PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title: Wastewater Methane Recovery Biogas Project at Dharikheda, Gujarat

Version 1.0

Date 17/10/2021

First CoU Issuance Period: 1 year, 9 months

Date: 01/02/2020 to 30/09/2021

Project Concept Note (PCN)
CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION	
Title of the project activity	Wastewater Methane Recovery Biogas Project at Dharikheda, Gujarat
Scale of the project activity	Small Scale
Completion date of the PCN	17/10/21
Project participants	Synergy Technologies UCR ID: 397176827
Host Party	India
Applied methodologies and standardized baselines	**AMS-III.H.** Methane recovery in wastewater treatment **AMS-I.C.**: Thermal energy production with or without electricity UCR Standard Protocol Emission Factors
Sectoral scopes	01 Energy industries (Renewable/NonRenewable Sources) 13 Waste handling and disposal
Estimated total amount of average GHG emission reductions during the crediting period	58809 CoUs (58809 tCO_{2eq})

SECTION A. Description of project activity

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

The project **Wastewater Methane Recovery Biogas Project at Dharikheda, Gujarat** is located at Shree Narmada Khand Udyog Sahakari Mandli Ltd. (SNKUSML), in Village Dharikheda, Region Timbi, Taluka - Rajpipla (Nandod), District Narmada, Gujarat

The details of the registered project are as follows:

Purpose of the project activity:
The project activity involves the setup of a biogas digester for the molasses based distillery with a production capacity of 45 klpd that were both commissioned in 2019. The new biogas digester and distillery was setup at project proponents existing sugar unit. The new distillery unit and biogas digester operates for 270 days/annum. The project activity is the extraction and combustion of biogas in boilers at the project activity site for power generation for captive usage. The project activity also includes combustion of other GHG neutral biomass residue fuels such as bagasse to supplement biogas fuel in the boiler The project activity is also the anaerobic treatment of wastewater for methane recovery. Since the project activity includes generation of steam and power with utilization of recovered biogas (methane), this avoids grid electricity imports thus reducing emissions from thermal sources connected to the project electricity grid system.

Products & Co-products	Unit	Quantity
Molasses based Distillery Unit	**KLPD**	**45**
Fuel alcohol production	Lac lit/annum	109.93
Impure spirit	lac lit/annum	6.08
Fusel Oil	lit/annum	24300
Biogas	M3/day	20365
Biocompost	TPA	19141

SIZES & UNITS OF EXISTING SUGAR ETP

Name of Units	No.s	Size (Meters)	Volume (m3)
Equalization tank	1	12.45x3.0SWD	365.03
Deoiler/Grease catcher tank	1	1.50 x 0.90	--
pH correction tank	2	2.45 ø x2.0 (ht)	9.420
Reaction tank	1	5.40 x 1.75 x 4.0	37.80
Primary clarifier	1	8.0 ø x 3.0 (deep)	150.72
1st stage aerated lagoon	1	12.0x 5.00x 4.0 + 5.0	240.0
2nd stage aerated lagoon	1	Top: 63.0x 18.0x 3.0 (deep) Bottom: 57.0 x 12.0 x 3.0	3,402.0
1st stage secondary clarifier	1	10.0 ø x 3.0 (deep)	235.50
2nd stage secondary clarifier	1	10.0 ø x 3.0 (deep)	235.50
Sludge pump	1	2.0 ø x 3.0 (deep)	9.42
Sludge Drying Beds (Primary stage)	3	7.0 x 5.0 x 4 no.s	--
Valve chamber	1	2.0 ø x 3.0 (deep)	9.42
MCC Room	1	5.0 x 2.0	--

India does not have a policy that specifically requires the control of GHG emissions from wastewater treatment across industries, and therefore the regular continuation of the project activity. Use of supplementary renewable fuel enables the distillery to continuously generate energy even at time of non-availability of methane enriched biogas/ bio-solids and avoid using fossil fuel (furnace oil). The project avoids methane emissions from open lagoons and storage systems and fossil fuel emissions for generation of equivalent energy. However, India's wastewater discharge pollution standard requires some level of wastewater treatment process to take place to comply with effluent discharge standards. Hence, the project activity undertaken is a voluntary activity. Projects using biomass for captive energy generation in India are generally considered to have a high risk of discontinuation, since the price of biomass as well as the unreliability of the supply chain favour a switch to coal fired energy generation in most cases. In the absence of the project activity, effluent wastewater would be stored in pre-existing or newly constructed open air lagoons or tanks for a period of time, where it would undergoe digestion with uncontrolled release of methane into the atmosphere leading to global warming.

