PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (COU) PROJECT

Title: 30 MW Bagasse based co-generation at M/S Shree Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd; Bidri (Mouninagar), Kolhapur, Maharashtra.

Version 1.0

Date 25-05-2025

First CoU Issuance Period: 12 Years

Crediting Period: 01-01-2013 to 31-12-2024

BASIC INFORMATION	
Title of the Project activity	30 MW Bagasse based co-generation at M/S Shree Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd; Bidri (Mouninagar), Tal- Kagal, Dist-Kolhapur, Maharashtra.
Scale of the project activity	Large Scale
Completion date of the PCN	25-05-2025
Project Participants	Project Proponent: M/S Shree Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd; Bidri (Mouninagar), Tal- Kagal, Dist-Kolhapur, Maharashtra. Aggregator: Climekare Sustainability Pvt ltd.(336812961)
Host Party	India
Applied methodologies and standardized baselines	CDMUNFCCC Methodology ACM0006: Electricity and heat generation from biomass(Ver.16)&UCR Standard for Emission Factor
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated total amount of average GHG emission reductions per year	42,484 CoU's or (42,484 tCO2eq)

SECTION A. Description of Project Activity

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

M/S Shree Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd; Bidri (Mouninagar), Tal- Kagal, Dist-Kolhapur (SDVSSKL) has been registered under registration no. G-279 of 1956 dated October 10, 1956, It is one of the most progressive sugar factory in the state of Maharashtra. Factory is operating 7500 TCD sugarcane crushing capacity and 30 MW cogeneration power plant. The existing Sugar unit is geographically located at Lat 16°25'44"N & Long 74° 08'17"E, at a maximum elevation of 559 m MSL.

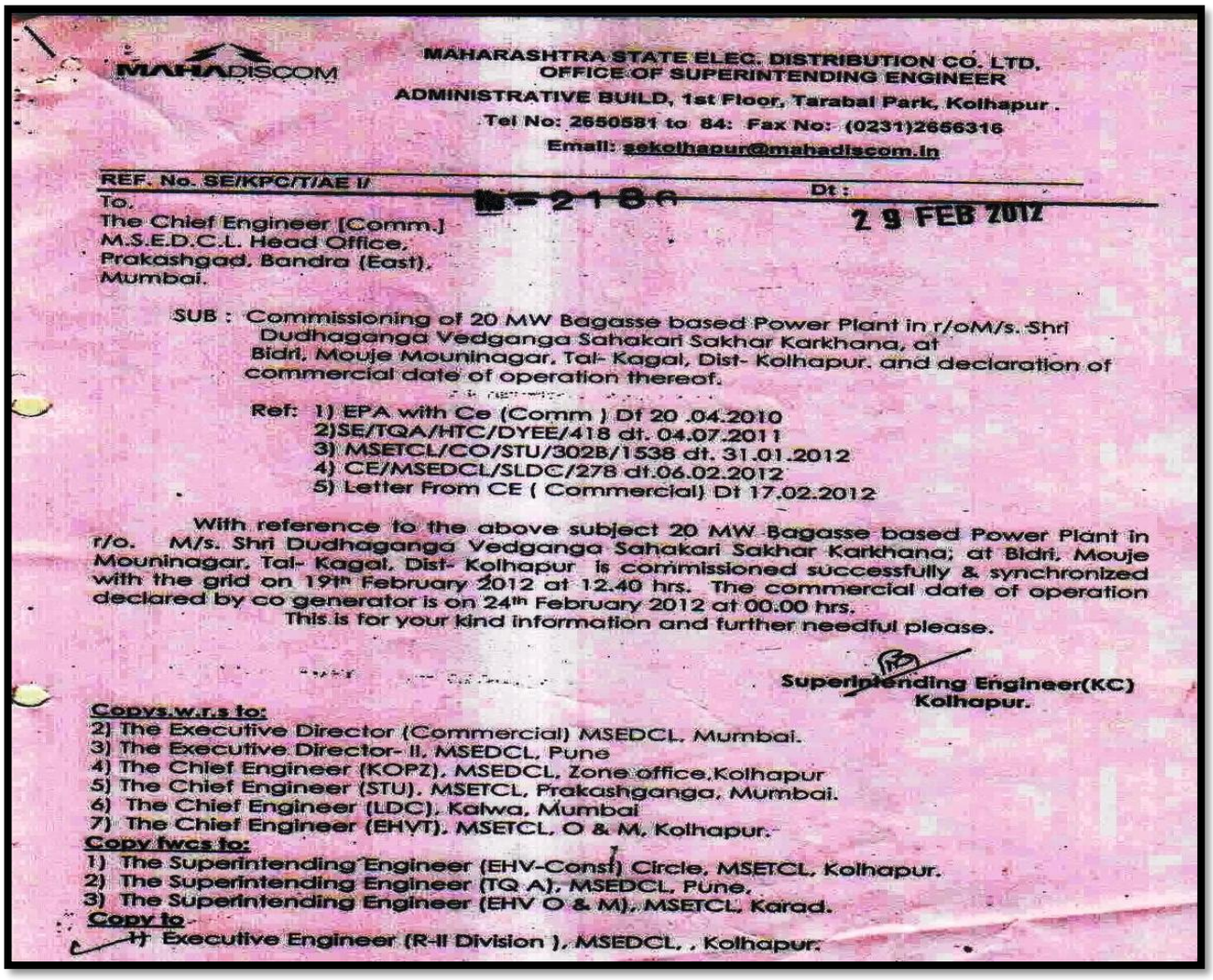
The project titled "30 MW Bagasse-Based Co-Generation by M/S Shree Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd; Bidri (Mouninagar)" is a bagasse-based co-generation (co-gen) power project successfully commissioned by Maharashtra State Electricity Transmission Company Limited (MSETCL).

- The 20 MW Turbine was commissioned on February 29, 2012.
- Another 10 MW Turbine was synchronized on December 06, 2022, and started exporting power on December 06, 2022. From December 06, 2022, the total capacity of the project proponent's turbine was 30 MW.

Purpose of the project activity:

The purpose of the project activity is to generate electricity using renewable biomass (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.

The PP has set up an integrated sugar mill with sugar crushing capacity of 7500 TCD. 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 / Energy Purchase agreement.



MAHADISCOM

MAHARASHTRA STATE ELEC. DISTRIBUTION CO. LTD.
OFFICE OF SUPERINTENDING ENGINEER
ADMINISTRATIVE BUILD, 1st Floor, Tarabai Park, Kolhapur .
Tel No: 2650581 to 84: Fax No: (0231)2656316
Email: sekolhapur@mahadiscom.in

REF. No. SE/KPC/T/AE I/ 2186 Dt : 29 FEB 2012

To,
The Chief Engineer (Comm.)
M.S.E.D.C.L. Head Office,
Prakashgad, Bandra (East),
Mumbai.

SUB : Commissioning of 20 MW Bagasse based Power Plant in r/oM/s. Shri Dudhaganga Vedganga Sahakari Sakhar Karkhana, at Bidri, Mouje Mouninagar, Tal- Kagal, Dist- Kolhapur. and declaration of commercial date of operation thereof.

