BIODIESEL PROJECT BY KOTYARK INDUSTRIES LIMITED

Document Prepared by TÜV SÜD South Asia Pvt. Ltd.

Project Title	Biodiesel Project by Kotyark Industries Limited
Report Title	Joint Validation and Verification Report of Biodiesel Project by Kotyark Industries Limited
Version	02
Report ID	ET-006197
Verification Period	15-September -2020 to 31-March-2022
Client	Kotyark Industries Limited
Pages	77
Date of Issue	09-November-2023
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Summary:

Validation Purpose

The project is constructed and operated by Kotyark Industries Limited and is designated to produce biodiesel with capacity of 500 KL per day from the feedstock to produce biodiesel, from the vegetable oils. The by-products produced like glycerol; bio-waste is sold out the project's contribution to sustainable development is made through the creation of an industrial sector, biodiesel production, non-existent in the country in the baseline scenario. It reduces emissions from the combustion of fossil fuels.

The operational life of the Bio- Diesel project activity is 25 years based upon the standard operational and maintenance practices followed at site.

The capacity of the plant is 500 KLD and there will be no further addition to the capacity with the plant efficiency of 80%.

The project activity is a greenfield project activity and no any facility was operating prior to the implementation of the project.

The objective of this validation activity is to have an independent third party for the assessment of the project design, estimated ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- The project's monitoring plan is assessed against "ACM0017: Production of biofuel, Version 4.0."
- The projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline v4.3 and standard version 4.4
- VCS standard v4.4
- VCS guideline v4.3

Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of estimated verified carbon units (VCUs).

A risk-based approach has been followed to perform this validation and verification activity. In the course of Validation, 06 Corrective Action requests (CARs) and 01 Clarification Requests (CLs),0 Forward action request (FARs) were raised and successfully closed (for validation). The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and project owners have provided TUV SUD with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

Verification Purpose

The project transforms the waste oil/fat into useful energy resources and thus preserve limited fossil fuel resources. The project is producing biodiesel by chemical reactions of transesterification and esterification technology with capacity of 500 KL per day from the waste oils.

The project is contributing in sustainable development by reduction of CO_2 emissions due to implementation of project activity and generates employment to the local stakeholders. Through Project activity economic development has been achieved in the project location by creating opportunities of employment during the project lifetime.

During the Current Monitoring Period from 15-September-2020 to 31-March-2022 (including first and last dates) the project activity contributed to the GHG reductions 57,874 tCO2e.

During the current monitoring period, project activity undergoes continued operation since their commissioning and no major breakdown had taken place.

The objective of this verification activity is to have an independent third party for the assessment of the project design, Actual ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- The project's baseline is assessed against "ACM0017: Production of biofuel, Version 4.0. "
- The project's monitoring plan is assessed against "ACM0017: Production of biofuel, Version 4.0."
- The projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline v.4.3 and standard version 4.4
- VCS standard v4.3
- VCS guideline v4.4

A risk-based approach has been followed to perform this joint validation and verification activity. In the course of validation + verification, 06 Corrective Action requests (CARs) and 01 Clarification Requests (CLs), 00 Forward action request (FARs) were raised and successfully closed. The review of the Monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and project owners have provided TUV SUD with sufficient evidence to verify the fulfillment of the stated criteria of VCS.

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1 INTRODUCTION

1.1 Objective

TUV SUD has been appointed by "**Kotyark Industries** " to perform the validation and verification of the project entitled "Bio diesel project by Kotyark Industries Ltd."" under VCS standard 4.3 and guideline version 4.2. The objective of this joint validation & verification activity is to have an independent third party for the assessment of the project design, ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- The project's baseline is assessed against "ACM0017, Version 4.0 "
- The project's monitoring plan is assessed against "ACM0017, Version 4.0"
- The projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline 4.3 and standard version 4.4.
- VCS standard v4.4
- VCS guideline v4.3

Validation& verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of estimated verified carbon units (VCUs).

1.2 Scope and Criteria

The scope of the Joint validation and verification is the independent and objective review of the Joint Project Description & Monitoring Report. The Joint VCS PD & MR are reviewed against the relevant criteria (see 1.1) and decisions by the CDM Executive Board, including the approved baseline and monitoring methodology. The validation and verification were based on the guidance given in the VCS guideline version 4.3 and standard version 4.4.

The assessment team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the Joint VCS PD & MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VCUs. The validation and verification are not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design and monitoring report combined.

The only purpose of the validation and verification is its usage during the registration /issuance process as part of the VCS project cycle. Therefore, TUV SUD can't be held liable by any party for decisions made or not made based on the validation/verification opinion, which will go beyond that purpose.

1.3 Reasonableness of Assumptions and Level of Assurance

The verification and validation have been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS.

1.4 Summary Description of the Project

The proposed project is constructed and operated by Kotyark Industries Limited and is designated to produce biodiesel with capacity of 500 KL per day from the feedstock to produce biodiesel, from the vegetable oils. The main product is the Bio Diesel which is sold to use in transportation applications and by-product produced like glycerol; which is further sold out. The scenario existing prior to the implementation of the project activity was business as usual, with users consuming fossil fuel without the proposed biodiesel mix. There are not any existing alternatives to the project activity. The project's contribution to sustainable development is made through the creation of an industrial sector, biodiesel production, non-existent in the country in the baseline scenario. It reduces emissions from the combustion of fossil fuels. The installed production capacity of the production plant is:

Particular	Type	Quantity with Unit
Bio Diesel	Product	500 KL PER DAY
Glycerin	By Product	70 KL PER DAY

Bio-diesel Project involves preparation of Biodiesel from waste vegetable oils through a chemical 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.

The operational life of the Bio- Diesel project activity is 25 years based upon the standard operational and maintenance practices followed at site.

The capacity of the plant is 500 KLD and there will be no further addition to the capacity with the plant efficiency of 80%.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

Validation and Verification Scope: The scope is defined as an independent and objective review of the Joint project design document and Monitoring report. The Joint VCS PD and MR is reviewed against the criteria stated in VCS standard version 4.4 and guideline version 4.3, including the approved baseline and monitoring methodology ACM0017 Version 4.0. The validation and verification were based on the requirements in the Validation and Verification Standard for project activities version 03.0 and VCS guideline version 4.3 and standard version 4.4.

The validation and verification are not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the combined project document and the Monitoring report.

Validation and Verification Process: The project assessment is based on the VCS standard version 4.4 and guideline version 4.3 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the assessment team, the members of the assessment team carried out:

- A desk review of the Joint project design documentation and monitoring report;
- Follow-up interviews with project stakeholders;
- The resolution of outstanding issues and the issuance of the final Joint –VAL &report and opinion.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. TUV SUD has developed a specific checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating/verifying the identified criteria.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, TUV SUD has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of TUV SUD.

The composition of audit team shall be approved by the TUV SUD ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).

- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Pankaj Kumar	LA	YES	YES	YES	YES
Pankaj Karn	TE (TA 7)	YES	YES	NA	YES
Milind Shende	TE (TA 5)	YES	YES	NA	YES
Shruti Kudtarkar	TR	YES	YES	YES	NA
Srikanth Meesa	TE (TA 7) for TR	YES	YES	YES	NA
Rajnish Sanghavi	TE (TA 5) for TR	YES	YES	YES	NA

Resolution of Clarification and Correction Action Request

The objective of this phase of the joint validation and verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for TUV SUD positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by TÜV SÜD South Asia Pvt. Ltd. were resolved during communications between the Client and TÜV SÜD South Asia Pvt. Ltd. to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the appendix 2.

The Joint VCS PD & MR Version 04 submitted by project owners on 15-November-2022 serves as the basis for the final assessment presented. Additional changes to the project during the joint validation and verification process are not considered to be significant with respect to the main VCS objectives. The two VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality Control

As final step of a joint validation and verification of the final documentation including the final Joint validation and verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e., each report has to be finally approved either by

the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the project owners, the positive validation/verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform.

2.2 Document Review

The Joint VCS PD & MR submitted by the Client was reviewed against the approved methodology and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1.

2.3 Interviews

An on-site audit was conducted for the project activity on 09-September-2022. Technical details & monitoring arrangement verified through onsite photographs/name plates and calibration certificates shared by PP. All the documents were cross checked to ensure conservative estimation of emission reduction.

During the on-site audit, the PP representatives were questioned about the implementation of the project activity. Several topics like the verification of commissioning date, recording, and monitoring of the data and the error accountability were discussed. To cross check the information provided by PP, various documents like technical specifications, commissioning certificates, plant records sheets, etc. were also verified. The names of the persons interviewed during on-site audit is given below;

Sr. No.	Name of Persons	Role/Designation
1)	Urvi Shah	Project Participant Representative
2)	Ghanshyam Nayak	Farmer
2)	Pushpendra Lakheri	Farmer
4)	Rani Kumari	Teacher
5)	Durgesh Ajmeri	Contractor
6)	Ram Singh Bisnoi	Farmer
7)	Shivam Rajput	Student

8)	Rinki Singh	Student
9)	Bhagwan Singh	Villager
10)	Prahlad Singh	Villager

2.4 Site Visits

Duration of on-site audit: 09-September-2022				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring.	RIICO Industrial Area, Swaroopgunj. Dist: Sirohi, Rajasthan	09-September-2022	Pankaj Kumar (Team Leader)

2.5 Resolution of Findings

The objective of this phase of the joint validation and verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for TUV SUD's positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by TUV SUD were resolved during communications between the Client and TUV SUD to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the Appendix 2.

The final Joint VCS PD & MR Version 06 submitted by project owners on 07-November-2023 serves as the basis for the final assessment presented. Additional changes to the project during the validation and verification process are not considered to be significant with respect to the main VCS objectives. The two VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring	01	02	00
Description of project activity	00	00	00
Application of selected baseline and monitoring methodology and selected			

- Applicability of methodology and standardized baseline	00	01	00
- Deviation from methodology	00	00	00
- Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
- Demonstration of additionality	00	00	00
- Emission reductions	00	01	00
- Monitoring plan	00	01	00
-Stakeholder's consultation process	00	00	00
- Public comments	00	00	00
Others (please specify)-Matter related to double counting- **for validation**	00	00	00
Others (please specify)-Matter related to Emission reduction calculation- **for**	00	00	00
ER achieved – Actual ER achieved calculations, Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines Compliance of monitoring activities with the registered monitoring plan Compliance with the calibration frequency requirements for measuring instruments Assessment of data and calculation of emission reductions or net removals Assessment of reported sustainable		01	
Total	**01**	**Validation+ Verification: 06**	**00**

2.5.1 The list of findings and their resolution is presented in Appendix 2 of this report.

Forward Action Requests

No FAR was raised during this joint validation and verification process. Please refer Appendix 2 for details.

3 VALIDATION FINDINGS

3.1 Project Details

The project is constructed and operated by Kotyark Industries Limited and is designated to produce biodiesel with capacity of 500 KL per day from the feedstock to produce biodiesel, from the vegetable oils. The main product is the Bio Diesel which is sold to use in transportation applications and by-product produced like glycerol; which is further sold out. The scenario existing prior to the implementation of the project activity was business as usual, with users consuming

fossil fuel without the proposed biodiesel. There are not any existing alternatives to the project activity. The project's contribution to sustainable development is made through the creation of an industrial sector, biodiesel production, non-existent in the country in the baseline scenario. It reduces emissions from the combustion of fossil fuels. Project proponent and other entities involved in the project.

Technology used in project:

Bio-diesel Project involves preparation of Biodiesel from waste vegetable oils through a chemical 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.

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.

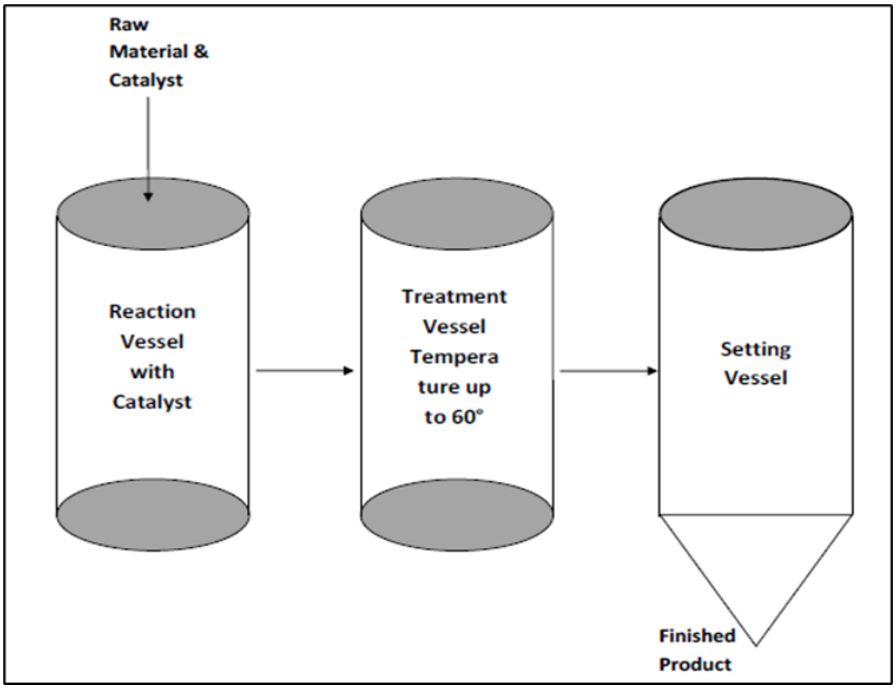


Fig. 1: Bio- Diesel manufacturing process

List of the equipment used in the technology:

- Reaction vessel
- Treatment Vessel

- Setting vessel

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

The operational life of the Bio- Diesel project activity is 25 years based upon the standard operational and maintenance practices followed at site.

The capacity of the plant is 500 KLD and there will be no further addition to the capacity with the plant efficiency of 80%.

The technical specifications, locations and other details are was checked during on-site inspection through interview plan personnel.