The unit has been traditionally using open lagoons and storage systems to treat its high strength (Chemical Oxygen Demand (COD)) wastewater with negligible methane capture. The methane generated due to anaerobic conditions prevailing in these lagoons and storages escaped unhindered to the atmosphere and contributed to global warming. With the expansion of the distillery capacity , and hence, more amount of effluent at disposal, the project proponent decided realized the impacts of the proposed changes to land-use and the high fugitive emissions of biogas at sites of the open lagoon. The project proponent decided to explore the market on advanced wastewater treatment technology that would enable them to avoid extensive effluent handling in open lagoons and fugitive emissions (primarily methane and fossil fuel used for direct and indirect energy generation). Thus the project proponent, being an environmentally conscious entity, decided to infuse fresh investment into a new methane capture scheme that required huge investment and phase-wise implementation due to the installation of a biogas digester.

The use of biomass such as sugarcane bagasse for on-site energy faces a significant supply chain barrier. The supply chain for bagasse is highly variable according to local conditions but is, in most cases, informal and erratic. Energy security from biomass is very poor on the long-term due to the uncertainty of the market but also at the short- and immediate term due to the informality of the market and the relative unreliability of suppliers. There is no steady supply of biomass, nor a steady cost. This barrier represents a major risk for industrial facilities, for whom energy security is paramount to continued production, which is the major line of business. Several studies have identified that the security of fuel is a more important factor than the simple economics of the fuel price for industrial energy users (Asian Institute of Technology, 2005; Evald, 2005).

For many projects within the sugar industry, that include utilisation of the biogas from spenwash and wastewater treatment in their climate change mitigation initiatives, the biogas used in a majority of the cases is mainly for electricity generation and export to the grid, rather than for captive power generation. Regular expenditure is incurred, additional to the expenditure from flaring projects, for maintenance of biogas management systems, and generators.

Projects using biomass for captive energy generation in India are generally considered to have a high risk of discontinuation, since the price of biomass as well as the unreliability of the supply chain favour a switch to coal fired energy generation in most cases (source: https://newclimate.org/wp-content/uploads/2017/05/vulnerability-of-cdm.pdf, May 2017). The revenue from the sale of carbon credits is hoped to mitigate such costs to the project owner since it is one of the few players in the industry to undertake early voluntary climate action.

The sale of voluntary carbon credits and revenue from the same will increase the financial attractiveness for the continued use of biomass at captive energy industries across India.

The project activity also uses the anaerobic treatment of wastewater for methane recovery and effective combustion of the biogas. The raw spentwash coming from the multipressure distillation system from the plant is at the rate of 8-11 liter per liter of alcohol produced (i.e. approx 450 m^3/day at about 12% total solids & spentless) and this is taken to the biogas plant for primary treatment. During the biomethanation process the COD will be reduced by about 65% and biogas will be produced at the rate of about 0.5 NM^3/kg of COD consumed. Total volume of biomethanated spentwash generated will be 482m^3/day with approximately 5 to 6 % solids.

The project proponent sells the bagasse to local particle wood manufacturers involved in replacing wood with the supplied bagasse. The project activity recovers and utilizes biogas for producing electricity for captive usage and hence replaces electricity which would have to imported from a fossil fuel powered grid in Gujarat.