Ref: 1) EPA with Ce (Comm) Dt 20 .04.2010
2)SE/TQA/HTC/DYEE/418 dt. 04.07.2011
3) MSETCL/CO/STU/302B/1538 dt. 31.01.2012
4) CE/MSEDCL/SLDC/278 dt.06.02.2012
5) Letter From CE (Commercial) Dt 17.02.2012

With reference to the above subject 20 MW Bagasse based Power Plant in r/o. M/s. Shri Dudhaganga Vedganga Sahakari Sakhar Karkhana; at Bidri, Mouje Mouninagar, Tal- Kagal, Dist- Kolhapur is commissioned successfully & synchronized with the grid on 19th February 2012 at 12.40 hrs. The commercial date of operation declared by co generator is on 24th February 2012 at 00.00 hrs.
This is for your kind information and further needful please.

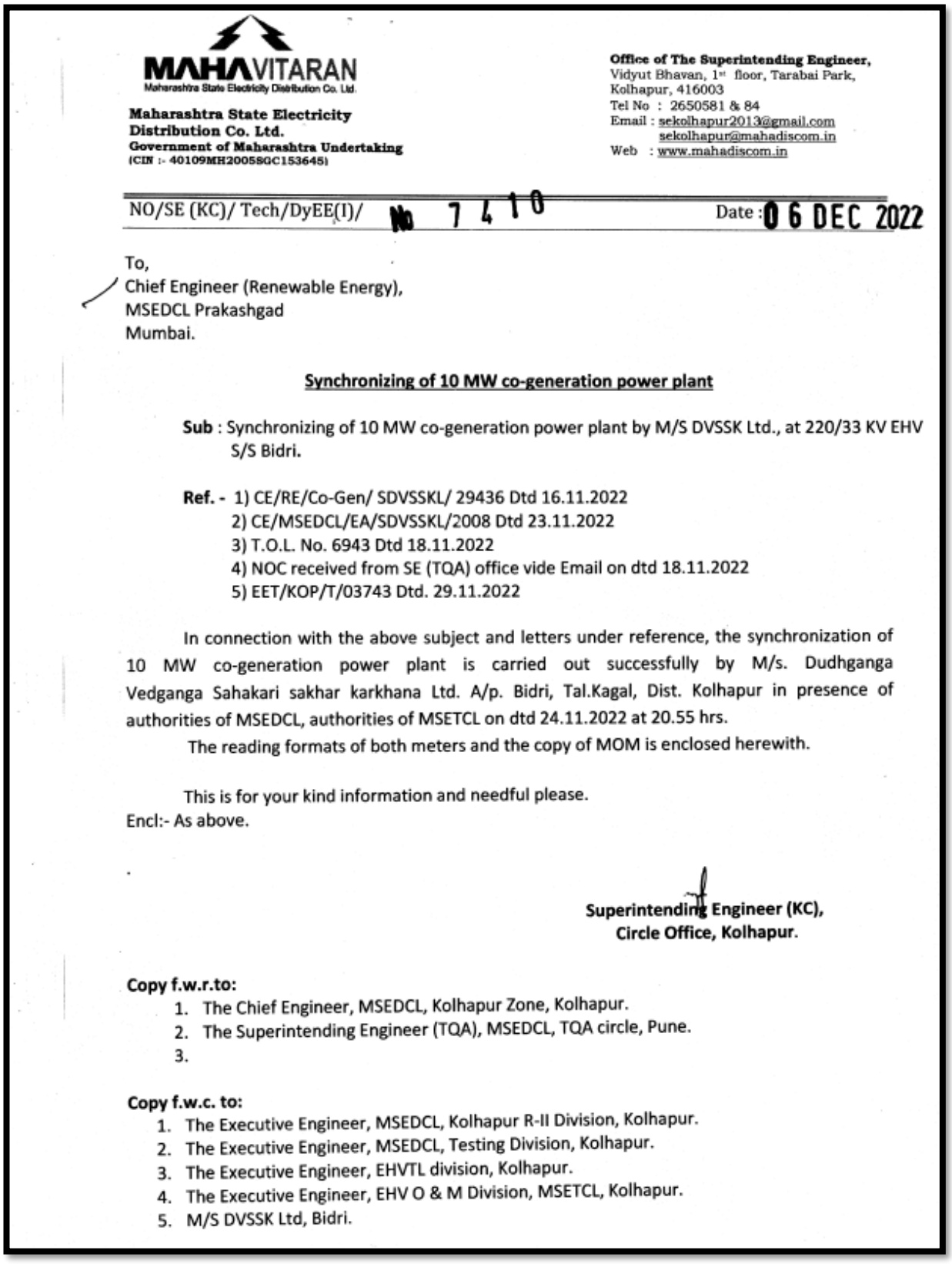
Superintending Engineer(KC)
Kolhapur.

Copys.w.r.s to:
2) The Executive Director (Commercial) MSEDCL, Mumbai.
3) The Executive Director- II, MSEDCL, Pune
4) The Chief Engineer (KOPZ), MSEDCL, Zone office,Kolhapur
5) The Chief Engineer (STU), MSETCL, Prakashganga, Mumbai.
6) The Chief Engineer (LDC), Kalwa, Mumbai
7) The Chief Engineer (EHVT), MSETCL, O & M, Kolhapur.

Copy fwcs to:
1) The Superintending Engineer (EHV-Const) Circle, MSETCL, Kolhapur.
2) The Superintending Engineer (TQ A), MSEDCL, Pune.
3) The Superintending Engineer (EHV O & M), MSETCL, Karad.

Copy to
1) Executive Engineer (R-II Division), MSEDCL, , Kolhapur.

Figure 1: Commissioning Certificates



MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

Maharashtra State Electricity Distribution Co. Ltd.
Government of Maharashtra Undertaking
(CIN :- 40109MH2005SGC153645)

Office of The Superintending Engineer,
Vidyut Bhavan, 1st floor, Tarabai Park,
Kolhapur, 416003
Tel No : 2650581 & 84
Email : sekolhapur2013@gmail.com
sekolhapur@mahadiscom.in
Web : www.mahadiscom.in

NO/SE (KC)/ Tech/DyEE(I)/ No 7410 Date : 06 DEC 2022

To,
Chief Engineer (Renewable Energy),
MSEDCL Prakashgad
Mumbai.

Synchronizing of 10 MW co-generation power plant

Sub : Synchronizing of 10 MW co-generation power plant by M/S DVSSK Ltd., at 220/33 KV EHV S/S Bidri.

Ref. - 1) CE/RE/Co-Gen/ SDVSSKL/ 29436 Dtd 16.11.2022
2) CE/MSEDCL/EA/SDVSSKL/2008 Dtd 23.11.2022
3) T.O.L. No. 6943 Dtd 18.11.2022
4) NOC received from SE (TQA) office vide Email on dtd 18.11.2022
5) EET/KOP/T/03743 Dtd. 29.11.2022

In connection with the above subject and letters under reference, the synchronization of 10 MW co-generation power plant is carried out successfully by M/s. Dudhganga Vedganga Sahakari sakhar karkhana Ltd. A/p. Bidri, Tal.Kagal, Dist. Kolhapur in presence of authorities of MSEDCL, authorities of MSETCL on dtd 24.11.2022 at 20.55 hrs.

