emissions during the year y due to fossil fuels co-fired by

the generation facility in tons of CO₂, in process j during the year y (tCO₂ / yr);

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$

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

COEF_{i,y} = the CO₂ emission coefficient of fuel type i in year y (tCO₂ / mass or volume unit);

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

The coefficient of emission factor of the fuel is calculated in accordance with the option 'B' of the "Tool to calculate project or leakage CO₂ emissions from fossil fuel consumption" which states that "The CO₂ emission coefficient **COEF_{i, y}** is calculated based on net calorific value and CO₂ emission factor of the fuel type i as follows:"

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$

Where:

COEF_{i,y} = the CO₂ emission coefficient of fuel type i in year y (tCO₂/ mass or volume unit);

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

EF_{CO2,i,y} = weighted average CO₂ emission factor of fuel type i in y

CO2 emission factor for coal	0.09970 tCO ₂ e/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 Inventories (99,700kg/TJ)
Hence, the project emission estimate on account of firing of coal fines is calculated as:	COEF _{i,y} = NCV _{i,y} × EFCO _{2i,y}	= 0.0142358 GJ/kg x 0.09970 tCO ₂ e/GJ = 0.001419305 tCO ₂ e/kg

PE_{EC,y} = 0 and,

PE_{Biomass,CH4,y} = 0.

B.5. Establishment and description of baseline scenario >>

The baseline scenario identified at the MR 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 technology 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 (MSEDCL) grid in the western region.

Direct off-site emissions in the project activity arise from the biomass residue transport. However, the biomass is generated from the in-house processes pertaining to the sugar processing industry, hence, biomass residue transport is only accounted if biomass residue is imported from outside the project boundary. 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 no biomass residue was collected from outside, thus for this monitoring period, the value of this parameter is zero, however, using the UCR principles of conservativeness, transport 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.

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 CO_{2e})

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

$$BE_y = EG_{pj,y} \times EF_{grid,y}$$

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).

Year	Net Power Exported Mwh	Baseline Emission Reductions tCO ₂ eq	Project Emissions (coal) tCO ₂ eq	Default Project Emissions Biomass Cultivation/ Transport tCO ₂ eq	ER tCO ₂ eq
2016	45122	40606	1519	4061	35024
2017	28237	25411	2105	2541	20763
2018	39049	35139	5886	3514	25735
2019	34790	31308	891	3131	27283
2020	39657	35688	2304	3569	29811
2021	44654	40182	892	4018	35267
2022	39314	35378	106	3538	31731
2023	33645	30277	0	3028	27246
Total	304467	273989	13703	27399	232860

$PE_{FFCO_2, y}$ = Estimated project activity fossil fuel emissions/yr = **13,703 tCO₂**

PE_y = Estimated default (Biomass Cultivation and transport) emissions/yr = **27,399 tCO₂**

LE_y = Leakage emissions = 0 tCO₂

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.

Calculated renewable power (MWh) to grid supplied in this MR = **3,04,467 MWh**

Calculated total baseline emission reductions (BE_y) = **2,73,989 tCO₂eq /yr**

Estimated Total Annual Emission Reductions (ER_y) = 2,32,860 CoUs (2,32,860 tCO₂eq)

Year	Emission Reductions (tCO ₂)
2016	35,024
2017	20,763
2018	25,735
2019	27,283
2020	29,811
2021	35,267
2022	31,731
2023	27,246
Total	2,32,860

B.6. Prior History>>

The Project has received no public funding.

However, the UCR project activity had been registered as a CDM project activity under the title: Shree Chhatrapati Shahu RE Project (CDM Project ID 1297) by the PP but CER's were not issued as the project got rejected.

CDM Registration Date	22/12/2006
CDM Crediting Period	01/04/2007 - 31/03/2014 (Fixed)
CERs Issued (MR Period 1)	n/a (Project was rejected)

Hence the UCR project activity has never been issued voluntary carbon credits for the current 2016- 2023 vintage years and there is no double counting of the credits envisioned. Additionally, the same will be stated in the undertaking provided in the Double Counting Avoidance Assurance Document (DAA) by M/s. Shree Chhatrapati Shahu Sahakari Sakhar Karkhana Ltd.