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

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

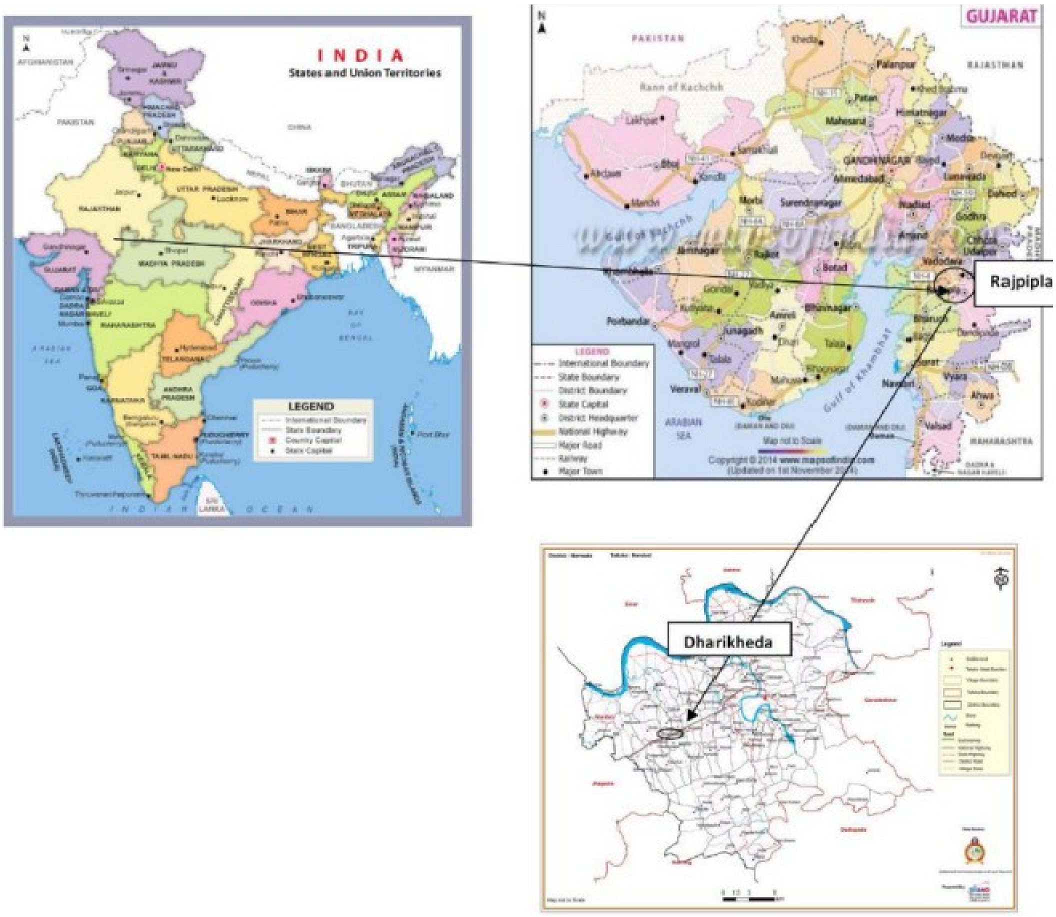
- **Social benefits:**
- The project activity contributes to employment generation in the local area for both skilled & unskilled people for operation and maintenance of the equipments.
- It has created steady higher value jobs and skilled workers at the facility. The project activity is contributing to the national energy security by reducing consumption of fossil fuels.
- The technology being used in the project is proven and safe for power/steam 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 methane captured from wastewater as a fuel for 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. Further, by generating electricity through utilising the biogas, the project helps in replacing fossil fuel intensive power generation from the local grid.
- Avoids global and local environmental pollution, leading to reduction of GHG emissions.
- The consumption of large volumes of water and the generation of organic compounds as liquid effluents are major environmental problems in sugar cane processing industry. By actively utilizing the effluents in the wastewater, this project reduces environmental damage.

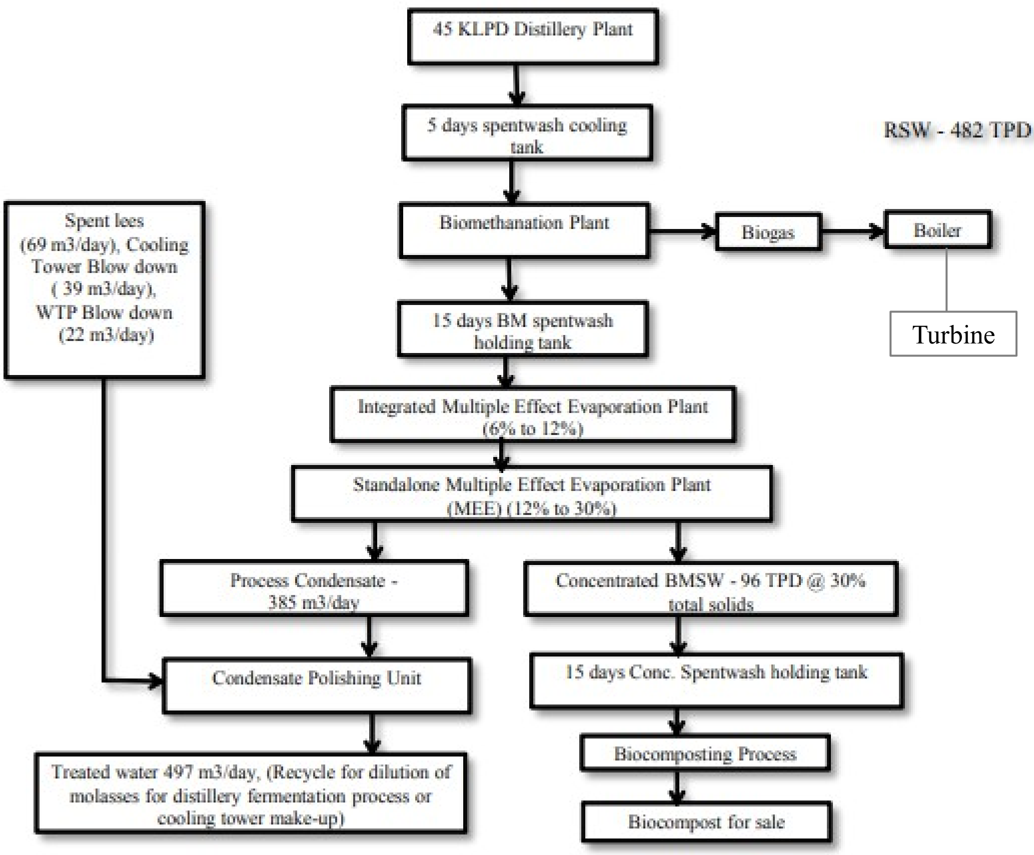
- **Economic benefits:**
- The project activity creates employment opportunities during the project stage and operation and maintenance of the boiler and wastewater treatment plant.
- The project activity helps in conservation of fast depleting natural resources like coal and oil thereby contributing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