Assessment team checked onsite and confirms that the details of the project proponent areas below: -

Organization name	Kotyark Industries Limited
Contact person	Mr. Gaurang Shah
Title	Chief Managing Director
Address	2nd Floor, A-3 Shree Ganesh Nagar Housing Society, Ramakaka Temple Road, Chhani, Vadodara – 391740. Gujarat, India
Telephone	+91-9978967732
Email	info@kotyark.com

Ownership

The Project is owned by M/s Kotyark Industries Limited, which is the project participant of the Project. The VVB team has demonstrated the ownership through Consent to Operate of Rajasthan State Pollution Control Board

Project start date Joint Validation & Verification Report: VCS Version 4.2

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

The project activity at Swaroopgunj site was commissioned and started operation on 15-September-2020 which is considered as the project start date.

Assessment team checked the commissioning details from the commissioning certificate provided by the project proponent.

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- September -2027

(Start and end dates included)

Project scale and estimated GHG emission reductions or removals

As per the section 3.10.1 of VCS standard version 4.4, the projects are classified as follows:

1) Projects: Less than or equal to 300,000 tonnes of CO2e per year

2) Large Projects: Greater than 300,000 tonnes of CO2e per year

The project activity has less than 300,000 tCO2e Emission reductions, hence these project activities are classified as “Project”

Project Scale	
Project	✓
Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
Year 1	238,373
Year 2	238,373
Year 3	238,373

Year 4	238,373
Year 5	238,373
Year 6	238,373
Year 7	238,373
Total estimated ERs	1,668,611
Total number of crediting years	7
Average annual ERs	238,373

Project location

Project Location	F-86 to F-90, RIICO Industrial Area, Swaroopgunj. Dist: Sirohi, Rajasthan – 307 023
Geo-Coordinate	24.64° N, 72.92° E

Conditions prior to project initiation

Assessment team during the desk review and on-site audit confirms that the scenario existing prior to the start of the implementation of the project activity is the fuel demand from vehicles and stationary applications using diesel within the project boundary which is now being satisfied by the project by replacing petro diesel to biodiesel. The waste oil/fat generated every day in the local area were used to be discharged into the municipal sewage system without recovery.

Project compliance with applicable laws, statutes and other regulatory frameworks

Assessment team checked the consent to operate certificate for Bio-diesel plant of capacity 500 KL per day in the name of PP issued Rajasthan State Pollution Control Board to confirm the project capacity and its relevant statutory requirements as per the host country regulations.

VVB team has also checked and confirmed that the Project have Factory License for setting up of the project from the State Government of Rajasthan and Explosive License for storage of Methanol from the Directorate of Explosive, Government of India.

Participation under other GHG programs

Assessment team has checked that the Project is not registered under any other GHG programs and neither has participated in any other GHG programs.

The Project is not rejected by other GHG programs. A declaration for the same is checked and found correct by the assessment team. Also, assessment team checked the following registries to confirm the same. The details of the registries checked are as follows:

- https://www.recregistryindia.nic.in/

- http://cdm.unfccc.int/
- http://www.goldstandard.org/
- www.verra.org

The Project does not intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

Renewable energy certificates are available for trading in the host country However, the same is not availed by the project participant. The undertaking regarding the same is submitted by PP which is acceptable to the assessment team and assessment team also checked the REC web site (https://recregistryindia.nic.in/) and found the declaration to be correct

Other forms of credit and supply chain (Scope 3) emissions

Assessment team confirms that the 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. Audit team checked the REC Mechanism database of India and found that the project activity is not accredited registered[1] under REC mechanism. Further, Declaration in effect of the same has been submitted by project proponent to audit team and found to be correct. Thus, it is concluded that the project activity not involved on other Emissions trading programs and other binding limits.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description. The details are presented transparently to the assessment team for analysis which lead to positive conclusion for this validation and verification.

Sustainable Development

The project is contributing in sustainable development by reduction of CO_2 emissions due to implementation of project activity and generates employment to the local stakeholders. Through Project activity economic development has been achieved in the project location by creating opportunities of employment during the project lifetime.

Project owner monitors the carbon emission with help of the record of biodiesel generated and emission factor of the diesel.

Quantity of employment will be monitored through employment record maintained at the site.

[1] https://www.recregistryindia.nic.in/index.php/publics/accredited_regens

- The project is producing biodiesel by chemical reactions of transesterification and esterification technology with capacity of 500 KL per day from the waste oils. Since commissioning of the project, it has avoided 57,874 tonnes of greenhouse gas emissions in the atmosphere. So, the project will contribute to the sustainable development and it is fulfilling SDG 13.

- The project is promoting local economic development and improving the level of people's life by proving potential job opportunities to the residents and it has been confirmed from training records and employment record that project has employed 15 number of people since commissioning and in this it is fulfilling SDG 8.5.

3.2 Participation under Other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program. Audit team checked the REC Mechanism database of India and found that the project activity is not accredited / registered under REC mechanism. Further, declaration for the same is checked and found correct by the assessment team. Also, assessment team checked the following registries to confirm the same. The details of the registries checked are as follows:

https://www.recregistryindia.nic.in/

http://cdm.unfccc.int/

http://www.goldstandard.org/

3.3 Safeguards

3.3.1 No Net Harm

There was no harm identified from the project and hence no mitigations measures are applicable. The project activity involves the installation of Biodiesel production plant using feed stocks waste oil/fats which is producing biodiesel thereby replacing the Petro diesel. Use of Biodiesel reduces the GHG/Environmental impact occurred in the baseline.

Further, the implementation of the project has improved local-socio economic development through creating career opportunities hence there will be no net harm for socio-economic impacts.

However, assessment team still conducted the No net harm assessment for some of the parameters and the result is described below:

Sr. No.	Indicator	Assessment team opinion
1	Air quality	The project activity leads to reduction of GHG emission and also the particulate emission is reduced to permissible limits by use of an ESP. Adequate measures were taken to mitigate the

Sr. No.	Indicator	Assessment team opinion
		envisaged impacts like spraying water on the road side to reduce dust level etc. This was confirmed by the local stakeholders. Therefore, it is validated that mitigation measures were robustly implemented on ground for air quality issues project will have a positive impact on air quality.
2	Soil condition	For mitigating the impacts during construction, various mitigation measures were taken which is validated from the plant records of PP and the interview with local stakeholders. It was also confirmed that, the vegetation planted at project site helps to reduce soil erosion. The same is confirmed during the discussion with stakeholders during remote audit. Therefore, it can be concluded that the project has no effect on soil conditions during its operation because it has no waste coming out.
3	Water Pollution	The project site is not on the migration route of migratory bird nor is the project affecting aquatic life. With the implementation of Project, the green cover has increased at the Project site; the biodiversity in the vicinity will be improved with the vegetation improvement.
4	Ecology	The project activity does not have any harmful impact on the ecology. There are no nearby forests, or zones high on biodiversity, or other sensitive locations around the factory that may be affected negatively due to the project. Further, no harmful impact is caused on the aquatic ecology as well as on the local vegetation. Individuals working in high noise zones is provided adequate gadgets for protection. Therefore, it can be concluded that the project has no effect on environment during its operation because it has no waste coming out.

3.3.2 Therefore, there will be no harm identified from the project activity.

Local Stakeholder Consultation

As per the VCS requirements, it is necessary to invite the relevant stakeholders, prior of the validation process. Moreover, the stakeholder meeting took place prior to the start date of the project activity which fulfill the requirement of VCS standard 4.3. The VVB checked the relevance of the dates during the validation on-site inspection. The detail of the invitation date and stakeholder meeting date is as below:

Venue: Balaji Bhavan, Nitoda Rd, Swaroopganj.

Date of meeting: 01- Aug- 2020

Time: 11 AM

The stakeholders identified by the project participant were local people/ NGOs who are the major population of the particular area, local communities and gram panchayat (Village head), technology supplier, project proponent representatives, and other people (farmers, students etc.)

involved in the project. Validation team verified the list of participants who attended the stakeholder meeting and feedback questionnaire and confirms the stakeholders identified are relevant. The validation team also verified the minutes of meeting to note that no negative comments were received and the same was cross checked with the information obtained during follow up interviews with the stakeholders. All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. Moreover, assessment team during the validation on-site inspection also noted that a grievance register is also put on site for the stakeholder to comment on any grievances during the operation lifetime of the project activity, the grievances from the stakeholder if found suitable will be addressed immediately by the top management and thus the approach is found appropriate for the project activity

Thus, Validation team is of the opinion that the stakeholder meeting was adequate and appropriate.

Environmental Impact

3.3.3 The project activity is bio diesel plant, which is free from any kind of anthropogenic emission. Project activity is not having any negative environmental impacts. Assessment team also confirmed from the certificate of consent to operate from Rajasthan State Pollution Control Board and as per guidelines on Environmental Impact Assessment published by Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India (GOI) under Environmental Impact Assessment notification 14-Sept-06. Further amendments to the notification have been done on 14-July-2018. As per notification:

"The following projects or activities shall require prior environmental clearance from the concerned regulatory authority, which shall herein after referred to be as the Central Government in the Ministry of Environment and Forests for matters falling under Category 'A' in the Schedule and at Category 'B' in the said schedule, before any construction work, or preparation of land by the project management except for securing the land, is started on the project or activity:

3.3.4 As the Bio diesel projects are not listed in any of the categories in the Schedule, the project is considered environmentally safe and as per regulations in Host Party-India no EIA is required.

Public Comments

3.3.5 Assessment team noted that this project was open for public comment from 05-July-2022 to 04-August-2022. No comments were received.

The details were checked by the assessment team in the following web platform

https://registry.verra.org/app/projectDetail/VCS/3095.

AFOLU-Specific Safeguards

This project is not AFOLU project; Hence this section is not required.

3.4 Application of Methodology

Title and Reference

Assessment team checked that following methodology and tools are applicable for the project activity. The details are as below:

3.4.1 **Methodology**

CDM Methodology ACM0017: Production of biofuel --- Version 4.0[2]

Any tools and other methodologies to which the selected methodology (ies) refer:

- CDM Tool 1:"Tool for the demonstration and assessment of additionality": Version 07.0.0[3].
- CDM Tool 15 "Tool for Upstream leakage emissions associated with fossil fuel use": Version 02.0[4].
- CDM Tool 24: "Common practice" : Version 03.1.[5]
- CDM Tool 25: "Apportioning emissions from production processes between main product and co and by-product" : Version 03.0.[6]
- CDM Tool 27: "Investment analysis" Version 12.0[7]

Applicability

3.4.2 The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:

Applicability for ACM0017 (Version 4.0): Production of biofuel.

Methodological Applicability	Project Justification	VVB Assessment
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 without blending for fuel combustion in existing stationary installations and	VVB team has checked from biodiesel sales invoice and confirm during the on-site inspection and interviews that the biodiesel will be supplied to consumers who

[2] https://cdm.unfccc.int/UserManagement/FileStorage/W9FPD1N04ULQHTCBMOIY2ASZ3V8E7R

[3] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf

[4] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-15-v2.0.pdf

[5] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-24-v1.pdf

[6] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-25-v1.pdf

[7] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v12.pdf

	vehicles in local transport sector. Hence Applicable.	use biodiesel for fuel combustion in existing stationary installations and vehicles in local transport sector. Hence, applicable.
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 from the Waste oil/fat. Hence Applicable.	The project activity will produce biodiesel from the waste oil/fat. The same has been confirmed during on-site audit. Hence, applicable.
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 VCUs will be claimed only by the producer. The project proponent has the No double counting declaration certificate from the buyers mentioning that the VCUs will only be issued to the producer of biodiesel.	VVB team has confirmed from the submitted declaration certificate mentioning that the VCUs will only be issued to the producer of biodiesel. As a part of communication with the end users, PP has signed this declaration certificate as already signed contractual agreement amendment was not possible for PP. The submitted declarations and communication with few buyers confirm that they will not claim the VCUs.

The conditions apply to the methodology: **a) Feedstock inputs:** **(i)** For all biofuels: if the biofuel in the project plant is only partly produced from the sources specified in paragraph 4 above, any volumes of biofuel that are also produced in the project plant but from other feedstock sources, are not included in the quantity of biofuel for which emission reductions are claimed. **(ii)** For biodiesel: the alcohol used for esterification is methanol from fossil origin. Volumes of biodiesel produced with alcohols other than methanol (for example, ethanol) are not included in the quantity of biodiesel for which emission reductions are claimed. **b) Dedicated plantations:** (i) If the biofuel is produced from seeds or crops that are cultivated in dedicated plantations, the project activity shall comply with the provisions. **(c) Biofuel plant and products:** **(i)** The fossil fuels, the biofuels and the blended biofuels comply with national regulations (if existent) or with suitable international standards. **(ii)** The project activity involves construction and operation of a biofuel production plant.	**a) Feedstock inputs:** **(i)** The project only uses waste oil/fat for biodiesel production, no biomass or biofuels involved. **(ii)** For biodiesel: Methanol has been used for esterification process. No Alcohols are used to produce biodiesel. **b) Dedicated plantations:** NA, as project only uses waste oil/fat for biodiesel production, no biomass involved. **c) Biofuel plant and products:** i. PP regularly monitor the biofuel as per the national regulations[8] and is complying with it. ii. The project activity involves construction and operation of a biofuel production plant and the unit is located at Rajasthan, India. iii. The by product (glycerol) is completely sold and PP has	VVB team has checked and confirmed during on-site audit, interviews and documents submitted that i) the project only used waste oil/fat for biodiesel production, no biomass or biofuels involved. This was confirmed based on purchase receipts and interviews with PP representatives. ii) Methanol has been used for esterification process and VVB confirmed that in India 98-99 % methanol is only produced from fossil origin[9] which was futher confirmed through interviews with methanol sellers. c) VVB has checked the sales invoices and confirmed that

[8] https://mopng.gov.in/files/uploads/NATIONAL_POLICY_ON_BIOFUELS-2018.pdf

[9] Survey Report Production of Methanol.pdf (dst.gov.in)

(iii) Any by-product (e.g., glycerol) is not disposed of or left to decay. It should be either incinerated or used as raw material for industrial consumption or sold. **(iv)** If biomass or biofuel is used at the project plant(s) (processing, production or blending plant) as fuel (e.g., for heat or electricity generation), then at least 95% of the biomass or biofuels used in these plants should be either biomass residues from the dedicated plantations established under the project activity or biofuel generated in the project plant. The amount of biofuel used should not be included in the quantity of biofuel for which emission reductions are claimed. **(d) Consumption of biofuel:** (i) The (blended) biofuel is used by consumers within the host country in existing stationary installations (e.g., captive generators) and/or in vehicles. (ii) In case of vehicles, the target consumer group (e.g., captive fleet of vehicles, gas stations, bulk consumers) and distribution system of the biofuel shall be identified and described in the CDM-PDD. (iii) If the (blended) biofuels are consumed in stationary facilities, the consumer, and the producer of the (blended) biofuel are bound	maintained the record for the same. iv. Biofuel (Biodiesel) generated in the project plant has been used for heating in the plant and the amount of biofuel used has not been included in the quantity of biofuel for which emission reductions has been claimed. Please refer ER sheet to justify the same and as per methodology quantity of biofuel eligible for crediting is equal to quantity of biofuel produced in the project plant minus quantity of biofuel consumed at the project. PP has maintained the record for the same. **(d) Consumption of biofuel** i. The biofuel is used by consumers within the host country (India) only. ii. The biodiesel produced will be supplied to local consumers who are using the same for vehicles and stationary applications.	the by product, glycerol is completely sold. VVB has checked the national regulation[10] applicable for the biodiesel produced and project activity complies with the same. VVB has also confirmed during the on-site verification, interviews and assessment from the ER sheet that biofuel used for heating has not claimed under ER.

