



# PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT



**Title: 8 MW Biomass based Power Project by Gemco.**

Version 1.0  
Date 15/10/2022

First COU Issuance Period: 8 years, 08 months  
Date: 01/01/2014 to 31/08/2022



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

BASIC INFORMATION

Title of the project activity	8 MW Biomass based Power Project by Gemco.
Scale of the project activity	Small Scale
Completion date of the PCN	15/10/2022
Project participants	Gemco Energy Limited
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I. D: “Grid connected renewable electricity generation”, version 18  Standardized Methodology: Not Applicable.
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of total GHG emission reductions	To be estimated during verification.  [An ex-ante estimate is 34,214 COUs per year]

## SECTION A. Description of project activity

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

The project titled as “**8 MW Biomass based Power Project by Gemco**” is located at Kaushambhi Road, Village: Dinod, District: Bhiwani, State: Haryana, Country: India. The project is an operational biomass based power generation project activity with continuous reduction of GHG, currently being applied under “Universal Carbon Registry” (UCR).

The details of the registered project are as follows:

#### Purpose of the project activity:

The project activity is promoted by “Gemco Energy Limited” (hereinafter called as project proponent or PP), is renewable power project that includes installation and operation of a 40 TPH biomass-based boiler in village Dinod of Bhiwani district in the state of Haryana in India. Gemco is a manufacturer and supplier of small pellet mill for biomass and feed, ring dies wood pellet mill, complete pellet plant and biomass briquette. This is a dedicated power plant installed & being operated by Gemco with the purpose of generating green electricity. The project was commissioned on 23<sup>rd</sup> August 2013 and has been in continuous operation since its commissioning.

Thus, the project activity utilises the renewable biomass for generation of electricity. It is capable to generate around 38,016 MWh per year, which is estimated based on operation with around 60%<sup>1</sup> utilization factor with efficient utilization of the available biomass energy through adoption of an efficient and modern technology. The net generated electricity from the project activity has been evacuated to regional grid under a long-term power purchase arrangement with the Haryana Power Purchase Centre (HPPC).

The project specific details along with commissioning period are as follows:

Capacity	Details (Nos., Type & Make)	Commissioning Date(s)
<b>Turbine: 8 MW</b>	Make: Triveni Engineering and Industries Ltd	23/08/2013
<b>Steam Generator: 40TPH</b>	Make: Cheema Boilers Limited	23/08/2013

Sl. No.	Make	Accuracy	Last calibration date	Village	District
HRT 55949	Secure Make - 3 Phase	0.2s	18/02/2020	Dinod	Bhiwani
HRT 55954	Secure Make - 3 Phase	0.2s	18/02/2020	Dinod	Bhiwani

The net generated electricity from the project activity is sold to the Haryana Power Purchase Centre (HPPC), under the Power Purchase Agreement (PPA) signed between the PP and the utility. In pre-project scenario, electricity delivered to the grid by the project activity would have otherwise been generated by the operation of fossil fuel-based grid-connected power plants and by the addition of

<sup>1</sup>PLF value of 60% has been considered for calculation from the monthly actual data to estimate the project calculations.

new fossil fuel-based generation sources in the grid. As the nature of the biomass project, no fossil fuel is involved for power generation in the project activity apart from emergency fuel.

The electricity produced by the project is directly contributing to climate change mitigation by reducing the anthropogenic emissions of greenhouse gases into the atmosphere by displacing an equivalent amount of power at grid. Hence, project activity is displacing the estimated annual net electricity generation i.e., 38,016 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 CO<sub>2</sub>e emission reductions by the project activity are expected to be 34,214 tCO<sub>2</sub>e, whereas actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification.

Since the project activity will generate electricity through biomass energy, a clean renewable energy source, it will not cause any negative impact on the environment and thereby contributes to climate change mitigation efforts.

## **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:**

- Biomass energy emits less harmful by-products compared to fossil fuels, which means cleaner air and healthier atmosphere for people living near the project region.
- Biofuel can improve rural economies by providing more people with unused land the opportunity to grown biomass products & by-products for energy use.
- The project activity is contributing to the national energy security by reducing consumption of fossil fuels.
- Thus, project will improve the economical index around the project area by means of local infrastructure development and job creation.

- **Environmental benefits:**

- The use of renewable biomass for energy has the potential to greatly reduce greenhouse gas emissions.
- It reduces the overreliance of fossil fuels.
- Bioenergy displaces the use of fossil fuels and prevents geologic carbon from being released into the atmosphere. When fossil fuel use is avoided, the geologic storage of carbon is preserved. This prevents the addition of new carbon to the atmosphere.
- The project activity will contribute to reduction of power demand-supply gap in the region in an environment friendly manner, thus meeting the development needs of the country.

