BIODIESEL PROJECT BY KOTYARK INDUSTRIES LIMITED

Document Prepared By: Infinite Solutions

Project Title	Biodiesel Project by Kotyark Industries Limited
Version	01
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Prepared By	Infinite Solutions
Contact	214-215 Milinda Manor, Opp. Next Treasure Island, 2 RNT Marg, Indore – 452001.

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1 PROJECT DETAILS

1.1 Summary Description of the Project

Biodiesel Project by Kotyark Industries Limited (hereafter referred to as "the Project") is located within the Economic and Technological Development Zone in India[1]. The project is constructed and operated by Kotyark Industries Limited and is designated to produce biodiesel with capacity of 500 KL per day. The installed production capacity of the production plant is:

Particular	Type	Quantity with Unit
Bio Diesel	Product	500,00 KL PER DAY
Glycerin	By Product	70.00 KL PER DAY

After commissioning, the Project is expected to reduce greenhouse gas emissions of approximately 1,26,559 tCO2e annually. The project will also contribute to sustainable development in the following aspects:

- Transform the waste oil/fat into useful energy resources and thus preserve limited fossil fuel resources.
- Along with CO2 reductions, the project will contribute to the sustainable development by reducing other pollutants such as SO2, NOx and CO due to fossil fuel combustion.
- Promoting the local economic development and improving the level of people's life by providing potential job opportunities to residents.

1.2 Sectoral Scope and Project Type

The project falls into sectoral scope 01: Energy industries (renewable - / non-renewable sources), sectoral scope 13: Waste handling and disposal.

The project is not a grouped project.

Methodology: ACM0017: Production of biofuel, Version 03.1[2]

[1] These estimations are based on the preliminary feasibility study conducted for the project's eligibility to apply voluntary emission scheme. Estimated GHG emission reductions or removals (tCO2e) are going to be measured in detail and finalized in accordance with the methodologies applied to the project in the final version of this PD which will be submitted to a Designated operational Entity (DoE) for the project's validation

[2] https://cdm.unfccc.int/methodologies/DB/ZNCG27VU8E0ABXO6GHGKTR75U0MIWL

1.3 Project Eligibility

The Project produces biodiesel based on oil/fat from biogenic origin to substitute petroleum diesel for the use as fuels. which is eligible under Version 4 of the VCS Standard.

1.4 Project Design

The project is not a grouped project.

Eligibility Criteria

NA

1.5 Project Proponent

Organization name	Kotyark Industries Limited
Contact person	Gaurang Shah
Title	CMD
Address	2nd Floor, A-3 Shree Ganesh Nagar Housing Society, Ramakaka Temple Road, Chhani, Vadodara – 391740. Gujarat, India
Telephone	+91-9978967722
Email	info@kotyark.com

1.6 Other Entities Involved in the Project

Organization name	Infinite Solutions
Role in the project	Project Consultant
Contact person	Mr. Jimmy Sah
Title	Chief Operating Officer
Address	Milinda's Manor, 214-215, 2, RNT Marg, Indore, Madhya Pradesh 452001
Telephone	+91-9644130430
Email	jimmy@infisolutions.org

1.7 Ownership

The Project is owned by M/s Kotyark Industries Limited, which is the project participant of the Project. Further the Ownership is demonstrated through Commissioning certificates. it is important to note here that the Mr. Gaurang Shah, the CMD of Kotyark Industries Limited.

1.8 Project Start Date

The project start date is 15th September 2020, as the operation start date.

1.9 Project Crediting Period

Crediting Period Type: Renewable (Renewable twice for a total of 21 years)

Crediting Period Start date: 15/September / 2020

Crediting Period End date: 14/August/2027

(Start and end dates included)

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

The estimated annual GHG emission reductions/removals of the project are:

☐ <20,000 tCO_2e/year

☐ 20,000 – 100,000 tCO_2e/year

☐ 100,001 – 1,000,000 tCO_2e/year

☒ >1,000,000 tCO_2e/year

Project Scale	
Project	
Large project	✓

Year	Estimated GHG emission reductions or removals (tCO_2e)
Year 1	1,26,559
Year 2	1,26,559
Year 3	1,26,559
Year 4	1,26,559

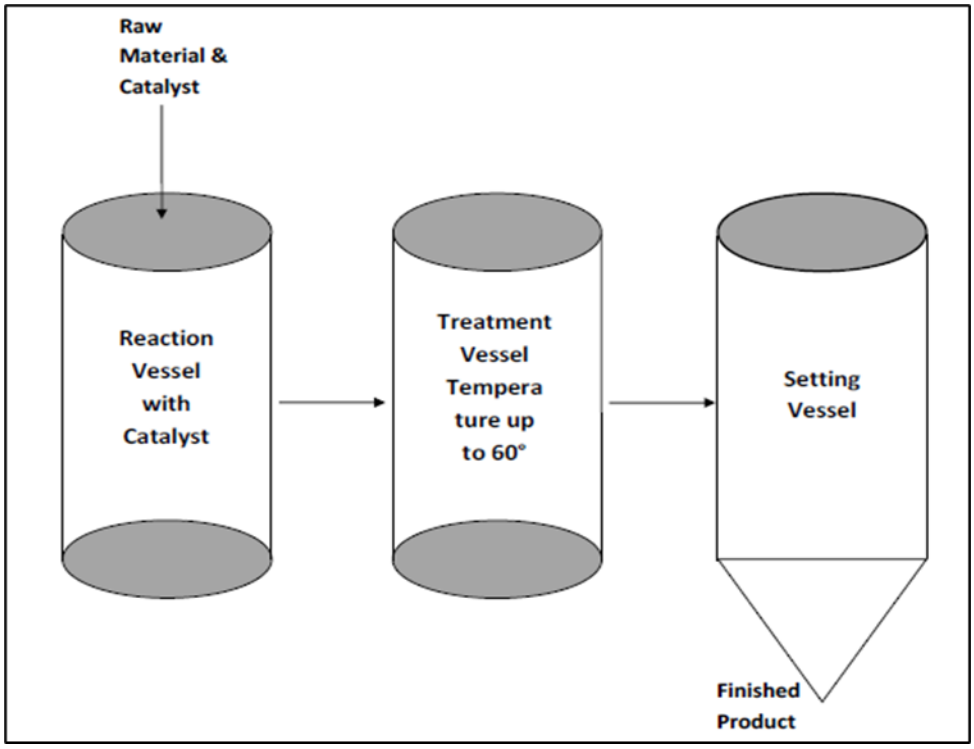
Year 5	1,26,559
Year 6	1,26,559
Year 7	1,26,559
Total estimated ERs	12,65,587
Total number of crediting years	7
Average annual ERs	1,26,559

1.11 Description of the Project Activity

Bio-diesel Project involves preparation of Biodiesel from vegetable oils through chemical a process. The product "Bio-diesel" is an eco-friendly and pollution free product and hence is an excellent source of renewable energy. Biodiesel refers to a non-petroleum-based diesel fuel consisting of short chain alkyl (methyl or ethyl) esters, made by transesterification of vegetable oil or animal fat (tallow), which can be used (alone, or blended with conventional Petro-diesel) in unmodified diesel-engine vehicles. Pure Biodiesel is biodegradable, nontoxic ad essentially free of Sulphur and aromatics. Chemically, Biodiesel is referred to as mono-alkyl esters of long chain fatty acids derived from renewable are carbohydrate sources as opposed to petroleum or coal, which are hydrocarbon, sources. The plant will be having an installed capacity of 500 KL per day.