[10] https://mopng.gov.in/files/uploads/NATIONAL_POLICY_ON_BIOFUELS-2018.pdf

by a contract that allows the producer to monitor the consumption of (blended) biofuel and that states that the consumer shall not claim CERs resulting from its consumption. (iv) If the (blended) biofuels are sold to an identified consumer group within the host party, the buyer, and the producer of the (blended) biofuel are bound by a contract that allows the producer to monitor the sale of (blended) biofuel and that states that the consumer shall not claim CERs resulting from its consumption. (v) If the biofuel is blended but neither used in stationary facilities nor sold to an identified consumer group, the blender and the producer of the biofuel are bound by a contract that allows the producer to monitor the blending of biofuel to ensure that blending proportions and amounts are monitored and meet all regulatory requirements, and that states that no CERs resulting from its consumption will be claimed. (vi) In any case where the host party exports beyond the national boundary (blended) biofuels of the same type(s) as the biofuel(s) produced in the project plant, the consumption of the produced (blended) biofuel shall be monitored to ensure that no double counting occurs. The	iii. Consumers are bound by contracts that allow monitoring of the consumption of blended biodiesel and state that the consumer shall not claim VCS VERs resulting from its consumption. iv. The identified consumer group (local consumers who are using diesel as a fuel) has shared the declaration certificate mentioning that Project proponent/producer has all the rights to claim the VCUs resulting from its consumption. Further, the PP/producer is monitoring the sale of the biofuel generated. v. There is no blending in the project. As blending is not involved in PA, there is no contract done between blender & producer of Biodiesel. Hence not applicable. vi. The biofuel produced in the project activity is only used	d) Biodiesel produced will be supplied to local consumers. Also the local consumers are bound by contract and shall not claim VCS VERs resulting from its consumption. The same has been verified during the on-site inspection and the declaration certificate from consumers provided by the PP. Hence acceptable.

consumer and the producer of the (blended) biofuel shall be bound by a contract that allows the producer to monitor the consumption of (blended) biofuel and that states that the consumer shall not claim CERs resulting from its consumption.	in the host country. Hence not Applicable.	
(vii) In case of stationary installations, biofuels with any blending fraction between 0 and 100% can be used. In case of vehicles, the blending proportion must be appropriate to ensure that the technical performance characteristics of the blended biofuels do not differ significantly from those of fossil fuels;	vii. There is no blending in the project. Hence not applicable.	
(viii) For biodiesel, the condition in 6.d.vii above is assumed to be met if the blending proportion is up to 20% by volume (B20). If the project participants use a blending proportion of more than 20%, they shall demonstrate in the CDM-PDD that the technical performance characteristics of the blended biodiesel do not differ significantly from those of Petro diesel and comply with all local regulations.	viii. There is no blending in the project. The Project activity involve production of biodiesel which is further used in stationary & transport applications. Blending is not involved in Project activity hence this condition is not applicable	VVB team has checked from biodiesel sales invoice and confirm during the on-site inspection and interviews that blending is not involved in the project activity.
(ix) Only biofuel consumed in excess of mandatory regulations is eligible for the purpose of the project activity.	ix. There are no mandatory regulations for biodiesel consumption. Hence, this project activity is completely voluntary.	

		VVB has checked the National Biofuel policy, 2018 and confirmed that there is no mandatory regulations for biodiesel consumption.

Applicability for CDM tool: 1 (*Version 07.0.0)*: "Tool for the demonstration and assessment of additionality".

Applicability	Justification	VVB Assessment
The use of the "Tool for the demonstration and assessment of additionality" is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.	The PP has not applied to the new or revisions to approved methodologies.	VVB has checked and confirmed that PP has not applied to new or revisions to approved methodologies. Hence ok.

Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	PP is using the Approved large scale methodology. Hence the additionality is calculated on the basis of CDM tool: 1: "Tool for the demonstration and assessment of additionality.	VVB has checked and verified that the PP has used the CDM tool 1 for calculation of additionality.

Applicability for CDM tool: 15 (Version 02.0): "Tool for Upstream leakage emissions associated with fossil fuel use".

Applicability	Justification	VVB Assessment
The tool is applicable to calculate leakage upstream emissions associated with fossil fuel use in either or both the baseline scenario and project activity.	Leakage upstream emissions associated with fossil fuel has been considered in the scenario.	PP has considered the leakage upstream emissions associated with fossil fuel. Hence, ok.
Upstream emissions associated with fossil fuel use are: (a) Fugitive emissions of CH_4 and CO_2, including venting, flaring and physical leakage from equipment; (b) CO_2 emissions from combustion of fossil fuels; (c) CO_2 emissions associated with consumption of electricity.	Leakage upstream emissions associated with CO_2 emissions from combustion of fossil fuels;	PP has considered the leakage upstream emissions associated with fossil fuel. Hence, ok.
Other greenhouse gas (GHG) emissions sources, such as those associated with the construction of equipment are relatively small and therefore not considered.	No other greenhouse gas (GHG) emissions sources have been considered.	It has been verified that no other GHG emissions sources have been considered.
The tool has two options to determine these emissions: **Option (A)** provides simple default emission factors for different types of fossil fuels and **Option (B)**	emission factor has been calculated based on each upstream emissions stage. Option (B) the relevant upstream emissions stages have been identified as per the tool	PP has calculated the emission factor as per the tool and is appropriate.

calculates emission factors based on emissions for each upstream emissions stage. Option (B) requires identifying the relevant upstream emissions stages and the corresponding emission factor for each stage, which may be a default value or calculated, such as according to the 2006 IPCC Tier 2 or 3 methodology.		
This tool is applicable to the following types of fossil fuels, which can be categorized to be either based on natural gas, oil or coal: **(a) Natural gas:** (i) Natural gas; (ii) Natural gas liquids (mixtures of primarily pentanes and heavier hydrocarbon); (iii) Propane, butane, and other types of liquefied petroleum gas (LPG); (iv) Liquefied natural gas (LNG); (v) Compressed natural gas (CNG); **(b) Oil:** (i) Light fuel oil (diesel); (ii) Heavy fuel oil (bunker or marine type); (iii) Gasoline; (iv) Kerosene (household and aviation); (v) Propane, butane, and other types of liquefied petroleum gas (LPG); **(c) Coal:**	Emission factor has been consider based on oil Light fuel oil (diesel);	VVB team has checked and confirm during the on-site inspection and interviews that gasoline is not replaced. VVB has also checked and confirmed that EF has been considered based on oil light fuel oil (diesel).

(i) Coal; (ii) Lignite.		
Methodologies which refer to this tool should state: (a) The fossil fuel type(s), as listed above, for which upstream emissions should be determined. For the situation that the fossil fuel is defined at the project level, instead of in the methodology, and does not exactly match a type listed above, then the closest approximation shall be selected in terms of the fuel characteristics (e.g. natural gas, oil or coal based fuel) and fossil fuel lifecycle stages (see Table 1 in the appendix); (b) Procedures to determine the amount of each fossil fuel type(s) used in the baseline or project situation on a net calorific value (NCV); (c) Whether there is a possibility that leakage upstream emissions values are less than 0, such as for project activities in which a fossil fuel in the baseline situation is displaced with a renewable fuel in the project situation. Otherwise, if negative values are calculated using this tool, then they are assumed to equal 0. In any case, net leakage should always be	(a) Emission factor has been consider based on oil Light fuel oil (diesel); (b) The amount of fuel has been considering form baseline because the fossil fuel has been replaced by biofuel. (c) Leakage emissions values are less than 0 then it is assumed to equal 0.	

considered as zero when net leakage effects are negative.		

Applicability for CDM tool: 24 (Version 03.1): "Common practice".

Applicability	Justification	VVB Assessment
This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality.	To prove additionality Tool for the demonstration and assessment of additionality has been used along with common practice test for the demonstration of additionality.	VVB has checked and confirmed that CDM tool 24 has been used to demonstration and assessment of additionality.
In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	common practice test done based on methodology of tool 24 (version 03.1).	VVB has checked and confirmed that CDM tool 24 has used for common practice test.

Applicability for CDM tool: 25 (Version 03.0): "Apportioning emissions from production processes between main product and co and by-product".

Applicability	Justification	VVB Assessment
The Executive Board has restricted the applicability of this document to the approved methodologies ACM0017 and AM0089 until further revisions are done by the Methodologies Panel.	PP has been using approved methodology ACM0017 version 4.0 (Production of biofuel).	VVB has checked and confirmed that PP has used approved methodology ACM0017, version 4.0
This methodological tool is applicable to project activities that apply any version of the	PP has been using approved methodology ACM0017 version 4.0	VVB has checked and confirmed that PP has used

approved methodologies AM0089 and ACM0017. Reference to the "Guidelines on apportioning emissions from production processes between main product and co- and by-products" (if any) in the project design document of registered project activities shall be read as "Methodological tool: Apportioning emissions from production processes between main product and co- and by-products".	(Production of biofuel). Biodiesel is main product and glycerin is by-product.	approved methodology ACM0017, version 4.0

Applicability for CDM tool: 27 (Version 03.0): "Investment analysis".

Applicability	Justification	VVB Assessment
This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", the guidelines "Non-binding best practice examples to demonstrate additionality for SSC project activities", or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario.	This is a applicable condition because Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality" has been used for investment analysis internal rate of return (IRR).	PP has used CDM tool 27, ver 03 for demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality".
In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	The investment analysis done based on methodology of tool 27 (version 03.1).	PP has used investment analysis based on the tool 27, version 03.1.

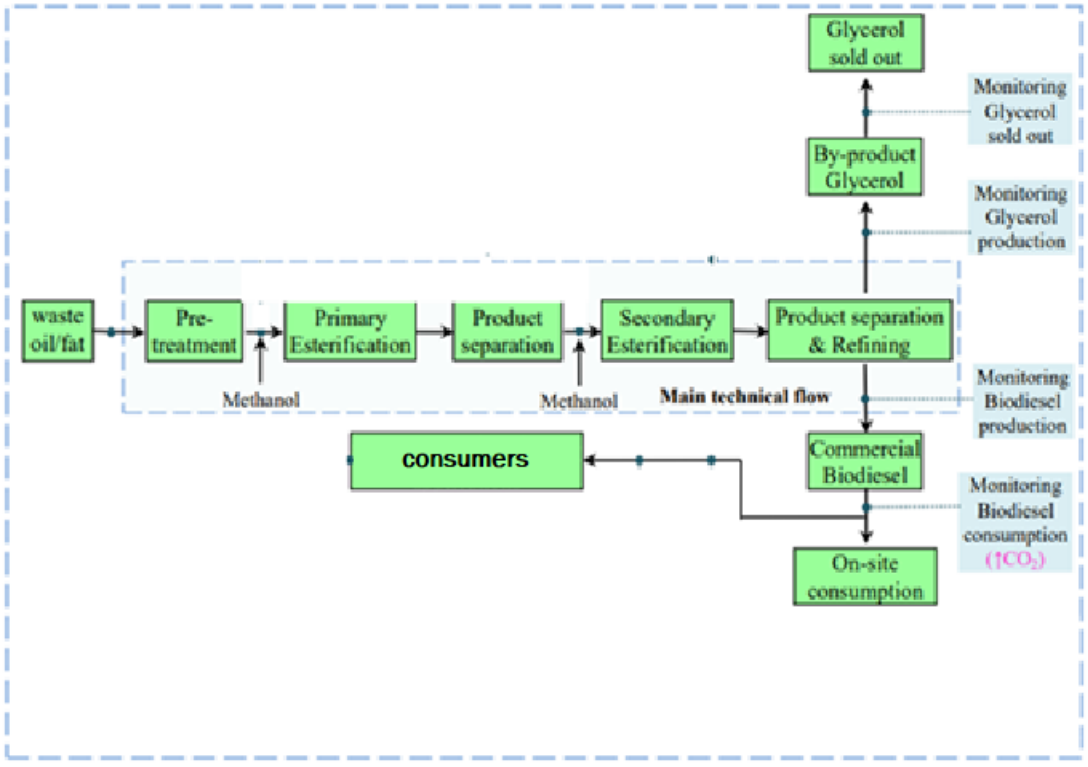
TUV SUD confirms that the application of the baseline methodology is transparent and conservative and confirms that the chosen baseline and monitoring methodology is applicable to the project activity.

The project activity qualifies as Scope 05 and Scope 07 in accordance with applicable provisions for project activity eligibility as it involves designated to produce biodiesel from the vegetable waste oils and Fat. The biodiesel is replacing diesel used in the various vehicles and stationary applications for e.g. Diesel generators.