- **Economic benefits:**

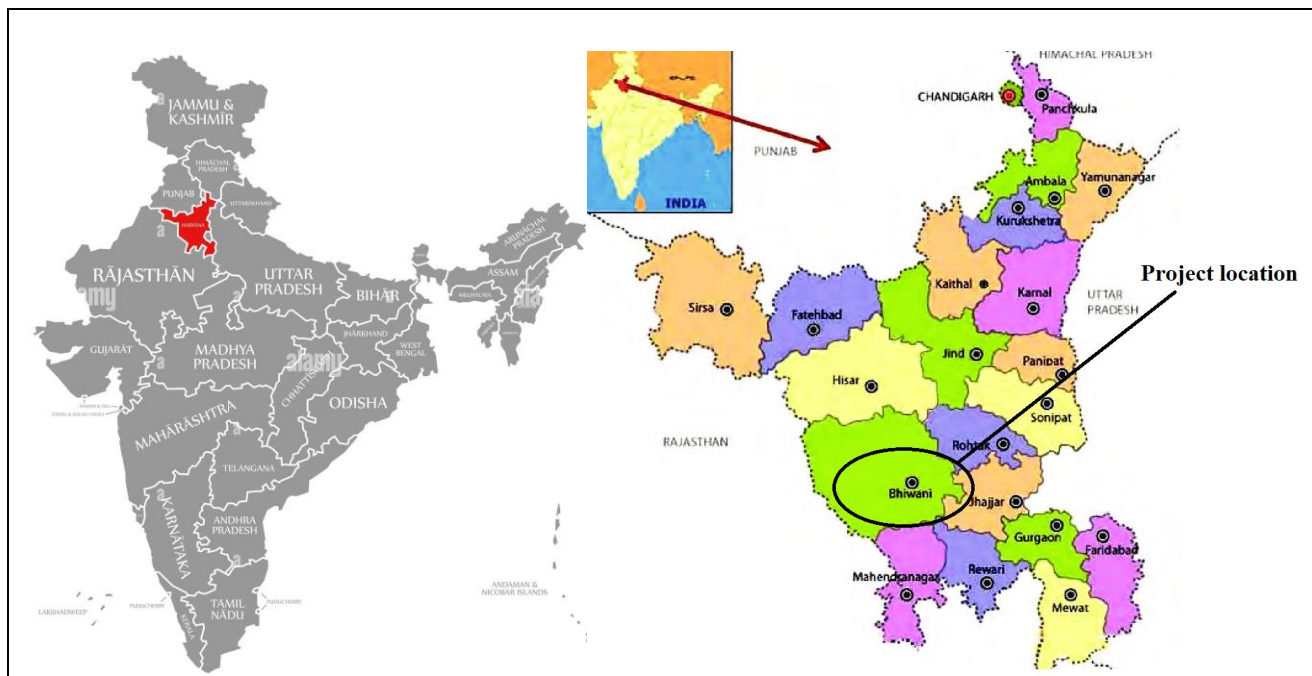
- Biomass energy offers substantial economic benefits to the local community, by creating new jobs for the local community, improving economic growth, and creating a green environment through the reduction of emissions and air pollution.
- Indirect incomes like the area where the project activity will take place will also benefit the local area like local driver, constructor, labour they can also benefited by the Project activity.

Thus, the project activity is contributing to various sustainable benefits which can be realized both in direct and indirect forms and positive impacts are realizable across the operational lifetime of the project.

### A.3. Location of project activity >>

Country : India  
District : Bhiwani  
Village : Dinod  
State : Haryana  
Code : 127021

The representative location map is included below:



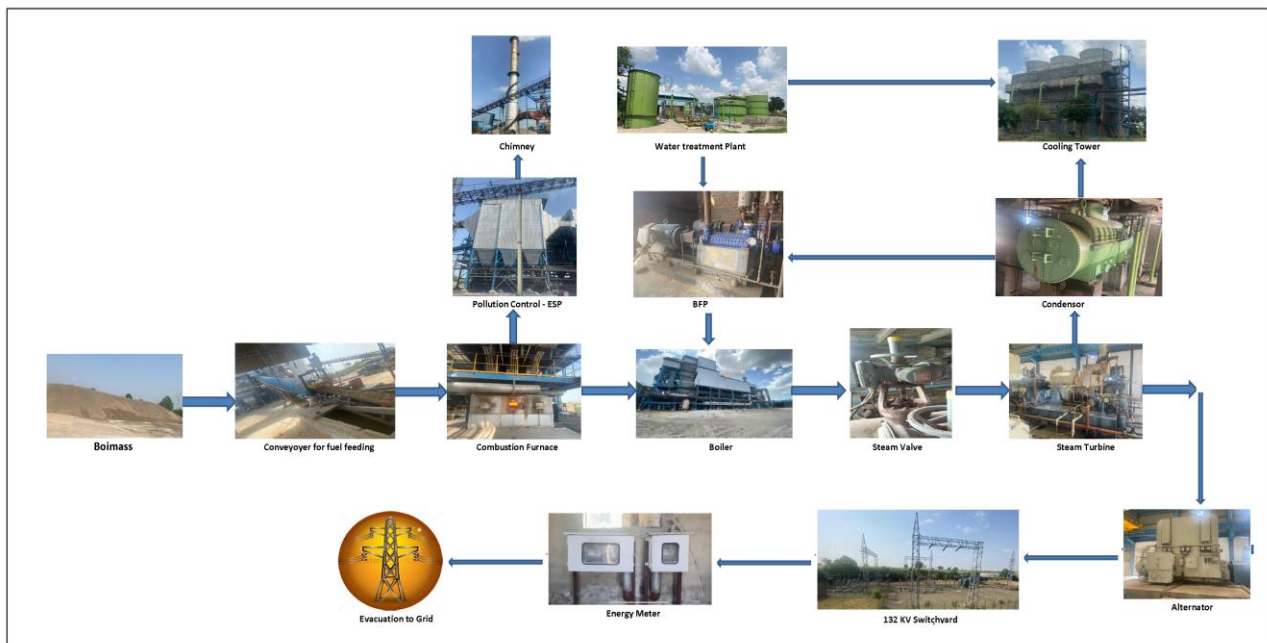
(Image courtesy: Google maps & images)