A.3. Location of project activity >>

Country: India.
District: Narmada
Village: Dharikheda,
Region: Timbi,
Taluka - Rajpipla (Nandod)
State: Gujarat

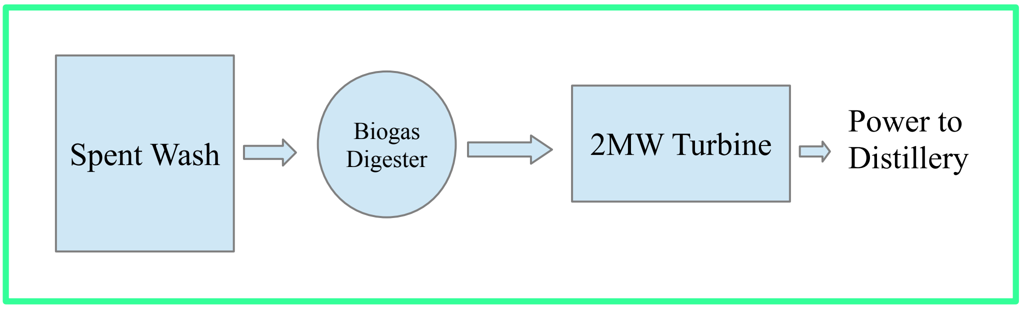


A.4. Technologies/measures >>



Biogas is a mixture of methane and carbon dioxide. It also has traces of hydrogen sulphide (3%), ammonia, oxygen, hydrogen, water vapour etc., depending upon feed materials and other conditions. Biogas is generated by fermentation of cellulose rich organic matter under anaerobic conditions. In anaerobic conditions, the methane-producing bacteria become more active. Thus, the gas produced becomes rich in methane. The bio-methanation plant has been procured from M/s Ecoboard Industries Ltd, Pune. The plant runs on a process essentially based on CSTR technology. The reactor operates in mesophilic temperature range. Central and lateral agitators are provided for achieving complete turbulence in the reactor. Treated spent wash is passed through one Lamella clarifier for removal of active bacterial mass, which is circulated again to the reactor to improve the overall effectiveness of the reactor. Biogas is collected in the gas holder and sent to the boiler. The process is sensitive to temperature and pH levels in the reactor, which requires continuous supervision and technological intervention. The technology used in digester is suitable to waste water with high concentration of particulates or extremely high concentration of soluble biodegradable organic materials.

The optimum utilization depends upon the successful physical installations, which in turn depend upon plant design and its selection. The basic conversion principle is that when a non-ligneous biomass is kept in a closed chamber for a few days, it ferments and produces an inflammable gas. The anaerobic digestion consists of three stages: I Hydrolysis; II Acid formation and III Methane fermentation. The processes are carried out by two sets of bacteria namely acid forming bacteria and methane formers. The acidogenic phase I is the combined hydrolysis and acid formation stages in which the organic wastes are converted mainly into acetate, and phase II is the methanogenic phase in which methane and carbon dioxide are formed. The better the three stages merge with each other, the shorter the digestion process.