B.7. Changes to start date of crediting period >>

The monitoring and issuance period is as follows:

UCR Monitored Period: 01 (Monitored Period Duration: 08 Years, 00 Months)

1st UCR Monitoring Period: 01/01/2016 to 31/12/2023

1st UCR Crediting Period: 01/01/2016 to 31/12/2023

B.8. 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.9. Monitoring period number and duration>>

Monitored Period: 01

1st Monitoring Dates: 01/01/2016 to 31/12/2023 (08 years, 00 months)

First Issuance Period: 01/01/2016 to 31/12/2023 (08 years, 00 months)

B.10. Monitoring plan>>

The Project Proponent has proposed to sell the surplus power as an exportable capacity from the said Bagasse based Co-generation power generation plant to MSEDCL to the tune of 9 MW in season and 3.5 MW in off season against the installed capacity of 12.5 MW. The electricity will be produced by using bagasse as fuel.

The supply of the surplus power available for export will be made after meeting the consumption of the sugar mill and the auxiliary consumption of the co-generation power plant. The generator has proposed to sell surplus power generated from the said plant to MSEDCL as under :-

Items		Value in MW	
		Season	Off- Season
1	Gross Power Generation Capacity	12.5 MW	7.0 MW
2	i) Power Consumption (For Sugar Mill Cane Crushing & Boiler Auxiliary)	1.0 MW	1.0 MW
	ii) Distilleries & Colonies	2.5 MW	2.5 MW
3	Total Consumption	3.5 MW	3.5 MW
4	Exportable Power at Interconnection point	9.0 MW	3.5 MW

Season means sugar cane crushing period during the year (150 days). Off season means period other than sugar cane crushing during the year (90 days). The monitoring of electricity data revolves around the power generation from the turbine generators and the auxiliary consumption of the power plant. All auxiliary units at the power plant is metered and there are also main meters attached to each turbine generator to determine their total generation.

Operational records and other evidences have been documented, collected and archived in either

hard-copies or electronic manners. The energy generation is metered by calibrated meters. The biomass consumption is measured by Weigh Bridge calibrated after every two year by state government organisation. Steam quantity, temperature and pressure are measured by calibrated meters. The date of calibration and next due date of calibration can be checked against the calibration certificates. All the values can be checked from the source data ie. plant records. The calorific value of biomass can be checked against the third party analysis reports.

The total amount of bagasse generated by the sugar plant can be calculated from the amount of cane crushed in the season (monitored variable), which is obtained from the in house records. Therefore, bagasse can be calculated using the formula:

$$\text{Bagasse} = \text{Cane} + \text{Added water} - \text{Juice}$$

This quantity will be cross-checked using an annual energy balance using the monitored steam values. The total heat generated as well as the heat generated by the project activity is monitored using the temperature and pressure values and calculating the enthalpies of the steam generated and the feed water. The management of the plant has designated one person to be responsible for the collation of data as per the monitoring methodology. The designated person collects all data to be monitored as mentioned in this project concept note document (PCN) and reports to the head of the plant. The overall project management responsibility remains with the Plant Head. The electricity generation from turbines and auxiliary consumption is recorded continuously on an hourly basis by the operators in the shift. At the end of the day this data is collated by the engineer in charge and signed off by the power plant manager. The steam data is also manually recorded on an hourly basis from the meters. The data is recorded in logbooks by the operators and the engineer in charge collates the data from these log books and stores them electronically. This data is used by engineer in charge to prepare a monthly report and send it to Plant Head for verification. The monthly reports become a part of the Management Information System (MIS) and are reviewed by the management during the quarterly review meeting.