#### A.4. Technologies/measures >>

The project activity involves the installation & operation of a 8 MW fully condensing steam turbine and a steam generator of 40 tonnes per hour (TPH) capacity.

##### Technical details:

Flowchart of the project activity:



**The equipment details are given below:**

Along with the 40 TPH boiler and the 8 MW Turbo-generator (TG), the other auxiliary units of the plant includes:

1. Fuel handling system with storage and processing arrangements
2. Ash handling system
3. Air pollution control device
4. Cooling water system and cooling tower
5. De-Mineralized (DM) water plant
6. Fire protection system
7. Air conditioning and ventilation
8. Complete electrical system for power plants and grid interconnection including power evacuation, instrumentation and control system, etc.

The power would be generated at the biomass-based power plant, then evacuated from the 11/33 kV, high voltage switch yard and will be exported to the HPPC grid system.

<b>Steam Generator</b>	<b>Make</b>
40 TPH	Cheema Boiler Limited
<b>Turbine Details</b>	<b>Make</b>
8 MW Fully Condensing	Triveni Engineering and Industries Ltd

In the absence of the project activity the equivalent amount of electricity would have otherwise been generated by the operation of fossil fuel-based grid-connected power plants and fed into Indian grid system, hence baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario as discussed in the previous section.

Further details of boiler and turbine are given under the appendix 1.



#### A.5. Parties and project participants >>

Party (Host)	Participants
India	<b>Gemco Energy Limited</b>  <b>Contact details:</b> Contact Person: Mr. Yogesh Sachdeva Director Ph: +91 (0129) 2274831 Email: <a href="mailto:ys@gemcocontrols.com">ys@gemcocontrols.com</a>  Address: 14/3, Mathura Road, Faridabad - 121 003, India.

## A.6. Baseline Emissions>>

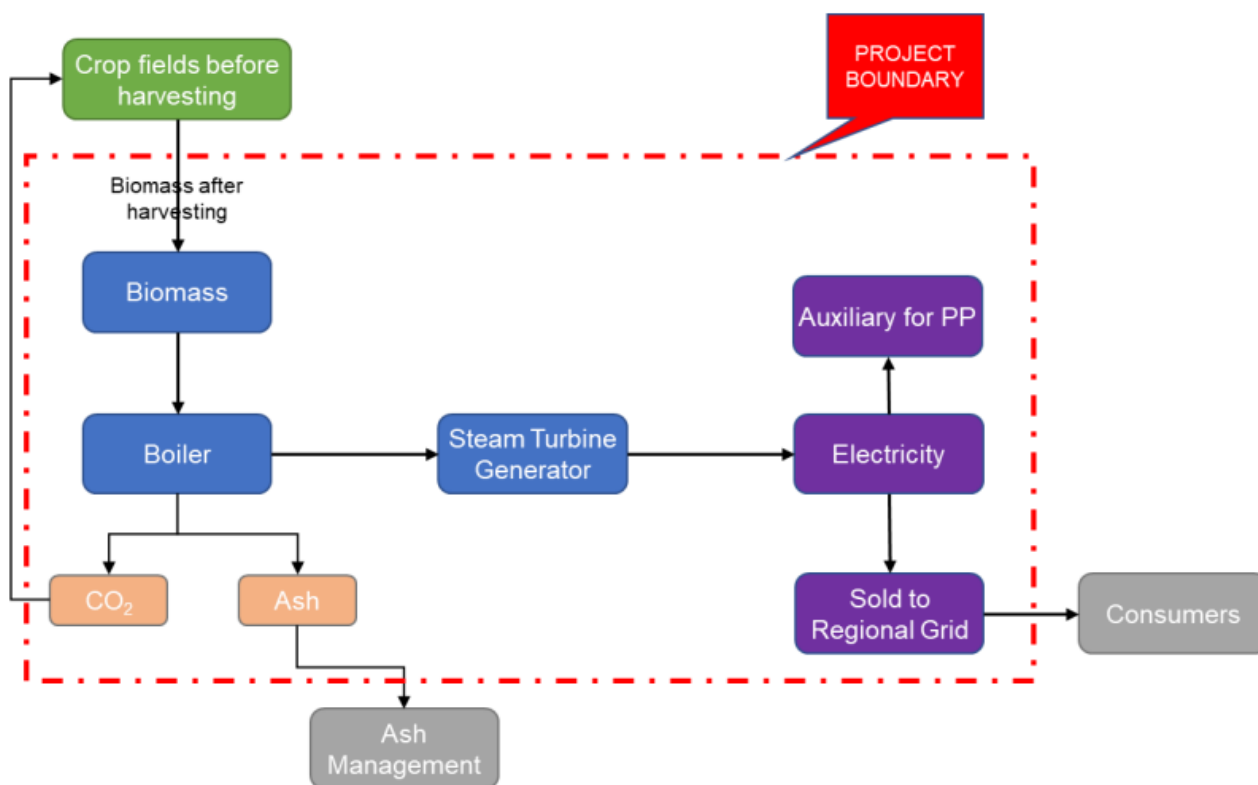
The baseline scenario identified at the PCN stage of the project activity is:

