PERRY JOHNSON REGISTRARS

Carbon Emissions Services, Inc.

VALIDATION REPORT

IOT MABAGAS LIMITED

IOT MABAGAS LIMITED POWER PLANT, PUDHUCHATRAM IN INDIA

REPORT NO. C-1-I-01-S-0167_VA

REVISION NO: 1.2

PERRY JOHNSON REGISTRAR CARBON EMISSIONS SERVICES, INC
755 W. BIG BEAVER ROAD, SUITE 1380, TROY, MI 48084

VALIDATION REPORT

Date of first issue:	Project No:
19 October 2011	C-1-I-01-S-0167
Approved by and date:	**Organisational unit:**
Bilal Anwar (13 November 2012)	PJRCDM (India) Pvt Ltd, Bangalore
Client:	**Client ref.:**
IOT Mabagas Limited	Mr. Beer Ali

Project Name:	IOT Mabagas Limited power plant, Pudhuchatram	
Country:	India	
Methodology:	AMS I.D	AMS III.AO
Version:	17	01
Sectoral Scope:	01	13
Project Type and Technology:	Renewable Energy Projects	Waste handling and disposal
ER estimate:	22,355 tCO_2e per annum	

Size

☐ Large Scale
☒ Small Scale

Validation Status

☒ Corrective Actions Requested
☒ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is PJRCES's opinion that the "IOT Mabagas Limited power plant, Pudhuchatram" in India, as described in the PDD version5.2 dated "03 November 2012", meets all relevant UNFCCC requirements for the CDM, all relevant host country criteria and correctly applies the baseline and monitoring methodologies AMS-I.D version17 and AMS-III.AO version 01. DOE thus, requests the registration of the project as a CDM project activity.

Report No.:	Date of this revision:	Rev. No.
C-1-I-01-S-0167_Va	8 November 2012	1.2

Report title:

IOT Mabagas Limited power plant, Pudhuchatram in India

Work carried out by:

Team Leader : Ms. Mathsy Kutty
Team Member : Mr. Chirag Gajjar
Team Member : Mr. Ajay Verma
Financial Expert : Ms Anuradha.S.
Technical Expert : Mr. Shailendra Jain

Work verified by:

S. Sathis Kumar
Dr. Chakradhar

Key words:

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ABBREVIATIONS

BAU	Business as usual
BM	Building Margin
BM	Build Margin
BSE	Bombay Stock Exchange
CAGR	Compound annual growth return
CAPM	Capital Asset Pricing Model
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CHP	Combined Heat & Power
CL	Clarification request
CM	Combined Margin
CM	Combined Margin
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DPR	Detailed Project Report
EB	Executive Board
EIA	Environmental Impact Assessment
EPA	Energy Purchase Agreement
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IML	IOT Mabagas Limited
IPCC	Intergovernmental Panel on Climate Change
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MAT	Minimum Alternate Tax
MCF	Methane conversion factor
MoEF	Ministry of Environment and Forests
MP	Monitoring Plan
NCV	Net Calorific Value
NEWNE	Northern Eastern Western and North Eastern
NGO	Non-governmental Organisation
O&M	Operation and Maintenance
ODA	Official Development Assistance

ODA	Official development Assesstance
OM	Operational Margin
OM	Operating Margin
PDD	Project Design Document
PJRCES	Perry Johnson Registrars Carbon Emissions Services, Inc
PLC	Programmable logic controller
PLF	Plant load factor
PP	Project participant
QA	Quality Assurance
QC	Quality Control
RBI	Reserve Bank of India
r_f	Risk free return
r_m	Market Return
SSC	Small Scale CDM
TANGEDCO	Tamil Nadu Generation and Distribution Corporation Ltd
TEDA	Tamil Nadu Energy Development Agency
TNAU	Tamil Nadu Agricultural University
TNEB	Tanil Nadu Electricity Board
TNERC	Tamil Nadu Electricity Regulatory Commission
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation & Verification Manual versio01.2
β	Beta
□	Efficiency Symbol
ρ	Density Symbol

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1 INTRODUCTION

The IOT Mabagas Limited (hereafter called Project participant (PP) or IML), has commissioned Perry Johnson Registrars Carbon Emissions Services, Inc[1] (then PJRCDM (India) Pvt. Ltd) hereafter called PJRCES or DOE)) to perform a validation of the IOT Mabagas Limited power plant, Pudhuchatram project in India (hereafter called "the project").

This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting and other relevant rules, including the host country legislation and sustainability criteria.

UNFCCC criteria refer to:

- Article 12 of the Kyoto Protocol,
- The CDM modalities and procedures
- The simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

1.1 OBJECTIVE

Purpose of this validation is to have an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of Article 12 of the Kyoto Protocol;
- the CDM modalities and procedures as agreed in the Marrakesh Accord under decision 17/CP.7;
- the annex to the decision: the simplified modalities and procedures for small scale subsequent decisions made by CDM Executive Board, decision 4/CMP.1, annex II
- Other relevant rules, including the Host Country legislation and sustainability criteria.

The above requirements are validated, in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 SCOPE

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan which are included in the PDD and other relevant supporting documents.

[1] The DOE accreditation has been shifted from Perry Johnson Registrars Clean Development Mechanism, Inc. to Perry Johnson Registrars Carbon Emissions Services, Inc. in due course of validation

The scopes of the validation are defined as below:

- The Kyoto Protocol, in particular § 12 and modalities and procedures for the CDM
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions and specific guidance by the EB published under http://cdm.unfccc.int
- Guidelines for Completing the Simplified Project Design Document (CDM-SSC-PDD), and the Proposed New Small Scale Methodologies (CDM-SSC-NM)
- Baselines and monitoring methodologies (including GHG inventories)
- Management systems and auditing methods
- Environmental issues relevant to the sectoral scope applied for
- Applicable environmental and social impacts and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

The information included in the PDD and the supporting documents have been reviewed against the requirements and criteria mentioned above and the QMS of PJRCES. The validation team has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consultation to the organization(s). However, stated requests for clarifications and/or corrective actions may provide input for improvements of the project design.

2 VALIDATION TEAM AND QUALITY CONTROL

The validation of the project activity has been carried out by qualified personnel in line with the procedures defined in PJRCES's quality manual for validation and team definition. The validation report has undergone a technical review before requesting registration of the project activity. The technical review was performed by an independent technical reviewer.

***Validation team*:**

Name	Qualification	Competency			Task Performed			
		Meth Expert	Technical Area	Host Country Exp.	Desk Review	Site Visit	Report Preparation	Independent Tech. Review
Chirag Gajjar	LV	☒ ☐	☒ ☐	☒	☒	☒	☒	

Ajay Verma	LV			☒		☒		
Mathsy Kutty†	LV & TL	☒	☒	☒	☒	☒	☒	
Anuradha S. Ψ	FE			☒	☒			
Shailendra Jain φ	TE		☒	☒				
Sathis Kumar	ITR	☒ □	☒	☒	NA			☒
Dr. Chakradhar	TE			☒	NA			☒

† Supervision of entire validation process i.e. Desk Review, Site Visit and Report Preparation
Ψ Provided inputs on the Final Validation Report Prepared
φ Provided inputs on Technical Features of the project activity during the validation.
□ For AMS-I.D only & Sector – 01 (TA-1.2 only)

Note:
1) LV – Lead Validator, TL – Team Leader, FE – Financial Expert, TE – Technical Expert, ITR – Independent Technical Reviewer
2) DR – Desk review of PDD and documents, SV – Site Visit, RP – Final Report Preparation.
3) Technical Expert involved has the required Host country knowledge

3 METHODOLOGY OF VALIDATION

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using PJRCES's internal procedures.

The validation of the project activity is carried out in the following phases:
- Desktop review of project design document (PDD) and other relevant documents
- Follow up interviews (site visits) with the relevant stakeholders
- Resolution of the identified corrective action requests (CARs), clarification requests (CL) and forward action requests (FARs) if any, followed by the issuance of the final validation opinion and final validation report.

3.1 DESK REVIEW

The desktop review includes:
- A review of the PDD (including annexes) and the relevant supporting documents. The detailed list of documents reviewed throughout the validation process, are included in the section 7, under references.
- Preparation of project specific validation protocol in line with the requirements of the validation and verification Manual
- Background investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders.
- Reporting of validation findings taking into account the public comments received on UNFCCC website

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements that a CDM project is expected to meet;
- It ensures a transparent validation process where the independent entity will document how a particular requirement has been validated and the result of the determination.

The validation protocol consists of three tables: Table 1 (Mandatory Requirements);

Table 2 (Requirement checklist); and Table 3 (Resolution of corrective Action and clarification request) as described in below

The completed validation protocol is enclosed in Appendix A to this report identifying Corrective Action Requests and clarification Requests.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*

Validation Protocol Table 2: Requirement checklist			
CDM Validation requirement	***Remarks***	***Evidence***	***Conclusion***
The various requirements as per para 37 of the CDM modalities and procedures, in line with the validation and verification manual version01.2	*Explains how conformance with the checklist question is investigated. Examples of means of validation are document review (DR) or interview (I). N/A means not applicable*	*The various sources that are referred to ascertain compliance to checklist questions.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*

Validation Protocol Table 3: Resolution of issues identified in Table 2			
Draft report clarifications, corrective action requests and forward action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a CAR, FAR or a CL, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the CAR, FAR or CL is explained.*	*The responses given by the project participants during the communications with the validation team should be summarized in this section.*	*This section should summarize the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

3.2 FOLLOW-UP INTERVIEWS

Qualified validation team of PJRCES conducted physical site inspection of the project activity between 07 September 2011 and 08 September 2011 to Namakkal, Tamil Nadu.

On 07 & 08 September 2011, PJRCES performed interviews with project participants to confirm selected information and to resolve issues identified in the document review.

IOT Mabagas Limited (Project participant, IML), Do-Inc (CDM Consultant) and local stakeholders were interviewed.

The main topics of the interviews are summarised in the table below.