The reading formats of both meters and the copy of MOM is enclosed herewith.

This is for your kind information and needful please.
Encl:- As above.

Superintending Engineer (KC),
Circle Office, Kolhapur.

Copy f.w.r.to:
1. The Chief Engineer, MSEDCL, Kolhapur Zone, Kolhapur.
2. The Superintending Engineer (TQA), MSEDCL, TQA circle, Pune.
3.

Copy f.w.c. to:
1. The Executive Engineer, MSEDCL, Kolhapur R-II Division, Kolhapur.
2. The Executive Engineer, MSEDCL, Testing Division, Kolhapur.
3. The Executive Engineer, EHVTL division, Kolhapur.
4. The Executive Engineer, EHV O & M Division, MSETCL, Kolhapur.
5. M/S DVSSK Ltd, Bidri.

Figure 2: Grid Connectivity report.

The Co-gen power project of 30 MW capacities is operating on bagasse only for 140 to180 days during season days. Actual number of mill operation days will be mentioned in the monitoring period. The project is generating clean energy at the designed level and after meeting the

captive requirement, the surplus energy is exported to the Maharashtra State Electricity Transmission Company Limited (MSEDCL). All the steam and power requirements of the sugar mill and co-gen power plant is meet internally from the project itself.

The project activity also induces environmental and sustainable development benefits. The project activity has introduced 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. Hence, project activity is displacing the estimated annual net electricity generation i.e., **52449 MWh** 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 **42,484 tCO2e,** whereas actual emission reductions achieved during the first CoU period shall be submitted as a part of first monitoring and verification.

The policy to grow in a sustainable manner with a commitment towards the environment has been adopted by SDVSSKL Bidri.

The technology used in the project activity is highly replicable as the country's sugar mills produce large quantities of bagasse that could be efficiently utilized to generate power. The export of electricity hence reduces GHG emissions by replacing the fossil fuel dominated grid based electricity with a renewable source of electricity. The high pressure boilers are fired by bagasse, a byproduct from the sugar manufacturing process to generate steam, which in turn powers all the steam turbines to generate electricity.

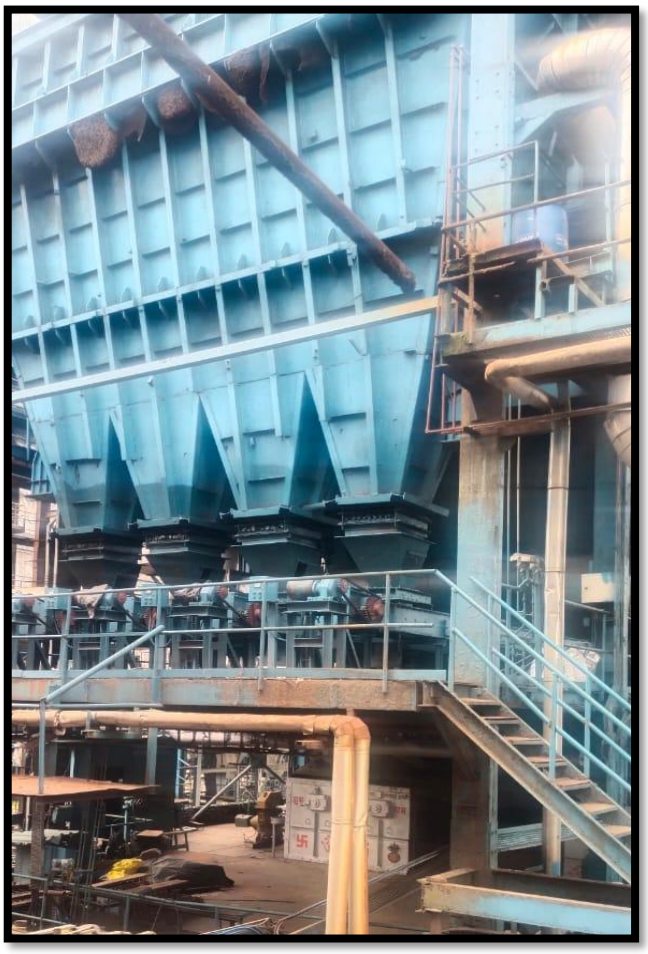


Figure 3: Image: Co-generation

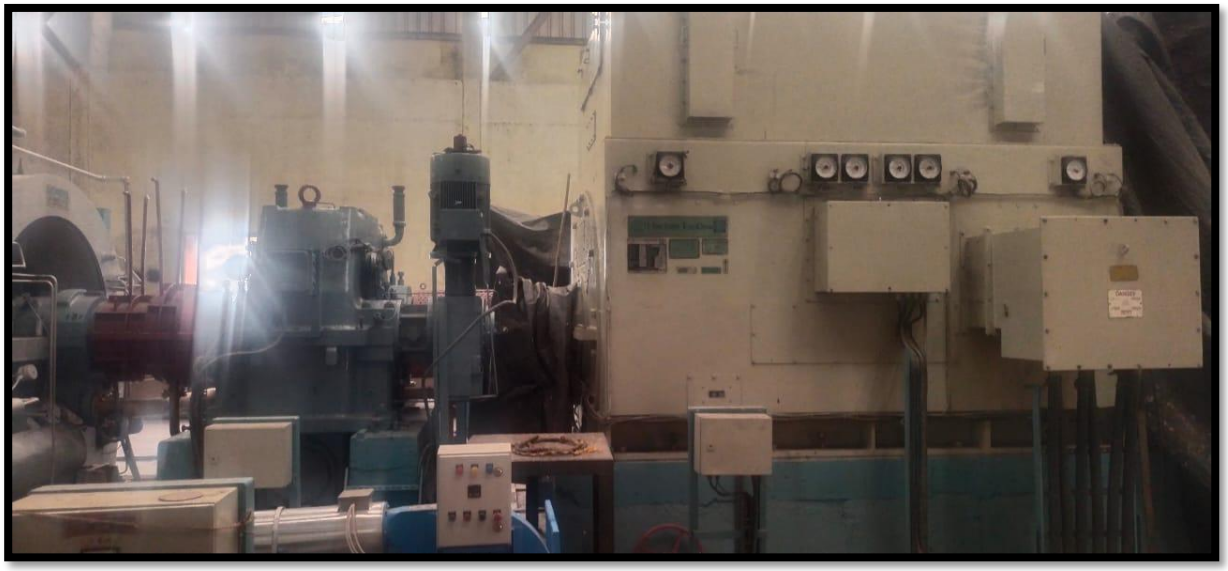


Figure 4: Turbine

Figure 5: Switch Yard

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.