- Grid

In the absence of the project activity, the equivalent amount of electricity would have been generated from fossil fuel-based power plants and exported to the southern regional grid (which is connected to the unified Indian Grid system) as national grid is predominantly sourcing from fossil fuel-based power plants. Hence, baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario.

Schematic diagram showing the baseline scenario:

**Project Scenario (in line with the project flow chart provided in the previous section):**



As per the approved consolidated methodology AMS-I.D. Version 18, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

***“The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid”.***

The project activity involves setting up of a new power plant which generates electricity from combustion of biomass which is a renewable source and to supply the produced power to the grid.

In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

#### **A.7. Debundling>>**

This project activity is not a debundled component of a larger project activity.

However, this is to further clarify that initially at the time of conceptualization the project was designed to have a total capacity of 15 MW, hence PPA provision was also considered for 15 MW; however actual implementation was considered only for 8 MW capacity which is the current project activity. Hence, there is no concern related to de-bundling from the project implementation aspect as well.

## 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:

AMS. I.D. (Title: “Grid connected renewable electricity generation”, version 18)

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

The project activity involves generation of grid connected electricity from the renewable biomass-based power generation project and is a Greenfield project activity. The project activity is having a turbine generator of 8 MW installed capacity; therefore, falls in small scale project activity and eligible under small scale methodology AMS-I.D. The project status corresponding to the methodology AMS-I.D. Version 18 and applicability of methodology is discussed below:

Applicability Criterion	Project Case
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:  (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project comprises of renewable biomass-based electricity generation unit which will supply electricity to a regional grid on a contractual agreement signed with the state electricity board and thus satisfies the criteria. Hence, project activity satisfies this applicability criterion.
2. Illustration of respective situations under which each of the methodology (i.e., AMS-I. D: Grid connected renewable electricity generation”, AMS-I. F: Renewable electricity generation for captive use and mini-grid” and AMS-I. A: Electricity generation by the user) applies is included in Table 2	According to the point 1 of the Table 2 in the methodology – “Project supplies electricity to a national/ regional grid” is applicable under AMS I.D. As the project activity supplies the electricity to HVPNL which is part of the regional grid, connected to the unified Indian grid system; the methodology AMS-I.D. is applicable
3. This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s);	The Project activity involves the installation of new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity. Thus, Project activity is a Greenfield

Applicability Criterion	Project Case
<p>(d) Involve a rehabilitation of (an) existing plant(s); or</p> <p>(e) Involve a replacement of (an) existing plant(s).</p>	<p>plant and satisfies this applicability condition (a).</p>
<p>4. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <p>(a) The project activity is implemented in existing reservoir, with no change in the volume of the reservoir; or</p> <p>(b) The project activity is implemented in existing reservoir, where the volume of the reservoir(s) is increased and the power density as per definitions given in the project emissions section, is greater than 4 W/m<sup>2</sup>.</p> <p>(c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m<sup>2</sup></p>	<p>The criterion is not applicable to the project activity as the proposed project is a biomass based power project.</p>
<p>5. If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.</p>	<p>The project activity involves the installation of a turbine generator with an installed capacity of 8 MW based on the renewable biomass and hence is within the 15 MW limit set by the methodology</p>
<p>6. Combined heat and power (co-generation) systems are not eligible under this category</p>	<p>This is not relevant to the project activity as the project involves only biomass-based power generating units.</p>
<p>7. In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.</p>	<p>The project is a Greenfield project as there is no addition to the existing renewable power generation from the time of commissioning of the project activity and hence this criterion is not applicable.</p>
<p>8. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement power plant/unit shall not exceed the limit of 15 MW.</p>	<p>The project is a Greenfield project as there is not any retrofit or replacement to the existing renewable power generation from the time of commissioning of the project activity and hence this criterion is not applicable.</p>
<p>9. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid, then the baseline for the electricity component shall be in accordance with procedure prescribed under</p>	<p>This is not relevant to the project activity as the project involves only biomass-based power generating units.</p>

Applicability Criterion	Project Case
this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS I. C.: Thermal energy production with or without electricity” shall be explored.	
10. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.	This is not relevant to the project activity as the project involves only biomass-based power generating units.

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

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 point with the grid.

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

As per applicable methodology AMS-I.D. Version 18, “The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the project power plant is connected to.”