Spent Wash
Biogas
Digester
2MW Turbine
Power to
Distillery

The technical specifications of the boiler and back pressure turbine are as follows:

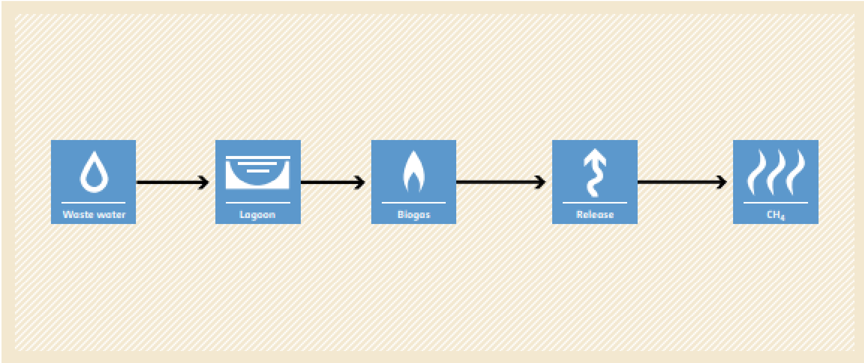
Specification	Value
Capacity of Boiler	20 TPH
Capacity of Turbine	2.0 MW
Number of Boilers /Turbine	1
Feed Material	Biogas/Bagasse
Enthalpy of Steam	3300 kJ/kg (at 45kg/cm^2 &490°C) (3.3 MJ/kg)
Operation days/annum	Molasses based distillery – 270 days/yr, 24hrs/day

A.5. Parties and project participants >>

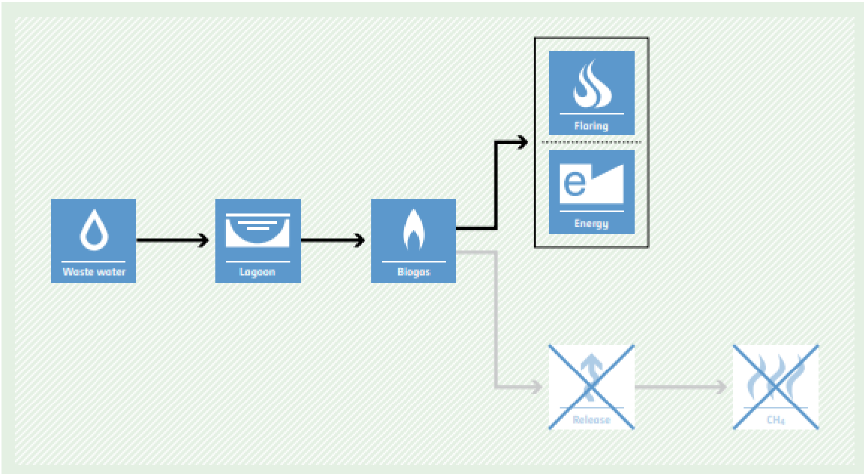
Party (Host)	Participants/Aggregator
India	Synergy Technologies UCR ID: 397176827 Plot No.9, SonaSarita, Abrama, Valsad. GJ. IND krunal@synergyvalsad.com

A.6. Baseline Emissions>>

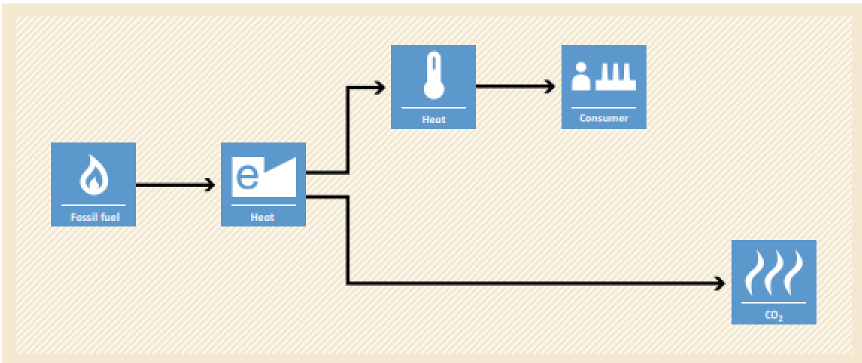
BASELINE SCENARIO
Methane from the decay of organic matter in wastewater or sludge is being emitted into the atmosphere.