Table 1: List of Interviewed persons /01/

Sl. №	Date	Name	Organization	Topic
01	07 and 08 September 2011	Krishnan Rajagopalan Chief Manager – B.D.	IOT Mabagas Limited	➲ Prior CDM Consideration. ➲ Financials of the project activity. ➲ Environmental compliance. ➲ Estimated emission reductions. ➲ Project additionality. ➲ Stakeholder consultation process. ➲ Technology applied and operational lifetime. ➲ Monitoring and reporting procedures presented in PDD. ➲ Calibration, internal audit and corrective action procedures. ➲ Provision for training, operation and maintenance.
02	07 and 08 September 2011	Geert Eenhoorn (CDM Consultant)	Do-Inc	
03	07 and 08 September 2011	K Ramesh Kumar (Poultry Farm Owner)	Ratham Farms Feeds	➲ Local Stakeholder consultation meeting topics. ➲ Supply of Poultry Litter and other conditions of poultry farms

Furthermore, interactions with Mr. Geert Eenhoorn & Mr. Lucas Koolschijn from Do-Inc (CDM consultant for the project), Mr. Beer Ali & Mr. Krishnan Rajagopalan and Starch and Sugar industries were used to confirm selected information and to resolve issues identified during the document review.

3.3 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to PJRCES's positive conclusion on the project design. In order to ensure transparency, a validation protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified.

Corrective action requests ***(CAR)*** are issued, where:

i) Mistakes have been made with a direct influence on project results;
ii) CDM and/or methodology specific requirements have not been met; or
iii) There is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification ***(CL)*** may be used where additional information is needed to fully clarify an issue.

Additionally, a forward action request ***(FAR)*** may be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. The FARs so identified however, shall not relate to the CDM requirements for registration.

The main changes between the PDD version01.5 dated 30 June 2011 webhosted on the UNFCCC website and the final PDD version5.2 dated 03 November 2012 are as provided below:

Table 2: Changes in the final PDD version5.2[/02/] as compared to PDD version01.5[/03/] published for global stakeholder consultation

Sl. №	Parameter	PDD version01.5 dated 30 June 2011 as compared to Final PDD version5.2 dated 03 November 2012
01	Description of the small-scale project activity	➲ The webhosted PDD version 01.5 did not provide clarity on the pre and post project scenarios. The same is now transparently provided in the final version5.2 of the PDD.
02	Technology/ measures of the	➲ The webhosted PDD version 01.5 did not provide clarity on the technology/measures employed by the project activity.

	small-scale project activity	➲ In the final version 5.2 of the PDD, the same is now transparently provided. It also includes the description of the various components of the project activity. It is now clearly described that the Mabagas International, which is the parent company of IML, provides the process know-how.
03	Applicability of Methodology AMS-III.D[2]	➲ Webhosted PDD version 01.5 applied AMS-III.D version17/07/. During the site visit it was confirmed that the project activity is co-digestion of Poultry Litter, Waste water from Starch industry, Press mud from Sugar Industry and Cow dung. Hence, as per AMS-III.D version17 applicability condition no. 3, PP could not apply this methodology, given the project design. The same was brought to PP's attention during the validation and subsequently in-line with guidance available at paragraph 40 (a) and (b) of the modalities and procedures for the CDM and paragraph 92 of EB25, the amended PDD version02.2[3] with AMS III.AO, was made publically available for a period of 30 days. ➲ The final version5.2 of the PDD uses the latest version01 of AMS-III.AO and its applicability conditions have been justified.
04	Project boundary	➲ Webhosted PDD version 01.5 wrongly applied AMS-III.D version17 to define the project boundary. The same is now correctly defined in-line with para11 of AMS-III.AO version01 in the final PDD version5.2.
05	Tool to calculate the emission factor for an electricity system[4]	➲ Webhosted PDD had applied the "*Tool to calculate the emission factor for an electricity system version02.2*", which was valid till 28 May 2012. Subsequent to which the tool was revised and now the final version5.2 of the PDD is consistent with latest version2.2.1 of the tool.
06	Demonstration of Additionality	➲ In the web hosted PDD version 01.5, PP referred to Attachment A to Appendix B/14/ for demonstration of additionality. ➲ In the final version5.2 of the PDD, PP has referred to "Non-binding best practice examples to demonstrate additionality for SSC project activities", EB35, Annex34/15/ for demonstration of additionality. The same is in-line with the paragraph 7(a) of the "General Guidelines to SSC CDM methodologies" (version17) and thus acceptable. ➲ PP also, included a brief description on the parameters such as Beta, Risk free rate, market return, market risk premium & Cost of equity in the final PDD version5.2, which was missing in the web hosted PDD version01.5. ➲ Justification for selection of period for BETA calculations and use of levered BETA to ascertain conservativeness resulted in the revised value of the benchmark.

[2] https://cdm.unfccc.int/methodologies/DB/0IB37O8ROJ5JRJXIUWQAJRCDUFKJP2/view.html
[3] https://cdm.unfccc.int/Projects/Validation/DB/G3WO8B7ORRKL2GC0109MBN4AF65MCF/view.html
[4] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf/history_view

07	Value & justification of "Benchmark" for post-tax *equity* IRR.	➲ Value of benchmark has been revised to 13.42% in the final version 5.2 of the PDD from 15% in the webhosted PDD version 01.5. ➲ In the web hosted PDD PP had wrongly used internal company benchmark of 15%. Since, the project activity can also be developed by entity other than the PP and hence, use of internal company benchmark is not in-line with para14 of investment guidelines. In the final version 5.2 of the PDD, PP followed para15 of the investment guidelines and calculated expected return on equity using Capital Asset Pricing Model (CAPM). The details of the same have been provided in the section 4.8.3.1 of this report.
08	Value of post-tax *equity* IRR	➲ The value of IRR has been revised to 6.71% in the final PDD version5.2 from 12.67% in the web hosted PDD version01.5. The main reasons for change in the IRR value are revision in the capital cost considered by PP as per the investment decision[/55.2/] revision in O&M cost & fertilizer revenue as per the DPR[/25/] applicable for the project activity and interest on shareholders loan which was not considered in the initial analysis. The detailed discussion on the IRR is provided in section 4.8.3 of this report.
09	Chronology of events	➲ The webhosted PDD version01.5 did not discuss the chronology of events to demonstrate the prior-CDM consideration. ➲ The same is now transparently described in the final PDD version5.2. The details on the prior CDM consideration is given in section 4.8.1 of this report.
10	Scenarios under which IRR crosses benchmark	➲ Scenarios under which IRR crosses benchmark were not identified in the PDD version01.5. ➲ The same now have been aptly justified in line with para21 of Investment guidelines in the final PDD version5.2. The details of the same are given in section 4.8.3.4 of this report.
11	Operational and management structure for monitoring	➲ The operational and management structure was ambiguously defined in the web hosted PDD version 01.5. The same is now transparently defined in the final PDD version 5.2 to reflect the responsibility at each level.

4 VALIDATION FINDINGS

The details of the assessment and the main results have been described below in accordance with the VVM reporting requirements. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

4.1 PARTICIPATION REQUIREMENTS

The section A.3 and Annex 1 of PDD identifies IOT Mabagas Limited (IML) as the project participant from the host Party India. Netherlands has been identified as Annex I Party and Mabanaft Carbon B.V. has been identified as project participant from the Annex I Party.

Keeping in view the requirements of Validation and Verification Manual version 01.2, PJRCES confirms following that:

Table 3: Participation Requirements

Party	Project Participants	Compliance with VVM version1.2
Host: India	**Private Entity**: IOT Mabagas Limited (IML)	PJRCES received and reviewed the Letter of Approval (LoA)/01.1/ dated 14 September 2012 issued by Ministry of Environment & Forests, Government of India which was submitted by PP and confirms following: ➲ LoA is issued by the DNA[5] of the Party. ➲ The Party has ratified Kyoto protocol on 26 August 2002[6]. ➲ Voluntary participation of the Party. ➲ Confirms that the project activity contributes to the sustainable development of host Party. ➲ Confirms the exact title of the project activity i.e. "IOT Mabagas Limited power plant, Pudhuchatram" ➲ Authorizes Participation of entity "IOT Mabagas Limited (IML)" as project participant. ➲ The Party does not wish to be project participant. ➲ The LoA is not conditional with respect to any versions of the PDD. ➲ There is no doubt with respect to the authenticity of LoA.
Annex I: The Netherlands	**Private Entity**: Mabanaft Carbon B.V.	PJRCES received and reviewed the Letter of Approval/01.2/ dated 02 April 2012 issued by Climate Change, Enterprise and International Affairs, Ministry of Infrastructure and the Environment, The Netherlands which was submitted by PP and confirms following: ➲ LoA is issued by the DNA[7] of the Party. ➲ The Party has ratified Kyoto protocol on 31 May 2002[8]. ➲ Voluntary participation of the Party. ➲ Confirms the exact title of the project activity i.e. "IOT Mabagas Limited power plant, Pudhuchatram" ➲ Authorizes Participation of entity "Mabanaft Carbon B.V." as project participant. ➲ The Party does not wish to be project participant. ➲ The LoA is not conditional with respect to any versions of the

[5] http://cdm.unfccc.int/DNA/index.html
[6] http://maindb.unfccc.int/public/country.pl?country=IN

		PDD. ➲ There is no doubt with respect to the authenticity of LoA.

It was validated by reviewing the financing pattern i.e. debt[/59/] and equity portion (i.e. share holders loan) of the project activity and validation team was able to confirm that the project does not involve public funding. Also the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards India.

4.2 PROJECT DESIGN

PDD template:

➲ PP has used latest template of "*Project Design Document Form (CDM-SSC-PDD) - version03*"[/16/] (latest available at the time of global stakeholder consultation process) for completing the PDD for the project activity. The PP also followed the guidance available in "*Guidelines for completing the simplified Project Design Document (CDM-SSC-PDD) version 05*"[/17/] for completing all the sections of the PDD which is the latest at the time of global stakeholder consultation process.