Thus, the project boundary includes the biomass-based steam generator, steam turbine generators and the Indian grid system.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected fossil fuel-based electricity generation	CO <sub>2</sub>	Yes	Main emission source
		CH <sub>4</sub>	No	Minor emission source
		N <sub>2</sub> O	No	Minor emission source
		Other	No	No other GHG emissions were emitted from the project
Project	Greenfield Biomass Power Project Activity	CO <sub>2</sub>	No	No CO <sub>2</sub> emissions are emitted from the project
		CH <sub>4</sub>	No	Project activity does not emit CH <sub>4</sub>
		N <sub>2</sub> O	No	Project activity does not emit N <sub>2</sub> O
		Other	No	No other emissions are emitted from the project

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

This section provides details of emission displacement rates/coefficients/factors established by the applicable methodology selected for the project.

As per para 19 of the approved consolidated methodology AMS-I.D. Version 18, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

***“The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid”.***

The project activity involves setting up of a new biomass-based power plant to harness energy from combustion of biomass and generate renewable energy i.e., electricity which is used for sale to national grid through PPA arrangement. In the absence of the project activity, the equivalent amount of power would have been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new fossil fuel-based generation sources into the grid. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A "grid emission factor" refers to a CO<sub>2</sub> emission factor (tCO<sub>2</sub>/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO<sub>2</sub>/MWh for the 2014 - 2020 years as a conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2021 & 2022, the combined margin emission factor calculated from CEA database in India results into higher emission than this UCR default value. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.

### Net GHG Emission Reductions and Removals:

$$\text{Thus, } ER_y = BE_y - PE_y - LE_y$$

Where:

$ER_y$  = Emission reductions in year y (tCO<sub>2</sub>/y)

$BE_y$  = Baseline Emissions in year y (t CO<sub>2</sub>/y)

$PE_y$  = Project emissions in year y (tCO<sub>2</sub>/y)

$LE_y$  = Leakage emissions in year y (tCO<sub>2</sub>/y)

### Baseline Emissions

Baseline emissions include only CO<sub>2</sub> emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants.

The baseline emissions are to be calculated as follows:

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

Where:

$BE_y$	=	Baseline emissions in year y (t CO <sub>2</sub> )
$EG_{PJ,y}$	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the UCR project activity in year y (MWh)
$EF_{grid,y}$	=	UCR recommended emission factor of 0.9 tCO <sub>2</sub> /MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

## Project Emissions

As per AMS-I. D, version 18, for most renewable energy project activities emission is zero.

As per applied methodology only emission associated with the fossil fuel combustion, emission from use of alternate fuel during unavailability of biomass, would be accounted for the project emission on actuals. Therefore, following project emission type has been considered for the project activity:

### Coal or other fossil fuel consumption:

The project activity has not considered and never used any fossil fuel (as can be verified from the given data and to meet any requirement in the project; hence there is no emissions due to usage of fossil fuel.

However, for future reference in case any fossil fuel is used within the project boundary, the CO<sub>2</sub> emissions from fossil fuel combustion in the project activity shall be calculated based on the quantity of fuels combusted and the CO<sub>2</sub> emission factor of those fuels, as follows:

$$PE_{FC,y} = \sum FC_{i,y} \times NCV_{i,y} \times EF_{CO_2,i}$$

Where:

$PE_{FC,y}$  = Project Emission due to alternate fossil fuel consumed during monitoring period

$FC_{i,y}$  = Quantity of fuel type 'i' consumed in liters (lit) or tonnes (t)

$NCV_{i,y}$  = Net Calorific Value of type of fuel used

$EF_{CO_2,i}$  = IPCC 2006 Emission factor for type of fuel used

i = fuel types combusted during the monitoring period

Hence,  $PE_y = PE_{FC,y}$

However, as justified above for the current crediting period the  $PE_y = 0$ .

## Leakage

As per the para 23 of the tool "Leakage in biomass small-scale project activities" version 04, under "Competing uses for the biomass" category – "The project participant shall evaluate ex-ante if there is a surplus of the biomass in the region of the project activity, which is not utilised. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least



25% larger than the quantity of biomass that is utilised including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions”.

In order to assess the availability of biomass in the project region, a biomass availability survey has been conducted by a credible third-party agent. Based on the biomass availability survey report it has been confirmed that there is sufficient biomass available in the region less than 50 km surrounding the site of the project activity. It confirms that there is no such leakage anticipated.

There is no other relevant source of leakage emission applicable to the project activity. Accordingly, the project activity does not result in any leakage emission.

Hence,  $LE_y = 0$

### **The net Emission Reductions:**

The actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification. However, for the purpose of an ex-ante estimation, following calculation has been submitted:

Estimated annual baseline emission reductions ( $BE_y$ )

$= 38,016 \text{ MWh/year} \times 0.9 \text{ tCO}_2/\text{MWh}$

$= 34,214 \text{ tCO}_2/\text{year}$  (i.e., 34,214 CoUs/year)

## **B.6. Prior History>>**

The project activity has not been registered under any other GHG program for generation or issuance of carbon offsets or credits for the said crediting period.