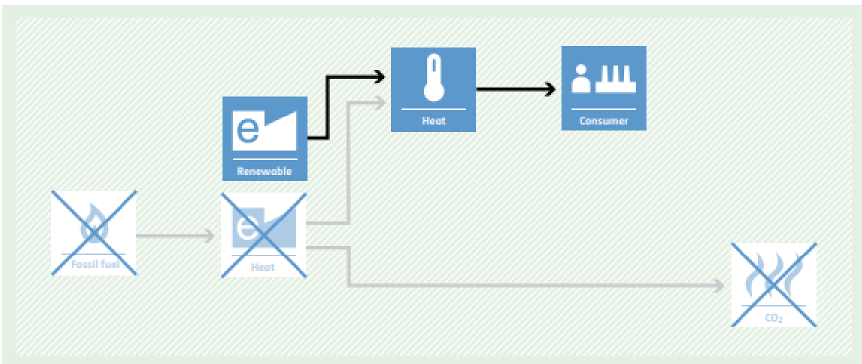
PROJECT SCENARIO
Methane is recovered and destroyed due to the introduction of new or modification of existing wastewater or sludge treatment system. In case of energetic use of biogas, displacement of more-GHG-intensive energy generation.



BASELINE SCENARIO
Energy generation (thermal heat and / or electricity) by more-carbon-intensive technologies based on fossil fuel. In case of retrofits or capacity addition, operation of existing renewable power units without retrofit and capacity addition.



PROJECT SCENARIO
Energy generation by installation of new renewable energy generation units, by retrofitting or replacement of existing renewable energy generation units as well as by switch from fossil fuel to biomass in modified existing facilities.



A.7. 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)
13 Waste handling and disposal

TYPE I - Renewable Energy Projects

CATEGORY- ***AMS-III.H. Methane recovery in wastewater treatment***
This methodology comprises measures that recover biogas from biogenic organic matter in wastewater by means of substitution of aerobic wastewater or sludge treatment systems with anaerobic systems with biogas recovery and combustion.

AMS-I.C.: Thermal energy production with or without electricity
This methodology comprises renewable energy technologies that supply users i.e. residential, industrial or commercial facilities with thermal energy that displaces fossil fuel use. These units include technologies such as energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.

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

Biomass used by the project plant is limited to biomass residues from sugarcane (bagasse) and biogas from spent wash
The annual average temperature of the biogas site is higher than 15°C
The biomass used by the project plant is not stored for more than one year.
The biogas is generated by anaerobic digestion of wastewater.
Biogas is used for renewable power generation for captive use.
The project activity involves the introduction of biogas recovery to an anaerobic wastewater treatment system such as anaerobic biogas reactor. Thus in absence of the project activity the project activity would have treated spent wash in the open lagoon until it attained the requisite discharge standards.
In absence of the project activity, the wastewater would have been treated in anaerobic open lagoons. The lagoons are ponds with a depth greater than two meters, without aeration.
The minimum interval between two consecutive sludge removal events is 30 days
The recovered biogas is utilised for captive power usage. The recovered biogas from the above measures is utilised for power generation directly instead of combustion/flaring.
Measures are limited to those that result in aggregate emissions reductions of less than or equal to 60 kt CO2 equivalent annually from all Type III components of the project activity
The applicability criteria of project category and measure – Type III.H. Methane Recovery in Wastewater Treatment are: 1. This project category comprises measures that recover methane from biogenic organic matter in wastewaters by means of one of the following options: (i) Substitution of aerobic wastewater or sludge treatment systems with anaerobic systems with methane recovery and combustion. If the recovered methane is used for heat and electricity generation the project can use a corresponding methodology under Type I project activities.
The total installed electrical energy generation capacity of the project equipment does not exceed 15 MW. This is a small scale project with total electricity capacity of 2 MW which is not greater than small scale thresholds defined by the applied methodology I.C. under Type I – renewable energy project activity, i.e. the total installed electrical

energy generation capacity of the project equipment does not not exceed 15 MW.
The generated electricity at the project activity displaces grid electricity being generated from mix of fossil fuel and renewable sources.

B.3. Applicability of double counting emission reductions >>

The biogas unit is constructed by the project proponent close to the distillery. The biogas unit, boiler and turbine have unique IDs, which is visible on the units. The Monitoring Report has the details of these details and will be provided to the UCR verifier during the verification process.

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

The project boundary includes the physical, geographical site(s) of:

- The wastewater and sludge treatment activity, in the baseline and project situations.
- All plants generating electricity located at the project site.
- The site of the anaerobic digester since the project activity recovers and utilizes biogas for producing electricity.