There are no Eco-sensitive zones like Tropical Forests, Biosphere Reserves, National Parks, Wild Life Sanctuaries, and Coral Formation Reserves within 10 km Influence Zone of the Project site. Environmental setting of the project site is given in **Table 1** below,

#	Features	Particulars
1	Location	M/s. Dudhganga Ved Sakhar Karkhana Ltd., (DVSSKL), At village Bidri, Mouninagar, Tal. Kagal, Dist. Kolhapur, Maharashtra
2	Latitude / Longitude Altitude	16° 25’41.72”N 74° 08’21.19”E
3	Daily average temp. in °C	Max.:27-36, min.:14-21
4	Average relative humidity	46 to 82 %

5	Annual rain fall in mm	664
6	Predominant wind directions	3 to 12 km/h, predominantly SW-NE and E-W
7	Soil type	Sandy loam, reddish-brown
8	Topography	Moderately undulated. No streams at the site.
9	Nearest highway	Kolhapur- Radhanagari Highway (SH 179)- 0.14 Km
10	Nearest railway station	Kolhapur Railway Station, 40 km
11	Nearest airport	Kolhapur :32 km
12	Nearest village	Bidri Village, 0.81Km
13	Nearest City	Kolhapur, 40Km
14	Nearest industry	None
15	Nearest water body	Dudhaganga River (0.4 km)
16	Environmentally sensitive?	None within 15 km. River as ab
17	Seismic characteristics	Safe as per Indian Seismological Institute.
18	ESZs	Radhanagari Wildlife Sanctuary (Project site is located at 10.1 Km from ESZ)

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.

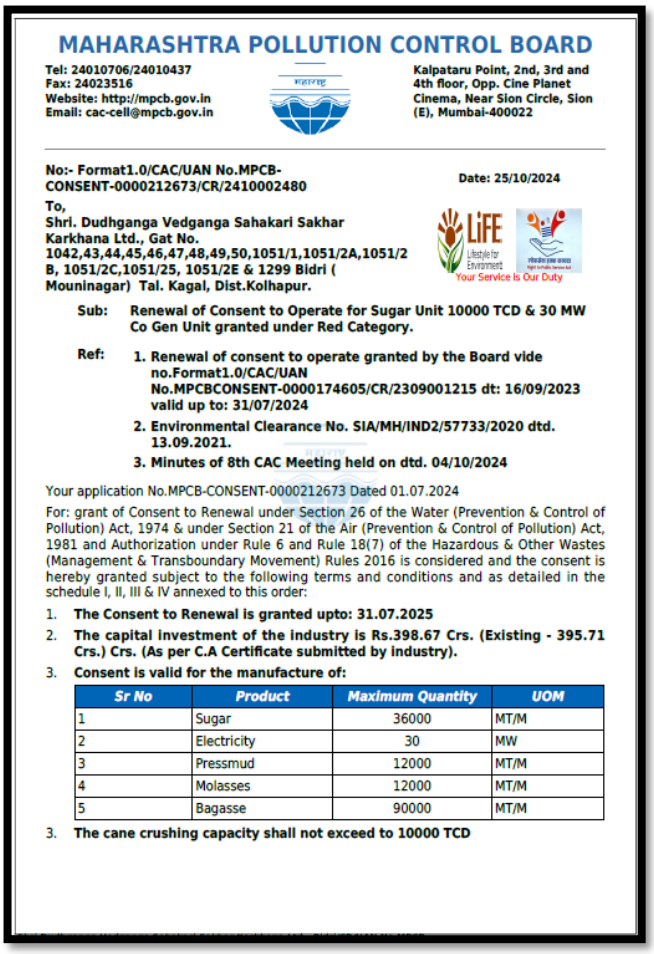
Environmental benefits:

- 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.

- Avoids global and local environmental pollution, leading to reduction of GHG emissions.
- 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 (NOx and SOx) 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.

Economic benefits:

- The project activity creates employment opportunities during the project stage and operation and maintenance of the Co-gen power plant.
  Employment Generation: - Factory workers, Sugarcane cutting contract workers, Sugarcane transport contract workers, Hamali work, Bagasse baling, Wheat work, Cleaning etc. Direct employment to thousands of workers through the work and as the above workers live in the factory premises, grocery, hotel, tire puncture, welding, garage, vegetable, chicken center, saloon, cloth, slippers, weekly market, fertilizers, medicines, drip irrigation etc. With the flourishing of businesses, thousands of unemployed have been provided indirect employment in the form of business.
- 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.



MAHARASHTRA POLLUTION CONTROL BOARD

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

Kalpataru Point, 2nd, 3rd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

No:- Format1.0/CAC/UAN No.MPCB-CONSENT-0000212673/CR/2410002480

Date: 25/10/2024

To,
Shri. Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd., Gat No. 1042,43,44,45,46,47,48,49,50,1051/1,1051/2A,1051/2B, 1051/2C,1051/25, 1051/2E & 1299 Bidri (Mouninagar) Tal. Kagal, Dist.Kolhapur.

Your Service Is Our Duty

Sub: Renewal of Consent to Operate for Sugar Unit 10000 TCD & 30 MW Co Gen Unit granted under Red Category.

Ref:
1. Renewal of consent to operate granted by the Board vide no.Format1.0/CAC/UAN No.MPCBCONSENT-0000174605/CR/2309001215 dt: 16/09/2023 valid up to: 31/07/2024
2. Environmental Clearance No. SIA/MH/IND2/57733/2020 dtd. 13.09.2021.
3. Minutes of 8th CAC Meeting held on dtd. 04/10/2024

Your application No.MPCB-CONSENT-0000212673 Dated 01.07.2024

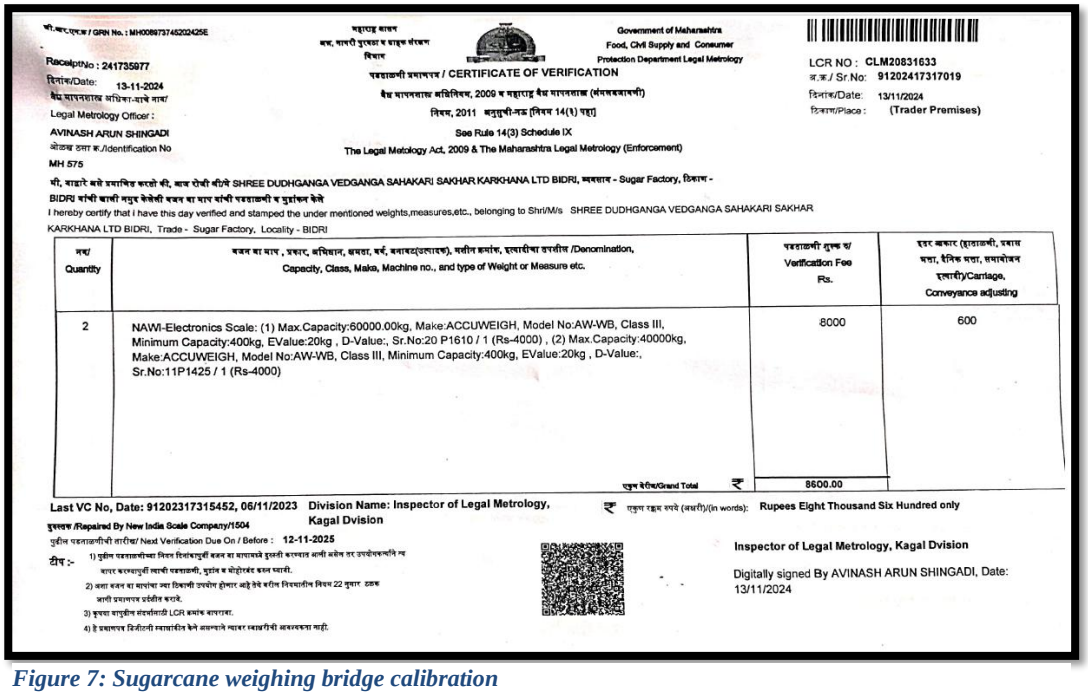
For: grant of Consent to Renewal under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 and Rule 18(7) of the Hazardous & Other Wastes (Management & Transboundary Movement) 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: 31.07.2025**
2. **The capital investment of the industry is Rs.398.67 Crs. (Existing - 395.71 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	36000	MT/M
2	Electricity	30	MW
3	Pressmud	12000	MT/M
4	Molasses	12000	MT/M
5	Bagasse	90000	MT/M