However, the project has been designed and developed based on the carbon revenue for long term sustainability. In this regard, project was initially designed for a larger capacity and was applied under Clean Development Mechanism (CDM) of UNFCCC for a total capacity of 15 MW under two phases, 8 MW being the first phase and another 7 MW to be followed in due course. However, due to delay in the process and also affected by low carbon pricing the project could not be moved forward under CDM and hence status under CDM remains only at the listing stage (i.e. global stakeholder consultation level) and was not considered further. This information can be checked from the CDM web interface:

<https://cdm.unfccc.int/Projects/Validation/DB/8A3OOEQ0XX722ANMLBA8HRTNJGQ460/view.html>

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

There is no change in the start date of crediting period; the project is applied under UCR with its first crediting period starting from 01/01/2013. Any change in consideration of crediting for CoUs shall be informed and updated during the verification.

**B.8. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>**

Not applicable.

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

Number : First Monitoring Period  
Duration : 08 years, 08 months  
01/01/2014 to 31/08/2022 (inclusive of both dates)

## B.8. Monitoring plan>>

### Data and Parameters available at validation (ex-ante values):

Data / Parameter	UCR recommended emission factor
Data unit	tCO <sub>2</sub> /MWh
Description	A "grid emission factor" refers to a CO <sub>2</sub> emission factor (tCO <sub>2</sub> /MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO <sub>2</sub> /MWh for the 2014- 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Source of data	<a href="https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRStandardNov2021updatedVer2_301121081557551620.pdf">https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRStandardNov2021updatedVer2_301121081557551620.pdf</a>
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid
Additional Comment	The combined margin emission factor as per CEA database (current version 17, Year 2022) results into higher emission factor. Hence for 2021-22 vintage UCR default emission factor remains conservative.

### Data and Parameters to be monitored (ex-post monitoring values):

Note: For the purpose of baseline ER accounting only one ex-post parameter is relevant, i.e. Net Electricity supplied to the Grid by the project activity (EG<sub>BL,y</sub>). However, in line with the CDM methodological guidelines, a few other monitoring parameters are also included. Hence, at the time of baseline emission reduction calculation only the EG<sub>BL,y</sub> will be used; whereas other parameters may be considered only for reporting purposes.

#### A. Main Monitoring Parameter for calculation:

Data / Parameter	EG <sub>BL,y</sub>
Data unit	MWh / year
Description	Net electricity supplied to the grid by the project activity
Source of data	Monthly Joint Meter Readings (JMRs)
Measurement procedures (if any):	Monitoring equipment – Energy Meters Accuracy class – 0.2 Calibration frequency – once in 5 years (as per CEA guideline)  Measured readings of the energy meter installed at the plant feeder grid interconnection point. This will be recorded every month jointly by representative officials of the discom/authority and the Gemco team. This record will be archived and stored.

	<p>For example, the JMR provides data/reading for Export and Import and recorded in both main and check meters. The net units for each month are provided in the JMR. The difference between these measured quantities of export and import values will provide the next net export quantity for that particular month.</p> $EG_{BJ,y} = EG_{\text{export}} - EG_{\text{import}}$ <p>Whereas, at plant level the data related to gross, auxiliary, export, import etc. are also recorded. Hence can be used for further cross checking purposes.</p>
Measurement Frequency:	Monthly
Value applied:	To be applied on actuals, during the first monitoring period.
QA/QC procedures applied:	<p>Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement.</p> <p><b>Cross Checking:</b> The meter reading is cross checked with the sales receipts of electricity. Also, the plant records can be considered for any backup calculations checks.</p>
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.

## B. Other Monitoring Parameters for reporting:

<b>Data / Parameter</b>	<b>EG<sub>Gross</sub></b>
Data unit	MWh / year
Description	Quantity of gross electricity supplied to the grid in year y
Source of data	Logbook record (manually and Electronically archived)
Measurement procedures (if any):	Plant records
Measurement Frequency:	Monthly (but Data will be monitored continuously)
Value applied:	To be applied on actuals, during the first monitoring period.
Monitoring equipment	Energy meter
QA/QC procedures applied:	Not applicable as this is a reporting parameter, not to be considered for calculation.
Purpose of data:	Only for the purpose of reporting.
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.

<b>Data / Parameter</b>	<b>EG<sub>aux</sub></b>
Data unit	MWh / year
Description	Quantity of auxiliary electricity consumed in year y
Source of data	Logbook records (manually and/or Electronically archived)
Measurement procedures (if any):	Plant records
Measurement Frequency:	Monthly (but Data will be monitored continuously)
Value applied:	To be applied on actuals, during the first monitoring period.
Monitoring equipment	Energy meter
QA/QC procedures applied:	Not applicable as this is a reporting parameter, not to be considered for calculation. However, internal QA/QC procedure is available at the project site and same is being followed for data monitoring and archiving.
Purpose of data:	For the purpose of Monitoring & reporting.
Any comment:	All the data will be archived till a period of two years from the end of the crediting period.

<b>Data / Parameter</b>	<b>M<sub>biomass,y</sub></b>
Data unit	tonnes/year
Description	Quantity of biomass consumed in year y
Source of data	Conveyor belt or plant level measurement
Measurement methods and procedures	Plant level records
Frequency of monitoring/recording	Continuously and recorded monthly basis.
Value monitored	To be applied on actuals, during the first monitoring period.
Monitoring equipment	Weigh bridge or equivalent measurement
QA/QC procedures to be applied	Internal QA/QC procedure is available at the project site and same is being followed for data monitoring and archiving.
Purpose of the data	For the purpose of Monitoring & reporting.
Comments	The data would be archived up to two years after the end of crediting period.