	Source	GHG	Included?	Justification/Explanation
Baseline	Emissions from electricity generated using fossil fuels	CO_2	**Included**	Major source of emission
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
	Methane Emissions from treatment of organic wastewater/lagoons on site	CO_2	Excluded	Excluded for simplification. This is conservative
		CH_4	**Included**	Major source of emission
		N_2O	Excluded	Excluded for simplification. This is conservative
Project Activity	Combustion of biomass for electricity and heat Emissions from anaerobic digester sludge drying bed	CO_2	Excluded	CO2 emissions from the decomposition of organic waste is not present. It is assumed that CO_2 emissions from surplus biomass do not lead to changes of carbon pools in the LULUCF sector
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative

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

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

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. Hence the baseline scenario is the electricity imported from a grid. ($BE_{power,y}$) ;
- Methane emissions from baseline wastewater treatment systems ($BE_{ww,treatment,y}$)

$$BE_y = BE_{power,y} + BE_{ww,treatment,y} - PE_y$$

BE_y= Baseline emissions in year y (t CO_{2e})

$BE_{power,y} = EG_{y,grid} \times EF_{y,grid}$

$BE_{power,y}$	=	Baseline emissions for the grid electricity displaced by the project in year y (t CO2e)
$EG_{y,grid}$	=	Amount of grid electricity displaced by project in year y (MWh)
$EF_{y,grid}$	=	Emission factor of the grid (t CO2e/MWh) = 0.9 (UCR Standard)

$BE_{power,y}$ = 7511 tCO2/yr

$BE_{ww,treatment,y}$ = Methane emissions from the baseline wastewater treatment systems affected by the project are determined using the COD removal efficiency of the baseline plant.

$Be_{power,y}$ =

PE_y = Project activity emissions on account of yearly transport of biomass to project site

$$BE_{ww,treatment,y} = \Sigma_i \left(Q_{ww,i,y} \times COD_{inflow,i,y} \times \eta_{COD,BL,i} \times MCF_{ww,treatment,BL,i} \right) \times B_{o,ww} \times UF_{BL} \times GWP_{CH4}$$

Where:

$Q_{ww,i,y}$	=	Volume of wastewater treated in baseline wastewater treatment system i in year y (m^3). The ex post emissions reduction calculation shall be based on the actual monitored volume of treated wastewater. (482m^3/day)
$COD_{inflow,i,y}$	=	Chemical oxygen demand of the wastewater inflow to the baseline treatment system *i* in year *y* (t/m^3). (0.15 t/m^3) (150000 ppm)
$\eta_{COD,BL,i}$	=	COD removal efficiency of the baseline treatment system *i*, determined as per monitored data (65%)
$MCF_{ww,treatment,BL,i}$	=	Methane correction factor for baseline wastewater treatment systems *i* (MCF values as per Table 1 below) (0.8)
i	=	Index for baseline wastewater treatment system
$B_{o,ww}$	=	Methane producing capacity of the wastewater (IPCC value of 0.25 kg CH_4/kg COD)
UF_{BL}	=	Model correction factor to account for model uncertainties (0.89)
GWP_{CH4}	=	Global Warming Potential for methane (21)
NCV_{BG}		Net calorific value of the biogas [GJ/t] (50.4) IPCC Guidelines for National Greenhouse Gas Inventories (Volume 2, Table 1.2)
Biogas quantity		20365 m^3/day

The Methane Correction Factor (*MCF*) shall be determined based on the following table:

Table 1 IPCC default values for Methane Correction Factor (*MCF*)

Type of wastewater treatment and discharge pathway or system	*MCF* value
Discharge of wastewater to sea, river or lake	0.1
Land application	0.1
Aerobic treatment, well managed	0.0
Aerobic treatment, poorly managed or overloaded	0.3
Anaerobic digester for sludge without methane recovery	0.8
Anaerobic reactor without methane recovery	0.8
Anaerobic shallow lagoon (depth less than 2 metres)	0.2
Anaerobic deep lagoon (depth more than 2 metres)	0.8
Septic system	0.5
Land application	0.1

The following baselines are zero or not applicable:

- Methane emissions from baseline sludge treatment systems ($BE_{s,treatment,y}$); Methane emissions on account of inefficiencies in the baseline wastewater treatment systems and presence of degradable organic carbon in the treated wastewater discharged. ($Be_{ww,discharge,y}$); Methane emissions from the decay of the final sludge generated by the baseline treatment systems ($BE_{s,final,y}$). Dried sludge is used as manure in farm land for cultivation surrounding the project boundary.