3. **The cane crushing capacity shall not exceed to 10000 TCD**

Figure 6: Consent to Operate



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

Receipt No : 241735977
दिनांक/Date: 13-11-2024
Legal Metrology Officer :
AVINASH ARUN SHINGADI
MH 575

LCR NO : CLM20831633
Date: 13/11/2024
(Trader Premises)

पडताळणी प्रमाणपत्र / CERTIFICATE OF VERIFICATION

वैध मापनशास्त्र अधिनियम, 2009 व महाराष्ट्र वैध मापनशास्त्र (अंमलबजावणी) नियम, 2011 अनुसूची-नऊ [नियम 14(1) पहा]

See Rule 14(3) Schedule IX

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

मी, याद्वारे असे प्रमाणित करतो की, आज रोजी मी/मे SHREE DUDHGANGA VEDGANGA SAHAKARI SAKHAR KARKHANA LTD BIDRI, व्यवसाय - Sugar Factory, ठिकाण - BIDRI यांची खाली नमूद केलेली वजन वा माप यांची पडताळणी व मुद्रांकन केले

I hereby certify that I have this day verified and stamped the under mentioned weights,measures,etc., belonging to Shri/M/s SHREE DUDHGANGA VEDGANGA SAHAKARI SAKHAR KARKHANA LTD BIDRI, Trade - Sugar Factory, Locality - BIDRI

नग/ Quantity	वजन वा माप , प्रकार, अभिज्ञान, क्षमता, वर्ग, बनावट(उत्पादक), यंत्रीय क्रमांक, इत्यादीचा उपयोग /Denomination, Capacity, Class, Make, Machine no., and type of Weight or Measure etc.	पडताळणी शुल्क रु/ Verification Fee Rs.	इतर आकार (हाताळणी, प्रवास भत्ता, दैनिक भत्ता, समायोजन इत्यादी)/Carriage, Conveyance adjusting
2	NAWI-Electronics Scale: (1) Max.Capacity:60000.00kg, Make:ACCUWEIGH, Model No:AW-WB, Class III, Minimum Capacity:400kg, EValue:20kg , D-Value:, Sr.No:20 P1610 / 1 (Rs-4000) , (2) Max.Capacity:40000kg, Make:ACCUWEIGH, Model No:AW-WB, Class III, Minimum Capacity:400kg, EValue:20kg , D-Value:, Sr.No:11P1425 / 1 (Rs-4000)	8000	600
	एकूण देय/Grand Total ₹	8600.00	

Last VC No, Date: 912023173154S2, 06/11/2023 Division Name: Inspector of Legal Metrology, Kagal Dvision

दुरुस्त /Repaired By New India Scale Company/1504

₹ एकूण रक्कम रुपये (अक्षरी)/(in words): Rupees Eight Thousand Six Hundred only

पुढील पडताळणी तारीख/ Next Verification Due On / Before : 12-11-2025

टीप :-
1) पुढील पडताळणीच्या नियत दिनांकापुर्वी वजन वा मापनाचे इतरही करण्यात आली असेल तर उपयोगकर्त्याने त्या वापर करण्यापुर्वी त्याची पडताळणी, मुद्रांक व मोहोरबंद करुन घ्यावी.
2) असा वजन वा मापांचा ज्या ठिकाणी उपयोग होणार आहे तेथे वरील नियमातील नियम 22 नुसार ठळक आणी प्रमाणपत्र प्रदर्शीत करावे.
3) कृपया वापुरील संदर्भासाठी LCR क्रमांक वापरावा.
4) हे प्रमाणपत्र डिजीटली स्वाक्षरीत केले असल्याने त्यावर स्वाक्षरीची आवश्यकता नाही.

Inspector of Legal Metrology, Kagal Dvision

Digitally signed By AVINASH ARUN SHINGADI, Date: 13/11/2024

A.3

Figure 7: Sugarcane weighing bridge calibration

Location of project activity >>

Country	:	India
Village	:	Bidri, Mouninagar
District	:	Kolhapur
State	:	Maharashtra
Latitude	:	16°25’41.72” N
Longitude	:	74°08’21.19” E