<b>Data / Parameter</b>	<b>NCV<sub>k,y</sub></b>
Data unit	GJ/mass or volume unit
Description	Net calorific value of biomass type k
Source of data	Laboratory records
Measurement methods and procedures	Plant level records
Frequency of monitoring/recording	Sample basis
Value applied	To be applied on actuals, during the first monitoring period.
Measurement methods	As per lab testing standard procedure

and procedures	
Purpose of Data	For the purpose of Monitoring & reporting.
Comments	The data will be archived electronically, and the archived data will be kept for 2 years beyond the Crediting Period

Data / Parameter	$W_{\text{biomass},y}$
Data unit	%
Description	Moisture content of the biomass (wet basis)
Source of data	Laboratory analysis results
Measurement methods and procedures	Plant records
Frequency of monitoring/recording	Sample basis
Value monitored	To be applied on actuals, during the first monitoring period.
Monitoring equipment	Laboratory analysis
QA/QC procedures to be applied	Internal QA/QC procedure is available at the project site and same is being followed for data monitoring and archiving.
Purpose of the data	Calculation of baseline emissions.
Comments	The data would be archived up to two years after the end of crediting period.

### C. Additional Parameter considered for project emissions:

Data / Parameter	$FC_{i,y}$
Data unit	Mass or volume unit/y
Description	Quantity of fossil fuel of type i consumed in year y
Source of data	Logbook maintained to record onsite
Measurement methods and procedures	Direct measurement at the point of consumption
Frequency of monitoring/recording	The data will be monitored continuously and aggregated monthly.
Value monitored	To be monitored as per actuals
Monitoring equipment	-
QA/QC procedures to be applied	Internal QA /QC procedure are available at the project site and same is being followed for data monitoring and archiving
Purpose of the data	Calculation of project emissions (currently not applicable).
Comments	<p>This is currently not a monitoring or ex-post parameter. However, this parameter is kept under the monitoring provision for any future requirement in case such situation arises that can lead to any project emissions.</p> <p>The data would be archived up to two years after the end of crediting period.</p>

## Appendix 1:

**Technical specification of the Steam generator (boiler) included under this project:**

TECHNICAL DATA SHEET TRAVELLING GRATE BOILER				
S.No.	DESCRIPTION	UNIT	100% MUSTARD HUSK	100% PADDY STRAW
1	CAPACITY	TPH	40	40
2	PRESSURE	Kg/cm2(g)	62	62
3	FUEL		100% MUSTARD HUSK	100% PADDY STRAW
4	GCV	Kcal/Kg	3054	3454
5	FEED WATER TEMPERATURE	DEG.C	120	120
6	SATURATION TEMPERATURE	DEG.C	286	286
7	SUPERHEATED TEMPERATURE	DEG.C	455±5	455±5
8	EFFICIENCY	%	76.5± 1	76.5± 1

**Technical specification of the Steam Turbine included under this project:**

Turbine Details	
Generator/ Alternator Type:	Biomass Generator
Make:	TRIVENI (India)
Type:	Frame 13E
Capacity:	8000 kW
Intel Steam Pressure:	65 ata.
Intel Steam Temperature:	485oC.
Bleed Steam Pressure:	4.95 ata
Exhaust Steam Pressure:	0.1 ata
Turbine Speed:	7545 RPM
Trip speed:	8300/8675 RPM
Gear Box Details	
Input Speed:	7545 RPM
Output Speed:	1500 RPM
Ratio:	5:1
Alternator Details	
Make:	BHEL

Capacity:	8000 kW
Voltage:	11 kV
Power Factor:	0.8
kVA:	10000 kVA
Speed:	1500 RPM
Insulation Class	
F no. of phase:	3
No. of Poles:	4



## Appendix 2:

List of different varieties of biomass fuel used in the project (indicative list based on historic data, but not limited to):

SL NO.	TYPES
1	Bagasse
2	Beat Chilka
3	Beet Chilka Rm
4	Cotton Stalk
5	Dandi Cutting
6	Gana Patti Cutting
7	Gram Husk
8	G.R. Husk
9	Ground Nut Husk
10	Guar Husk
11	Kaju Chilka
12	Mandi Waste
13	Mustard Husk
14	Popular Leaf
15	Prali Bales
16	Prali Cutting
17	Randa Burada
18	Rice Husk Burada
19	Safeda Chilka
20	Upale Chips
21	Vinear Chips
22	Wooden Burada
23	Wooden Chips
24	Cotton Waste
25	Gr Mix
26	Moongfli Chilka
27	Sarkanda/B
28	Scrap Wooden Chips
29	Misc. Items

Year-wise consumption mentioned in monitoring report after verification.