Bio- Diesel can be manufactured through different processes as under:

- Vegetable oils can be converted to fatty acids, which in turn are converted to esters Vegetable oil can also be converted to methyl or ethyl esters directly, using acid or base accelerate (catalyze) the transesterification reaction.



Steps involved in manufacturing of Bio-Diesel are:

1. **Preparation:** Cleaning / heating bio-lipid or vegetable oil. If cleaning/heating is not done, more quantity of soap will be produced with the biodiesel, the conversion index from vegetable oil to Bio-Diesel will be smaller and will result more than triglycerides.
2. **Titration:** Optional pH for Bio-Diesel is 7 (neutral), same as that of distilled water (and most tap water). Some vegetable oil has a high level of free fatty acids which require an acid Esterification (to obtain) a pH lower than 3 before alkaline Transesterification.
3. **Mixing:** Proper ratio of Methanol and catalyst (potassium hydroxide) should be mixed to produce potassium methoxide.
4. **Combination:** The reaction temperature between potassium methoxide and Bio-lipid should be 60 ° - 70° C.
5. **Separation:**
    - Glycerol is removed from Bio-Diesel by gravity separation
    - Traces of methanol is removed from Bio-Diesel by heating

1.12 Project Location

Project Location	F-86 to F-90, RIICO Industrial Area, Swaroopgunj. Dist: Sirohi, Rajasthan – 307 023
Co-ordinate	24.8852° N, 72.8575° E

1.13 Conditions Prior to Project Initiation

The Scenario existing prior to the start of the implementation of the project activity is: The scenario existing prior to the start of the project is the equivalent fuel demand from existing stationary installations and vehicles within the project boundary satisfied by the project would have been satisfied by petroleum diesel. For the material level, large amounts of waste oil/fat generate every day in the local area, and most are discharged into the municipal sewage system without recovery. The baseline scenario is the same as the scenario existing prior to the start of the project.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

Legislation concerned for this current project activity there is no mandate law and enforcement mentioned as per the state level and country level. This project Is voluntary initiatives by the Project Proponent.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The Project has not participated in any other GHG programs.

1.15.2 Projects Rejected by Other GHG Programs

The Project is not rejected by other GHG programs

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

Net GHG emission reductions or removals generated by the Project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits.

1.16.2 Other Forms of Environmental Credit

The Project has no intent to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

1.17 Sustainable Development Contributions

1.17.1 Sustainable Development Contributions Activity Description

Transform the waste oil/fat into useful energy resources and thus preserve limited fossil fuel resources.

	• Transform the waste oil/fat into useful energy resources and thus preserve limited fossil fuel resources.
	• Along with CO2 reductions, the project will contribute to the sustainable development by reducing other pollutants such as SO2, NOx and CO due to fossil fuel combustion.
	• Promoting the local economic development and improving the level of people's life by providing potential job opportunities to residents.

1.17.2 Sustainable Development Contributions Activity Monitoring

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	The project has avoided emission of 1,26,559 tCO2e in the atmosphere	Since commissioning the project has avoided emission of 1,26,559 tCO2e in the atmosphere.
2)	8.5	Number of People Employed	Implemented activities to increase	15 number of people employed	The project has Employed 15 peoples since commissioning.

1.18 Additional Information Relevant to the Project

Leakage Management

Where applicable, describe the leakage management plan and implementation of leakage and risk mitigation measures.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

Further Information

There are no information or incidents that will have bearing on the eligibility of the project, the net GHG emission reductions or removals, or the quantification of the project's net GHG emission reductions or removals.

2 SAFEGUARDS

2.1 No Net Harm

There was no harm identified form the project and hence no mitigations measures are applicable.

2.2 Local Stakeholder Consultation

All the stakeholders have been invited through invitation letters and/ or public notice to attend the stakeholders meeting.

The agenda for the meeting is as follows.

- Introduction of the project
- Implementation of solar milling plant
- Grievance Mechanism for stakeholders
- Feedback/Questions from Stakeholders
- Question and Answer session.

PP has explained how such projects help in mitigating impacts due to Global Warming. He briefly explained the gist of VCS standards prerequisites and sustainability projects in the country. Further, he explained the impacts of these projects which lead to providing clean energy, increase

in employment opportunities both long term and short term, increased income and thereby leading to improvement in living standard of the people

2.3 Environmental Impact

Project activity is not having any negative environmental impacts.

2.4 Public Comments

The project shall be listed for 30 days period. In case any comments are received they shall be incorporated during the validation.

2.5 AFOLU-Specific Safeguards

NA

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

ACM0017: Production of biofuel --- Version 3.1

Weblink :
https://cdm.unfccc.int/filestorage/I/9/8/I98X36PVOJZBEG7W2AKY4RDSUNLFM0/Production%20of%20biofuel.pdf?t=eGF8cjlhaGtlfDD97W-624Z3tVHvpP0RjSn7

3.2 Applicability of Methodology

1. The methodology is applicable to project activities that reduce emissions through the production, of blended biofuels to be used in existing stationary installations and/or in vehicles	the biodiesel will be supplied to consumers who use biodiesel for fuel combustion in existing stationary installations and/or vehicles in local transport sector
2. The biofuel is produced from one or a combination of the following feedstock: (a) Waste oil/fat. (b) Seeds or crops that are cultivated in dedicated plantations. (c) Biomass residues (e.g., agricultural residues, wood residues, organic wastes).	the biodiesel is produced form the Waste oil/fat.

3. In order to avoid double counting of emission reductions, the methodology ensures that the CERs can only be issued to the producer of the biofuel. The project proponent shall demonstrate that double counting of emission reductions will not occur e.g., via a contractual agreement with the end-user(s), feedstock producer or other stakeholder involved in the supply chain	Kotyark Industries is the original manufacture / producer for the biodiesel. And the VCS VERs will be claimed only by the producer.
4. The conditions apply to the methodology:	The project only uses waste oil/fat for biodiesel production, no biomass or biofuels involved.