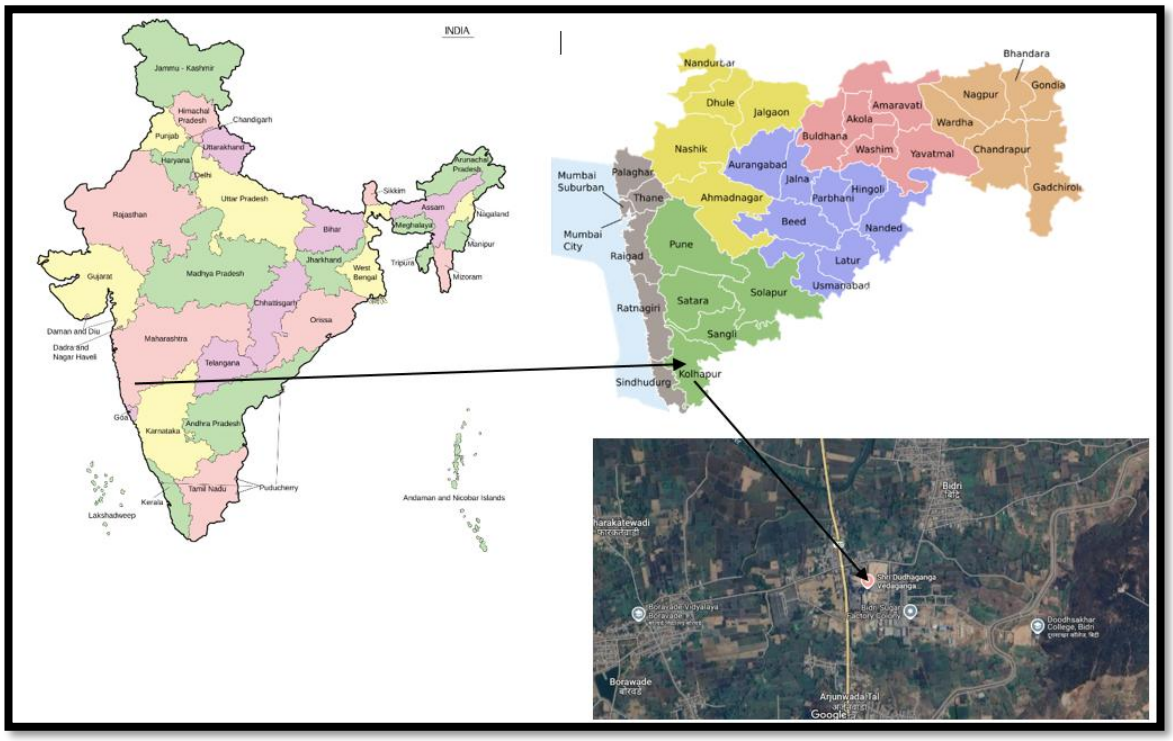


Figure 8: Map Location

Figure 9: Project Boundary

A.4 Technologies/measures >>

The UCR project activity is a grid-connected bagasse based cogeneration power plant with a high back 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.

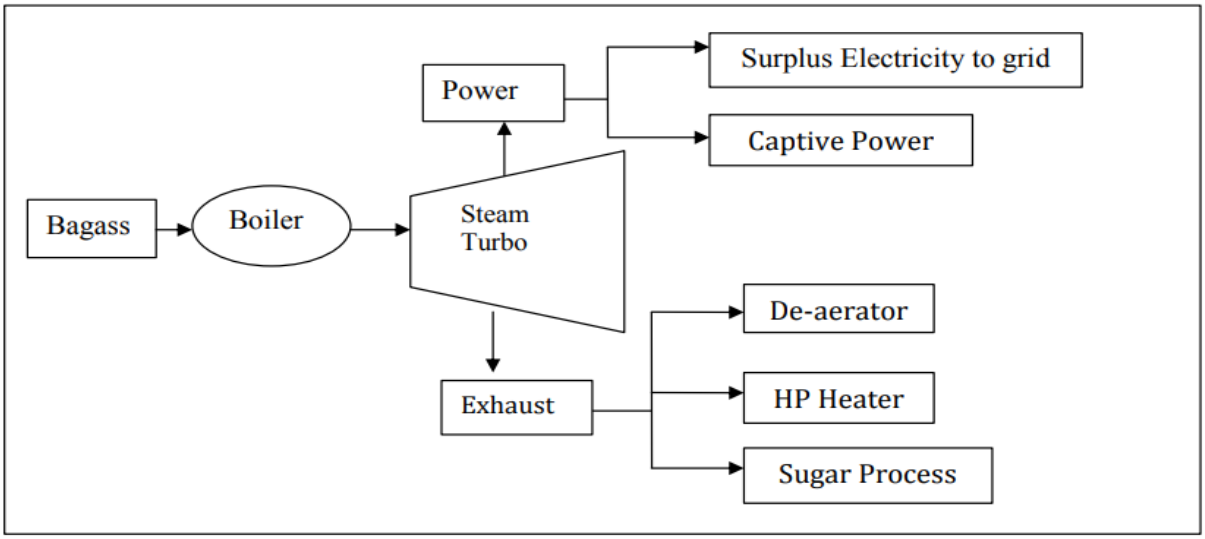
The technology of biomass residue based high steam pressure power generation itself is known and in use in India. The use of high pressure system allows for increased efficiency levels for electricity generation.

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.



Process flow diagram of cogeneration power plant.

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

TURBINE

1	Type: - SST300 VE 45 AL No.: - 32110206. <u>Season</u> P inlet: - 85 Ata. P bleed^{-1}: - 9.826 Ata. P extraction: - 3.00 Ata. P exhaust: - 0.060 Ata. T inlet: - 510 °c T bleed^{-1}: - 239 °c T extraction: - 132.9 °c T exhaust: - 35.89 °c <u>Off Season</u> P inlet: - 85 Ata. P bleed^{-1}: - 7.427 Ata. P extraction: - 3.00 Ata. P exhaust: - 0.100 Ata. T inlet: - 510 °c T bleed^{-1}: -221.9 °c T extraction: - 138.1 °c T exhaust: - 45.53 °c POWER Season / Off Season: - 20000 kw Speed :- 6800 RPM	**Siemens LTD Vadodara Gujarat**

TURBINE GEAR BOX

Gear Box Serial No. 3019 X 600030 NCLF Rated power: - 2140KW / 28702HP Input Speed: - 6850 Output Speed: - 1500 Ratio: - 4. 567 Service Factor: - 1. 3 No. of Teeth / Pinion: - 137/30 Lube oil Recommended: - ISO – VG – 46 Lube Oil QTY.: - 400 LPM Lube Oil Pressure: - 1.5 – 2.0 Kg/cm²	BARING GEAR MOTAR Kw: - 30 Rpm: - 1470 A: - 54 P.F.: - 0.84 V: - 415 Hz: - 50 %Eff.: -92.5 IP: -55 Duty: - S1 Ins.cl: -F Frame: - 200 L Type: - 3~Induction Motor.	Triveni Engineering & Industries LTD Mysore India BARING GEAR MOTAR GEAR BOX: - ELECON GEAR
<u>BARING GEAR MOTAR GEAR BOX</u> Sr. No.: - 608095 Type: - SNU Size: - 9 inch Ratio: - 10: 1	D.E. / N.D.E. BRG: - 6312 C3 Pressing. Grease approx.: - 10 g After every 4000 operating hours.	

A.C. ALTERNETOR

M/C No.: - 2K100.21012-01 Bearing D.E. & N.D.E.: - SLEEVE Grs. / Oil: - ISO VG 46 Qty :- lgm / lpm D.E. & N.D.E. :- 30 LPM	Output: - 25000 KVA Standard: - IS 4722 No. of Phases: - 3 No. of Poles: - 4 Voltage (AC): - 11000 V Current (AC): - 1312 A Frequency: - 50Hz Speed: - 1500 min-1 Limited Speed: - 1800 min-1 P.F.: - 0.8 Type of stator corm.: -Star Exc. Voltage (DC): - 246 V Exc. Current (DC): - 617 A Altitude: - <1000 Type: - TC 172 Weight: - 52340 Kg In closure system: - IP 54 Cooling system: - IC 81 W Temp.: - 32° c Max.T. Rise of st. by RTD: - 84° c Class of Ins.: - ARM F FLd :- F Space Heater: - 4 Qty Supply: - 200-240 Volts Wattage: - 1000 Watt Phase :- 1	TOYO DENKI