Project Activity:

➲ The project activity is a Greenfield activity and the same was confirmed during the physical site inspection. The project activity involves collection and utilization of poultry litter, cow dung, press mud and sago water (effluent from the starch industry) to recover biogas and generate electricity in the Namakkal district, Tamil Nadu. The generated electricity is exported to regional grid of Southern Grid. In the pre-project scenario the poultry litter was left for anaerobic decay for period of up to six to nine months leading to methane emissions into the atmosphere. The other sources of the substrate i.e. cow dung, press mud and sago water was left untreated in the pre-project scenario resulting in the environmental pollution[/18/]. Since the extent of the methane emissions from these additional wastes (other than poultry litter) is not explicit, the PP does not intend to claim emission reductions for this portion of biomass residues/substrates digested in the project activity.

➲ All the waste collected by the project activity is pre-mixed and then co-digested anaerobically in two primary digesters and two secondary digesters for recovery of biogas, while the digested slurry is used to produce organic fertilizer[/25/]. Thus, recovered biogas mainly comprises of methane and which is subsequently supplied to two units of Power generators for generation of electricity to the tune of 2.4MW. A project layout drawing has been incorporated in the final PDD version5.2. The same was cross checked by the technical expert of PJRCES and found to be OK.

[7] http://cdm.unfccc.int/DNA/index.html
[8] http://maindb.unfccc.int/public/country.pl?country=NL

- The organic material remaining following the digestion process will be sold to local farmers[19]. In order to ensure that the material resulting from the co-digestion process can be divided into residual waste and leachate FAR#01 (in section 4.5 of this report) have been raised during the course of validation.

- The proposed project activity envisages reducing greenhouse gas emissions through:
  - Capture of methane emitted from the anaerobic treatment of poultry litter; and
  - Using the captured biogas to generate renewable electricity.
  - In cases of emergency, or while the non-operation of the power generation unit, the biogas generated is flared using an enclosed flare.

Technical Specifications:

- The technical specifications of individual components such as primary digesters (2x3200m³), secondary digesters (2x4900m³), power units (2x1.2MW), extruder, enclosed flare, etc have been cross checked by the validation team (including the technical expert) with the original technical specifications given by the technology supplier[20].

Geographical location:

- PJRCES have cross checked geographical coordinates i.e. the latitude and longitude data provided by the PP[21] and found to be appropriate. The same was also cross checked with the Energy purchase agreement[22] between PP and Tamil Nadu Generation and Distribution Corporation Ltd (TANGEDCO) and found to be correct.

Table 4: Location Details

Project Owner	Survey No.	Village	Block	District	Latitude	Longitude
IOT Mabagas limited	52/1, 52/2, 53/1A and 53/2A	Thattayan garpatti	Pudhu chatra m	Namakkal	N11° 23' 29.64"	E78° 10' 41.44"

Expected Annual Power generation:

- The annual expected generation by this project activity is 15,397MWh. The generation has been calculated based on gas engine capacity (1.2 x 2 = 2.4MW), gas engine Plant load factor (PLF-86%), gas engine efficiency (41.39%) and annual operating hours (8,760). PP has used efficiency value as per the third party i.e. "*Green Power International (P) Ltd*" proposal[24]. PP has used the PLF of 86% from the Detailed Project Report (DPR), which is used for bank financing and approved[25]. The same is in-line with guidance available at para-3(a), Annex11, EB48. PJRCES confirms that it has verified the approved DPR during the site visit and document review and hence, acceptable.

Expected Biogas generation:

- The proposed project activity is expected to generate following amount of biogas from

various sources collected.

- The input parameters and calculation of the same have been cross checked with various source documents[/25/28/30/] in order to confirm their correctness and found to be in order. The detailed discussion is given in section 4.7 of this report.

Table 5: Expected Biogas Production[/28/]		
Feedstock	**Input**	**Gas production**
	Tonnes/year	**m³/years**
Chicken litter	37,000	74,00,000
Agri waste	58,000	4,82,000
Cow Dung	1,825	1,02,808
Total		**79,84,808**

De-bundling:

- In accordance with Appendix-C of the "*Simplified Modalities and Procedures for Small-Scale project activities*" PP has demonstrated that there is no CDM project activity or application to register another small scale project activity which is with the same project participants, in the same category and technology/measure, registered within previous 2 years and whose project boundary is within 1km of the project boundary of the proposed small scale activity. The same was also confirmed during the site visit and subsequent interviews with PP. PJRCES also visited the UNFCCC website[9] and confirmed that the proposed project activity is not a de-bundled component of a large project activity.

Based on the vetting of the information provided in the PDD and supporting documents submitted by PP, PJRCES considers the project description to be complete and accurate.

4.3 CREDITING PERIOD AND PROJECT DURATION

- Date of issuance of purchase order for the digesters and gas turbines i.e. 22 July 2011 has been considered as the starting date of the project activity. The same was cross-checked by vetting the original purchase orders[/26/] issued PP. The validation of the purchase orders revealed that start date considered by PP is the earliest date on which PP had committed expenditures for gas engines related to implementation of the project activity and the same can be considered as point of no return towards the project implementation. The same was found to be in-line with the latest guidance available at "*Glossary of CDM terms version 06*"[10].

- The operation life time of plant machinery is considered to be 20 years. The same was cross checked with section 8.7 of the TNERC tariff order dated 27 April 2009[/27/] and found to be in

[9] https://cdm.unfccc.int/Projects/projsearch.html
[10] http://cdm.unfccc.int/Reference/glossary.html, http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf

order.

- PP has opted for fixed crediting period of 10 years. Considering the operational life time of 20 years of the project activity, the crediting period of 10 years is conservative.

- PP has considered 01 January 2013 as the start date of the crediting period which is acceptable.

4.4 ELIBIBILITY AS SCALE OF PROJECT ACTIVITY

- Based on the technical design of the project activity i.e. annual biogas generation capacity and power generation capacity as confirmed in section 4.2 above, the project activity is expected to reduce emissions by 223,550 tCO_2e during the 10 year crediting period i.e. average of 22,355 tCO_2e annually. The spreadsheet[/28/] calculations have been cross-checked and found to be in order.

- The capacity of the project was validated by vetting the proposal[/24/] and technical specifications[/20/] and purchase order[/26/] placed by PP, investment decision[/55/] and Energy purchase agreement (EPA)[/22/]. The investment decision, dated 28 January 2011[/55.1/] confirms the capacity of the project to be 2.0MW. This was subsequently revised to 2.4MW and the same was confirmed by Board resolution dated 12 May 2011[/55.2/]. This was further substantiated by vetting of EPA[/22/] and amendment approval by TEDA[/23.1/] and it was found that the total capacity under the project activity is 2.4MW.

- Through interview of PP representative during the site visit by the validation team, it had been confirmed that the PP do not intend to increase the generation capacity of the project activity. Thus, validation team is able to confirm that the total size of the project will remain under 15MW, the limits of small scale project activity Type I "Renewable energy project activities with a maximum output capacity equivalent up to 15MW (or an appropriate equivalent)" during every year of the entire crediting period of ten years. Hence, validation team confirms that the project activity satisfies the criteria set out for use of the SSC M&P with respect to Type I activities.

- Furthermore, PP has provided an estimation of emissions reductions by the project activity over the crediting period. It was validated that the estimation is done in accordance with the applied methodology AMS-III.AO version01. Validation team cross checked the calculations and was able to confirm that the project activity will result into emission reductions of 22.355 $ktCO_2e$ in each year and will not go beyond the limits of 60 $ktCO_2e/y$ over the entire crediting period. Hence, validation team confirms that the project activity satisfies the criteria set out for use of the SSC M&P with respect to Type III activities.

- Based on the discussions above validation team confirms that the project activity is eligible

to apply small scale methodologies AMS-III.AO[/06/], version01 and AMS-I.D[/05/], version17.

4.5 APPLICABILITY OF METHODOLOGY TO PROJECT ACTIVITY

➲ PDD final version5.2 correctly applies the baseline and monitoring methodologies AMS-III.AO, version01[/06/] and AMS-I.D version01[/05/].

AMS-III.AO version01:

- The proposed project activity is a co-digestion of poultry litter, cow dung and organic wastes from sugar and starch processing which were left to decay leading to (partial) anaerobic decomposition without biogas recovery in the absence of the project activity. As the PP is able to demonstrate the baseline for poultry litter[/18/19/31/] and hence, claims ER from methane avoidance will be claimed only for poultry litter.
- It is also demonstrated that the biomass quantity available in the region is 25% larger than the quantity required by the project activity[/19/].
- As confirmed in section4.4 above PP has demonstrated that the project activity will result in emission reductions less than 60 $ktCO_2e$ annually.
- It was validated during the site visit and document review[/40/46.1/] that in the pre-project scenario the waste i.e. poultry litter were disposed off in a solid waste disposal site and the identified stockpile can accommodate the waste to be used for the project activity for the duration of the crediting period.
- It is demonstrated that the radius of 200km is appropriate[/30/] for transportation of any waste (poultry litter, agri waste and cow dung) and of compost. This was further validated during the site visit by the validation team and found appropriate.
- It is validated during the site visit that the resulting waste from digestion is dried in the sun and handled aerobically. The residual waste is then sold to farmers to be further utilized as compost. PP has opted to monitor the same through parameter APP_{COMP}. It was validated by review of third party report[/19/] that residual waste is not stored under anaerobic conditions.
- PP has claimed that the 50% of the liquid is re-circulated in the project plant system and 50% is sprayed on drying compost. Since, the plant was not operation at the time of the site visit and hence, validation team has raised FAR#01 during the course of validation.
- PP intends to generate the power from the capture biogas to the tune of 2.4MW as confirmed by review of EPA[/22/]. In case of emergency situations the biogas is diverted to enclosed flare and thus, considered appropriate. Since, the PP is utilizing the captured biogas to produce electricity and hence, PP has also demonstrated conformance to AMS-I.D version17 as follows.

AMS-I.D version17:

- The project activity generates the renewable power using recovered biogas from renewable biomass and supplies the generated power to Southern region grid, which is fossil fuel dominant. The same was confirmed by reviewing the latest available Central Electricity

Authority (CEA) annual report[11]. The same was further substantiated through review of the EPA/22/.