3.3 Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Vehicles and Stationary Combustion Installations Consuming Petro diesel	CO_2	Yes	Main source of baseline emissions.
		CH4	No	Excluded for simplification. CH4 and N2O emissions are assumed to be very small. No systematic difference to project activity
		N2O	No	
		Other	-	-
Project	On-site energy consumption at biodiesel production plant and, if applicable, the oil production plant(s)	CO2	Yes	Significant emission source
		CH4	No	Excluded for simplification. CH4 emissions are assumed to be very small.
		N2O	No	Excluded for simplification. N2O emissions are assumed to be very small
		Other	-	-
	Combustion of fossil fuel derived methanol in the biodiesel ester	CO2	Yes	Significant emission source.
		CH4	No	Excluded for simplification. CH4 emissions are assumed to be very small.
		N2O	No	Excluded for simplification. N2O emissions are assumed to be very small
		Other	-	-
	Transportation of oil seeds, vegetable oils	CO2	Yes	Significant emission source.
		CH4	No	Excluded for simplification. CH4 emissions are assumed to be very small.

Source		Gas	Included?	Justification/Explanation
	and or oil/fat wastes	N2O	No	Excluded for simplification. N2O emissions are assumed to be very small
		Other	-	-
	Transportation of biodiesel to blending facility	CO2	Yes	Significant emission source.
		CH4	No	Excluded for simplification. CH4 emissions are assumed to be very small.
		N2O	No	Excluded for simplification. N2O emissions are assumed to be very small
		Other	-	-
	Anaerobic Wastewater treatment in crude vegetable oil production.	CO2	No	Not applicable, the biodiesel is produced from waste oil/fat.
		CH4	No	Not applicable, the biodiesel is produced from waste oil/fat.
		N2O	No	Not applicable, the biodiesel is produced from waste oil/fat.
		Other	-	-
	Cultivation of land to produce oil seeds (if the feedstock is vegetable oils and / or fats from plants produced in dedicated plantations)	CO2	No	Not applicable, the biodiesel is produced from waste oil/fat.
		CH4	No	Not applicable, the biodiesel is produced from waste oil/fat.
		N2O	No	Not applicable, the biodiesel is produced from waste oil/fat.
		Other	-	-

3.4 Baseline Scenario

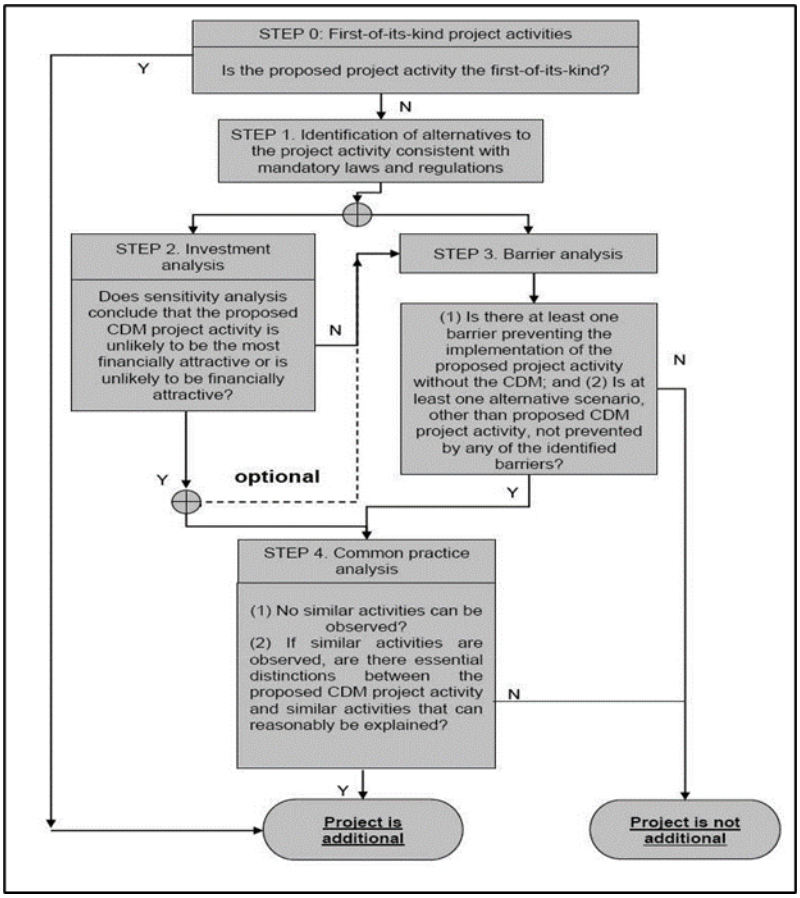
Petroleum diesel is widely used as fuel in the transport sector in India, so the scenario existing prior to the start of the project is the equivalent fuel demand from existing stationary installations and vehicles within the project boundary satisfied by the project would have been satisfied by petroleum diesel. For the material level, large amounts of waste oil/fat generate every day in the local area, and most are discharged into the municipal sewage system without recovery. The baseline scenario is the same as the scenario existing prior to the start of the project.

3.5 Additionality

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the	Not Applicable

proposed project (including the version number and the specific paragraph, if applicable).	
Describe how the proposed project meets the criteria for deemed additionality.	Not Applicable

Thus, the project follows section 5.3.2 of the applied methodology which requires the project proponent to determine the additionality based on "Tool for the demonstration and assessment of additionality", Version 07.0.0. The stepwise approach to establish additionality of the project activity has been followed, details of which are provided in the following paragraphs:



Step 0: Demonstration whether the proposed project activity is the first-of-its-kind

The proposed project activity is biodiesel production project; hence not the first of its kind. Hence, this step is not applicable.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

As the baseline scenario is prescribed by applied methodology, hence no further analysis is carried out to identify alternatives.

Step 2: Investment Analysis

As per para 29 of "Tool for the demonstration and assessment of additionality" v7.0.0, it is determined that the proposed project activity is not an economically or financially feasible option. To conduct the investment analysis, Methodological tool: Investment analysis, version 10.0 (EB 105 annex 06) has been referred.