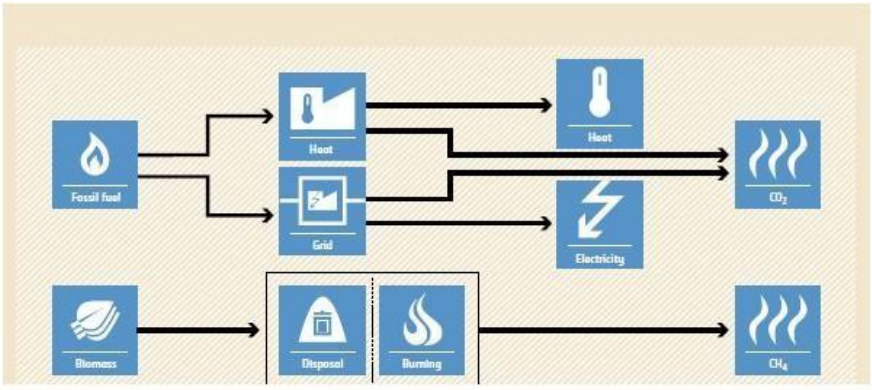
A.5 Parties and Project Participants >>

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

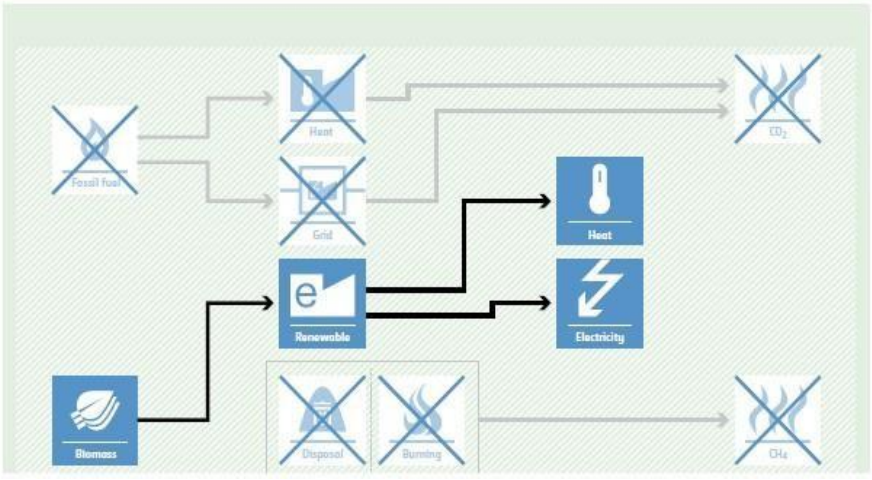
Party (Host)	Participants/Aggregator
India	**Project Owner:** M/s. Dudhganga Ved Sakhar Karkhana Ltd., (DVSSKL), At village Bidri, Mouninagar, Tal. Kagal, Dist. Kolhapur, Maharashtra **Project Aggregator:** Climekare sustainability Pvt. Ltd.

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 CO_2 on-site emissions associated with bagasse combustion.

The operation during crushing season is of 180 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 CO_2 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.2 Applicability of methodologies and standardized baselines >>

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

The project activity is a power generation project using a biomass (bagasse) and displaces CO2 emissions from electricity generation in power plants that are displaced due to the project activity. Since the project activity 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.
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 **30 MW** which is acceptable as per the applied large scale methodology.
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.
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.
The biomass used by the project plant is not stored for more than one year. The biomass used by the project plant is not processed chemically or biologically (e.g.

	through esterification, fermentation, hydrolysis, pyrolysis, bio-or chemical degradation, etc.) prior to combustion.
	The Project Activity uses biomass residues from a production process (e.g. production of sugar), and the implementation of the project does not result in an increase of the processing capacity of (the industrial facility generating the residues) raw input (e.g. sugar) or in other substantial changes (e.g. product change) in this process.
	The project activity unit does not co-fire fossil fuel and/or does not exceed the limit of 25% co-firing fossil fuel criteria as per the UCR Protocol for such projects. The project is using 100% bagasse as a fuel.
	Bio-mass generated power is used for direct grid supply and for meeting the captive need facility. The project activity is 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.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, turbine and energy meters have unique IDs, which is visible on the units. The Monitoring Report has the details of the same and will be provided to the UCR verifier during the verification process.

There is no double accounting of emission reductions in the project activity due to the following reasons:

- Project is uniquely identifiable based on its location coordinates,
- Project has dedicated commissioning certificate and connection point,
- Project is associated with energy meters which are dedicated to the generation/feeding pointwith the grid.

Hence the UCR project activity has never been issued voluntary carbon credits for the current 2013- 2024 vintage years and there is no double counting of the credits envisioned. Additionally, the same has been stated in the undertaking provided in the Double Counting Avoidance Assurance Document (DAA) by M/s. Dudhganga Ved Sakhar Karkhana Ltd., (DVSSKL)

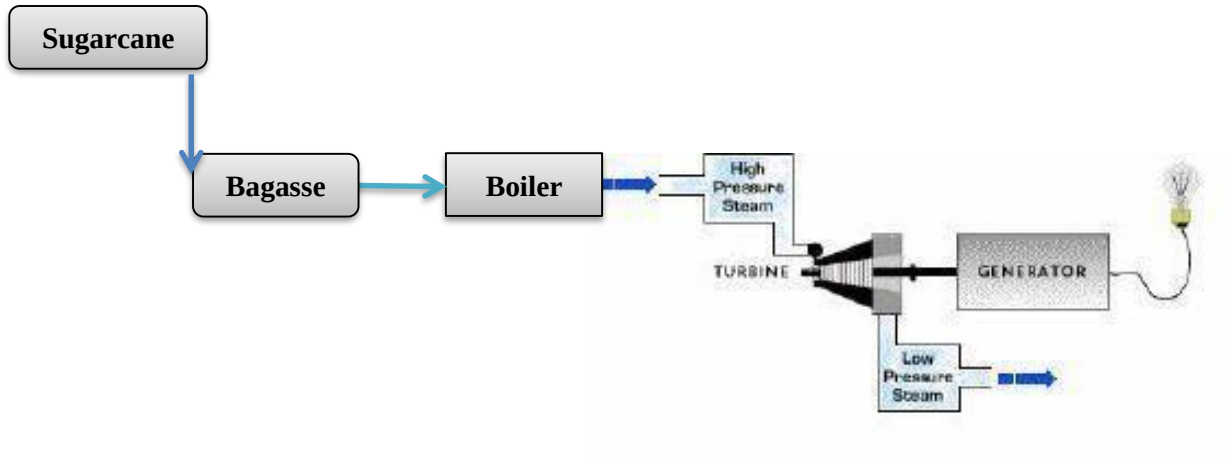
B.4 Project boundary, sources and greenhouse gases (GHGs) >>

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 he 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.