The monthly reports can be made available during the verification of the project activity, to estimate the monthly emission reductions, which are also, included in the MIS. The monitoring personnel are familiar with the process of monitoring and documentation. They have been maintaining and reviewing the factory records pertaining to the sugar manufacturing.

As per the Power Purchase Agreement (PPA), the energy exported to the MSEDCL Grid is recorded from two independent meters viz., Main Meter and Check Meter and reading of main meter is used for billing. In the event of main meter not in operation / fails, the reading of the check meter shall be used for billing.

Power Generation, Export & Auxiliary Consumption, fuel consumption are being recorded daily and the same is being verified and approved by Manager (O&M). The Calibration of monitoring equipment has been carried out according to the specifications of the equipment (1st calibration in 2 years of installation and thereafter subsequent calibrations at an interval of 1 year). All the meters are tested for accuracy annually by an independent agency, which is accredited with

National Accreditation Board for Testing & Calibration Laboratories (NABL), Department of Science & Technology, Government of India.

All the meters are checked and calibrated each year by an independent agency and they are maintained as per the instructions provided by their suppliers. Hence there are no uncertainties or adjustments associated with data to be monitored. An internal audit team, comprising of personnel from the factory but from a department other than utility, reviews the daily reports, monthly reports, procedure for data recording and maintenance reports of the meters. This team checks whether all records are being maintained as per the details provided in the PCN. The audit team also enlists the modifications/corrective actions required, if any, in more accurate monitoring and reporting. All the data and reports will be kept at the offices of the sugar mill until 2 years after the end of the crediting period or the last issuance of CoUs for the project activity, whichever occurs later.

Emergency preparedness plans have been laid out to meet with situations leading to unintended emissions. These emergency situations have been identified as:

1. Fire in the fuel yard
2. Fuel spoilage due to water. These emergency situations have been taken care by putting up a fire safety system and a water drainage system in the fuel yard T.

Parameters	Description	Measured Data
$Q_{s,y}$	Quantity of steam supplied per year measured at recipient's end	The net heat generated from the project plant is determined as a difference between the steam energy (based on measured steam flow, temperature and pressure) and feed water energy (based on feed water flow, temperature). The outlet steam conditions, pressure and temperature, are continuously monitored using pressure transmitter and temperature sensor respectively. The steam flow rate is monitored on a continuous basis using the steam flow meter. At the boiler outlet, steam pressure and temperature condition, the enthalpy is obtained from the standard steam table. The multiplication of the enthalpy of steam with the steam flow rate, gives the total heat content of the outlet steam from the boiler. Similarly, the enthalpy of feed water has also been monitored and reported and the same was considered to obtain the final Q project plant which reflects the actual net quantity of heat generation from the project plant boiler. The readings recorded from the flow meter are

converted to MWh.

turbine 12.5 MW

Turbine Load point list

Load point	Unit	Season	Off Season
* Live Steam			
Pressure	ATA	64.00	64
Temp.	Deg C	480	480
Flow	ton/hr	70	55.75
* Exhaust to condenser			
Pressure	ATA	0.062	0.101
Temp.	Deg C	36.42	45.61
Power O/P	Kwatt	10250	12500
* Bleed Steam			
Pressure	ATA	8.00	8.0
Temp.	Deg C	190	190
Flow	ton/hr	12.71	5.1616
* Extraction Steam			
Pressure	ATA	2.5	2.5
Temp.	Deg C	135	135
Flow	ton/hr	51.71	9.612

Turbine 9 MW

Turbine Load point list

Load point	Unit	Season	Off Season
* Live Steam			
Pressure	ATA	64.00	64
Temp.	Deg C	480	480
Flow	ton/hr	70	55.75
* Exhaust to condenser			
Pressure	ATA	0.062	0.101
Temp.	Deg C	36.42	45.61
Power O/P	Kwatt	10250	12500
* Bleed Steam			
Pressure	ATA	8.00	8.0
Temp.	Deg C	190	190
Flow	ton/hr	12.71	5.1616
* Extraction Steam			
Pressure	ATA	2.5	2.5
Temp.	Deg C	135	135
Flow	ton/hr	51.71	9.612

T_{steam,y}

Temperature of steam at the recipient's end

A temperature transmitter is used to measure the temperature of the steam produced. The temperature of the steam is monitored on a continuous basis and recorded daily. A daily average value of temperature is recorded in the plant log book. The recorded daily values of the temperature of steam were 480°C over the monitoring period.