Sub-step 2a: Determine appropriate analysis method

As per "Tool for the demonstration and assessment of additionality" (version 07.0.0), for financial analysis of the project, the following three options are available:

Option I: Simple Cost Analysis

Option II: Investment Comparison Analysis

Option III: Benchmark Analysis

The project will generate revenues from sale of biodiesel and glycerine; therefore, Option I is not applicable. Option II also does not apply since there is no comparable investment alternative available to the project participant in line with para 32 of the Methodological tool: "Tool for the demonstration and assessment of additionality" (version 07.0.0). The most appropriate financial analysis method is therefore option III: the benchmark analysis,

Sub-step 2b: Option III. Apply benchmark analysis

The suitable financial indicator needs to be selected considering the project type and decision-making context. For this project activity as explained in above section 2.4 that the most plausible baseline scenario for the project activity is the continuation of the current practice i.e., PP has choice to invest or not to invest in Bio-Diesel project. The guidance available at the time of decision making was Guidance 19 of "Guidance on the Assessment of Investment Analysis", Version 05, EB 62, Annex 5 which states that. The benchmark approach is therefore suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e., cases where the choice of the developer is to invest or not to invest." Also, as per the latest available "Investment Analysis Tool" Version 10 para 7 and 9 considers NPV (Net Present Value) as one of the financial indicators designed to calculate the return on the cost of investment and as per the applicable methodology most plausible baseline scenario for the project activity is the continuation of the current practice hence the benchmark analysis is considered appropriate in context of the project activity. Hence, PP has chosen the benchmark analysis and considered NPV as the suitable indicator in context of the Bio-Diesel project.

PP has chosen (a) Investment barrier among the barrier listed in para 10 of tool, to demonstrate the additionality of the project activity. Hence, the additionality for the proposed project activity is established with an in-depth investment barrier analysis which may affect the successful implementation of the proposed project activity.

The results of investment analysis show the negative NPV values for all the three project instances. Hence, the sensitivity analysis has been conducted to check the robustness of the investment analysis results. Sub-step 2d: Sensitivity analysis:

To show the robustness of the financial analysis, a sensitivity analysis is carried out on key factors that may impact the performance of the project activity. As per Guidance 27 & 28 of EB 105, Annex 06, "the sensitivity analysis of the project parameters which may substantially influence" only those parameters that constitute more than 20% of either total project costs or total project revenues are subjected to reasonable variation. The critical parameters thus identified for determination of financial viability of project are as follows:

1) Capacity Utilization

2) Raw Material

3) Project cost

4) Selling price (Bio-Diesel)

5) Selling price (Glycerine)

According to para 28 of Annex 06 EB 105, 'As a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances".

Probability to breach the benchmark:
Sensitivity Parameter 1: Capacity Utilization
Sensitivity Parameter 2: Raw material
Sensitivity Parameter 3: Project Cost
Sensitivity Parameter 4: Selling price (Bio Diesel)
Sensitivity Parameter 5: Selling price (Glycerine)

Even in the best scenarios through decreasing the Investment cost, the project is not able to overcome the investment barrier and would require carbon benefits for its successful operations. From the above discussion of barrier analysis, it can be concluded that the project is additional in terms of investment and organization capacity to bring the project into implementation.

Step -3: Barrier analysis

Barrier analysis has not been used.

Step 4: Common practice analysis

For the concerned project activity, common Practice Analysis has been carried out. The project is developed with biodiesel production of 100 TPD. Thus, common practice analysis has been carried out for large scale project activity. The project activity is located in state of Rajasthan in India; hence, Rajasthan state is considered as Geographical area for the project activity. Stepwise approach for common practice analysis has been carried out as per Methodological tool "Common Practice", version 03.1 EB 84, Annex 7:

Step (1): Calculate applicable capacity or output range as +/- 50% of the total design capacity or output of the proposed project activity.

Step (2): Identify similar projects (both CDM and non-CDM) which fulfil all the following conditions:

- The projects are located in the applicable geographical area:
- The projects apply same measure as the proposed project activity:
- The projects use the Same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity.
- The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g., clinker) as the proposed project plant.
- The capacity or output of the projects is within the applicable capacity range for the chosen projects.
- The projects started commercial operation before the PSF is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity

3.6 Methodology Deviations

There is no methodology deviation.

4 ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

From the **ACM0017: Production of biofuel — Version 3.1, Paragraph 38,** States that Baseline emissions from displaced fossil fuel are determined as follows:

$$BEy = BFy \times NCVBF, y \times EFCO2, FF \quad \text{Equation (1)}$$

With

$$BF_y = \left[min\left\{ \left(P_{BF,y} - P_{BF,on-site,y}\right); \left(\sum_l f_{PJ,l,y} \times C_{BF,l,y}\right) \right\} - P_{BF,other,y} \right] \quad \text{Equation (2)}$$

$$\times \left(\frac{\sum_i C_{BF,i,y} \times \left(\frac{f_{PJ,i,y} - f_{reg,y}}{f_{PJ,i,y}} \right)}{\sum_i C_{BF,i,y}} \right)$$

Where:

BE_y = Baseline emissions during the year y (tCO2)

BF_y = Quantity of biofuel eligible for crediting in year y (t)

$NCV_{BF,y}$ = Net calorific value of biofuel produced in year y (GJ/t)

$EFCO2,FF$ = Carbon dioxide emissions factor for displaced fossil fuel (tCO2/GJ)

PBF,y = Quantity of biofuel produced in the project plant in year y (t)

$PBF,on-site,y$ = Quantity of biofuel consumed at the project plant(s) (biofuel production and/or feedstock processing) in year y (t)

$PDBF,other,y$ = Quantity of biofuel that is either produced with alcohols other than methanol from fossil origin or produced using feedstock or waste oil(s)/fat(s) other than those eligible under this methodology according to the applicability conditions in year y (t)

CBF,i,y = Quantity of biofuel type i consumed/sold/blended in year y (t)

fPJ,i,y = Fraction of biofuel in the blended biofuel type i in year y (ratio)

$freg,y$ = Fraction of biofuel in the blended biofuel which is required by mandatory regulations of the host country in year y (ratio)

i = Blended biofuel type (e.g., B5, B10, B20, B50 etc.)

4.2 Project Emissions

Project activity emissions are calculated as follows:

$PE_Y = AF_{1,Y}.(PE_{BF,Y} + PE_{MeOH,Y} + PE_{Tr,y} + AF2_{,Y}. PE_{BC,y})$

Where:

PE_y = Project emissions in year *y* (tCO_2)

$PE_{BPF,y}$ = Project emissions at the biodiesel production plant and, if applicable, the oil production plant(s) in year *y* (tCO_2)

$PE_{MeOH,y}$ = Project emissions from fossil carbon in the biodiesel due to esterification with methanol of fossil origin in year *y* (tCO_2)

$PE_{Tr,y}$ = Project emissions from transportation in year *y* (tCO_2)

$PE_{BC,y}$ = Project emissions associated with the cultivation of land to produce oil seeds in year *y* (tCO_2)

$AF_{1,y}$ = Allocation factor for the production of biodiesel in year *y* (fraction)

$AF_{2,y}$ = Allocation factor for the oil seeds cultivation in year *y* (fraction)