It reduces emissions from the combustion of fossil fuels, which is helping in emissions of CO2 gases. In the VCS PDMR version 05, PP has also demonstrated applicability of tools considered for the proposed project activity as applicable due to the methodology. The same was checked by the assessment team and it was confirmed that application of tools is transparently described in the VCS PDMR and is appropriate.

Project Boundary

3.4.3 The project located at F-86 to F-90, RIICO Industrial Area, Swaroopgunj. Dist: Sirohi, Rajasthan – 307023, India. The boundary for the project is as follows ;



The sources and GHG gases involved for Project activity are as below:

Source	Gas	Included?	Justification/Explanation
Baseline	CO_2	Yes	Main source of baseline emissions.

Source		Gas	Included?	Justification/Explanation
	Vehicles and Stationary Combustion Installations Consuming Petro diesel	CH_4	No	Excluded for simplification. CH_4 and N_2O emissions are assumed to be very small. No systematic difference to project activity
		N_2O	No	
		Other	-	-
Project	On-site energy consumption at biodiesel production plant and, if applicable, the oil production plant(s)	CO_2	Yes	Significant emission source
		CH_4	No	Excluded for simplification. CH_4 emissions are assumed to be very small.
		N_2O	No	Excluded for simplification. N_2O emissions are assumed to be very small
		Other	-	-
	Combustion of fossil fuel derived methanol in the biodiesel ester	CO_2	Yes	Significant emission source.
		CH_4	No	Excluded for simplification. CH_4 emissions are assumed to be very small.
		N_2O	No	Excluded for simplification. N_2O emissions are assumed to be very small
		Other	-	-
	Transportation of oil seeds, vegetable oils and or oil/fat wastes	CO_2	Yes	Significant emission source.
		CH_4	No	Excluded for simplification. CH_4 emissions are assumed to be very small.
		N_2O	No	Excluded for simplification. N_2O emissions are assumed to be very small
		Other	-	-
	Transportation of biodiesel to blending facility	CO_2	Yes	Significant emission source.
		CH_4	No	Excluded for simplification. CH_4 emissions are assumed to be very small.
		N_2O	No	Excluded for simplification. N_2O emissions are assumed to be very small
		Other	-	-
	Anaerobic Wastewater treatment in crude	CO_2	No	Not applicable, the biodiesel is produced from waste oil/fat.
		CH_4	No	Not applicable, the biodiesel is produced from waste oil/fat.

Source		Gas	Included?	Justification/Explanation
	vegetable oil production.	N_2O	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)	CO_2	No	Not applicable, the biodiesel is produced from waste oil/fat.
		CH_4	No	Not applicable, the biodiesel is produced from waste oil/fat.
		N_2O	No	Not applicable, the biodiesel is produced from waste oil/fat.
		Other	-	-

Baseline Scenario

3.4.4

According to methodology ACM0017, version 4.0 the baseline scenario of the project is demonstrated and determined through the following steps.

- **Production of fuels (P):** What would have happened at the production level in the absence of the CDM project activity?
- **Consumption (C):** Which fuel would have been consumed in the absence of the CDM project activity?
- **Material (M):** What would have happened to the material used as input for production of biodiesel in the absence of the CDM project activity?

Since in the project activity biofuel is not produced from seeds or crops from plants cultivated in dedicated plantations, Land use for plantation (L) is not taken into consideration.

For the fuel production (P),

According to latest approved version 07 of the "Tool for the demonstration and assessment of additionality" at the production level the realistic and credible alternatives can be assessed through the following steps:

Alternative P1: Continuation of current practices with no investment in biofuel production capacity;

The scenario P1 can be a possible baseline scenario, where there is no investment in the biodiesel production capacity and the fossil fuel is used for the generation of petrol- diesel for end usage.

Alternative P2: The project activity implemented without the CDM; and

The project faces investment barrier and described in section 3.5 hence this scenario is not applicable.

Alternative P3: Investment in any other alternative fuel replacing partially or totally the baseline fuel.

Investment in other alternative baseline fuel source is a part of baseline scenario and hence applicable.

Investment in any other alternative such as CNG, DME or LPG for end usage in the mobile transportation is not viable for the project owner. Firstly, PP has done research and development for analyzing the commercial production of biodiesel and its utilization purposes. Secondly, India is in serious shortage of natural gas resources[11] and thus, there is no condition for development of CNG and LNG, Thirdly, domestic researches on DME production technology have just started and in nascent stage and thus, alternative P3 isn't feasible. To conclude, the most plausible baseline scenario for fuel production is Alternative P1 (Continuation of current practices with no investment in biodiesel production capacity).

For the consumption of fuel (C), the most plausible baseline scenario is determined as follows:

Step 1: Identify all realistic and credible alternatives for the fuel used by end consumers.

For the intended consumer of biodiesel, the realistic and credible alternative(s) may include

Alternative C1: Continuation of petroleum diesel consumption:

Alternative C2: Consumption of biodiesel from other producers:

Alternative C3: Consumption of other single alternative fuel such as CNG or LPG etc:

Alternative C4: Consumption of a mix of above alternative fuels:

Alternative C5: Consumption of biodiesel from the proposed project plant.

Step 2: Eliminate alternatives that are not complying with applicable laws and regulations.

All the alternatives identified comply with the local laws and regulations.

Step 3: Eliminate alternatives that face prohibitive barriers.

Alternative C1: In India, all the heavy vehicles operated by petroleum diesel therefore C1: Continuation of petroleum diesel consumption is possible case.

[11] https://www.niti.gov.in/sites/default/files/energy/Shale-gas-in-India-Prospects-and-Challenges-1.pdf

Alternative C2: In India, very few biodiesel manufactures are in the country at present time and manufacture of biodiesel is very less than the requirement of the biodiesel[12]. Therefore, in absence of availability of biodiesel, the alternative C2, consumption of biodiesel from other producers is not feasible, this option faces prevailing barrier as there is a clear lack of manufactures in the region.

Alternative C3: Consumption of other single alternative such as CNG or LPG will require modification in the consumer's stationary installation and vehicles,[13] which needs additional expense for consumers and in India all of its petro products are being imported and hence it's not practical and rather may prove costly to have CNG and PNG upgraded to be used on commercial scale, Therefore, Alternative C3 is not a realistic and credible alternative due to prevailing practice barrier.

Alternative C4: Similarly, since alternative fuels such as CNG or LPG are not credible due to prevailing practice barrier in the country[14], thus Alternative C4: Consumption of a mix of above alternatives fuels is not feasible either.

Alternative C5: The project isn't financially attractive without Carbon Crediting revenue due to the fact there are no other financial incentives at this stage of the developing technology from the proposed project plant isn't feasible. Alternative C5 is assessed with the help of financial analysis (IRR) provided by PP for the Project activity thus, alternative C5: Consumption of biodiesel from the proposed project plant.

In conclusion, Alternative C1: Continuation of petroleum diesel consumption faces no prohibitive barriers and is considered to be the most plausible baseline scenario for consumption of fuel (C).

For the material (M) level, the most plausible baseline scenario is determined as follows:

Step 1: Identify all realistic and credible alternatives for the material used by the project. For the material (M) level, the realistic and credible alternative(s) may include

Alternative M1: Use of material for production of biodiesel (by the project proponent or by others);

Alternative M2: Use for material production of substances other than fuel;

Alternative M3: Incineration of material for the purpose of energy recovery;

Alternative M4: Incineration of material without energy recovery;

[12] A review of global current scenario of biodiesel adoption and combustion in vehicular diesel engines - ScienceDirect (Table 6, page number 1574).

[13] https://auto.economictimes.indiatimes.com/news/industry/govt-allows-retrofitment-of-cng-and-lpg-kits-in-bs-vi-compliant-vehicles/93715768

[14] The CNG and LPG has different chemical parotitis so their alternative fuels can't mix with each other please follow link to know more details https://www.uti.edu/blog/diesel/cng-lpg-lng-fuel

Alternative M5: Disposal of material in an anaerobic or aerobic manner.

Step 2: Eliminate alternatives that are not complying with applicable laws and regulations. All the alternatives identified comply with Indian laws and regulations.

Step 3: Eliminate alternatives that face prohibitive barriers. Most consumers in India do not even know about biodiesel, thus, biodiesel production from waste oil/fat is far from being a common practice in India. Thus,

Alternative M1: Use of material for production of biofuels (by the project proponent or by others) is not feasible. In the absence of the project, the waste oil/fat generated every day in the local area were used to be discharged into the municipal sewage system without recovery, thus, M1 is not feasible.

Alternative M2: Use for material production of substances other than fuel is feasible. Incineration of waste oil/fat with energy recovery is not a common practice in India, thus

As mentioned above, the waste oil/fat generated every day in the local area is discharged into the municipal sewage system without recovery. This is the common practice in India but not incineration. thus, Alternative M3 Alternative and M4 is not feasible.

No waste oil/fat is treated by anaerobic or aerobic technologies in India. Thus, Alternative M5: Disposal of material in an anaerobic or aerobic manner is not feasible.

In the absence of the project, the waste oil/fat may be probably used to produce chemical substances, like oleic acid which is prevailing practice and requires less investment thus Alternative M2: Use for material production of substances other than fuel is feasible.

Therefore, the most plausible baseline scenario for the project is: P1: Continuation of current practices with no investment in biodiesel production capacity; C1: Continuation of petroleum diesel consumption; M2: Use for material production of substances other than fuel.

3.4.5 Assessment team conclude that the above-mentioned baseline scenario is in line with the applied methodology “ACM0001, version 19”. Same is also reflected in final PD 064. Thus accepted.

Additionality

As per section 3.14 ‘Additionality’ of the VCS Standard V4.4, the additionality of the project is determined by the following tests

Legal Requirement test: It has been confirmed by the verification team that there are no enforced laws, statutes, regulations, court orders, environmental-mitigation agreements, permitting conditions or other legally binding mandates requiring its implementation, or requiring the implementation of a similar technology/measure that would achieve equivalent levels of GHG emission reductions.

The verification team has assessed the relevant regulations to confirm the project meets the legal requirement test:

- Factories act
- Indian boiler act
- National green tribunal act
- Environment protection act
- Disaster management act
- Petroleum act
- National policy on biofuel, 2018

a) **Additionality Test:** As per section 5.3.2 of the applied methodology the Project owner has determined additionality by using the CDM tool 1: "Tool for Demonstration and Assessment of Additionality" version 7.0.0

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

As per applied tool, the project activity is not a first of its kind initiative and hence the PP chooses not to apply the given step.

Hence, the proposed project activity is not first-of-its-kind.

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

As the baseline scenario is identified with reference to the applied methodology, the identified alternative to the project activity is alternative P1, C1 and M2 complies with local laws and regulations in India.

Therefore, the most plausible baseline scenario for the project is: P1: Continuation of current practices with no investment in biodiesel production capacity; C1: Continuation of petroleum diesel consumption; M2: Use for material production of substances other than fuel.

Sub-step 1b: Consistency with mandatory laws and regulations

This has been discussed in the legal requirement test above. The verification team has assessed mandatory laws and regulations and confirms that all alternatives are

in compliance with mandatory laws and regulations in Rajasthan, India.

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. The PP has shown the economic and financial evaluation of the project in the IRR sheet.

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

As the project is selling generated biodiesel and glycerine to the consumers i.e., mobile consumers, it will generate financial benefits other than carbon revenue related income; therefore, Option I is not applicable. Option II and Option III can be a feasible identified appropriate analysis method for the identified baseline and the project activity, but the PP has chosen to demonstrate investment analysis using Option III: Benchmark Analysis as there are no comparable investment options available for the alternate fuel source identified, as mentioned in the baseline scenario assessment.

All the steps followed to reach the conclusion has been assessed and the choice of analysis technique is accepted by the verification team.

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

The PP followed the tool 27 para 15, Investment analysis tool to establish the benchmark and the Post tax equity IRR has been chosen as the financial indicator for the demonstration of financial unviability for the proposed project activity. Since, the PP is demonstrating financial unattractiveness of the project and the project cost involves both equity and debt, post-tax equity IRR is considered to be the appropriate option to indicate financial unattractiveness. The post-tax equity IRR is found to be appropriate financial indicator by the verification team. All the input financial parameters considered for the IRR analysis are sourced from the DPR. As per para 15 of Investment analysis, "The applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or WACC are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for an equity IRR. Benchmarks supplied by relevant national authorities are also appropriate. The VVB shall validate that the benchmarks used are applicable to the project activity and the type of IRR calculation presented."

The PP has chosen required/ expected return on equity as their benchmark, is found to be appropriate and in line with the applied tool.

The PP has chosen to apply 10.79%, which is a default value for the expected return on equity as per investment analysis tool, hence found to be appropriate.

As per para 16 of the investment tool/17/, "In situations where an investment analysis is carried out in nominal terms and the available IRR benchmarks are in real terms, project participants shall convert the real term values of benchmarks to nominal values by adding the inflation rate.

The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used."

The PP has chosen the inflation rate given by Central government in consultation with the RBI as consumer Price Index (CPI) inflation as the target for the period from August 5, 2016 to March 31, 2021, which gives 4.00%, which is found to be acceptable as the inflation rate from RBI for the duration of crediting period is not available and hence the targeted inflation rate of the RBI (central bank) has been used. The verification team has cross-verified and found out that PP has taken the inflation rate forecast for India given by Central government in consultation with the RBI as of 05/08/2016[15], which is latest available at the time of investment decision, and hence, value is found to be appropriate and in line with the applied tool.

PP converted the default values which is in real terms into nominal terms by using the following equation:

Nominal Benchmark = {(1+Real Benchmark) *(1+Inflation rate)}-1

Default value for Real Benchmark = 10.79%.

Inflation Rate = forecasted inflation rate for India published by Central government in consultation with the RBI /48/ = 5.30%, which was available at the time of investment decision.

Nominal Benchmark estimated = ((1+10.79%) *(1+4.00%)) – 1 = 15.22%.

The assessment team has verified all the above said documents and confirmed that the benchmark identified to compare the financial attractiveness of the project activity is appropriate.