- The project activity involves installation of new power plant to generate electricity using recovered biogas. It was confirmed during the site visit that in pre-project scenario there was no renewable power generation plant at the proposed site.
- The project activity is a renewable power project and does not contain any non-renewable component. Also, it is not a co-generation system nor does it involve addition of renewable generation units at an existing renewable power generation facility and is neither retrofit or replacement and hence, para4 to para8 of AMS-I.D version17 are not applicable to the project activity.

- PJRCES has reviewed the section B.2 of the final PDDv5.2 and confirms that the project meets the relevant applicability conditions of both the applied methodologies.

- During the course of validation PJRCES identified the discrepancy in the justification provided by the PP against the applicability conditions of both the applied methodologies. Thus, PJRCES raised Corrective Action Requests i.e. "*CAR#03, 04, 04.1, 05, 05.1 and 05.2*" as detailed in Table: 3 of Appendix A of this report. The same have been successfully closed by PP. PJRCES reviewed the justification provide by the PP and cross verified the information against the supporting documents and found the same to be acceptable.

- In-line with the Para3 of AMS-III.AO, version01, PP is also required to demonstrate compliance to para1 and 2(c) of AMS-III.D. PP has demonstrated the compliance to para1 and 2(c) of AMS-III.D, version18/08/ in the PDD final version5.2.
  - The condition 1(b) requires PP to demonstrate that the "Manure or the streams obtained after treatment are not discharged into natural water resources". In response to CAR#04(b) raised by PJRCES for compliance of the condition 1(b) of AMS-III.D, version18, it their response PP cited the reasoning that since, the plant is not operational and hence, PP would demonstrate the same in the future during the crediting period and hence, Forward Action Request#01 is now raised.

FAR#01	PP is requested to demonstrate following during the course of verification. a. The generated manure is treated as an organic fertilizer and sold to farmers. b. PP to demonstrate how the outflow of liquid fraction from the project system is discharged. c. PP to demonstrate that there is no liquid discharge either to subsequent waste water treatment system or to the natural water receiving body. d. PP to demonstrate that it has obtained the Consent to Operate for the

[11] *Source: Table 3.4, 3.5, 3.6 of CEA General Review 2006 available at www.cea.nic.in/reports/yearly/general_review_rep/0405/ch3.pdf*

	facility.

- PJRCES confirms that the each and every applicability conditions of applied methodologies i.e. AMS-I.D ver17 and AMS-III.AO ver01 have been satisfied by PP and the methodologies can be applied to the project activity. The details of the same have been addressed in Section B.1 of Table: 2 of Appendix A of this report. This is in-line with para76 of VVMver01.2 and hence, acceptable.

- PJRCES also, made a visit to the project site and did not find any instances which would result in additional greenhouse gas emissions occurring due to sources that are not addressed by AMS-I.D ver17 and AMS-III.AO, ver01 within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which is expected to contribute more than 1% of the overall expected average annual emission reduction that are not addressed by the methodology. This, is in-line with para77 of VVMver01.2 and hence, acceptable.

4.6 PROJECT BOUNDARY

The project activity applies AMS-I.D ver17 and AMS-III.AO ver01. Definition of project boundary as per the applied methodologies is as follows:

AMS-I.D ver17, para09: "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to"

- In-line with the same, PP has considered the Southern regional grid as the electricity distribution system. The facility supplying the power to the regional grid, metering equipment and substation & southern regional grid have been included in the project boundary. The same has been validated during the site visit and subsequent interviews with the PP representatives and found to be OK.

Table 6: GHGs involved in the project boundary as per AMS-I.D, ver17

	GHGs involved	*Description*
Baseline emissions	CO_2	*The electricity that is delivered to the Southern regional grid which is dominated by fossil fuel based power plants. The power plants involve generation of carbon dioxide emissions.*
Project emissions	*Nil*	*As per AMS I.D. version 17*
Leakage	*Nil*	*As per AMS I.D. version 17*

AMS-III.AO ver01, para11:

↳ The project boundary is a physical, geographical site:

Table 7: Compliance with AMS-III.AO, ver01		
Project boundary condition		**Compliance of the proposed project activity with the given condition**
A	Where the solid waste (including animal manure, where applicable) would have been disposed and the methane emission occurs in absence of the proposed project activity;	➲ PP has included the Poultry farms from where the poultry litter is sourced[/25/]. The same would be procured within the radius of 200km[/40/]. ➲ Since, the PP cannot demonstrate that the organic matter from "cow dung (which PP will obtain from gaushala cow farms), sago water (which PP will obtain from sago industries) and press mud (which PP will obtain from sugar industries)"[/25/] would otherwise have been decayed in the absence of the project activity. Thus the same have been excluded from the estimation of baseline emissions. However, the same have been included in the project boundary for the purpose of estimating project emissions that will occur due to transportation and hence, included in the project boundary. Validation team cross verified the same during the physical site inspection. This is also, in-line with the applicability condition §1(c) and hence, considered appropriate.
b	In the case of projects co-digesting wastewater, where the wastewater would have been treated anaerobically in the absence of the project activity;	➲ PP would be co-digesting the sago water (which PP will obtain from sago industries), as confirmed above the same has been excluded from the estimation of baseline emissions. However, the same have been included in the project boundary for the purpose of estimating project emissions that will occur due to transportation and hence, included in the project boundary.
c	Where the treatment of biomass or other organic matters through anaerobic digestion takes place;	➲ The four closed digesters and the power plant of which they are a part, are included in the project boundary and hence, acceptable.
d	Where the residual waste from biological treatment or products from those treatments, like slurry, are handled, disposed, submitted to soil application, or treated thermally/mechanically;	➲ PP has included the drying yard within the project site, for the residual waste from the digestion; and the farmlands outside the project site, where the composted residual waste from the project activity is submitted to soil are included in the project boundary. The same was confirmed during the site visit and hence, considered appropriate.
e	Where biogas is burned/flared or gainfully used, including biogas sale points, if applicable;	➲ PP is completely utilizing the biogas to generate the electricity. PP has also kept a provision for burning/flaring excess biogas. This is happening

		within the facility where biogas is produced and subsequently utilized. This facility is part of project boundary. There is no sale of biogas. This was confirmed during the physical site inspection and interviews with PP and hence, acceptable.
f	And the itineraries between them (a, b, c, d and e), where the transportation of waste, wastewater, where applicable manure, residual waste after digestion, or biogas occurs.	➲ PP has included the emissions due to transportation of litter, cow dung, press mud, wastewater, residual waste after digestion within the project boundary and hence, acceptable.

Table 8: GHGs involved in the project boundary as per AMS-III.AO, ver01		
	GHGs involved	***Description***
Baseline emissions	*CH_4*	➲ *Capturing methane from the co-digestion of poultry litter.*
Project emissions	*CH_4*	➲ *Methane emissions from physical leakage of the digester system.* ➲ *Methane emissions due to flare inefficiency.*
	CO_2	➲ *Due to on site grid electricity consumption.* ➲ *Due to on site fossil fuel (diesel) consumption.* ➲ *Due to incremental transportation distances*
Leakage	*Nil*	➲ *As per AMS III.AO. version01*

The final PDD version5.2 correctly delineates the project boundary and the same meets the requirements of applied methodologies AMS-I.D, ver17 and AMS-III.AO, ver01. All the emission sources as required by respective methodologies are also, included in the project boundary as confirmed above. The choices to exclude the gases have been adequately justified as cross checked by PJRCES against the respective methodology.

As confirmed above in section 4.6 of this report, the validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which is expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by AMS-I.D ver17 and AMS-III.AO, ver01.

This is in-line with para 80 of VVMver01.2 and hence, acceptable.

4.7 BASELINE ASSESEMENT

The proposed project activity is an anaerobic co-digestion of organic wastes i.e. poultry litter, cow dung, sago water and press mud and recovery of biogas. Thus, recovered biogas is further used to produce the electricity which is fed into the southern region grid. Thus, as confirmed in

section 4.5 above, PP has applied AMS-I.D, ver17 for determination of baseline for electricity displacement and AMS-III.AO, ver01 for recovery of biogas from co-digestion of organic waste. The description of the baseline determination in-line with both the applied methodology is given below.

AMS-III.AO, ver01, Baseline for Anaerobic co-digestion of organic wastes:

- The project activity has applied the methodology AMS-III.AO "*Methane recovery through controlled anaerobic digestion*" version01. Para12 of the methodology pre-defines the baseline scenario. As per the methodology, "*the baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter (including manure where applicable) are left to decay within the project boundary and methane is emitted to the atmosphere.*"

- The proposed project activity proposes to use poultry litter, cow dung, press mud and sago water to recover the biogas. In-line with para1(c) of AMS-III.AO version01 and as confirmed in section 4.5 above since, PP cannot demonstrate that the organic matter i.e. cow dung, press mud and sago water would otherwise have been left to decay and hence, baseline emissions related to such organic matters has been accounted as zero. This is conservative and hence, accepted by validation team. Hence, baseline scenario related to emissions only from poultry litter is explained.

Baseline Scenario related to emissions from Poultry Litter:

- It was validated during the site visit that the in the absence of the project activity, the poultry litter that accumulated under the cages after being piled up, were transported to an open land where it is stockpiled resulting in anaerobic decomposition of the litter. During the site visit the piles at the open fields, of height of about 2-3 meters were noticed. The same was also substantiated by the TNAU report[/46.1/]. Some instances of the waste being utilised as organic manure by farmers in Kerala were also noticed. However, this happened over a period of 6-9 months. This validates the fact that sufficient quantity of litter is accumulated which justifies its transportation to the other state. It was also validated by conducting interviews with the poultry farm owners that currently no system to recover the biogas from the project activity existed. It was further validated[/31/] that there are no legislations or regulations, which mandate poultry farm owners, to treat these litter through anaerobic digestion and utilisation of the biogas thus produced.
- Thus, based on the above discussions the validation team confirms that the PDD correctly identifies the baseline scenario for the emissions related to poultry litter in the absence, of the project activity and the same is in-line with para12 of AMS-III.AO version01. The same has been transparently described in the final PDD.