	Source	GHG	Included?	Justification/Explanation
Baseline	GHG Emissions from fossil fuel in Grid Baseline Power Generation Uncontrolled burning or decay of surplus biomass residue	CO2	**Included**	Major source of GHG emissions
		CH4	Excluded	Excluded for simplification. This is conservative
		NO2	Excluded	Excluded for simplification. This is conservative
		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	Emissions from Biomass Project Activity On-site fossil fuel and electricity consumption due to the project activity (stationary or mobile) Off-site transportation of biomass residue Combustion of biomass residue for electricity and / or heat generation	CO2	Excluded	No fossil fuel / electricity are 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
		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.5 Establishment and description of baseline scenario >>

- Emission reductions are calculated as follows:

$ERy = BEy - PEy - LEy$ (Eq.1) Where,

ERy = Emissions reductions in year y (tCO2)
BEy = Baseline emissions in year y (tCO2)
PEy = Project emissions in year y (tCO2)
LEy = 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 CO_2 emission factor for the electricity displaced due to the project activity during the year y in tons CO_2/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 (ERy) the emission reduction due to the project activity is calculated as the difference between the baseline emissions and the sum of the project emissions and the leakage:

ERy = BEy - (PEy + LEy) Equation-(1)

BE_y = Baseline emissions in year y (tCO2e)

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

BE_y= EGpj, y*EF grid, y Equation (2)

BE_y = 52449 * 0.9 = 47204

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) for period 2013 to 2023 and (0.757 tCO2/MWh) for vintage 2024.

Project Emission:

- Project Emissions is calculated as follow:

$$PE_y = PE_{Biomass,y} + PE_{FF,y} + PE_{GR1,y} + PE_{GR2,y} + PE_{CBR,y} + PE_{BG}$$

Where,

PE_y	=	Project emissions in year *y* (tCO_2)
$PE_{Biomass,y}$	=	Project emissions associated with the biomass and biomass residues inyear *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 projectsite (t CO_2)
$PE_{GR2,y}$	=	Emissions due to are 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_2e)
$PE_{BG2,y}$	=	Emissions from the production of biogas in year *y* (tCO_2e)

In this project activity electricity is imported from the grid ($PE_{GR1, y}$) which will count as project emissions. This amount will be deducted from the total value of emission reduction post-ante.

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,

PEy = 47204 * 10% Equation (3)

PEy = 4720.

Leakage Emission:

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.

LEy = 0 Equation (4)

ERy = BEy - (PEy + LEy)

= 47204 – (4720+0)

ERy = **42,484 CoU's/Yr**

Prior History >>

The project has registered in REC (Renewable Energy Certificate)
https://www.recregistryindia.nic.in/index.php/publics/registered_regens

B.6 Changes to start date of crediting period >>

The start date of crediting period is 01-01-2013.

B.7 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.8 Monitoring period number and duration >>

First Issuance Period	:	12 Years.
Crediting Period	:	01-01-2013 to 31-12-2024
Monitoring Period	:	01-01-2013 to 31-12-2024

Monitoring Plan

Data and Parameters to be monitored

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 are 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. 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 i.e. 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:

Bagasse = Cane + Added water – 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 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.

All the meters are checked and calibrated each year by an independent agency i.e. (MSEDCL). 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 haven been taken care by putting up a fire safety system and a water drainage system in the fuel yard.

Parameters	Description
$Q_{S,y}$	Quantity of steam supplied per year measured at recipient's end
$T_{steam,y}$	Temperature of steam at the recipient's end
$P_{steam,y}$	Pressure of steam
$E_{steam,y}$	Enthalpy of the saturated steam supplied to the recipient
$T_{Feedwater}$	Temperature of boiler feed water
$E_{Feedwater}$	Enthalpy of feed water
$EG_{thermal,y}$	Net quantity of thermal energy supplied by the project activityduring the year y
$B_{Biomass,y}$	Net quantity of biomass consumed in year y (on dry basis)
$MC_{biomass}$	Moisture content of the biomass

Monthly joint meter reading of main meters installed at interconnection points are taken and signed by authorized officials of and MSETCL on the first five days of every month. Records of this joint meter reading are maintained by M/S Shree Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd and MSETCL. Daily and monthly reports stating the net power export is prepared by the shift in-charge and verified by the plant manager. Power Purchase Agreement (PPA) with MSETCL has been signed. Reliability of energy data is maintained as per PPA. M/S Shree Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd archives and preserves all the monthly invoices raised against net saleable energy and also archives the complete metering data at generation electronically. All the records are maintained at site. Maharashtra Pollution Control Board (MPCB) and Environment Department of Maharashtra have prescribed standards of environmental compliance and monitor the adherence to the standards M/S Shree Dudhganga Vedganga Sahakari Sakhar Karkhana Ltd has received the 'Consent to Operate' the plant. State's regulatory body of power is Maharashtra State Electricity Transmission Company Limited (MSEDCL) and they have issued consent for the installation of co-generation power plant of 35 MW capacity. As a buyer of the power, the MSEDCL is a major stakeholder in the project and hold the key to the commercial success of the project.

Data/Parameter	EG project plant, y
Data unit	MWh
Description	Net quantity of electricity generated in the project plant during the year y
Source	**M/s. Dudhganga Ved Sakhar Karkhana Lt (DdVSSKL)** -factory records (JMR / Credit notes)
Measurement methods and procedures	This value will be determined annually from the records maintained at the factory. All auxiliary units at the power plantare 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 are 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 anengineer 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. Digitalmeters 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.

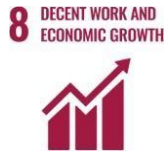
Data/Parameter	**EF grid,y**
Data unit	Grid Emission Factor
Description	tCO_2/MW_h
Source of data Value(s) applied	UCR CoU Standard Default for Indian grid 0.9 tCO_2/MW_h for the period 2013-2023 0.757 tCO_2/MW_h for the vintage 2024
Measurement methods and procedures	NA
Monitoring frequency	NA
QA/QC	The parameter is conservative.
Purpose of data	To estimate baseline emissions

Data/Parameter	**NCV_k**
Data unit	GJ/t
Description	Net Calorific Value of Biomass Residue Type *K*
Source of data Value(s) applied	Measurements will be carried out by reputed labs and reported indry biomass basis.
Measurement methods and procedures	On site and in labs
Monitoring frequency	Every 6 months
Purpose of data	Quality control
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
Measurement methods and procedures	Monitoring: The quantity of biomass fed into the boiler iscontrolled. Data type: Measured Responsibility: Boiler Operator
Monitoring frequency	Daily / Monthly
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.

United Nations Sustainable Development Goals:

The project activity generates electrical power using Biomass, there by displacing non-renewable fossil resources resulting to sustainable, economic and environmental development. In the absence of the project activity 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:

Development GoalsTargeted	SDG Target	Indicator (SDG Indicator)
SDG 7: Affordableand Clean Energy 	**7.2:** By 2030, increase substantially the share of renewable energy in the global energy mix **Target: Renewable Power in 52,449 MWh/yr**	**7.2.1**: Renewable energy share in the total final energy consumption
SDG 8: Decent Work and EconomicGrowth 	**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:** • 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.
SDG 13: Climate Action 	**13.2**: Integrate climate change measures into national policies, strategies and planning **Target: 42,484 quantity of tCO2 reduced /yr**	**13.2.1**: Number of countries that have communicated the establishment or Operationalization of an integrated policy/ strategy