Benchmark Estimation

Default Value as per Investment Analysis Tool	10.79%
Long Term Target Inflation forecast for India	4.00%
Benchmark	**15.22%**

Sub-step 2C: Calculation and comparison of financial indicators

[15] Reserve Bank of India - Function Wise Monetary (rbi.org.in)

<table>
<tr><th>Item</th><th>Value</th><th>Means of verification</th></tr>
<tr><td>Installed capacity</td><td>500 KL/day</td><td>The project proponent has decided to install the biodiesel plant pursuant to the Board decision dated 19/01/2019 and as assed from the DPR copy available during decision making time. The project activity involves installation of Bio-Diesel (B100) of European Standard EN 14214 or Indian Equivalent IS 15607 from multiple feedstock (especially waste/used vegetable oils) in India. The capacity of the project is to treat 500 KL/day. The project capacity has been cross check with the technical specification; Hence the project capacity is found acceptable.</td></tr>
<tr><td>Project Cost (without working capital margin)</td><td>725.39 INR Mn</td><td>The Project cost values has been sourced from the DPR of Kotyark prepared at the time of investment decision. The project cost is cross verified from the Charted Accountant Certificate covering the project cost, which was found to be comparable, and found acceptable. The breakup of cost.
<table>
<tr><th>Project Cost Break-up</th><th>INR Mn.</th></tr>
<tr><td>Land Cost</td><td>132.97</td></tr>
<tr><td>Building & Site Works</td><td>3.51</td></tr>
<tr><td>Plant & Machinery</td><td>337.34</td></tr>
<tr><td>Other Assets</td><td>1.57</td></tr>
<tr><td>Working Capital Margin</td><td>250.00</td></tr>
<tr><td>PROJECT COST</td><td>725.39</td></tr>
</table>
The verification team has also tried cross check project cost from another similar registered project but there is no comparable project. Whereas PP has shared Supply Agreements for cross check. So, the project cost considered for the IRR analysis for the proposed project activity is from the DPR is found appropriately considered.

A Sensitivity analysis has been conducted by PP for ±10% and we can see that the variation in project cost does not breaches the benchmark. Moreover, since the plant is commissioned and actual project cost is available hence if we</td></tr>
</table>

<table>
<tr><td></td><td></td><td>consider the actual cost of the project even then the benchmark is not breached.

Hence, the given value was assessed to be reliable and correct.</td></tr>
<tr><td>Annual Capacity Utilization Factor</td><td>80.00%</td><td>The Capacity Utilization (i.e. Designed Capacity of the Plant) values has been sourced from the DPR of Kotyark prepared at the time of investment decision. The Capacity Utilization is cross verified from the technical specification of the plant, which was found to be comparable, and found acceptable. A Sensitivity analysis has been conducted by PP for ±10% and we can see that the capacity utilization breaches the benchmark when the Plant Utilization has increased by 10% over and above the designed capacity of the plant for the entire life of the project which is unrealistic scenario. Moreover, since the plant is commissioned and plant records shows that plant is operating at the CUF achieved in first year is 40%. Hence, the given value was assessed to be reliable, correct and an increase in CUF unrealistic scenario.</td></tr>
<tr><td>Raw Material Cost</td><td>Cost –Mn
Escalation – 10%</td><td>The Raw Material cost values has been sourced from the DPR of Kotyark prepared at the time of investment decision. The project cost is cross verified from the by actual cost of raw material cost, which was found to be higher than that considered, and found acceptable.

The breakup of cost:
<table><tr><td></td><td>KL</td><td>Cost per KL</td></tr><tr><td>Non-Edible Oil</td><td>46,000.00</td><td>37,720.00</td></tr><tr><td>Alcohol</td><td>24,490.00</td><td>3,918.40</td></tr><tr><td>Catalyst</td><td>82,000.00</td><td>1,640.00</td></tr><tr><td>Total</td><td></td><td>43,278.40</td></tr></table>
The verification team has also tried cross check raw material cost from another similar registered project but there is no comparable project. Whereas PP has shared Bills of Raw material purchased for cross check. The verification team has also checked the bills with the annual escalation % from the plant sources and 10% escalation is found acceptable when comparing with the inflation rate during decision making</td></tr>
</table>

		time. So, the project cost considered for the IRR analysis for the proposed project activity is from the DPR is found appropriately considered. A sensitivity analysis has been conducted by PP for ±10% and we can see that the raw material cost breaches the benchmark when the raw material cost is decreased by 10% over the entire life of the project which is highly unlikely scenario, as the IRR Model has workout by considering 10% escalation. Moreover, since the plant is commissioned and actual project cost is available hence if we consider the actual cost of the project even then the benchmark is not breached. Hence, it can be concluded that 10% decrease in raw material cost is highly unlikely to happen and unrealistic and the given value was assessed to be reliable, correct and a decrease in Raw material Cost unrealistic scenario.
Selling Price of Biodiesel	Rs. 52 /liter Escalation – 10%	The Selling price of Biodiesel has been sourced from the DPR of kotyark prepared at the time of investment decision. The Selling price of Biodiesel is cross verified from the by actual bills and it is found that the Wholesale Price is INR 50/Ltr. And Retail Price is INR 56/Ltr. which was found to be lower than that considered. The sensitivity analysis is worked out for ±10% and we can see that the Selling Price of Bio Diesel breaches the benchmark when the Selling Price of Bio Diesel is increased by 10% over the entire life of the project which is highly unlikely scenario. As the IRR Model has workout by considering 10% escalation in the Selling Price of Bio Diesel every year further escalation of 10% every year for the entire life of project is highly unlikely and unrealistic. The verification team has cross checked Biodiesel price from independent public, the Price of Biodiesel is INR 42.3/Ltr. https://pib.gov.in/PressReleasePage.aspx?PRID=1542151 . Hence the Selling price considered as per DPR is acceptable. The verification team has also checked historical price of petro diesel and 10% escalation is found acceptable when comparing with the inflation rate during decision making time. Hence, it can be concluded that increase of 10% over and above the 10% escalation in Selling Price of Bio Diesel is highly unlikely to happen and unrealistic. Therefore, it is concluded by verification team that the selling price of Biodiesel considered in the financial analysis is correct.

Selling Price of Glycerin	Rs.35 /liter	The production of Glycerin is the by-product of Biodiesel and the value is found appropriately considered as per the DPR/24/ produced and standards in the market. Hence it is ok. The sensitivity analysis is worked out for ±10% and we can see that the variation in Selling Price of Glycerin cost does not breaches the benchmark. Hence, it can be concluded that increase of 10% over and above the 10% escalation in Selling Price of Glycerin is highly unlikely to happen and unrealistic.
Loan Interest Rate	11%	The values have been sourced from the DPR available at the time of decision making. The same is also cross-checked from the loan agreement between PP and INDIAN OVERSEAS BANK submitted to the verification team.
Depreciation Rate	Building & Site Works- 3.17% Plant & Machinery- 4.75% Other Assets-9.50%	As per the Companies act for the most commonly used assets, the depreciation rates for Building and site are 3.17%, Plant and machinery can be 4.75% and other assets 9.5%. Hence the parameters are conservatively considered as per the DPR and as per the Companies Act https://taxadda.com/depreciation-rates-as-per-companies-act-2013/
Salvage value	5%	The project activity is the utilization of waste oil or fat oil for biodiesel production, that replaces the petro diesel consumption. It falls under Biofuels as confirmed from the Biofuel Policy, implemented in 2009.The biofuel plants can be considered under renewable biomass category and since, the penetration level of the Biodiesel Industry is low in India, and during investment decision time the CERC guidelines are considered for decision making for the general parameters. As per CERC guidelines Salvage value for RE projects. CERC_RE-Tariff-Regulations 2017-20 (cercind.gov.in) Verification team confirmed the residual value of 5% considered in the financial analysis by the project owner is appropriate for this type of projects as it is well within limits. Further, Salvage value, 10% of the depreciable assets along with the land cost are added back in the IRR calculations accordance to methodological tool investment analysis Version 12.0/17/. Verification team has confirmed that the calculation is done as per the local accounting regulations

		which are in accordance with latest methodological tool for Investment Analysis. Thus, it is concluded by verification team that the salvage value considered in the financial calculation is correct and appropriate.
Income tax rate (%)		
MAT	18.5%	Tax rates applicable to a domestic company. Project owner has considered Minimum Alternate Tax as 18.50%, surcharge of 12% and cess of 4% in investment analysis for the project activity which was valid and available to the Project Owner at the time of investment decision making time. Applicable tax rates have been verified from: https://www.bcasonline.org/Referencer2015-16/Taxation/Income%20Tax/rates_of_income_tax.html Verification team has checked the tax rate applicable to the financial year in which the investment decision was taken and its calculation to confirm that the tax rate considered in financial calculation is correct and in line with Income Tax Act 1961, Government of India. Appropriateness of the same has been checked and confirmed by financial expert involved in the verification team of the project activity. This is found to be appropriate, and it is accepted.
Surcharge	12.00%	
Health and Education Cess	4.00%	
Final tax rate (%)		
Income Tax rate	29.12%	The income tax rate is considered as per income tax act of the host country prevailing at the time of investment decision. Hence, it has been accepted by the verification team.
MAT	21.55%	The MAT is considered as per income tax act of the host country prevailing at the time of investment decision. Hence, it has been accepted by the verification team.

For calculation of financial indicator, all relevant costs and revenues were found to be included in the IRR sheet provided by the PP. All assumptions and estimates used for input values were checked against the relevant sources. VVB has checked that land cost, salvage value and working capital are considered while doing investment analysis and has been added back in the final year cashflow calculation.

VVB has also confirmed that income tax benefits for e.g. exemption under section 80IA, 80IAB, 80IAC, 80IB etc. are considered while doing investment analysis for the project activity.

It Is calculated based on the cash outflows and cash inflows into the project activity. Based on the result of IRR spreadsheet, post tax equity IRR is lower than the benchmark. The input assumptions and IRR outcome are assessed and found appropriate. post tax equity IRR of the proposed project activity has been calculated as 6.33% based on the parameters given without considering the carbon revenue. Project activity does not use any ODA or governmental incentive; however, bank loan is used. Based on the above, verification team can conclude that the project is not financially attractive and could benefitted from the carbon revenues.

Based on above the equity IRR works out to:

Equity IRR	Benchmark
6.33%	15.22%

Sub-step 2d: Sensitivity analysis:

The sensitivity analysis has been carried out by the PP for a reasonable range of variations of +/- 10% of major parameters, this is found to be appropriate as per para 28 of the Investment analysis tool/17/ The project owner has considered all the variables that constitute more than 20% of either total project costs or total project revenue i.e. CUF, Raw material cost, Project cost, selling price of Biodiesel and Glycerol in the sensitivity analysis and hence this is found to be in line with paragraph 27 of investment analysis tool/17/.

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".

Variation %	-10%	Normal	10%
Capacity Utilization	5.75%	6.33%	6.82%
Raw Material	36.80%	6.33%	0.00%
Project Cost	6.44%	6.33%	6.23%

Selling Price (Bio Diesel)	0.00%	6.33%	34.38%

Based on the above calculations, it is concluded that the benchmark for post-tax equity IRR is not reached even with +/- 10% variation in the major parameters.

It is verified that the benchmark is reached if:

1. **CUF is increased by 10% CUF** - Considered by the project owner from DPR report/21/ is appropriate as verified from the plant log sheet for the first year. The CUF is cross checked and found the plant running at 40 % well below the DPR assumptions. Hence, as per our opinion, further increase in PLF is highly unlikely scenario.
2. **Raw material cost reduced by 10 % -** The price of raw material escalated over time and hence 10 % reduction in the raw material is unlikely scenario for the project breaching benchmark value as cross checked from year wise invoices.
3. **Project Cost is reduced by 10%** - The total cost of the project activity is 725.39 INR Mn with post tax Equity IRR without carbon revenues of 6.33%. The proposed project activity is already commissioned and operational and, we can say that the major costs has already been covered by the PP, which has been verified from on-site visit.
4. **Selling price of Biodiesel increased by 10 %** - Further increase selling price rate is highly unlikely scenario as the project selling price is less than the DPR Value and the inbuilt escalation of 10 % is already considered in the IRR sheet, with the post-tax IRR less than benchmark as per the verified invoices and PPA's.
5. **Selling Price (Glycerin) increased by 10% -** Glycerine is a by-product and even after increasing the selling price by 25%, the project will not be breaching benchmark.

The sensitivity analysis results were found to be appropriate and was found to be calculated in-line with the methodological tool – Investment analysis as verified from the IRR sheet.

Step -3: Barrier analysis

Barrier analysis has not been chosen by PP.

Step 4: Common practice analysis

Common practice analysis has been carried out by using the methodology tool 24: Common Practice Version 03.1 and its stepwise approach The project activity is located in state of Haryana in India; hence, Haryana state is considered as Geographical area for the project activity. The start date of the project activity is 15/09/2020. Stepwise approach for common practice analysis has been carried out as per Methodological tool "Common Practice", version 03.1 EB 84, Annex 7.

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

Range	Capacity (TPD)
50%	660.00

Capacity of the proposed project activity	**440.00**
-50%	220.00

The calculation for the step 1 is found to be appropriate and in-line with the applicable methodology tool.

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

Conditions	Assessment
The projects are located in the applicable geographical area	The PP has chosen the state of India as the applicable geographical area for analysis, which is found to be in-line with the definition of geographical area in the applied methodology tool and location of the project activity. The PA involves Biodiesel generation from waste fat oil. The location of the project activity is in the state of Haryana, India and there are no sectoral policies applicable is regulated by the Government as till date only handful of biodiesel plant are operational in India including the PA. Hence the entire India and Haryana state is considered for Common Practice analysis and found acceptable by the verification team.
The projects apply the same measure as the proposed project activity	The project is a biodiesel manufacturing facility, As per para 10 of the Common Practice, the project is using measure (b) "Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies". Therefore, PP has chosen projects applying same measure (b)
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 PA uses waste oil for biodiesel generation to replace fossil fuels. Hence, fat oil would be the applicable energy source. The PP has applied only fat oil as input source of raw material considered for analysis, which is found to be appropriate, as cross checked by verification team with plant records.
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 PA implements the technology to produce only biodiesel as main product to replace petro diesel in the geographical area as confirmed by the verification team.