AMS-I.D, ver17, Baseline for Electricity displacement by the project activity:

- The project activity has applied the methodology AMS-I.D "*Grid connected renewable electricity generation*" version17. Para10 of the methodology pre-defines the baseline

scenario.

- As per the applied methodology, if the project activity is the installation of a new grid-connected renewable power plant/unit, "*the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.*"

- In case of the project activity, it is defined that the baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources in the Southern grid of India. Southern regional grid has thus been considered as baseline grid for the project activity.

- PJRCES by means of review of the equipment purchase orders/24/, energy purchase agreements (EPA)/22/ and through interviewing equipment suppliers it was confirmed that the project activity is a new grid-connected renewable power plant and hence the baseline scenario is correctly described in the PDD version5.2.

- PP has applied the "*Tool to calculate the emission factor for an electricity system*", version2.2.1 (EB63, Annex19)/12/. The baseline emission factor has been calculated as combined margin (CM) emissions factor, which is weighted average of the operating margin and the build margin emission factors sourced from "*CO_2 Baseline Database for the Indian Power Sector*" version06/29/ published by the Central Electricity Authority (CEA)[12], Ministry of Power, Government of India, latest available at the time of publishing PDD for global stakeholder consultation.

- Version06 of the database refers to the version2.0 of the tool, whereas PP has applied version2.2.1 of the tool. The key modifications to version2.0 of the Tool to calculate emission factor for an electricity system as per latest version2.2.1 are as follows.

Table 9: Key modification in the from version2.0 to version2.2.1 of Tool to calculate the emission factor for an electricity system

Version	Nature of Revision	Steps to ensure conservativeness
02.1.0	The tool was amended to allow the use of an operating margin emission factor different form zero in case of connected electricity systems located in countries other than the project host country.	This modification does not impact the emission factor for the project as the project activity as it is located in the same country as the project host country.
02.2.0	Amendment to provide flexibility for LDCs and countries where less than	This is not applicable in the case of India as more than 10 CDM projects have been

[12] http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm

	ten CDM projects have been registered, when calculating the grid emission factor; and	registered.
02.2.0	Extend the procedure for the identification of sample groups of power units relevant to build margin calculation.	PP has used the revised procedure for the identification of sample groups of power units relevant to build margin calculation. As per the revised procedure, the resulting sample of power units relevant to build margin calculation remain same as per the sample used by CEA Database Ver06, and therefore, there is no impact on the emission factor. Hence, emission factor as per CEA database version06 has been used.
02.2.1	Editorial amendment to: ↳ Fix unit errors in equations (4) and (6); ↳ Provide clarity throughout the text.	These are editorial amendments and not changes in the calculations of grid emission factor. Therefore, this does not impact the emission factor calculations

- From the above table it can be concluded that the version change in the tool does not have effect on the emission factor calculations.

- The database for baseline estimation issued by the CEA has been developed consistently with the availability of data in India. The database is an official publication of the Government of India for the purpose of CDM baselines. Hence the CEA database used as a source for the emission factor calculations is acceptable to the validation team.

In-line with para87 of VVM ber01.2, PJRCES confirms following:

- All the assumptions and data used by the project participants have been listed in the PDD, including their references and sources.
- All the documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD. A complete list of documents is provided in section 6 (references) of this report.
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonable represents what would occur in the absence of the CDM project activity.

The application of the baseline methodologies is transparent and conservative.

4.8 ADDITIONALITY ASSESSMENT

- The PP has applied baseline and monitoring methodologies i.e. AMS-I.D version17 and AMS-III.AO versio01. Both the methodologies require PP to apply the general guidelines to SSC CDM methodologies, information on additionality (attachment A to Appendix B) general guidance on leakage in biomass project activities (attachment C to Appendix B).

- Following guidance, guidelines and tools have been applied for the project activity.
  - Guidelines on the assessment of investment analysis, version05. (EB62, Annex5)
  - Guidelines on the demonstration and assessment of prior consideration of the CDM, version04.0 (EB62, Annex13).
  - Guidelines for the reporting and validation of Plant Load Factors, version01 (EB48, Annex11).

- In-line with the above PP has followed Information on additionality given in attachment A to appendix B latest version 08 [13] to demonstrate additionality. Thus, PP has opted to demonstrate additionality using option (a) i.e. Investment barrier. Furthermore, PP uses benchmark analysis to demonstrate additionality and "post-tax equity IRR" has been chosen as the financial indicator, which is compared with the "*Cost of Equity*".

4.8.1 PRIOR CDM CONSIDERATION AND CONTINUED ACTION TO SECURE CDM STATUS

- As validated in the section 4.3 of this report, the start date of the project activity is 22 July 2011/24/.

- The guidance provided in para2 of "*Guidelines on the demonstration and assessment of prior consideration of the CDM*" latest version04 (EB62, Annex13), the project activities with start date after 02 August 2008, the project participant must inform a Host Party designated national authority (DNA) and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such notification must be made within six months of the project activity start date. "***Such notification is not necessary if a project design document (PDD) has been published for global stakeholder consultation*** or a new methodology proposed to the Executive Board ***for the specific project before the project activity start date.***"

[13] https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid05.pdf

- The PDD for the project was published for global stakeholder consultation[14] on ***01 July 2011,*** which is earlier than the start date ***22 July 2011*** considered by PP. Thus in-line with the guidance above, PP is not required to notify EB or DNA of the host country.

- Based on the documents submitted and discussions held, validation team is able to confirm that the:
  - PP was aware of the CDM benefits prior to the start date of the project activity.
  - Proposed project activity would not have taken place without CDM status.
  - The benefits of the CDM were a decisive factor in the decision to proceed with the project activity.

4.8.2 INVESTMENT ANALYSIS: CHOICE OF APPROACH

- PP has demonstrated that the proposed project in the absence of any external financial support i.e. revenue from sale of Carbon Credit would not have been implemented. PDD demonstrates that the project activity would not be economically or financially attractive when compared with the benchmark. In order to assess the claim of the PP that the project scenario is financially unattractive, validation team has adopted the following strategy

  - Determining the suitability of the investment analysis method, suitability of financial indicator selected and suitability of benchmark applied.
  - Conducting an assessment of parameters and assumptions used in calculating the financial indicator and determining the accuracy and suitability of parameters.
  - Cross-checking the parameters against third-party or publicly available sources
  - Reviewing annual financial reports related to the project participant
  - Assessing the correctness of computations carried out and documented; and
  - Subjecting the critical assumptions of the project activity to reasonable variations to determine under what conditions variations in the result would occur, and the likelihood of these conditions

- The project activity generates benefits i.e. revenue from electricity sold to the grid other than the CDM benefits and hence the simple cost analysis is not suitable for the project activity and this is in line with "*Guidelines on the assessment of Investment analysis version05*".

- PP has opted for "benchmark analysis" to demonstrate the additionality of the project activity. For demonstrating the financial viability of the project activity, PP has chosen investment barrier and to demonstrate the investment barrier, PP has opted for benchmark analysis. Since in this instance, baseline is outside the direct control of the project developer (grid connected power), the choice of the project developer is restricted to "invest or not to invest", the benchmark approach is most suited as per the latest version of Guidance19 of

[14] https://cdm.unfccc.int/Projects/Validation/DB/O48X2OYZJE0Z9GM5X1PUXX8JD9MM83/view.html

Annex05 of EB62. The baseline scenario identified for the project activity does not require any investment hence the "benchmark analysis" is most suitable for the project activity in-line with the para19 of the "*Guidelines on the assessment of investment analysis" version05*".

- Against this background, and discussions in subsequent paragraphs would reveal, validation team concludes that the additionality justification given by the project developer is in accordance with the requirements derived from the approved CDM methodology and the methodological tools referred therein as well as the guidance given by EB vide paragraphs 108-110 of VVM version1.2.

4.8.3.1 INVESTMENT ANALYSIS: BENCHMARK SELECTION

- "*Cost of Equity*" derived using Capital Asset Pricing Model (CAPM), has been considered as suitable benchmark. Since, the calculation of ROE is based on the standard market parameters and specific characteristics of the project type, and hence, it is not linked to subjective profitability expectation of individual investor which is in-line with para13, EB62, Annex5.

- **Cost of Equity**:
  - The benchmark has been derived using Capital Asset Pricing Model (CAPM), which is a widely accepted methodology for determining Return on Equity in the host country, and is in-line with "*Guidance on assessment of investment analysis version05*", Annex5, EB62.

  - CAPM is based on the portfolio theory of finance in which risks are classified into:
    - Systematic risk - risk applicable to the market as a whole, such as inflation, tax rises, interest rates, etc.
    - Specific risk - residual risk unique to an individual firm or a small group of companies that form a subset of the market.

  - The theory stipulates that specific risks can be eliminated through diversification and hence, only systematic risks determine the return expectation of investors. The basis of CAPM is the relationship between risk and return, which can be expressed by the following formula

$$\mathbf{r_a = r_f + \beta_a * [\, r_m - r_f \,]}$$

Where:

r_a	= the expected rate of return on equity (cost of equity)
r_f	= is the risk free rate of return (e.g. average yield on government securities)
r_m	= the expected rate of return on a market portfolio
Beta (β)	= the coefficient reflecting the volatility (risk) of the stock relative to the

market, which measures the systematic risk of the stock.

- **r_f – Risk free return**: Risk free return has been considered as per the information provided by the Reserve Bank of India (RBI). RBI or Reserve Bank of India is the Central Bank of India, which regularly publishes these values and hence the source is appropriate. The risk rate (8.69%) is the compounded return of weighted average yield on State Government Securities for the years 1997-98 to 2009-10 for a period of 12 years (which is more than the length of the crediting period) published on 24 August 2010. The compounded return is appropriate as the investment cost in the project activity is high.