P_{steam,y}	Pressure of steam	A Pressure transmitter is used to measure the pressure of the steam produced. The pressure of the steam generated is monitored on a continuous basis and recorded daily. The daily average value is taken from the digital reading and the same is recorded into log books.
E_{steam,y}	Enthalpy of the saturated steam supplied to the recipient from each boiler	The enthalpy of feed water is obtained from the steam table at the temperature condition of the feed water supplied to the project boilers.
T_{Feedwater}	Temperature of boiler feedwater	A temperature transmitter is used to measure the temperature of the feedwater and is monitored on a continuous basis and recorded daily. A daily average value of temperature is recoded in to the plant log book.
E_{Feedwater}	Enthalpy of feed water	Enthalpy of feed water for the project plant from each boiler for the entire monitoring period was measured.
E_{Gthermal,y}	Net quantity of thermal energy supplied by the project activity during theyear y	The enthalpy of steam is obtained from the steam table by using pressure and temperature condition (temperature and pressure as being monitored above) of the steam generated from the project boiler.
B_{Biomass,y}	Net quantity of biomass consumed in year y (on drybasis)	The quantity of biomass type (on “as received” basis) combusted in the project plant is measured on conveyor belt by load cells. Load cells are calibrated on an annual basis according to the standard procedure by the PP. Calibration certificates of load cells are available on site. Calibration of load cell had been done by accredited a NABL (National Accreditation Board for Testing and Calibration Laboratories) approved lab. The amount of biomass combusted in the process can be verified from the plant log books. It is worth mentioning here that this parameter is not being used in the ER calculation.
MC_{biomass}	Moisture content of the biomass	NA

Gross electricity generation is being measured continuously by energy meters. The meter readings are recorded in the plant log books on shift wise basis. Energy meters have been calibrated as per standard procedures by third party agencies which are also according to the monitoring plan. The

same can be verified from the calibration certificates provided during the UCR verification process.

Month/Year	Total Generation (kwh)	Net Export (KWH)
Jan-16	1,28,45,733	7264756.88
Feb-16	1,27,95,800	7141601.25
Mar-16	1,31,70,210	7285215
Apr-16	8,85,627	5788770
May-16	28,84,665	2413953.75
Jun-16	-	-
Jul-16	-	-
Aug-16	-	-
Sep-16	-	-
Oct-16	-	-
Nov-16	1,01,25,538	6343805.63
Dec-16	1,40,68,955	8883843.75
TOTAL 2016	6,67,76,528	4,51,21,946

Month/Year	Total Generation (kwh)	Net Export (KWH)
Jan-17	1,39,56,768	8499000
Feb-17	1,27,39,251	7773000
Mar-17	% Cofiring coal exceeds biomass by more than 15%	
Apr-17	-	-
May-17	-	-
Jun-17	-	-
Jul-17	-	-
Aug-17	-	-
Sep-17	-	-
Oct-17	81,644	52,500
Nov-17	93,38,543	49,61,250
Dec-17	1,39,80,000	69,51,000
TOTAL 2017	5,00,96,206	2,82,36,750

Month/Year	Total Generation (kwh)	Net Export (KWH)
Jan-18	1,29,71,999	60,96,000
Feb-18	1,21,80,588	60,90,750
Mar-18	1,21,07,532	68,07,750
Apr-18	82,92,236	69,72,750
May-18	32,72,212	26,22,000
Jun-18	-	-
Jul-18	-	-
Aug-18	-	-
Sep-18	-	-
Oct-18	48,468	26,192
Nov-18	77,53,115	39,97,500
Dec-18	1,33,42,722	64,36,500
TOTAL 2018	6,99,68,872	3,90,49,442