The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1	As per Step 1 of common practice analysis applicable capacity range is +/- 50%. The PA has installed capacity of 100 TPD, and PP has chosen the capacity range from 50 TPD to 150 TPD, which is found to be appropriate.
The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.	The start date of the concerned project activity is, which is the date of purchase order of the project plant taken by the PP for the project activity. Therefore, projects, which has started its commercial operation before 15/09/2020, have been considered for analysis. The same was confirmed during onsite visit.

There are 3 projects identified which meets all the above conditions. The assessment team has checked and confirmed that these three projects has started their commercial operation before the PDMR for the project activity was published for global stakeholder consultation or before start date of the project activity whichever is earlier. The projects are as follows:

S. No.	Project name	Commissioning year
1	Kaleesuwari Refinery Private Limited	2008
2	Universal Biofuels	2008
3	Emami Biotech Pvt Ltd	2009

Numbers of Similar projects which fulfil above-mentioned conditioned are N biodiesel = 3.

Step (3): Within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing verification. Note their number Nall.

There are no similar projects identified as per the Common practice tool. The number of similar projects identified are Nall = 3

Step (4): Within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number Ndiff.

As per para 12 of common practice analysis, the project activity has to be separated from the different technologies on the basis of point (d) Investment climate on the date of the investment decision, (iv) Legal regulations. From the projects identified above, those projects which employ “different technologies” have been excluded and the number of such projects has been identified as Ndiff.

This condition is not applicable as there are no biodiesel plant with different technologies identified before decision-making time. Hence Ndiff = 0

Step (5): calculate factor F=1-Ndiff/Nall representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

Factor F = 1-Ndiff/Nall

Hence, F = 1

And Nall - Ndiff = 0;

As per para 18 of common practice analysis v3.1, "The proposed project activity is a "common practice" within a sector in the applicable geographical area if the factor F is greater than 0.2 and Nall-Ndiff is greater than 3." Thus, the verification team had concluded that the project activity is not a common.

The information mentioned in PDMR is duly supported by evidence quoted therein. The verification team has described all steps taken, and sources of information used to cross-check the information contained in the PDMR. The verification team determined that the evidence assessed is credible, where appropriate.

Quantification of GHG Emission Reductions and Removals

3.4.6 Assessment team checked the baseline, project and leakage calculation and confirm that the evaluation of baseline, project and leakage is as per the approved methodology and formula used to calculate the same is correct. The detail analysis is as below:

Quantification of baseline emissions

From the **ACM0017: Production of biofuel — Version 4.0 Paragraph 38,** states that Baseline emissions from displaced fossil fuel are determined as follows:

$$BE_y = BF_y \times NCV_{BF,y} \times EF_{CO2,FF} \quad \text{Eq. (1)}$$

With,

$$BF_y = \left[min\left\{ \left(P_{BF,y} - P_{BF,on-site,y}\right); \left(\sum_i f_{PJ,i,y} \times C_{BF,i,y} \right) \right\} - P_{BF,other,y} \right] \times \left[\frac{\sum_i C_{BF,i,y} \times \left(\frac{f_{PJ,i,y} - f_{reg,y}}{f_{PJ,i,y}} \right)}{\sum_i C_{BF,i,y}} \right] \quad \text{Eq. (2)}$$

Where:

BE_y = Baseline emissions during the year y (tCO_2)

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)

$EF_{CO2,FF}$ = Carbon dioxide emissions factor for displaced fossil fuel (tCO_2/GJ)

$P_{BF,y}$ = Quantity of biofuel produced in the project plant in year y (t)

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

$P_{DBF,other,y}$ = 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)

$C_{BF,i,y}$ = Quantity of biofuel type i consumed/sold/blended in year y (t)

$f_{PJ,i,y}$ = Fraction of biofuel in the blended biofuel type i in year y (ratio)

$f_{reg,y}$ = 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.); however there is no blending in the Biodiesel sold.

Quantification of project emissions

Project activity emissions are calculated as follows:

$$PE_y = PE_{Biomass,y} + AF_{1,y} \times PE_{MeOH} \quad \text{Eq. (3)}$$

Where:

PE_y = Project emissions in year y (tCO_2)

$PE_{Biomass,y}$ = Project emissions associated with the biomass and biomass residues 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)

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

1. Project emissions associated with the biomass and biomass residues ($PE_{Biomass,y}$)

No biomass is being used in the project so $PE_{Biomass,y}$ is not applicable.

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:

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

Eq.(4)

Where:

$PE_{MeOH,y}$	=	Project emissions from fossil carbon in the biodiesel due to esterification with methanol of fossil origin in year *y* (tCO_2)
$MC_{MeOH,y}$	=	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 CO_2 (tCO_2/tC)

Quantification of 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:

$$LE_y = LE_{MeOH,y} + LE_{BR,y} - LE_{FF,y} \qquad \text{Eq. (5)}$$

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)
$LE_{BR,\,y}$	=	Leakage emissions from displacement of existing uses of waste oil/fat or biomass residues in year y (tCO_2)
$LE_{FF,\,y}$	=	Leakage related to the avoided production of fossil fuel in year y (tCO_2)

Emissions from production of methanol that is used in the esterification process to produce the biodiesel are estimated as follows:

$$LE_{MeOH,y} = MC_{MeOH,y} \times EF_{MeOH,PC}$$ ersion 4.2

Eq. (6)

Where:

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

$MC_{MeOH,y}$ = Quantity of methanol consumed in the biodiesel plant, including spills and evaporation on-site in year y (t MeOH)

$EF_{MeOH,PC}$ = Pre-combustion (i.e. upstream) emissions factor for methanol production (tCO_2/t MeOH)

There are no Leakage emissions from displacement of existing uses of waste oil/fat or biomass residues so $LE_{BR,y}$ is not applicable. VVB has conducted interviews with PP representatives and waste oil/fat generators who confirmed that the used waste oil/fat is not diverted from any existing use and hence same is found acceptable.

Leakage related to the avoided production of fossil fuel

$$LE_{FF,y} = BF_y \times \sum_x \sum_i \sum_j NCV_{BF,y} \times EF_{i,j,x,y}$$

Eq. (7)

Where:

$LE_{FF,y}$ = Leakage related to the avoided production of fossil fuel in year y (tCO_2)

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)

$EF_{i,j,x,y}$ = Emission factor for upstream emissions stage i associated with consumption of fossil fuel type x from fossil fuel origin j applicable to year y (t CO_2e/TJ)

The net emission reduction is calculated as **(rounded down values)**

$ER_y = BE_y - PE_y - LE_y$

ER_Y=271,061 - 21,450 – 11,238

ER_Y=238,373 tCO_2e

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)
15-Sept-2020 to 31-Dec-2020	79,059	6,256	3,278	69,525
01-Jan-2021 to 31-Dec-2021	271,061	21,450	11,238	238,373
01-Jan-2022 to 31-Dec-2022	271,061	21,450	11,238	238,373
01-Jan-2023 to 31-Dec-2023	271,061	21,450	11,238	238,373
01-Jan-2024 to 31-Dec-2024	271,061	21,450	11,238	238,373
01-Jan-2025 to 31-Dec-2025	271,061	21,450	11,238	238,373
01-Jan-2026 to 31-Dec-2026	271,061	21,450	11,238	238,373
01-Jan-2027 to 14-Sept-2027	192,002	15,194	7,960	168,848
Total	**1,897,427**	**150,150**	78,666	**1,668,611**
No. of years	**7**			
Average	**271,061**	**21,450**	**11,238**	**238,373**

3.4.7

Methodology Deviations

3.4.8

Assessment team confirms that no methodology deviation is applicable for the present project activity.

Monitoring Plan

To calculate the emission reductions the following parameters are fixed ex-ante as per the approved methodology ACM0017 (Version 04).

Parameters determined ex-ante: -

The parameter remains fixed throughout the crediting period are available during the joint validation and verification stage. The same is explained and assessed below:

Data / Parameter	NCV_{FF}
Data unit	GJ/t
Description	Net calorific value of fossil fuel (diesel) displaced
Source of data	2006 IPCC Guidelines
Value applied:	43
Justification of choice of data or description of measurement methods and procedures applied	Default value has been taken from 2006 IPCC Guidelines
Purpose of Data	NA
Assessment	VVB has cross checked with the 2006 IPCC guideline and found the value applied is appropriate and acceptable.

Data / Parameter	EFCO2, FF
Data unit	tCO_2/GJ
Description	*Carbon dioxide emissions factor for* fossil fuel displaced
Source of data	2006 IPCC Guidelines
Value applied:	0.0741
Justification of choice of data or description of measurement methods and procedures applied	Default value has been taken from 2006 IPCC Guidelines
Purpose of Data	For Baseline emission calculation
Assessment	VVB has cross checked with the 2006 IPCC guideline and found the value applied is appropriate and acceptable.

Data / Parameter	$EF_{i,j,x,y}$
Data unit	tCO_2e/TJ
Description	Emission factor for upstream emissions stage i associated with consumption of fossil fuel type x from fossil fuel origin j applicable to year y

Source of data	Tool "Upstream leakage emissions associated with fossil fuel use"
Value applied:	5.244
Justification of choice of data or description of measurement methods and procedures applied	Tool "Upstream leakage emissions associated with fossil fuel use" has been used to get value.
Purpose of Data	For leakage emissions calculation
Assessment	VVB has cross checked the tool Upstream leakage emissions associated with fossil fuel use" and confirmed that the value used to get $EF_{i,j,x,y}$ is appropriate and acceptable.

Data / Parameter	$EF_{C,MeOH}$
Data unit	tC/t MeOH
Description	Carbon emission factor of methanol, based on molecular weight
Source of data	Methodology ACM0017: Production of biofuel --- Version 4.0
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 4.0
Purpose of Data	*For* project *emissions calculation*
Assessment	The value is taken as per the methodology ACM0017, ver 4.0. Hence in line with the applied version of methodology. The EF is correctly applied by the PP in ER sheet while calculating the ex-post ERs.

Data / Parameter	EF_{MeOH_PC}
Data unit	tCO_2/t MeOH
Description	Pre combustion (i.e. upstream) emissions factor for methanol production
Source of data	Apple 1998: and 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 4.0
Purpose of Data	For leakage emissions calculation
Assessment	VVB team has checked and confirmed that the value is taken from Apple 1998: and 2006 IPCC Guidelines which is Based on 30 GJ/t energy requirement and average of IPCC emissions factors for natural gas and diesel oil.

Data and Parameters Monitored

Data / Parameter	$f_{PJ,i,y}$
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	NA
Frequency of monitoring/recording	Every batch produced
Value applied:	100%
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 of baseline emissions
Calculation method	*Equation (*2)
Comments	Till now there is no blending at project activity

Data / Parameter	$f_{reg,y}$

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 (National Policy on Biofuels)[16]
Description of measurement methods and procedures applied	NA
Frequency of monitoring/recording	Annually
Value applied:	7%
Monitoring equipment	NA
QA/QC procedures applied	NA
Purpose of data	Calculation of baseline emissions
Calculation method	Equation (2)
Comments	NA

Data / Parameter	$MP_{Glyc,y}$
Data unit	t
Description	Amount of by-product glycerol produced during plant operation
Source of data	Plant Record
Description of measurement methods and procedures applied	Weighbridge to measure the weight of produced by-product
Frequency of monitoring/recording	Annually
Value applied:	15,800 Tons
Monitoring equipment	Weighbridge

[16] https://mopng.gov.in/en/refining/bio-diesal#:~:text=On%2010.08.,consumers%20for%20blending%20with%20diesel.

QA/QC procedures applied	Weighbridge will be calibrated once in year and Measured amounts to be crosschecked against mass balance of the biofuel production unit
Purpose of data	NA
Calculation method	NA
Comments	This monitored parameter is used to meet the applicability condition "The by-product (e.g. glycerol) is not disposed of or left to decay. It should be either incinerated or used as raw material for industrial consumption or sold"

Data / Parameter	$MU_{Glyc,y}$
Data unit	*t*
Description	*Amount of by-product (e.g. glycerol) incinerated or sold or used*
Source of data	Plant Record
Description of measurement methods and procedures applied	Weighbridge will be calibrated once in year and to measure the weight of produced by-product
Frequency of monitoring/recording	Annually
Value applied:	15,800 Tons
Monitoring equipment	*All quantity of produced glycerol must be monitored*
QA/QC procedures applied	All produced by-product cross checked by sales data or internal records
Purpose of data	NA
Calculation method	NA
Comments	This monitored parameter is used to meet the applicability condition "The by-product (e.g. glycerol) is not disposed of or left to decay. It should be either incinerated or used as raw material for industrial consumption or sold"

Data / Parameter	$P_{BF,y}$
Data unit	t

Description	Quantity of biofuel produced in the project plant in year y
Source of data	on-site measurements by project participants
Description of measurement methods and procedures applied	Weighbridge will be calibrated once in year and to measure the weight of produced biofuel
Frequency of monitoring/recording	All produced biofuel must be metered every day
Value applied:	*105*,600
Monitoring equipment	Weighbridge
QA/QC procedures applied	*Cross check production and consumption data with sales records* and pant records
Purpose of data	Calculation of Baseline emissions
Calculation method	Equation (2)
Comments	NA

Data / Parameter	$PBF_{on\text{-}site,y}$
Data unit	t
Description	Quantity of biofuel consumed at the project biofuel 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	Weighbridge will be calibrated once in year and weighbridge is used to record the quantity of biofuel consumed.
Frequency of monitoring/recording	All consumed biofuel must be metered every day
Value applied:	3,168
Monitoring equipment	Metering system at fueling station
QA/QC procedures applied	Cross check production and consumption data with sales records and pant records
Purpose of data	Calculation of Baseline emissions
Calculation method	Equation (2)

Comments	Not Applicable

Data / Parameter	$PBF_{on\text{-}site,y}$
Data unit	t
Description	Quantity of biofuel consumed at the project biofuel 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	Weighbridge will be calibrated once in year and weighbridge is used to record the quantity of biofuel consumed.
Frequency of monitoring/recording	All consumed biofuel must be metered every day
Value applied:	3,168
Monitoring equipment	Metering system at fueling station
QA/QC procedures applied	Cross check production and consumption data with sales records and pant records
Purpose of data	Calculation of Baseline emissions
Calculation method	Equation (2)
Comments	Not Applicable

Data / Parameter	$CB_{F,i,y}$
Data unit	T
Description	Quantity of blended biofuel 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	Use calibrated measurement equipment that is maintained regularly and checked for proper functioning
Frequency of monitoring/recording	Continuous recording of filling consumers´ stationary combustion installations or vehicles

Value applied:	105,600
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 and pant records
Purpose of data	Baseline emissions
Calculation method	Equation (2)
Comments	Till now there is no blending at project activity

Data / Parameter	$NCV_{BF,y}$
Data unit	GJ/t
Description	Net calorific value of biofuel produced in year y
Source of data	Time to time Laboratory analysis
Description of measurement methods and procedures applied	Laboratory analysis
Frequency of monitoring/recording	Annually
Value applied:	38.4
Monitoring equipment	Laboratory report
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 range, possibly collect additional information or conduct measurements
Purpose of data	Calculation of Baseline emissions
Calculation method	Equation (1 and 7)
Comments	Analysis has to be carried out by accredited laboratory. A sample represents if uncertainty of the NCV does not exceed ±5% at 95% confidence level.