The Project doesn't involve the cultivation of land to produce oil seeds, so $PE_{BC,y}$ =0, and $AF_{2,y}$ =*0.*

1. Project emissions at the biodiesel production plant and oil production plants ($PE_{BPF,y}$) These emissions include fuel and electricity consumption that occurs at the site of the biodiesel production plant and, if applicable, emissions associated with the anaerobic treatment of wastewater in the oil production plant(s). These emissions are estimated as follows:

$$PE_{BP,Y} = \sum PE_{FC,j,y} + PE_{EC,Y} + PE_{W,y}$$

Where:

$PE_{BPF,y}$ = Project emissions at the biodiesel production facility and, if applicable, the oil production plant(s) in year y (tCO_2)

$PE_{FC,j,y}$ = Project emissions from combustion of fuel type *j* in the biodiesel production plant and oil production plant(s) in year *y* (tCO_2)

$PE_{EC,y}$ = Project emissions from electricity consumption in the biodiesel production plant and oil production plant(s) in year *y* (tCO_2)

$PE_{w,y}$ = Project emissions from anaerobic treatment of waste water in year *y* (tCO_2)

Emissions from fossil fuel consumption ($PE_{FC,j,y}$)

This emission source should include CO_2 emissions from all fossil fuel consumption that occurs at the site of the biodiesel production plant and, if applicable, the oil production plant(s) and that is attributable to the project activity. This shall include, inter alia, fossil fuel combustion for heat and/or electricity generation. The project emissions from fossil fuel combustion ($PE_{FC,i,y}$) shall be calculated following the latest version of "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion". For this purpose, the processes *j* in the tool correspond to all fossil fuel combustion sources at these plants.

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

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

Where:

$PE_{FC,i,y}$ = Project emissions from combustion of fuel type i in the biodiesel production plant in year y (tCO_2)

$FC_{i,y}$ = The quantity of fuel type i combusted during the year y (mass or volume unit/yr)

$COEF_{i,y}$ = The CO_2 emission coefficient of fuel type i in year y (tCO2/mass or volume unit)

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

$EF_{CO2,i,y}$ = The weighted average CO_2 emission factor of fuel type *i* in year y (tCO_2/GJ)

Emissions from electricity consumption ($PE_{EC,y}$)

Emissions from electricity consumption includes electricity delivered from the grid to the biodiesel production plant and, if applicable, the oil production plant(s). Electricity generated on-site should not be included here. The project emissions from electricity consumption ($PE_{EC,y}$) will be calculated following the latest version of "Tool to calculate baseline, project and/or leakage emissions from electricity consumption".

$$PE_{EC,y} = EC_y \times EF_{CO2,EL,y} \times (1 + TDL_y)$$

Where:

$PE_{EC,y}$ = Project emissions from electricity consumption in the biodiesel production plant in year *y* (tCO_2)

EC_y = Quantity of electricity consumed in year y(MWh/yr)

$EF_{CO2,EL,y}$ = CO_2 Emission factor for electricity generation in year y (tCO2/MWh)

TD_{Ly} = Average technical transmission and distribution losses in year y

The electricity consumed by the Project is delivered from Capro Power Limited, which belongs to Scenario B of "*Tool to calculate baseline, project and/or leakage emissions from electricity consumption".* Thus, the conservative default value of 1.3 tCO_2/MWh is chosen as the emission factor ($FE_{CO2,EL,y}$) and the default value of 20% is chosen as the average technical transmission and distribution losses for providing electricity to the Project (TDL_y).

Project emissions from waste water treatment ($PE_{W,y}$)

Emissions associated with the anaerobic treatment of wastewater in the oil production plant(s) should be estimated where applicable.

If the methane from anaerobic treatment of wastewater is vented to the atmosphere, then PEw,y is estimated as follows:

$$PE_{w,y} = Q_{COD,y} \cdot PCOD,y \cdot B_0 \cdot MCF_p \cdot GWP_{CH4}$$

$PE_{w,y}$ = Project emissions from anaerobic treatment of waste water in year *y* (tCO_2e)

$Q_{COD,y}$ = Amount of wastewater treated anaerobically or released untreated from the crude vegetable oil production plant in year *y* (m3)

$PCOD,_y$ = Chemical Oxygen Demand (COD) of wastewater in year *y* ($tCOD/m_3$)

B_0 = Maximum methane producing capacity (t CH4/t COD)

MCF_p = Methane conversion factor (fraction)

$GWPCH_4$ = Global warming potential of CH4 (tCO_2e/tCH_4)

The Project doesn't include oil production plant, so $PE_{W,y}$ =0.

2. Project emissions from fossil carbon in the biodiesel due to the use of methanol from fossil origin in the esterification process ($PE_{MeOH,y}$)

Under the current applicability of the methodology, methanol of fossil origin is used for the esterification of waste oil/fats. In the esterification process, the carbon from the methanol remains in the esters. Thus, a fraction of the carbon in the biodiesel is of fossil origin and need to be accounted as project emissions. These emissions are estimated as follows:

$$PE_{MeOH,y} = MC_{MeOH,y} \cdot EF_{C,MeOH} \cdot \frac{44}{12}$$

Where:

$PE_{MeOH,y}$ = Project emissions from fossil carbon in the biodiesel due to esterification with methanol of fossil origin in year *y* (tCO2)

$MC_{MeOH,y}$ = Quantity of methanol consumed in the biodiesel plant, including spills and evaporations in year *y* (tonnes)

$EF_{C,MeOH}$ = Carbon emissions factor of methanol, based on molecular weight (tC/tMeOH)

44/12 = Molecular weight ratio to convert t of carbon into t of CO2 (tCO_2/tC)

3. Project emissions from transportation ($PE_{Tr,y}$)

Project emissions from transportation only have to be accounted if distances of more than 50km are covered.

Project emissions from transportation include the following sources, where applicable:

· Any transportation of waste oil/fats to the biodiesel production plant; and

· Any transportation of the biodiesel to the site where it is blended with petrodiesel.

Emissions are calculated based on the actual quantity of fossil fuel consumed for transportation.

$$PE_{tr,y} = \sum_{m}\sum_{i}(FC_{m,i,y} \times NCV_i \times EF_{CO2,i})$$

Where:

$PE_{Tr,y}$ = Project emissions from transportation in year *y* (tCO_2)

$FC_{m,i,y}$ = Fuel consumption of type *i* for transporting material *m* in year *y* (t)

NCV_i = Net calorific value of fuel type *i* (GJ/t)

$EF_{CO2,i}$ = Carbon dioxide emissions factor for fuel type *i* (tCO_2/GJ)

m = Material transported (e.g. oil seeds, vegetable oil and biodiesel).