## Appendix 3:

List of energy meters applicable to the project monitoring and their basic details:

SL No.	Main Meter	Make	Accuracy	Reference calibration date
1	HRT 55949	Secure Make - 3 Phase	0.2s	18/02/2020
2	HRT 55954	Secure Make - 3 Phase	0.2s	18//02/2020

CERTIFICATE OF CALIBRATION										
<p>Issued by :  <b>YADAV MEASUREMENTS PRIVATE LIMITED</b>            Plot no. F-373-375 RIICO Bhamashah Industrial Area,            Kaladwas, Udaipur-Rajasthan-313003, INDIA            Tel: 0091-294-2650127,28, Fax: 0091-294-2650129            Email: Yadav.Measurements@ymllabs.com            website: www.yadavmeasurements.com            CIN number: U31909RJ2003PTC018450</p>										
<p>Page 1 of 5</p>										
<p>Certificate No.: YMPL/322695/116055 ULR-CC27352000000832F</p>										
1	<p>Name and address of customer :- M/s GEMCO ENERGY LIMITED            Kausambhi Road, Village-Dinod            Distt.-Bhiwani-127021, Haryana</p>									
2	<p>Reference</p> <p>Service request form number :- 2019-20/1531            Date of receipt of EUC :- 18-Feb-2020            Condition of EUC on receipt :- Satisfactory</p>									
3	<p>Location of calibration :- GRID END, 132kV Switch Yard            M/s GEMCO ENERGY LIMITED            Kausambhi Road, Village-Dinod            Distt.-Bhiwani-127021, Haryana</p>									
4	<p>Calibration Details</p> <p>Date of issue :- 18-Feb-2020            Date of calibration :- 18-Feb-2020            Due Date of calibration :- 17-Feb-2021</p>									
5	<p>Description of equipment under calibration</p> <p>Name :- Three Phase Energy Meter            Sr.No :- HRT55954            Make :- Secure Meters Limited            Type :- E3M021, 3Ph 4 Wire            Voltage :- 3x63.5Vp-n            Current :- Ib: 1A Imax: 2A            Voltage Ratio :- ~110V/V3            Current Ratio :- ~1A            Class :- 0.2s For Active and Reactive            Meter constant :- 160 imp/unit            Unit :- Wh, VAh, W VAh, VA            Frequency :- 50Hz</p> <table border="1"> <thead> <tr> <th></th> <th>Initial Energy</th> <th>Final Energy</th> </tr> </thead> <tbody> <tr> <td>Wh Import</td> <td>1908296</td> <td>1908422</td> </tr> <tr> <td>Wh Export</td> <td>1890932</td> <td>1890982</td> </tr> </tbody> </table>		Initial Energy	Final Energy	Wh Import	1908296	1908422	Wh Export	1890932	1890982
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Wh Import	1908296	1908422								
Wh Export	1890932	1890982								
6	<p>Environmental conditions of measurements</p> <p>Temperature :- 25.3-30.2°C            Relative Humidity :- 40-45%            Weather :- Clear</p>									
7	<p>Witnessed by</p> <p>Mr. Parveen Mund            SDO M&amp;P HVPN Hisar            Mr. Rajesh Kumar            SDO M&amp;P DHBVN Bhiwani            Mr. Narender Pannu            DGM, Gemco Energy Limited Bhiwani</p>									
<p>Checked by : <i>Aziz</i>  <i>Kamran Pathan</i></p> <p>Approved by : Scientist-1  <i>Taj Singh</i>  <i>Qitaz Ogr</i>            QF.CP.CALB.4B.01.00</p>										



# CERTIFICATE OF CALIBRATION

Issued by :  
**YADAV MEASUREMENTS PRIVATE LIMITED**  
 Plot no. F-373-375 RIICO Bhamashah Industrial Area,  
 Kaladwas, Udaipur-Rajasthan-313003, INDIA  
 Tel: 0091-294-2650127, 28, Fax: 0091-294-2650129  
 Email: Yadav.Measurements@ymllabs.com  
 website: www.yadavmeasurements.com  
 CIN number: U31909RJ2003PTC018450



CC-2735

Certificate No.: YMPL/322695/116053

ULR-CC273520000000830F

Page 1 of 5

1 Name and address of customer	M/s GEMCO ENERGY LIMITED Kausambhi Road, Village-Dinod, Distt.-Bhiwani-127021, Haryana										
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5 Description of equipment under calibration	Name - Three Phase Energy Meter Sr.No. - HRT55849 Make - Secure Meters Limited Type - E3M021, 3Ph 4 Wire Voltage - 3x63.5Vp-n Current - 1b: 1A Imax: 2A Voltage Ratio - -/110V/N3 Current Ratio - -/1A Class - 0.2s For Active and Reactive Meter constant - 160 imp/unit Unit - Wh, VAh, W, VAh, VA Frequency - 50Hz <table border="1"> <thead> <tr> <th></th> <th>Initial Energy</th> <th>Final Energy</th> </tr> </thead> <tbody> <tr> <td>Wh Import</td> <td>17255</td> <td>17331</td> </tr> <tr> <td>Wh Export</td> <td>1892231</td> <td>1892281</td> </tr> </tbody> </table>			Initial Energy	Final Energy	Wh Import	17255	17331	Wh Export	1892231	1892281
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Checked by:

*[Signature]*

*Dharmendra*

Approved by: Scientist-1

*[Signature]*  
*T. S. Singh*

DECR/CALB.4B.01.00