Month/Year	Total Generation (kwh)	Net Export (KWH)
Jan-19	1,34,19,471	62,56,500
Feb-19	1,24,02,469	58,93,500
Mar-19	1,08,18,110	66,96,750
Apr-19	73,93,488	61,71,000
May-19	1,59,187	1,30,500
Jun-19	-	-
Jul-19	-	-
Aug-19	-	-
Sep-19	-	-
Oct-19	-	-
Nov-19	49,75,296	27,04,500
Dec-19	1,41,45,963	69,36,750
TOTAL 2019	6,33,13,984	3,47,89,500

Month/Year	Total Generation (kwh)	Net Export (KWH)
Jan-20	1,39,58,818	64,08,000
Feb-20	1,33,32,253	63,17,250
Mar-20	99,23,649	51,70,500
Apr-20	59,06,517	50,18,250
May-20	52,50,004	44,15,250
Jun-20	-	-
Jul-20	-	-
Aug-20	-	-
Sep-20	-	-
Oct-20	64,062	42,750
Nov-20	1,15,72,311	58,81,500
Dec-20	1,41,66,114	64,03,500
TOTAL 2020	7,41,73,728	3,96,57,000

Month/Year	Total Generation (kwh)	Net Export (KWH)
Jan-21	1,38,41,573	65,45,250
Feb-21	1,26,94,448	59,03,250
Mar-21	1,28,90,870	66,35,250
Apr-21	72,28,248	59,37,750
May-21	75,22,926	62,67,000
Jun-21	8,77,046	6,24,000
Jul-21	-	-
Aug-21	-	-
Sep-21	-	-
Oct-21	18,08,113	8,87,250
Nov-21	1,24,49,182	56,96,250
Dec-21	1,35,14,304	61,57,500
TOTAL 2021	8,28,26,710	4,46,53,500

Month/Year	Total Generation (kwh)	Net Export (KWH)
Jan-22	1,38,73,434	62,59,500
Feb-22	1,27,77,042	58,27,500
Mar-22	1,22,58,301	65,28,000
Apr-22	66,37,914	54,36,750
May-22	32,57,519	25,77,750
Jun-22	-	-
Jul-22	-	-
Aug-22	-	-
Sep-22	-	-
Oct-22	11,53,478	5,77,500
Nov-22	1,27,62,581	59,67,750
Dec-22	1,40,70,603	61,39,500
TOTAL 2022	7,67,90,872	3,93,14,250

Month/Year	Total Generation (kwh)	Net Export (KWH)
Jan-23	1,36,93,196	62,12,500
Feb-23	1,24,50,316	59,66,250
Mar-23	73,46,008	47,55,750
Apr-23	61,83,062	49,25,500
May-23	20,12,832	15,59,250
Jun-23	-	-
Jul-23	-	-
Aug-23	-	-
Sep-23	-	-
Oct-23	53,957	31,500
Nov-23	98,55,165	44,39,250
Dec-23	1,38,46,304	57,54,750
TOTAL 2023	6,54,40,840	3,36,44,750

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 IPCC 2006 Guidelines (1,409,191 to 5,493,456 kCal/Ton). NCV _i [Net calorific value of biomass, { MWh/ton }] ranges between 2.56-2.60 MWh/ton.
Description	Net Calorific Value of Biomass Residue Type K
Source of data Value(s) applied	Measurements is carried out by reputed labs and reported in drybiomass basis.
Measurement methods and procedures	On site and in labs
Monitoring frequency	Every 6 months
Purpose of data	Quality control
Uncertainty level of data	Low

Data/Parameter	Q _{biomass,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.
Measurement methods and procedures	Monitoring: The quantity of biomass fed into the boiler is controlled. Data type: Measured Responsibility: Boiler operator
Monitoring frequency	Daily
QA/QC	The amount of biomass used can be cross checked by the purchase orders and stock inventory. Quantity of biomass has been monitored. Biomass measuring device has an accuracy level of +/- 0.5% of full scale, and ranging between 0-120 TPH.