4.3 Leakage

This methodology estimates the following sources of leakage:

- Emissions associated with the production of the methanol used for esterification;
- If the biodiesel is produced from waste oil/fat, displacement of existing uses of waste oil/fat that may result in increased demand for fossil fuels elsewhere;
- Positive leakage associated with the avoided production and transportation of petrodiesel.

Please note that the leakage emissions shall not be less than zero. In cases where, in year y, LEy is less than zero, consider it as zero. The leakage emissions are calculated as follows:

$$LE_y = LE_{MeOH,y} + LE_{WOF,y} - LE_{PD,y}$$

Where:

LE_y = Leakage emissions in year y (tCO_2)

$LE_{MeOH,y}$ = Leakage emissions associated with production of methanol used in biodiesel production in year y (tCO_2)

$LE_{WOF,y}$ = Leakage emissions from displacement of existing use of waste oil/fat in year y (tCO_2).

$LE_{PD,y}$ = Leakage related to the avoided production of petrodiesel in year y(tCO_2)

Leakage related to the production of crude oil ($LE_{PROD,y}$)

$$LE_{PROD,y} = BD_y \cdot \frac{NCV_{BD,y}}{NCV_{PD}} \cdot EF_{PROD}$$

Where:

$LE_{PROD,y}$ = Leakage related to the production of crude oil in year y (tCO_2)

BD_y = Quantity of biodiesel eligible for crediting in year *y* (t)

$NCV_{BD,y}$ = Net calorific value of biodiesel produced in year y (GJ/t)

NCV_{PD} = Net calorific value of petrodiesel (GJ/t)

EF_{PROD} = Emission factor for production of crude oil (tCO_2e/t)

Leakage related to oil refining ($LE_{REF,y}$)

$$LE_{REF,y} = BD_y \cdot \frac{NCV_{BD,y}}{NCV_{PD}} \cdot EF_{REF}$$

Where:

$LE_{REF,y}$ = Leakage related to refining of crude oil in year y (tCO_2)

BD_y = Quantity of biodiesel eligible for crediting in year *y* (t)

$NCV_{BD,y}$ = Net calorific value of biodiesel produced in year y (GJ/t)

NCV_{PD} = Net calorific value of petrodiesel (GJ/t)

EF_{REF} = Emission factor related to oil refining (tCO_2e/t)

Leakage related to the long distance transport ($LE_{LDT,y}$)

$$LE_{LDT,y} = BD_y \cdot \frac{NCV_{BD,y}}{NCV_{PD}} \cdot EF_{LDT}$$

Where:

$LE_{LDT,y}$ = Leakage related to the long distance transport in year y (tCO_2)

BD_y = Quantity of biodiesel eligible for crediting in year *y* (t)

$NCV_{BD,y}$ = Net calorific value of biodiesel produced in year y (GJ/t)
NCV_{PD} = Net calorific value of petrodiesel (GJ/t)
EF_{LDT} = Emission factor related to long distance transportation (tCO2e/t)

Emission reductions

Emission reductions are calculated as follows:

$$ER_Y=(BE_Y-PE_Y-LE_Y)$$

Where:

ER_y = Emission reductions in year y (tCO_2)

BE_y = Baseline emissions in year y (tCO_2)

PE_y = Project emissions in year y (tCO_2)

LE_y = Leakage emissions in year y (tCO_2)

4.4 Estimated Net GHG Emission Reductions and Removals

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
Year-1	1,36,385	9,826	0	1,26,559
Year-2	1,36,385	9,826	0	1,26,559
Year-3	1,36,385	9,826	0	1,26,559
Year-4	1,36,385	9,826	0	1,26,559
Year-5	1,36,385	9,826	0	1,26,559
Year-6	1,36,385	9,826	0	1,26,559
Year-7	1,36,385	9,826	0	1,26,559
Total	13,63,850	98,263	0	12,65,587

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	NCV_{PD}
Data unit	GJ/T
Description	Net calorific value of Petro diesel
Source of data	2006 IPCC Guidelines for GHG Inventories
Value applied:	43
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	For baseline emissions calculation
Comments	NA

Data / Parameter	$EF_{CO2,PD}$
Data unit	*tCO2/GJ*
Description	*Carbon dioxide emissions factor for Petro diesel*
Source of data	2006 IPCC Guidelines
Value applied:	0.0741
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	*For Baseline emission calculation*
Comments	*Not Applicable*

Data / Parameter	$EF_{CO2,EL,y}$

Data unit	*tCO2/MWh*
Description	*CO2 Emission Factor for electricity generation in year y*
Source of data	Tool to calculate baseline, project and/or leakage emissions from electricity consumption
Value applied:	1.3
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	*For project emissions calculation*
Comments	*N*A

Data / Parameter	TDL_Y
Data unit	-
Description	*Average technical transmission and distribution losses for importing electricity in year y*
Source of data	Tool to calculate baseline, project and/or leakage emissions from electricity consumption
Value applied:	20%
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	*For Project emissions calculation*
Comments	-

Data / Parameter	EF C,MeOH

Data unit	*tC/t MeOH*
Description	*Carbon emission factor of methanol, based on molecular weight*
Source of data	
Value applied:	0.375
Justification of choice of data or description of measurement methods and procedures applied	*In line with the ACM0017: Production of biofuel --- Version 3.1*
Purpose of Data	*For project emissions calculation*
Comments	Not Applicable

Data / Parameter	$EF_{CO2,I,y}$
Data unit	*tCO2/GJ*
Description	*Carbon di oxide emission factor for fuel type I (diesel) combusted by the project during biodiesel production*
Source of data	IPCC data 2006
Value applied:	0.0741
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	*For project emissions calculation*
Comments	*Not Applicable*

Data / Parameter	EFMeOH_PC
Data unit	*tCO2/t MeOH*

Description	*Pre combustion (i.e. upstream) emissions factor for methanol production*
Source of data	2006 IPCC Guidelines
Value applied:	1.95
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	*For leakage calculation*
Comments	*Based on 30 GJ/t energy requirement and average of IPCC emissions factors for natural gas and diesel oil.*

Data / Parameter	EF PROD
Data unit	*tCO2e/t petrodiesel*
Description	*Emission factor for production of crude oil*
Source of data	
Value applied:	0.073
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	*For leakage calculation*
Comments	*NA*

Data / Parameter	EFREF
Data unit	*tCO2e/t petro diesel*

Description	*Emission factor related to oil refinery*
Source of data	
Value applied:	0.233t-Co2/t-petrodiesel
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	*For leakage calculation*
Comments	*NA*

Data / Parameter	EFLDT
Data unit	tCO2e/t petrodiesel
Description	Emission factor related to long distance transportation Source
Source of data	
Value applied:	A conservative figure of 0 is adopted
Justification of choice of data or description of measurement methods and procedures applied	In line with the ACM0017: Production of biofuel --- Version 3.1
Purpose of Data	For Leakage calculation
Comments	NA