- **β – Beta:** Beta is the measure of risk of a specific sector/company. The measured equity beta for a particular company relates to the unique capital structure (debt/equity ratio) of that firm. Since, the project is having a debt component and hence, PP has opted to use the levered BETA. It is claimed that the since, the debt can result in tax advantages that reduces the volatility and hence validation team confirms that the use of levered BETA is considered appropriate. Furthermore, the project activity is recovering biogas from co-digestion of organic wastes and subsequently generating power hence, PP selected the companies that operates in similar sector (i.e. power and fertilizer sector) that of project activity. Therefore, validation team confirms that in the absence of adequate data on companies which are exclusively into the exactly same type of business (i.e. biogas recovery and power generation projects), the next option for assessing the risk of these projects is to consider the data available on companies which are involved in similar businesses. The details of the companies selected by PP have been cross checked by validation team and found to be acceptable. The equity beta has been calculated from BSE Sensex data and company stock price, which are publicly available. BSE Sensex has an advantage of having the longest history and the data is available for 28 years and considered appropriate for the source of data for calculations. As a general financial practice two to five year period is considered appropriate for the estimation of beta depending upon the individual investor' history in relevant operations i.e. project activity area. In this instance, since the PP has no history and hence, PP has calculated the equity beta for Power Index and 12 fertilizer companies for a period of 2 years (2011-2009). The Beta of these companies has been source from *http://www.bseindia.com/*

Table 10: BETA values considered[54]

Sl. №	Sector	Beta
1	Power Index	0.95
2	Fertilizer Sector	1.17
Average		**1.06**

- **r_m – Market Return**: The average market return has been calculated with the help of the Compound Annual Growth Rate (CAGR) based on the publicly available stock index – BSE Sensex. Market return or Compound Annual Growth Rate (CAGR) is calculated for the

period from 01 February 1996 to 27 January 2011 i.e. for 15 years equivalent to the life of the project activity and hence, considered appropriate. The data for the same has been sourced and verified from BSE Sensex data available at Bombay stock exchange website[15].

- The CAGR gives the measure of the average returns from the stock market investments over a period of time. It is a more accurate measure than simple average of returns and is calculated as

  CAGR = { [Ending value / Beginning value] ^ [1 / no. of years] } – 1

- PJRCES confirms the computation for market rate of return as 13.15% for the period 01 February 1996 to 27 January 2011.

- **Risk Premium (r_m - r_f)**: the risk premium is calculated as a difference of market return and risk free rate.

- Based on the above formula PP has calculated the value of Cost of Equity for individual investors as follows

Table 11: Expected Return on Equity		
Parameter	**Value**	**Source**
r_f Risk free return	8.69 %	RBI Publication[16]
β_a Average levered Beta	1.06	Calculated (Spreadsheet Benchmark ROE)
r_m Market Return	13.15%	Calculated (Spreadsheet Benchmark ROE)
Market Risk Premium	4.46%	Calculated (Spreadsheet Benchmark ROE)
Cost of Equity	**13.42%**	Calculated (Spreadsheet Benchmark ROE)

- While PJRCES considers the benchmark chosen as appropriate for the project activity as it is derived from values which are standard in the market and do reflect the investment climate in terms of expected revenues and risks associated with the investment in the project activity.

4.8.3.2 INVESTMENT ANALYSIS: INPUT PARAMETERS

- PP has sourced input values based on the TNERC Tariff Order dated 27 April 2009/34/, third party PLF report/05/ and national accounting regulations, which were available at the time of investment decisions. PJRCES also checked and confirmed that the tariff order used by PP

[15] http://www.bseindia.com/stockinfo/stockprc.aspx
[16] http://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/0RBIAN240810_F.pdf

was the latest order available and still valid at the time of investment decision (i.e. 28 January 2011).

- PP sourced the values mainly from Detailed Project Report (DPR) dated 13 December 2010/25/ and TNERC tariff order 2009/27/. It was validated by review of board resolution dated 28 January 2011 that DPR is the basis for investment decision. Considering the gap of less than 2 months between DPR and investment decision it is confirmed that the input values considered in the analysis, materially would not have changed. The input values considered by PP in the final PDD and analysis are consistent with the DPR values and TNERC order values. This is in-line with para113 of VVM version01.2. The values considered in the DPR are further cross checked with the third party TIDE technocrat report/19/40/ wherever possible. This is in-line with para111(b) of VVM version01.2. Also on the basis of PJRCES specific local and sectoral expertise, we confirm that the input values from the DPR are valid and applicable at the time of the investment decision.

- The detailed explanation on input values considered with justification has been provided below.

Table 12: Input Parameters

Sl. №	Data/Parameters	Value (in INR)	Source/ remarks
A	**Capital Expenditure**		
1	Fixed Assets	284,000,000	The investment decision date is 28 January 2011 as confirmed by review of the initial board resolution/55.1/. The capacity for the project was subsequently revised to 2.4 MW and hence, the final cost for the project activity is considered as per Board meeting/55.2/ dated 12 May 2011 for revision in the capacity from 2.0 MW to 2.4 MW and revision for the Capex[17]. The cost considered by the PP was also, consistent with DPR and hence, considered appropriate.
2	Land purchase cost	13,000,000	This has been confirmed by review of deed of sale and Land development agreement dated 22 September 2010 available at the time of investment decision and hence, acceptable.
3	**Total capital expenditure**	**297,000,000**	Calculated
B	**O&M cost (per annum)**		
4	Power plant O&M	6,393,000	This has been confirmed by review of DPR (page 129 for escalation rate & page 134 item 12 for Power unit O&M costs).[18]. Furthermore the DPR has been approved by Tamil
	Escalation	5.0%	

[17] Cost is also, cross checked against IRR Annex 1 Letter of Intent for lump sum EPC execution

			Nadu Energy Development Agency[44]. Since, the same is in-line with Para113, VVMver01.2 and hence, considered appropriate.
5	Biogas Plant O&M (incl. Insurance)	25,777,000	This has been confirmed by review of DPR (page 129 for escalation rate & page 134 for Biogas plant O&M costs). The escalation is also cross checked with from a recent TNERC publication on renewable energy power plants has been used ("Comprehensive Tariff Order for Biomass based power plants", TNERC 2009)[34]. This was the latest available at the time of investment decision and hence, considered appropriate.
	Escalation	5%	
C	**Tariffs and Receipts**		
6	Biomass power tariff (INR/kWh) in 2012	4.92	This has been sourced from TNERC Tariff Order dated 27 April 2009 and hence, considered appropriate. The escalation in tariff has been considered at 3% which is also, validated by reviewing TNERC tariff order and hence, considered appropriate.
	Fertilizer revenue	**39,735,500**	
7	Fertilizer sales price (INR/t)	1,750	This price is based on 3rd party consultant report (i.e. Tide Technocrats[40]) which was available at the time of investment decision and hence, considered appropriate.
D	**Financial parameters**		
8	Tax rate year 1-10 (Minimum Alternate Tax)	19.93%	Under the section 80 IA of the Income Tax Act 1961, the PP is exempted from income tax on all earning generated from the project for the period of 10 years. The PP can choose the tax holiday window for a single 10 year period anytime during the first 15 years of the project life. However, domestic companies are liable to pay a minimum alternate tax (MAT) which is currently pegged at 19.93%[41] and has been considered under the financial analysis. Thus considered appropriate.
9	Tax rate year 11-15 (Corporate Tax)	32.445%	This is in-line with Income Tax Act 1961[42] and hence, considered appropriate
10	Interest Rate of Bank Loan	13.25%	As per the Central Electricity Regulatory Commission regulations 2009[43] (Terms and Conditions for Tariff determination from Renewable Energy Sources – published on 15 September 2010 – latest available at the time of investment decision and hence, considered appropriate). Shareholders loan is considered as part of the equity. Since, in this instance the equity part has been sourced from the borrowings from the shareholders and hence, treating of the same as equity is considered appropriate. The financial expert of validation team has reviewed the spreadsheet and confirms that the same has been prepared in accordance with the national accounting practice and hence, considered appropriate.
11	Bank Loan Duration (years)	10	
12	Equity (%)	30.0%	
13	Debt (%)	70.0%	
14	One time subsidy	36,000,000	This is considered based on the Detailed Project Report of 2.0 MW biogas to power generation project at

[18] Cost is also, cross checked against IRR Annex 4 O&M Schedule

			Puduchatram[25] which states 15,000 INR per kW installed. As PP schedules to install 2.4 MW subsidy is expected to be 15,000 INR/kW x 2400 kW = 36,000,000 INR Furthermore the DPR has been approved by Tamil Nadu Energy Development Agency[44]. Since, the same is in-line with Para113, VVMver01.2 and hence, considered appropriate.
15	Lifetime of project activity (years)	20	The life time of the project activity has been assumed in line with the TNERC tariff order and hence, considered appropriate.
16	Depreciation Rate for tax calculations	15	This was confirmed by review of Income tax act, 1961.
17	Salvage value after 20 years:	5%	This was confirmed by reviewing section 295 of the Companies act, 1956. Since, the financial assessment is presented for 15 years and hence, the fair value after 15 years is considered while calculating depreciation is already taking into account the salvage after 20 years and hence, considered appropriate.
18	Fair value of the project activity assets.	84,300,000	The life time of the project activity is 20 years where as the assessment has been conducted for 15 years, and hence, PP has considered the salvage value at the end of the 15 year. This is in-line with as per paragraph 3 of the GUIDELINES ON THE ASSESSMENT OF INVESTMENT ANALYSIS (Version 05), EB62 annex 05 and hence, considered appropriate.

4.8.3.3 INVESTMENT ANALYSIS: CALCULATION AND CONCLUSION

- The three important parameters, which determine the "post tax *equity* IRR" of the project are project cost, financing pattern, and profitability estimates. PJRCES validated the investment decision taken by the project proponent and the consistency and appropriateness of the input values with the timing of investment decision. The input values as presented in Section B.5 of the PDD has been consistently applied in the financial calculations and were verified from other available sources.