Data / Parameter	$MC_{MeOH,y}$

Data unit	tMeOH
Description	Quantity of methanol consumed in the biofuel plant, including spills and evaporations on-site in year y
Source of data	Plant record
Description of measurement methods and procedures applied	Weighbridge will be calibrated once in a year weighbridge is used to record the quantity of methanol consumed.
Frequency of monitoring/recording	Continuously
Value applied:	15,600
Monitoring equipment	Weighbridge
QA/QC procedures applied	*Crosscheck against methanol purchase receipts and calculated stoichiometric requirements*
Purpose of data	Calculation of *Project emissions*
Calculation method	Equation (6)
Comments	Adjust for stock changes when comparing purchase data with consumption data; also used for leakage calculations. Use most conservative values. Any spills on-site and evaporation are accounted as consumption. Please note that data should also report the source of methanol - from fossil fuel or non-fossil fuel sources. As per the applicability only biofuel produced using fossil fuel-based methanol can be credited.

Data / Parameter	$AF_{1,y}$
Data unit	Fraction
Description	Allocation factor for the production of biofuel n year y
Source of data	Tool TOOL25 version 03.0 “Apportioning emissions from production processes between main product and co and by-product”
Description of measurement methods and procedures applied	Calculated Using Tool “Apportioning emissions from production processes between main product and co and by-product”
Frequency of monitoring/recording	Annually

Value applied:	1
Monitoring equipment	NA
QA/QC procedures applied	NA
Purpose of data	*Project emissions*
Calculation method	Equation (3)
Comments	NA

All data used by the project participants and/or supporting documents, including their references and sources are listed in the Joint PD&MR. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the joint PD & MR. All values used in the joint PD & MR are considered reasonable and conservative in the context of the VCS project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the joint PD & MR.

Monitoring Plan

The monitoring plan defines the standards and rules according to which the emission reductions of the project activity are monitored and verified in conformance with all relevant requirements of the VCS. The monitoring plan and procedures can be updated and adjusted to meet the operational requirements.

During on-site audit, it has been found that in order to obtain reliable monitoring data, the project owner has established a monitoring management structure prior to the start of the crediting period. Responsibilities have been assigned to all staffs involved in the project activity. A general Manager was appointed who has the overall responsibilities for the monitoring of the project, other staffs are responsible for the data recording, data collecting, data archiving and emission reduction calculation.

In line with the applied methodology. PP has defined a quality manual including QA/QC procedures which ensures elements of the CDM related monitoring procedures is assured and and control their quality.

A quality management representative from the project participant will ensure that the monitoring procedures are established and that they meet the requirements as specified in this methodology.

VVB noted that PP will establish a complete monitoring documenting mass balance, adjusted for stock changes, covering: (a) Amounts of waste oil/fat or biomass residues purchased and processed, if applicable; (b) Amounts of feedstock from dedicated plantations purchased and processed; if applicable; (c) Amounts of catalysts purchased, processed and recovered; (d) Amounts of methanol purchased and processed; (e) Amounts of glycerol or other by-products produced and incinerated and/or sold for utilization; (f) Amounts of blended biofuel consumed, sold or blended.

This mass balance will be based on a combination of purchase/sales records and records of measurements, in accordance with the measuring instruments available at the plant and stationary consumers or fuelling stations of the captive fleet owner in case of use in transport sector.

The mass balance will serve as a QA/QC instrument to crosscheck results of monitoring parameters as defined in the following section.

PP will ensure that the following procedure is used to verify the actual amount of biofuel from waste oil/fat or biomass residues that is consumed by the end user for displacement of fossil fuel and its correspondence with the produced amount of biofuel from waste oil/fat or biomass residues:

(a) If the biofuel is produced from waste oil/fat or biomass residues the produced amount of biofuel from these sources is recorded by a periodically calibrated metering system;

(b) If the biofuel is produced from feedstock cultivated in dedicated plantations, the produced amount of biofuel from feedstock from dedicated plantations is recorded by a periodically calibrated metering system;

(c) The amount of biofuel produced from waste oil/fat, biomass residues, or from feedstock from dedicated plantations transported to the storage of the blender is recorded by a calibrated metering system at the point of filling the (road) tankers and at the point of delivery at the blender site;

(d) During the process of creating the biofuel blend at the blending station, the blending operation shall be monitored to assure adequate mixing of the products in the specified proportions. This includes measuring and recording the volumes and blend levels as verified through bills of lading, meter printouts or other auditable records of both the biofuel and fossil fuel, which comprise the blended biofuel;

(e) Contractually the biofuel producer has to monitor consumption by the consumer as follows:

(i) The receiving amount of blended biofuel in the gas station or final distributor has to be recorded by a calibrated metering system and the storage fill level is recorded by a calibrated filling level indicator;

(ii) For stationary installations, the amount of the blended biofuel filled into the installation where combustion takes place must be recorded by a calibrated metering system;

(iii) If blending is done by a third party contractual arrangement shall be made, that the receiving amount of biofuel at the blending facility has to be recorded by a calibrated metering system and the storage fill level is recorded by a calibrated filling level indicator.

3.5 Non-Permanence Risk Analysis

Not applicable for the present project activity.

4 VERIFICATION FINDINGS

4.1 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the Joint VCS PD & MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the Joint VCS PD & MR.
Findings	CAR 06 has been raised and resolved successfully.
Conclusion	The verification team has reviewed the emission reduction (ER) spread sheet and checked all the formulae and verified them to be correct and in line with the monitoring plan of the registered PDD and the applied monitoring methodology. All the monitored parameters are described above in section 3.4. All the ex-ante parameters which are used in the calculation of emission reduction are presented in section 6.1 of the PD & MR transparently. It is confirmed that all the ex-ante parameters have been correctly used in the emission reduction calculation. **Baseline Emissions: -** The baseline emissions are calculated as follow: $$BF_y = \left[min\left\{ \left(P_{BF,y} - P_{BF,on-site,y}\right); \left(\sum_i f_{PJ,i,y} \times C_{BF,i,y} \right) \right\} - P_{BF,other,y} \right] \times \left(\frac{\sum_i C_{BF,i,y} \times \left(\frac{f_{PJ,i,y} - f_{reg,y}}{f_{PJ,i,y}} \right)}{\sum_i C_{BF,i,y}} \right)$$ $BF_{,Y}$ = 22,943.126 tons Thus, $BE_y = BF_y \times NCV_{BF,y} \times EF_{CO2,FF}$ BEy = 22,943.1× 38.4 ×0.0741 = 65,283 tCO_2e **Project Emissions: -** The Project emissions are calculated as follow: $PE_y = PE_{Biomass,y} + AF_{1,y} \times PE_{MeOH}$ $PE_{Biomass,y}$ = 0 $AF_{1,y}$ = 0.938,

PE_{MeOH} = 5,092.390

PE_y = 0 + 0.938 ×5,092.390

PE_y = 4,777 tCO_2e (Round up value)

Leakage Emissions

LEy = 7,250.939+ 0 – 4,620,048

LEy = 2,631 tCO_2e

Hence,

$ER_Y = (BE_Y - PE_Y - LE_Y)$

ER_Y = 65,283 - 4,777 – 2,631

ER_Y = 57,874 tCO_2e (Round down)

The verification team has checked the supporting documents for the monitoring period as per the project activity applied for verifications and found all the parameters are monitored and recorded as per the monitoring plan in the Joint VCS PD & MR. The verification team has crosschecked the emission reduction sheet and monitoring report data.

TUV SUD checked the ER sheet and found the below summary of project wise emission reductions for each vintage, correct and in line with applied methodologies.

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-Sept.-2020 to 31-Dec.-2020	6,726	853	819	5,053
01-Jan.-2021 to 31-Dec.-2021	43,726	3,125	1,649	38,952
01-Jan.-2022 to 31-March-2022	14,831	799	163	13,869
Total	**65,283**	**4,777**	**2,631**	**57,874 (Round down)**

4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the on-site inspection, the location of all relevant meters of the project is also checked through google maps and commissioning certificates.
Findings	No findings were raised.
Conclusion	• Records were submitted by the project proponent as evidences to determine emission reduction; • The records, data and information provided were found valid for the current verification period. The documents were verified during on-site assessment and when possible, were checked directly from its source; • Interviews were performed during on-site audit with involved personnel and PP's representatives; • The GHG emission reduction calculations were check step by step with PP's representatives; - the quality of evidences was found of adequate level by the verification team to ensure an accurate quantification of the emission reductions. • The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the remote audit. • On-site audit and interview with site personnel also confirms that the operational and organizational chart as mentioned in registered CDM PDD is as per the site practice and thus assessment team confirms that the details are correct. •

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5 VALIDATION AND VERIFICATION OPINION

Validation Conclusion: - *TÜV SÜD South Asia Pvt. Ltd.* has been engaged by "**Kotyark Industries Limited"** to perform the Joint validation and verification of the "**Biodiesel Project by Kotyark Industries Limited.**"

The management of the project participant/owner is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set

out within the project's Monitoring Plan in the Joint VCS PD & MR and the approved methodologies; ACM0017, Ver. 4.0

Our Validation approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board and VCS board. Our approach is risk-based, drawing on an understanding of the risks associated with estimated GHG emissions data and the controls in place to mitigate these. The validation can confirm that:

- The projects description compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline v.4.3 and standard version 4.4.
- The project's baseline and additionality are assessed against "ACM0017, Ver. 4.0"
- The project's monitoring plan is assessed against "ACM0017, Ver. 4.0"

A risk-based approach has been followed to perform this validation activity. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews with Project Owner have provided TUV SUD with sufficient evidence for positive validation opinion as per the requirement of VCS.

The project is expected to generate 1,668,611 tCO_2e during the length of entire crediting period (15-September-2020 to 14-September-2027).

Verification Conclusion: -

Our Verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that

- The project is operated as planned and described in the project document;
- The monitoring plan is as per the applied methodology;
- The monitoring process in Monitoring Report is as per the joint PD & MR.
- The development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- The installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately
- The monitoring system is in place and generates GHG emission reductions data;
- The GHG emission reductions are calculated without material misstatements.
- No limitation observed for the present verification

Verification period: 15-September-2020 to 31-Marchl-2022 (first and last date included) Verified GHG emission reductions and removals in the above verification period.

Year	Baseline emissions or removals (tCO2e)	Project emissions or removals (tCO2e)	Leakage emissions (tCO2e)	Net GHG emission reductions or removals (tCO2e)
15-Sept.-2020 to 31-Dec.-2020	6,726	853	819	5,053
01-Jan.-2021 to 31-Dec.-2021	43,726	3,125	1,649	38,952
01-Jan.-2022 to 31-March-2022	14,831	799	163	13,869
Total	**65,283**	**4,777**	**2,631**	**57,874**

TUV SUD checked the calculation in ER sheet and confirmed that estimated ER is calculated using the unitary method. The daily VCUs generation is calculated using the ratio of annual average generation of the commissioned plant by the number of days in a year, then the calculated daily VCUs generation is multiplied with the monitoring duration of the project.

Assessment of Ex ante emission reduction with actual emission reduction achieved in the current monitoring period:

Ex-ante emissions reductions/removals	Achieved emissions reductions/removals	Percent difference	Justification for the difference
367,682 tCO_2e	57,874 tCO_2e	- 84.26 %	The achieved emissions reductions are less in comparison to ex ante emissions reductions during the current monitoring period due to less market demand and Indian transporters hesitate to adopt[17] it. Oil manufacturing companies purchase biodiesel from producers based on

[17] https://www.thehindubusinessline.com/economy/logistics/biodiesel-a-renewable-environment-friendly-fuel-faces-slow-adoption-in-india/article67318323.ece#:~:text=India's%20annual%20biodiesel%20consumption%20grew,140%20million%20litres%20in%202021.

			market demand & requirement.