MONTH/YY	Qbiomass,yr Biomass consumed (tonnes)
Jan-16	41,697
Feb-16	36,932
Mar-16	27,393
Apr-16	17,137
May-16	-
Jun-16	-
Jul-16	-
Aug-16	-
Sep-16	-
Oct-16	-
Nov-16	14,215
Dec-16	42,760
TOTAL 2016	1,80,134

MONTH/YY	Qbiomass,yr Biomass consumed (tonnes)
Jan-17	40,623
Feb-17	36,176
Mar-17	% Cofiring coal exceeds biomass by more than 15%
Apr-17	-
May-17	-
Jun-17	-
Jul-17	-
Aug-17	-
Sep-17	-
Oct-17	-
Nov-17	24,730
Dec-17	41,180
TOTAL 2017	1,42,709

MONTH/YY	Qbiomass,yr Biomass consumed (tonnes)
Jan-18	38,355
Feb-18	35,231
Mar-18	33,517
Apr-18	18,763
May-18	8,245
Jun-18	-
Jul-18	-
Aug-18	-
Sep-18	-
Oct-18	-
Nov-18	22,716
Dec-18	40,746
TOTAL 2018	1,97,573

MONTH/YY	Qbiomass,yr Biomass consumed (tonnes)
Jan-19	41,697
Feb-19	36,932
Mar-19	27,393
Apr-19	17,137
May-19	-
Jun-19	-
Jul-19	-
Aug-19	-
Sep-19	-
Oct-19	-
Nov-19	14,215
Dec-19	42,760
TOTAL 2019	1,80,134

MONTH/YY	Qbiomass,yr Biomass consumed (tonnes)
Jan-20	43,317
Feb-20	41,733
Mar-20	30,572
Apr-20	14,424
May-20	19,239
Jun-20	-
Jul-20	-
Aug-20	-
Sep-20	-
Oct-20	-
Nov-20	33,467
Dec-20	40,706
TOTAL 2020	2,23,458

MONTH/YY	Qbiomass,yr Biomass consumed (tonnes)
Jan-21	39,702
Feb-21	38,253
Mar-21	39,334
Apr-21	20,122
May-21	19,901
Jun-21	-
Jul-21	-
Aug-21	-
Sep-21	-
Oct-21	5,706
Nov-21	38,603
Dec-21	42,368
TOTAL 2021	2,43,989

MONTH/YY	Qbiomass,yr Biomass consumed (tonnes)
Jan-22	42,589
Feb-22	38,719
Mar-22	37,073
Apr-22	18,045
May-22	9,852
Jun-22	-
Jul-22	-
Aug-22	-
Sep-22	-
Oct-22	2,968
Nov-22	34,464
Dec-22	39,084
TOTAL 2022	2,22,794

MONTH/YY	Qbiomass,yr Biomass consumed (tonnes)
Jan-23	38,785
Feb-23	38,336
Mar-23	22,028
Apr-23	16,667
May-23	7,177
Jun-23	-
Jul-23	-
Aug-23	-
Sep-23	-
Oct-23	154
Nov-23	32,249
Dec-23	44,950
TOTAL 2023	2,00,346

Data/Parameter	EGproject plant, y
Data unit	MWh
Description	Net quantity of electricity generated in the project plant during theyear y
Source	M/s. Shree Chhatrapati Shahu SSK Ltd.-factory records
Measurement methods and procedures	This value will be determined annually from the records maintained at the factory. All auxiliary units at the power plant are metered and there is also a main-meters attached to each turbine generator to determine their total generation.
Monitoring frequency	The hourly recordings of data is to be taken from energy meters located at the project activity site. This data is to be recorded hourly by the shift attendant and entered into logbooks on site. This hourly data is to be signed off at the end of every shift by an engineer in charge of the shift and again at the end of each day and signed off by the power plant manager. The energy meters are calibrated annually by an independent third party
QA/QC	Net electricity production has been calculated by deducting auxiliary consumption from gross generation of the plant. Digital meters calibration procedures are planned. Daily productions details are kept in log books and electronic data base. Energy meters are of class 0.2 with tolerance of 0.5%. All Meters are calibrated by accredited