- The "post tax *equity* IRR" was computed for a period of 15 years, which is less than the period of expected operation of the underlying project activity (technical lifetime) and thus PP has used the salvage value at the end of the assessment year. This is in-line with para03 of Investment guidance and hence considered to be appropriate. Validation team confirmed the appropriateness of the technical lifetime of the project activity through reference i.e. TNERC tariff order[34]. The validation team considers the lifetime of the project activity of 20 years as reasonable.

- The IRR calculations are provided in excel spread sheet[28]. The calculations were verified and found to be correct by PJRCES. The assumptions used in the calculations were deemed to be correct by PJRCES. The equity IRR calculated are summarized in the table below

which confirms that the project in the absence of CDM benefits when compared to the benchmark is financially unattractive.

Table 13: Summary of equity IRR		
Entity	**Equity IRR**	**Benchmark (Return on Equity)**
IOT Mabagas Limited.	6.71%	13.42%

4.8.3.4 INVESTMENT ANALYSIS: SENSITIVITY ANALYSIS

- The rational given in the para20 of "*Guidelines on assessment of Investment analysis* version05" stipulates that the "*The initial objective of a sensitivity analysis is to determine, in which scenarios the project activity would pass the benchmark or become more favorable than the alternative*" i.e. the sensitivity should be conducted to prove that investment analysis conducted is robust.

- Hence, as per para20, EB62, Annex5, the capital cost of the project, Biogas plant O&M and revenue from fertilizer and electricity sales and cost of substrate purchase that would contribute to 20% of the total project cost and hence, PP has included sensitivity of these parameters in the PDD. There are no other costs which account for more than 20% of project cost or revenue. Guidance on the assessment analysis, version 05 (EB62 Annex5) states that as a general point of departure, variation in the sensitivity analysis should at least cover a range of -10% and +10%.

- Furthermore, PP has provided the range of sensitivity to the extent when the IRR would cross benchmark. This is in-line with para21 of investment guidance. A summary of the sensitivity analysis is given below.

Table 14: Summary of Sensitivity analysis		
Parameter	**% Change**	**Justification of probability of occurrence**
Capital expenditure	**-26.6%**	The capital cost has been sourced from the board decision dated 12 May 2011. Since, the EPC contract[19] that has already been signed by PP and IOT Infrastructure and Energy Services Ltd and hence, any variation in the project cost is hypothetical.
Biogas Plant & Power Plant O&M	**-33.0%**	A cost reduction of 33.0% in the O&M expenditure seems highly unlikely if not impossible since 30% of the total O&M costs are based on agreed fixed cost as per O&M contract with Greenpower International which was available at the time of investment decision. Therefore a cost reduction of 33.0% would be required on the remaining 70% O&M proportion which is hypothetical.
Substrate cost	**-32%**	The assumed substrate cost in the model as presently applied are already conservative estimates since the economic assessment does

[19] IRR Annex 1 Letter of Intent for lump sum EPC execution

		not take into consideration the inflationary trend observed in India at present. A cost reduction of 32% therefore seems highly unlikely during the crediting period of the project activity.
Fertilizer Revenue	**37.5%**	PPs claims that an increase in the price for organic fertilizer will go hand in hand with a cost increase for the substrate, which would result in a balanced margin. Currently the PP has assumed fertilizer revenues of 1750 INR/tonne. Thus, increase of 37.5% results in organic fertilizer selling price (untreated or upgraded – i.e. raw dried bio-digestate in bulk) of 2199 INR/tonne which is above the estimated maximum value of 2100 INR/t by Tide Technocrats. Hence an increase in the fertiliser revenue by 37.5% was found unrealistic.
Electricity Revenue	**16.8%**	The value of electricity tariff for the period of EPA agreement i.e. 15 years is fixed by the TNERC[/27/] and the expectation of an increase by 16.8% is therefore only hypothetical. The same is also confirmed by review of Energy purchase agreement[/22/] between PP and TANGEDCO.

Based on the discussion above, the validation team concludes that the PP has sufficiently and transparently demonstrated in the PDD that the project is unlikely to be the most financially attractive alternative and hence, the project activity is additional.

4.9 MONITORING PLAN

- The project activity applies the monitoring methodology AMS.I.D, version17, for the monitoring of emission reductions. The emission reductions are calculated by multiplying the net energy exported by the project activity and grid emission factor. Therefore the monitoring plan includes monitoring of electricity exported to the Southern gird, electricity imported from the Southern grid. Details of the data collection and frequency of data recording and associated formats are described and observed to be adequate.

- The responsibilities and authorities for project management, procedures for monitoring and reporting, and QA/QC procedures have been systematically established and formalized. Data will be archived electronically until 2 years after the end of the crediting period.

- The project activity also applies the monitoring methodology AMS.III.AO, version01, for the monitoring of emission reductions. The emission reductions are determined ex post through direct measurement of biogas fuelled, flared or gainfully used. Therefore the monitoring plan includes monitoring of methane captured or destroyed or gainfully used by the project activity. Details of the data collection and frequency of data recording and associated formats are described and observed to be adequate.

- Sampling Plan: PP has explained the objective of the sampling, field measurement, target population, sample method procedure for data collection and sample size. PP has provided a Sampling for monitoring parameters "Average incremental distance for waste type", "Average incremental distance for compost transportation" and "Compost application". As the applied methodology AMS-III.AO version01 do not provide any specific guidance and hence, PP considered confidence level of 90% with 10% precision level. The sampling plan was validated and found to be in-line with "*Standard for sampling and surveys for CDM project activities and programme of activities* (Version 2.0)". based on the same the validation team is able to confirm following:
  - The sampling plan presents a reasonable approach for monitoring the parameters.
  - The estimate of the target population is validated and considered to be reliable.
  - The proposed sample size is adequate to achieve 90/10 confidence/precision level.
  - The sampling procedure is clear with respect to identification on the selection of samples.
  - The QA/QC procedures have been systematically established and formalized.
  - Data will be archived electronically for a period of 2 years after the end of crediting period.

- The monitoring plan is in line with the approved applied monitoring methodology AMS-I.D. "Grid connected renewable electricity generation" version17 and AMS-III.AO, "Methane recovery through controlled anaerobic digestion" version01. The monitoring plan will give opportunity for real measurements of emission reductions that will be accrued.

4.9.1 PARAMETERS DETERMINED EX-ANTE

AMS-I.D, version17:

- The baseline emission factor for the Southern grid is established ex-ante based on the approved methodology AMS-I.D version17, using a combined margin approach consisting of 50% operating margin and 50% build margin approach.

- The combined margin emission factor for the displaced electricity was calculated based on the "Tool to calculate the emission factor for an electricity system" version 02.2.1 (hereinafter referred to as "the tool"), in accordance with the applied methodology. This is the currently active version of the tool applicable from 29 September 2011.

- Baseline EF is to be calculated as a CM consisting of operating margin (OM) and build margin (BM) factors based on data from an official source made publicly available. PP uses the EF for the grid electricity as calculated in CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power Government of India. The database is an official publication of the Government of India for the purpose of CDM baselines. The CEA Database version06 has been applied as it was current at the time of submission of the PDD for validation. The CEA database version applies the "Tool to calculate emission factor for an electricity system version2.0". As already confirmed in the

section 4.7 of this report CEA database version06 is applicable to the project activity.

Table 15: Summary of emission factor calculation in line with version 02.2.1 of the tool	
Step: 1	➪ Requires identification of the relevant electric power system. In line with the requirements specified in the tool, the PP has used a regional grid definition applicable for large countries like India with layered dispatch systems. Historically, the Indian power system was divided into five independent regional grids, namely Northern, Eastern, Western, Southern, and North-Eastern (NEWNE). Each grid covered several states. Since August 2006 however, all regional grids except the Southern Grid have been integrated and are operating in synchronous mode, i.e. at the same frequency. The project activity is located in Southern grid and hence its selection for the purpose of estimation of baseline emission factor is considered appropriate. Therefore, PJRCES confirms the applicability of Step 1 of the tool.
Step: 2	➪ Gives the PP an option to include off-grid power plants in the project electricity system. The PP has chosen only grid power plants for analysis.
Step: 3	➪ Requires the selection of an operating margin method. Of the four methods provided in the tool for calculating the operating margin ($EF_{grid,OM,y}$), the PP has selected the simple OM method. The tool specifies that the simple OM method can only be used if the low-cost/must-run resources constitute less than 50% of total grid generation in 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production. ➪ The Simple OM method selected by the PP is justified and appropriate as the average proportion of low-cost/must run resources as average of 5 years for Southern grid (2005-06: 27.0%, 2006-07: 28.2%, 2007-08: 27.1%, and 2008-09: 22.8%, 2009-10: 20.6%) is less than 50%. Low operating cost/must run resources include hydro, wind, low-cost biomass and nuclear. ➪ The tool provides two options – (i) ex-ante option and (ii) ex-post option in calculating the simple OM. The PP has chosen the ex-ante option for determining the OM. This choice of ex-ante option, which is based on a 3-year generation-weighted average, is based on the most recent data available at the time of submission of the PDD to the DOE for validation. It was found to be acceptable in view of the availability of the requisite data vintages. The data for the years 2007-08, 2008-09 and 2009-10 have been used for calculation of Simple OM.