5.2 Data and Parameters Monitored

Data / Parameter	Cwaste oil/fat
Data unit	*ton/yr*
Description	*Waste oil/fat purchased in year y*

Source of data	Records at the entrance of the project plant
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	*Annually*
Value applied:	*12000*
Monitoring equipment	*Records at the entrance of the project plant*
QA/QC procedures applied	*The weighbridge will be calibrated periodically*
Purpose of data	
Calculation method	Every purchased waste oil/fat must be monitored
Comments	NA

Data / Parameter	fPJ,i,y
Data unit	Ratio
Description	Fraction of biodiesel in the blended diesel from the project activity, with blending ratio i, in year y
Source of data	Records from blending operations
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	Annually
Value applied:	0%
Monitoring equipment	Records from blending operations

QA/QC procedures applied	During the process of creating the blended biodiesel at the blending station, the blending operation shall be monitored to assure adequate mixing of the products in the correct proportions.
Purpose of data	
Calculation method	
Comments	NA

Data / Parameter	freg,y
Data unit	%
Description	Fraction of biodiesel in the blended biodiesel which is required by mandatory regulations of the host country in year y
Source of data	Regulations in the Host Country
Description of measurement methods and procedures applied	-
Frequency of monitoring/recording	Annually
Value applied:	-
Monitoring equipment	-
QA/QC procedures applied	-
Purpose of data	
Calculation method	Applicability conditions
Comments	NA

Data / Parameter	Various parameters; Compliance of biodiesel produced with national regulations
Data unit	*Various data units*
Description	*Compliance of produced biodiesel with national regulation, biodiesel properties*
Source of data	Various measurements based on national or international standards.
Description of measurement methods and procedures applied	-
Frequency of monitoring/recording	*Annually.*
Value applied:	-
Monitoring equipment	-
QA/QC procedures applied	*According to national or international standards.*
Purpose of data	
Calculation method	
Comments	

Data / Parameter	MPGlyc,y
Data unit	*t*
Description	*Amount of byproduct glycerol produced during plant operation*
Source of data	Plant Record
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	*Annually*

Value applied:	500 KL Day
Monitoring equipment	*All quantity of produced glycerol must be monitored*
QA/QC procedures applied	*Weighbridge will be calibrated periodically*
Purpose of data	*Applicability conditions*
Calculation method	
Comments	NA

Data / Parameter	$PB_{D,y}$
Data unit	*t*
Description	*Quantity of biodiesel produced in the project plant in year y*
Source of data	on-site measurements by project participants
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	*Annually*
Value applied:	*43153*[3]*
Monitoring equipment	
QA/QC procedures applied	*Cross check production and consumption data with sales records*
Purpose of data	*Baseline emissions*
Calculation method	
Comments	

[3] * operate at 25% of its installed capacity at present

Data / Parameter	PBD,on-site,y
Data unit	*t*
Description	*Quantity of biodiesel consumed at the project biodiesel production plant and/or the oil production plant(s) in year y*
Source of data	Metering system at fueling station
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	
Value applied:	
Monitoring equipment	*Metering system at fueling station*
QA/QC procedures applied	*Cross check production and consumption data with sales records*
Purpose of data	*Baseline emissions*
Calculation method	
Comments	

Data / Parameter	CBBD,I,y
Data unit	*t*
Description	*Quantity of blended biodiesel with blending ratio i, consumed by the captive user in year y*
Source of data	Metering system at fueling station

Description of measurement methods and procedures applied	
Frequency of monitoring/recording	*Annually*
Value applied:	*00*
Monitoring equipment	*Continuous recording of filling consumers' stationary combustion installations or vehicles*
QA/QC procedures applied	*Cross check production and consumption data with sales records*
Purpose of data	*Baseline emissions*
Calculation method	
Comments	
Data / Parameter	NCVBD,y
Data unit	GJ/t
Description	Net calorific value of biodiesel produced in year y
Source of data	Laboratory analysis
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	Annually
Value applied:	41.0031
Monitoring equipment	
QA/QC procedures applied	Check consistency of measurements and local / national data with default values by the IPCC. If the values differ significantly from IPCC default values, possibly collect additional information or conduct measurements
Purpose of data	Baseline emissions

Calculation method	-
Comments	-

Data / Parameter	MCMeOH,y
Data unit	*tMeOH*
Description	*Quantity of methanol consumed in the biodiesel plant, including spills and evaporations on-site in year y*
Source of data	Mass meters
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	
Value applied:	
Monitoring equipment	
QA/QC procedures applied	*Crosscheck against methanol purchase receipts and calculated stoichiometric requirements*
Purpose of data	*Project emissions*
Calculation method	
Comments	NA

Data / Parameter	FCm,i,y
Data unit	*t*
Description	*Fuel consumption of type i for transporting material m in year y*

Source of data	Truck operator records
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	*Annually*
Value applied:	*6562.66 t (fuel consumption by both ship and trucks)*
Monitoring equipment	
QA/QC procedures applied	*Crosscheck fuel purchase data with average consumption for the type of vehicle provided by the manufacturer*
Purpose of data	*Project emissions*
Calculation method	-
Comments	

Data / Parameter	AF1,y
Data unit	*Fraction*
Description	*Allocation factor for the production of biodiesel in year y*
Source of data	
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	*Annually*
Value applied:	
Monitoring equipment	
QA/QC procedures applied	
Purpose of data	*Project emissions*

Calculation method	
Comments	

Data / Parameter	AF2,y
Data unit	*Fraction*
Description	*Allocation factor for the production of biodiesel in year y*
Source of data	
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	
Value applied:	
Monitoring equipment	-
QA/QC procedures applied	
Purpose of data	*Project emissions*
Calculation method	
Comments	

Data / Parameter	FCI,y
Data unit	*t*
Description	*Quantity of fuel type i combusted by the project for biodiesel production in year y*
Source of data	On-site measurements

Description of measurement methods and procedures applied	
Frequency of monitoring/recording	*Annually*
Value applied:	
Monitoring equipment	
QA/QC procedures applied	
Purpose of data	*Project emissions*
Calculation method	
Comments	

Data / Parameter	NCVi,y
Data unit	*GJ/t*
Description	*Net calorific value of fuel type i consumed by the project in the year y*
Source of data	Laboratory analysis
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	*Annually*
Value applied:	
Monitoring equipment	
QA/QC procedures applied	
Purpose of data	*Project emissions*
Calculation method	