	external third party, as per standard procedures, periodically.
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Data/Parameter	EF grid,y
Data unit	Grid Emission Factor
Description	tCO ₂ /MWh
Source of data Value(s) applied	UCR CoU Standard Default for Indian grid 0.9 tCO ₂ /MWh for the period 2013-2023
Measurement methods and procedures	NA
Monitoring frequency	NA
QA/QC	The parameter is conservative.
Purpose of data	To estimate baseline emissions

Data/Parameter	EG grid,y
Data unit	MWh
Description	Net quantity of electricity supplied to the grid
Source of data Value(s) applied	JMR and/or Monthly Meter Readings
Measurement methods and procedures	Type: Calculated Data type: Monitored This parameter may be checked with the necessary invoices or JMR (issued by the state grid) each month.
Monitoring frequency	Daily
QA/QC	Energy meters on existing turbines are calibrated on annual basis by NABL accredited labs. Electricity generation in these units are recorded and kept in log books for verification purpose. Energy meters are of class 0.2 with tolerance of 0.5%. All Meters are calibrated by accredited external third party, as per standard procedures, periodically
Purpose of data	To estimate baseline emissions
Uncertainty level of data	Low



**Shree Chhatrapati Shahu
Sahakari Sakhar Karkhana Ltd., Kagal**



INVOICE

To: SE (O&M) MSEDCL, Kolhapur Circle, Tarabai Park, Kolhapur.

Invoice No. SCSSSKL/ MSEDCL /INV/19-20/ 02

May 04, 2019

For the Month of May. 2019.

Name of Generator :- Shree Chhatrapati Shahu Sahakari Sakhar Karkhana Ltd, Kagal					
Name of the Board :- Maharashtra State Distribution Company Limited					
C.T. Ratio Available/Connected: 75/1A P.T. Ratio Available/Connected: 110KV/110V			Date of first Commissioning - 15/03/2008, For 12.5 MW 25/11/2012, For 9.0 MW		
Scale Factor (if any) Multiplying Factor:- 750		Installed Generation Capacity		21.5 MW (12.5 MW + 9MW)	
Meter Make /Meter no.- Elster A1800, Sr. No.-16636489		Surplus Generation Capacity		12.00 MW season 10.69 MW off season	
KWH			RKVAH		
Previous Reading (01/05/2019)		292599.935		Previous Reading (01/05/2019)	
Current Reading (01/06/2019)		292802.57		Current Reading (01/06/2019)	
(A) Difference		202.635		(A) Difference	
(B) Difference x MF		151976.25		(B) Difference x MF	
		Ratio:-- KWH : RKVAH		46.10 %	
KWh Exported	Unit Rate as per EPA	Amount	Short fall RKVAH	Penalty per RKVAH	Amount of Penalty
151976.25	Rs. 6.64	10,09,122/-	NIL	Rs.0.25	NIL

Less Penalty Amount: NIL.

Total Amount Payable: Rs. 10,09,122 /- (Ten Lakhs Nine Thousand One Hundred Twenty Two only)

**Jitendra Chavan
Managing Director**

"Shrimant Jaysingrao Ghatge Bhavan" Kagal 416 216 Dist - Kolhapur Phone No. (02325) 244211 to 244214
Fax No. - 244241 Kolhapur Office :- (0231) 2054450 E-mail : mail@shahusugar.com, Website - www.shahusugar.com
● I. T. PAN No. AAAAS1032M ● VAT TIN No. - 27270410837V ● CST TIN No. - 27270410837C ●



ISO 9001:2015