PE_y: The project activity involves transportation of molasses/bagasse from outside the plant and therefore the emission associated with consumption of fossil fuel due to transportation is calculated as follows:

$$\mathbf{PE_y} = \Sigma BF_{T,k,y} / TL_y \ \text{x}\ ADV_y \ \text{x}\ EF_{km,\ CO2,\ y,}$$

$BF_{T,k,y}$ = Quantity of biomass residue type k that has been transported to the project site during the year y (tons of dry matter or liter)

TL_y = Average truck loads of the trucks used (tons or liter) during the year y

ADV_y = Average round trip distance (from and to) between the biomass residue fuel supply sites and the site of the project plant during the year y (km)

$EF_{km,CO2,y}$ = Average CO_2 emission factor for the trucks measured during the year y (tCO_2/km)

$BF_{T,k,y}$	= Quantity of biomass bought and transported = from outside	= 11840 t/yr
TL_y	= Average truck load of the trucks used	= 10 t/y
ADV_y	= Average return trip distance between the biomass fuel supply sites and the project plant	= 30 km

$EF_{km,CO2,y}$ = Average CO2 emission factor of the trucks = 0.001 tCO_2/km

PE_y = 35.52 ~36 tCO_2/y

Estimated $\boldsymbol{BE}_{ww,treatment,y}$ = 51883 tCO_2

Estimated total baseline emission reductions ($\boldsymbol{BE_y}$) = 58809 tCO_2

Year	Baseline Emissions (tCO2)
2020	24200
2021	34609
Total	58809

B.6. Prior History>>

The project activity has not applied to any other GHG program for generation or issuance of carbon offsets or credits.

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

There is no change in the start date of crediting period.

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>>

First Issuance Period: 1 years, 9 months – 01/02/2020 to 30/09/2021

B.8. Monitoring plan>>

Data/Parameter	Date of commissioning of biogas units
Data unit	Date.
Description	Actual date of commissioning of the project device
Source of data Value(s) applied	Monitoring Report As and when commissioned
Measurement methods and procedures	The construction processes are maintained from its initiation to completion dates for the biogas unit. Thus the start date of each of the unit installed is recorded in the monitoring report.
Monitoring frequency	As and when commissioned and fixed and recorded in the monitoring report
Purpose of data	To estimate baseline emissions

Data / Parameter:	$BG_{burnt,y}$
Data unit:	m^3
Description:	Biogas volume in year *y*
Measurement procedures (if any):	The amount of biogas recovered or otherwise utilized (e.g. injected into via a dedicated piped network) is monitored ex post, using continuous flow meters.
Monitoring frequency:	Monitored continuously.
Any comment:	-

Data / Parameter:	$BR_{PJ,n,y}$
Data unit:	tonnes on dry-basis

Description:	Quantity of biomass used in the project activity in year *y* (tonnes on dry-basis)
Source of data:	On-site measurements
Measurement procedures (if any):	Calibrated weight meters.
Monitoring frequency:	Data monitored continuously and aggregated as appropriate, to calculate emissions reductions
QA/QC procedures:	Crosschecked with annual energy balance that is based on purchased quantities and stock changes
Any comment:	

Data / Parameter:	w_{CH4}
Data unit:	%
Description:	Methane content in biogas in the year *y*
Source of data:	IPCC
Measurement procedures (if any):	The fraction of methane in the biogas (default value of 60% methane content is used)
Monitoring frequency:	-
QA/QC procedures:	-
Any comment:	-

Data / Parameter:	$Q_{ww,i,y}$
Data unit:	m^3/month
Description:	The flow of wastewater
Measurement procedures (if any):	Measurements are undertaken using flow meters
Monitoring frequency:	Monitored continuously.
Any comment:	-

Data / Parameter:	LOC_y
Data unit:	Days
Description:	Operation of the industrial facility using the process heat in year *y* (days)
Source of data:	On-site measurements
Measurement procedures (if any):	Sum of the days of operation of the UCR project activity facilities during year *y*
Monitoring frequency:	-
QA/QC procedures:	-
Any comment:	-

Data / Parameter:	$COD_{WW,y}$
Data unit:	$tCOD/m^3$
Description:	Average chemical oxygen demand of the waste water in year *y* ($tCOD/m^3$)
Source of data:	On-site measurements
Measurement procedures (if any):	-
Monitoring frequency:	Measured at least every six months, taking at least three samples for each measurement.
QA/QC procedures:	-
Any comment:	-