Comments	

Data / Parameter	ECy
Data unit	*MWh*
Description	*Quantity of electricity consumed for biodiesel production in year y*
Source of data	On-site measurements
Description of measurement methods and procedures applied	
Frequency of monitoring/recording	
Value applied:	*1555.1*
Monitoring equipment	
QA/QC procedures applied	
Purpose of data	*Project emissions*
Calculation method	-
Comments	-

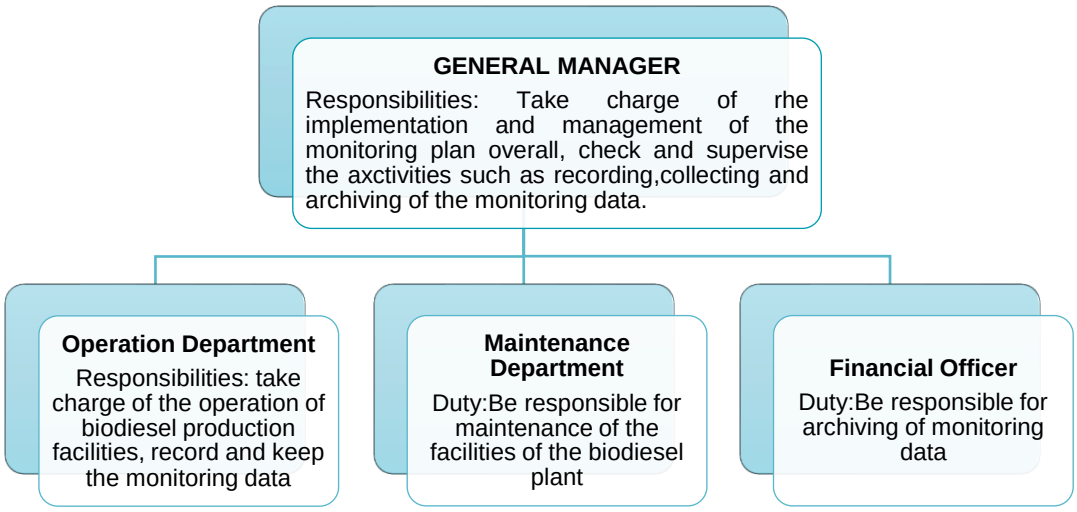
5.3 Monitoring Plan

Monitoring management structure

In order to obtain reliable monitoring data, the project owner will establish a monitoring management structure prior to the start of the crediting period. Clear responsibilities will be assigned to all staffs involved in the project activity. A general Manager will be appointed who has the overall

responsibilities for the monitoring of the project, other staffs will be responsible for the data recording, data collecting, data archiving and emission reduction calculation.

The detailed structure is as follows:



(1) Electricity Meter

The electricity consumption from Capro Power Limited for biodiesel production will be monitored by electricity meter installed in accordance with CEA[4]. The meter will be calibrated once in 5 year by qualified entity.

(2) Weigh Bridge

The amount of waste oil/fat, fuel and methanol consumed for biodiesel production, the amount of biodiesel and byproduct glycerol produced and sold will be measured by weighing meter at the biodiesel plant.

Data monitoring

The monitoring process are as follows:

- The designated persons read the meters and record the data according to requirements described in section B.7.1 and then collect and submit the data on a monthly basis.

[4] https://cea.nic.in/wp-content/uploads/2020/02/amend_15122014.pdf

- The general manager is in charge of checking the accuracy and completeness of the collected data:
- The financial office is responsible of archiving the data and sale receipts.
- All the relevant data records will be kept by the project owner during the crediting period and two years after the end of crediting period.

Quality control

1. **Calibration of meters**

   The calibration of meters will be conducted in accordance with national regulations by qualified entity to ensure the accuracy. The meter will be calibrated once in 5 years.

2. **Emergency treatment**

   When the meter breaks down, the project owner should inform the qualified calibration organization to check, calibrate, test and treat the meter so as to recover the normal monitoring site.

3. **Data management**

   All monitoring data and records will be archived electronically and be kept at least for 2 years after the end of crediting period.

4. **Training program**

   The project developer will organize at least 1 training in a year regarding operational regulations, quality control (QC), data monitoring and data management regulation etc.

6 ACHIEVED GHG EMISSION REDUCTIONS AND REMOVALS

6.1 Data and Parameters Monitored

Data / Parameter	BDy

Data unit	*Quantity of biodiesel eligible for year y (t)*
Description	
Value applied:	*43153.05*
Comments	

6.2 Baseline Emissions

Baseline emissions

Based on formula (1) in section B.6.1, the baseline emissions are calculated as follow:

$$BF_y = \left[min\left\{ \left(P_{BF,y} - P_{BF,on-site,y}\right); \left(\sum_i f_{PJ,i,y} \times C_{BF,i,y}\right) \right\} - P_{BF,other,y} \right]$$

$$\times \left(\frac{\sum_i C_{BF,i,y} \times \left(\frac{f_{PJ,i,y} - f_{reg,y}}{f_{PJ,i,y}} \right)}{\sum_i C_{BF,i,y}} \right)$$

BDY= 43153.05t

Thus,

BEy= BDY XNCV BD, Y X EFCO2PD,Y

= 43153.05* 42.65*0.0741= 136385 tCO2

6.3 Project Emissions

Based on formula (3) in section B.6.1, the baseline emissions are calculated as follow:

$PE_y = AF_{1,y} \times (PE_{BPF,y} + PE_{MeOH,y} + PE_{Tr,y} + AF_{2,y} \times PE_{BC,y})$

= 9826 TCO_2

Where,

$PE_{BPF,Y} = \sum PE_{FC,J,Y} + PE_{EC,Y} + PE_{W,Y}$

$= FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y} + EC_y \times EF_{CO2,EL,y} \times (1+TDL_y) + PE_{W,y}$

$= 5998.17\ tCO_2$

$PE_{MEOH,Y} = MC_{MeOH,Y} \text{ X } EF_{C,MeOH} \text{ X } 44/12$

$= 3664.8783 \quad TCO_2$

$PE_{tr,y} = \sum\sum FC_{m,j,y} \text{ x } NCV_i \text{ x } EF_{CO2})$

$= 163.2979 \ tCO_2$

$AF_{2,y}=0$, and $PE_{BC,y}=0$.

6.4 Leakage

According to the methodology, if leakage emissions are less than zero, consider it as zero.

6.5 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
15/09/2020 to 31/12/2020	33,629.17	2422.93	0	31206.24
01/01/2021 t0 31/12/2021	1,36,385	9,826	0	1,26,559
01/01/2022 To 31/03/2022	33,629.17	2422.93	0	31206.24
Total	2,03,643.34	14671.86	0	188971.48

APPENDIX X: <TITLE OF APPENDIX>

Use appendices for supporting information. Delete this appendix (title and instructions) where no appendix is required.