APPENDIX 1: DOCUMENTS REVIEW UNDER VALIDATION & VERIFICATION

No.	Author	Title	References to the document	Provider
1.	NA	Consent to Operate	Consent to Operate issued by Rajasthan State Pollution Control Board.	Project participant
2.	TÜV SÜD South Asia	Contract of the PP with the DOE	Contract of the PP with the DOE	Project participant
3.	NA	Technical specifications	Technical specifications Of Bio-diesel plant from manufacturers	Project participant
4.	NA	Draft Joint VCS PD&MR Version 01 Revised Joint VCS PD&MR Version 06	19-April-2022 07- November-2023	Project participant
5.	NA	Emission Calculation sheet- version 01- Estimated ER Emission Calculation sheet- Version 04- Estimated ER	19-April-2022 07- November-2023	Project participant
6.	NA	Reference link is provided.	Ministry of Petroleum and Natural Gas https://mopng.gov.in/en/page/11 2 Tax Rates.pdf (incometaxindia.gov.in) UNFCCC www.cdm.unfccc.int Income tax act 1961 http://law.incometaxindia.gov.in/DI T/ VCS: Verified Carbon Standard www.v-c-s.org	Independent Search

7.	NA	Tools/ guidelines used in the project activity	UNFCCC CDM web site • CDM Tool 1: "Tool for the demonstration and assessment of additionality": Version 07.0.0 • CDM Tool 15 "Tool for Upstream leakage emissions associated with fossil fuel use": Version 02.0 • CDM Tool 24: "Common practice", Version 03.1 • CDM Tool 25: "Apportioning emissions from production processes between main product and co and by-product": Version 03.0 • CDM Tool 27: "Investment analysis" Version 12.0 • UNFCCC Methodology: ACM0017, ver. 4.0 • Glossary of CDM terms version 07 • VCS joint validation and verification report template Version 4.2	UNFCCC
9.	NA	VCS Declaration	Declaration from PP for Participation under Other GHG Programs	Project participant
10.	NA	Calibration Certificate	Weight Calibration certificate	Project participant
11.	NA	Sale Invoice	Sales invoices of bio-diesel	Project participant
12	NA	DPR Copy	Detailed Project Report	Project participant
13	NA	National policy	The National Biofuel policy, 2018	Project participant
14	NA	Declaration	Declaration certificate mentioning that the VCUs will only be issued to the producer of biodiesel	Project participant
15	NA	Declaration certificate	Declaration certificate from consumers	

APPENDIX 2: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS, FORWARD ACTION REQUESTS (CAR/CL/FAR)

Table 1. Remaining FAR from previous verification

FAR ID	NA	**Section no.**		**Date :**
Description of FAR				
NA				
Project participant response				**Date:** DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				**Date:** DD/MM/YYYY

Table 2. CL from this validation and verification

CL ID	01	**Section no.**	1.1, 1.2	**Date :** 14-Sept-2022
Description of CL				
1. PP shall provide copy of commissioning certificate. 2. PP shall clarify why latest version of applied methodology has not been referred. 3. The copy of factory License provided, mentions that the license will remain in force till 31/03/2021 but in the same license, date of expiry of the license is 31/03/2020, which is contradictory, please clarify 4. PP shall also provide copy of no ODA certificate				
Project participant response				**Date :** 30-Jan-2023
1. Consent to operate by Rajasthan State Pollution Control Board and 1st invoice of sell of bio diesel are submitted hereby to substantiate commissioning date. 2. An old version of the methodology was referred as an editorial error; the PDMR has now been updated to reflect the most recent version of the methodology ACM0017: Production of biofuel", Version 04.0. 3. The Factory License was received on 31/03/2019 which was valid till 31/03/2021; further before the due date of the license, the request for the renewal has been applied and got renewed on 03/03/2021 which will be valid till 31/03/2030. 4. The No ODA certificate submitted hereby.				
Documentation provided by project participant				
Consent to operate. 1st invoice of sell of bio diesel. Declaration certificate. PDMR version 4.				

DOE assessment	Date: 27-Feb-2023
1. PP has now submitted the consent to operate certificate from Rajasthan State Pollution Control Board which mentioned the validity period from 28/03/2019 to 29/02/2024. Assessment team has cross checked with 1st invoice of sell of bio diesel and found correct. 2. PP has now updated the methodology ACM0017, Version 4.0 in the revised version 04 of PDMR. Hence okay. 3. PP has submitted the renewed licence valid till 31/03/2030. Hence okay. 4. PP has provided NO ODA declaration dated 22/08/2022. Hence accepted. **Hence, CL#01 is closed.**	

Table 3. CAR from this validation and verification

CAR ID	01	Section no.	1.1, 1.2	Date: 14-Sept-2022
Description of CAR				
1. In sec. 1.1 of PDMR, project location is missing in line with template of VCS PDMR 2. In sec. 1.2, latest version of applied methodology not referred and version of VCS programme standard is also not latest throughout the PDMR.				
Project participant response				**Date:** 30-Jan-2023
1. The project location has been updated in the sec.1.1 as per template VCS PDMR version 4.2. 2. Sec 1.2 and whole PDMR has been updated throughout as per latest version methodology "ACM0017 :Production of biofuel", Version 04.0.				
Documentation provided by project participant				
1. PDMR version 4.				
DOE assessment				**Date: 27-Feb-2023**
1. It has been found that the submitted PDMR is in track change mode under old version 4.1. PP shall revise and transfer the PDMR in latest version of PDMR template. 2. PP has updated the version of Applied methodology. It is noted that the VCS standard is not referred the latest version in section 1.3 of the PDMR. Hence, CAR#01 is open.				
Project participant response				**Date:** 09- March -2023
1. The PDMR has been revised as per latest version of PDMR template i.e., Joint Project Description & Monitoring Report: VCS Version 4.2. 2. The section 1.3 of the PDMR has been updated according to VCS standard version 4.4.				
Documentation provided by project participant				
1. PDMR version 5.				
DOE assessment				**Date:10-Mar-2023**
1. PP has now revised the PDMR template as per latest VCS version 4.2. 2. The PDMR has been updated as per VCS standard version 4.4. Hence okay. **Hence, CAR#01 is closed.**				

CAR ID	02	Section no.	2.2	Date: 14-Sept-2022
Description of CAR				

1. Sec. 1.18 of PDMR is incomplete. PP shall complete this section in line with template for filling VCS PDMR
2. PP has not provided any details regarding local stakeholder consultation in sec. 2.2 of PDMR. PP shall provide all the supporting documents of LSC conducted (copy of invitation, MoM, Summary of comments received etc.)
3. In sec. 2.3 of PDMR, PP shall provide description, why EIA is not required and exempted from environmental clearance process.
4. In sec. 2.4 of PDMR, PP shall provide the web link of VERRA website and provide the details if listing period is over

Project participant response	**Date:** 30-Jan-2023

1. Sec. 1.18 of PDMR has been updated as per template VCS PDMR version 4.2.

2. Local stake holder consultation details have been updated in sec. 2.2 of PDMR and all the supporting documents has been submitted with the responses.

3. As the Bio diesel projects are not listed in any of the categories in the Schedule under MOEFCC, the project is considered environmentally safe and also as per regulations in Host Party (India) no EIA is required and accordingly section 2.3 of PDMR has been updated.

4. The project was listed at the VCS website from 05-July- 2022 to 04-August-2022 so listing period got over on 04-August-2022 and same can be crosschecked from the web link of VERRA website https://registry.verra.org/app/projectDetail/VCS/3095 .

Documentation provided by project participant

1. Copy of invitation, MoM and attendance of LSH meeting.
2. PDMR version 4.

DOE assessment	**Date: 27-Feb-2023**

1. PP has now updated the Sec 1.18. of PDMR though it has been found that the submitted PDMR is in track change mode under old version 4.1. PP shall revise and transfer the PDMR in latest version of PDMR template.
2. PP has now provided details of Local stakeholder consultation in sec 2.2 of the revised version 04 of PDMR. All the supporting documents have been provided which has been checked by the assessment team and found correct.
3. PP has now given the explanation and revised the section 2.3 of the PDMR. VVB team has checked the same and confirmed.
4. PP has now provided the web link of VERRA in section 2.4 of the revised PDMR. Hence okay.

Hence, CAR#02 is open.

Project participant response	**Date:** 03- March -2023

1. The PDMR has been revised as per latest version of PDMR template i.e. Joint Project Description & Monitoring Report: VCS Version 4.2.

Documentation provided by project participant

1. PDMR version 5.

DOE assessment	**Date:10-Mar-2023**

1. PP has now updated the latest version 4.2 of PDMR template. Hence okay.

Hence CAR#02 is closed.

CAR ID	03	**Section no.**	2.2	**Date:** 14-Sept-2022

Description of CAR

1. PP shall update the section 3.1 in line with latest version of applied methodology and corresponding tools.

2. Sec. 3.4 of PDMR need to be revisited. PP is requested to establish most plausible baseline scenario based on latest version of methodology and provide appropriate justification for selection of most plausible scenario in the absence of project activity. PP has referred some Chinese reports and FSR to justify the scenarios which seems to be incorrect.
Project participant response **Date:** 30-Jan-2023
1. Section 3.1 of PDMR has been updated as per latest methodology "ACM0017: Production of biofuel", Version 04.0 and corresponding tools. 2. In section 3.4 Baseline scenarios have been revised and justified in VCS PDMR version 4 as per version 4.0 of methodology ACM0017 (Production of biofuel).
Documentation provided by project participant
1. PDMR version 4.
DOE assessment **Date: 27-Feb-2023**
1. PP has now updated the versions of applied methodology ACM0017, ver 04 and applied tools in the revised PDMR. Hence okay. 2. PP has now provided baseline scenario based on latest version of methodology. **Hence, CAR#03 is closed.**

CAR ID	04	Section no.	3.2	Date: 14-Sept-2022
Description of CAR				
Declaration from PP regarding participation in other trading / GHG programs, rejection under other GHG program etc. is missing. PP requested to submit the same.				
Project participant response				**Date:** 30-Jan-2023
1. Declaration certificate regarding participation in other trading / GHG programs, rejection under other GHG program etc. is submitted with the responses.				
Documentation provided by project participant				
1. Declaration certificate.				
DOE assessment				**Date: 27-Feb-2023**
1. PP has now submitted the declaration certificate. **Hence, CAR#04 is closed.**				

CAR ID	05	Section no.	3.3.5	Date: 14-Sept-2022
Description of CAR				
1. In sec. 3.5, PP need to include detailed calculation of NPV which has been chosen as financial indicator along with supporting for input parameters 2. PP shall also provide common practice analysis along with supporting documents/ references which is missing in VCS PDMR 3. Excel spread sheet for financials is also not appropriate and with discrepancies. PP shall provide corrected spread sheet				
Project participant response				**Date:** 30-Jan-2023
1. Section 3.5 has been updated and calculation of investment analysis has been included in the PDMR and revised investment analysis sheet has been submitted along with responses. 2. Common practice analysis data has been updated in VCS PDMR and supporting documents of common practice analysis is submitted with the responses. 3. Revised investment analysis sheet is submitted with responses.				
Documentation provided by project participant				

1. CPA sheet
2. Revised investment analysis sheet.

DOE assessment	Date:27-Feb-2023

1. PP has revised the 3.5 section and now chosen IRR as financial indicator. The section has indicated the input parameters but did not provide the supporting for the same. Hence PP need to clarify.
2. In common practice analysis, PP need to clarify how the steps has justified. PP shall provide the document/reference for Nall in CPA sheet.
3. PP has now provided the updated and revised investment analysis sheet. VVB team has checked and confirmed the same.

Hence, CAR#05 is open.

Project participant response	Date: 03- March -2023

1. The supporting documents of IRR sheet has been provided with the responses to clarify the input parameters.
2. The steps have been justified on summary sheet of CPA and since no bio diesel project registered in CDM or any other standard therefore $N_{biodiesel} = N_{all}$.

Documentation provided by project participant

1. DPR
2. CPA sheet

DOE assessment	Date:10-Mar-2023

1. PP has now provided supporting documents for equity IRR input parameters.
2. PP has submitted the summary sheet and explained the justification for common practise analysis.

Hence, CAR #05 is closed now.

CAR ID	06	Section no.	3.4.6	Date: 14-Sept-2022

Description of CAR

1. Data and Parameters mentioned in Section 5.1 and 5.2 is not in line with the applied methodology ACM0017 Version 4.0. Sec. 5.1 and 5.2 to be revisited in line with applied methodology
2. Estimation GHG reductions in sec. 4.4 is not in line with estimated ER sheet
3. PP need to revisit the section 5.3 and provide description of monitoring plan specific to the project
4. PP requested to submit all supporting documents for all the monitoring parameters and monitored values of the project activity to assessment team along with the calibration certificates of all the measuring equipment/ meters applicable to the monitoring period.
5. Sec. 6.0 which provides calculation and estimation of actual GHG reduction achieved during current monitoring period is also incomplete and calculations provided for emission reductions not consistent with ER spread sheet.

Project participant response	Date: 30-Jan-2023

1. Data and parameters mentioned in Section 5.1 and 5.2 (now sec.6.1 and 6.2 as per template VCS PDMR version 4.2) have been reviewed and all applicable parameters as per latest methodology “ACM0017: Production of biofuel”, Version 04.0 has been included.

2. GHG reductions in sec. 4.4 (now sec.5.4 as per template VCS PDMR version 4.2) has been revised as per estimated ER sheet and revised ER sheet has been submitted with responses.

3. Monitoring plan has been updated in section 5.3 (now sec.6.3 as per template VCS PDMR version 4.2) of PDMR specific to biodiesel project activity. 4. All supporting documents for all the monitoring parameters and monitored values relevant to the project activity along with calibration certificate is submitted with responses.   5. Actual GHG reductions data and calculations has been updated in section 6.0 (Sec. 7.0 as per template VCS PDMR version 4.2) as per revised actual ER spread sheet.
Documentation provided by project participant
1. Revised estimated ER sheet. 2. Revised actual ER sheet. 3. Calibration certificate of Weigh Bridge. 4. Test Report - Biodiesel. 5. PDMR version 4.
DOE assessment — **Date**: 03- March -2023
1. PP has now updated the data and parameters in Sec 5.1 and Sec 5.2 in line with methodology ACM0017 Version 4.0. Hence okay. 2. PP has revised the Estimation GHG reductions as per estimated ER sheet and same been checked by assessment team. Hence okay. 3. PP has now revised and updated the monitoring plan as per comments. VVB has checked and confirmed. 4. PP has submitted the supporting documents for all parameters which are checked and found correct. 5. The value of baseline emission and project emission provided in section 7 is not consistent with the actual ER sheet. **Hence, CAR#06 is open.**
Project participant response — **Date:** 03- March -2023
1. section 7 of PDMR has been updated as per actual ER sheet.
Documentation provided by project participant
1. PDMR version 5.
DOE assessment — **Date**: 10-March-2023
1. PP has now revised section 7 as per actual ER sheet. **CAR #06 is closed.**

Table 4.FAR from this validation and verification

FAR ID	**Nil**	**Section no.**		**Date:** 14-Sept-2022
Description of FAR				
No FAR is raised				
Project participant response				**Date:DD/MM/YYYY**
Documentation provided by project participant				
DOE assessment				**Date:DD/MM/YYYY**