Step: 4	➪ Requires the calculation of the operating margin emission factor according to the selected method. "Selected method" in this context is the "simple OM" chosen in Step 2 of the tool. Further PP has followed option A to calculate the simple OM value. This is in-line with the tool and considered appropriate. ➪ In validating Step 3, PJRCES confirmed the calculations with respect to the OM emission factor PP has used the date for 2007-08, 2008-09 and 2009-10 the Southern grid and arrived at the operating margin value of 0.966 tCO_2/MWh.
Step: 5	➪ Requires calculation of the build margin emission factor. The CEA database provides a BM value for Southern grid as 0.7634. As part of validation of Step 5 of the tool, PJRCES confirmed through independent calculations that the BM for Southern grid for the year 2009-10 as 0.763 tCO_2/MWh.
Step: 6	➪ Requires calculation of the combined margin emission factor as per the following equation: $EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$ ➪ According to the guidance on selecting alternative weights in the tool, the default weights applicable for all other project i.e. non-wind & non-solar projects are $w_{OM} = 0.5$ and $w_{BM} = 0.5$ for the first and subsequent crediting period have been applied, ➪ The baseline grid emission factor has been calculated as; ➪ For Southern grid = 0.865 tCO_2e/MWh

AMS-III.AO, version01:

➲ The parameters determined ex-ante in-line with AMS-III.AO, version01 are summarized as follows

Table 16: Parameters Determined ex-ante

Sl. №	Parameter	Value (unit)	Justification of the Source
01	**GWP_{CH4}** Global Warming Potential (GWP) of methane.	21	➪ Since, the same has been sourced from Applied methodology AMS-III.AO, version01, equation01[/06/] and hence, considered appropriate.
02	**$D_{CH4} = \rho_{CH4,n}$** Density of methane at normal conditions (20 ºC and 1 atm pressure)	0.67 (kg/m³)	➪ The value has been sourced from the IPCC 2006 Guidelines[/45/] for National Greenhouse Gas Inventories under the volume 04 "Agriculture, Forestry and Other Land Use". In absence of choice of data, the IPCC default value is the best option to use and thus considered appropriate.
03	**MCF_j** Methane conversion factor for manure management. Only for poultry litter.	22.84 (%)	➪ The same has been sourced from a third party report[/46/] i.e. "Methane Emission Potential of Poultry Litter" prepared by Department of Bioenergy, Tamil Nadu Agricultural University (TNAU) and hence, considered appropriate.

Table 16: Parameters Determined ex-ante			
Sl. №	**Parameter**	**Value (unit)**	**Justification of the Source**
04	**$B_{o, LT}$** Maximum methane production potential (in the baseline situation). LT = Livestock = poultry.	0.24 (m^3CH_4/kg)	➪ As no country specific factors are available and hence, the same has been sourced from IPCC 2006 Guidelines[45] for National Greenhouse Gas Inventories under the volume "Agriculture, Forestry and other Land use" for "Emissions from Livestock and Manure Management" Table 10A-9, page 10.82 and hence, considered appropriate.
05	**$VS_{LT,y}$** Volatile solids for livestock	0.02 (Kg/head/day)	➪ As no country specific factors are available and hence, the same has been sourced from IPCC 2006 Guidelines[45] for National Greenhouse Gas Inventories under the volume "Agriculture, Forestry and other Land use" for "Emissions from Livestock and Manure Management", Table 10A-9, page 10.82 and hence, considered appropriate. ➪ Since, PP has not adjusted the parameter with site specific factor and hence, the parameter w_{site} is not required to be monitored.
06	**$MS\%_{Bl,j,y}$** Fraction of manure handled in baseline animal manure management system j in year y.	100 (%)	➪ The same has been sourced from a third party report[46] i.e. "Methane Emission Potential of Poultry Litter" prepared by Department of Bioenergy, Tamil Nadu Agricultural University. PJRCES has reviewed the same and hence, considered appropriate. ➪ As per para26 of AMS-III.D version16, Sl. No. 15 MS% is required to be monitored if, animal manure system is treated in different systems. In this instance as confirmed during the site visit, the animal manure is not treated in different system and hence, no monitoring is required.
07	**$EF_{CO2,diesel,y}$** CO_2 emission factor of diesel used in the year y.	74.8 (tCO_2/TJ)	➪ PP has sourced the same from table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines[45] on National GHG Inventories. In the absence of the suppliers invoices the use of IPCC values is considered appropriate and hence, acceptable and is in-line with the applied methodology and the methodological tool.
08	**NCV_{Diesel}** Net calorific value of diesel.	43.3 (GJ/tonne)	➪ PP has sourced the same from table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines[45] on National GHG Inventories. In the absence of the suppliers invoices the use of IPCC values is considered appropriate and hence, acceptable and is in-line with the applied methodology and the methodological tool.
09	**ρ_{diesel}**	0.83	➪ Since, the same has been sourced from CO_2 Emission

Table 16: Parameters Determined ex-ante			
Sl. №	**Parameter**	**Value (unit)**	**Justification of the Source**
	Density of diesel.	(tonne/m³)	Database Version 6.0, March 2011. Appendix B (page 25) of the CO_2 Baseline Database for the Indian Power Sector User Guide and hence, considered appropriate and is in-line with the applied methodology and the methodological tool.
10	**$EF_{CO2,transport}$** CO_2 emission factor from fuel use due to transportation.	0.326 ($kgCO_2$/km)	↳ The same has been estimated based on the 8 km/litre of average fuel consumption value, which is cross checked against the Feedstock transport quotation dated 06 September 2010[47] and also, PJRCES cross checked the calculation and hence, considered appropriate. $= \frac{(NCV_{Diesel} \times \rho_{Diesel} \times EF_{CO2,diesel,y})}{F_{diesel,avg}}$ $= \frac{\{ 43.3/1000 \text{ (TJ/tonne)} \times 0.83 \text{ (tonne/m}^3\text{)} \times 74.8 \text{ (tCO}_2\text{/TJ) } \}}{8 \text{ (Km/litre)} \times 1 / 1000 \text{ (m}^3 \text{ / litre)}}$ $= 0.366$ $kgCO_2$/km
11	**$\eta_{flare,h} = FE_y$** Flare efficiency in hour h based on measurements or default values.	90 (%)	↳ This is in-line with the "Tool to determine project emissions from flaring gases containing methane (Version 01)"[11] ↳ As required by the tool PP is monitoring the "temperature" and "flow rate of the residual gas at the inlet of the flare" and thus using 90% efficiency is considered appropriate. ↳ Also, in case of use of enclosed flare, PP has also clarified the use of 0%, 50%, 90% and 100% of the flare efficiency in-line with the tool and AMS-III.AO and hence, considered appropriate.
	↳ FAR#02: As per the "*Tool to determine project emissions from flaring gases containing methane*, version01", to use a 90% default value. Continuous monitoring of compliance with manufacturer's specification of flare (temperature, flow rate of residual gas at the inlet of the flare) must be performed. Since, the plant is yet to be commissioned, manufacturer's specification of flare are not yet available and hence, PP will demonstrate compliance to the requirements of the tool during verification period.		
12	**$fv_{CH4,RG,h}$** Volumetric fraction of CH4 in the residual gas in the hour h.	60 (%)	↳ This is in-line with the option for flare efficiency i.e. use of default values as per "Tool to determine project emissions from flaring gases containing methane (Version 01)"[11] ↳ The same has been sourced from a third party report[46]

Table 16: Parameters Determined ex-ante			
Sl. №	**Parameter**	**Value (unit)**	**Justification of the Source**
			i.e. "Methane Emission Potential of Poultry Litter" prepared by Department of Bioenergy, Tamil Nadu Agricultural University (TNAU). PJRCES has reviewed the same and hence, considered appropriate.
13	**$TDL_{j,y}$** Average technical transmission and distribution losses for providing electricity to source j in year y.	20 (%)	↳ Since, the project activity is likely to draw electricity from gird and also, have a diesel gen set as a backup, it falls under "Case CIII: Electricity from both the grid and captive power plant(s)" of "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" version01[/48/], PP has opted to use the default values of 20% in case of import from Grid and 3% in case of use of gen set and hence, considered appropriate.

4.9.2 PARAMETERS MONITORED EX-POST

AMS-I.D, version17:

➲ Parameters monitored in-line with AMS-I.D version17. QA/QC, data archiving and data apportioning is defined at the end of the table.

Table 17: Parameters Monitored ex-post			
Sl. №	**Parameter**	**Value used for ER calculation (unit)**	**Justification**
01	**$EG_{BL,y}$** Net electricity supplied by the project activity to the grid.	15.26 (GWh/y)	**Compliance to Meth**: ↳ This is in-line with Para24 of the AMS-I.D version17 and hence, considered appropriate. **Measurement**: ↳ The data is measured continuously using the one primary energy meter and one secondary energy meter. The meter readings are also noted in form of a log book on monthly basis. **Source**: ↳ The data will be sourced from the generation statement issued by TANGEDCO and hence, considered appropriate. The invoices raised by PP can be used as cross checking of the net electricity supplied to grid.
02	**$EG_{gross,y}$** The gross	18.00 (GWh/y)	**Compliance to Meth**: ↳ This is in-line with Para24 of the AMS-I.D version17

Table 17: Parameters Monitored ex-post			
Sl. №	**Parameter**	**Value used for ER calculation (unit)**	**Justification**
	electricity generated by the project activity.		and hence, considered appropriate. This parameter would be used as secondary cross checking point for the net electricity supplied to grid. **Measurement**: ↳ Monitored continuously based on an energy meter on the generator panel of the engines this is logged on PLC (programmable logic controller). This is also, recorded in the form of a logbook on monthly basis. **Source**: ↳ This parameter is recorded internally for the purpose of cross checking of the net electricity supplied by the project activity and hence, internal records i.e. monthly reports prepared by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
Calibration of energy meter: ↳ PP has opted to calibrate the energy meter annually. Since, the calibration is beyond PP's control PP will ensure that it is calibrated at-least once in 3 years. This is in-line with the § 17.c of the general guidelines to SSC CDM methodologies (version 17) and hence, considered appropriate.			

QA/QC Procedures:

↳ The meters will have accuracy class of 0.2. PP has defined calibration frequency of meters at least once in 3 years. This is in line with the "*General guidelines to SSC CDM methodologies version17*" and hence, considered appropriate.

Data archiving:

↳ Project participant has provided for archiving in electronic form of all the monitored data. This is stated transparently in section B.7.1 of the PDD version5.2. Project participant has provided for keeping the data records for 2 years after the end of the last crediting period.

Apportioning (*in case of mismatch in crediting period date and billing date*):

- In case of mismatch in crediting period date and billing date, the PP would follow the apportioning procedure to determine the partial days of generation. The same have been cross checked by PJRCES and found to be acceptable. PP would calculate the ratio of partial days of generation to that of total generation for the month. This ratio would be used to apportion the generation statement reading for the particular month. PP would cover the any discrepancy in the subsequent monitoring period.

- The monitoring plan is in line with the approved monitoring methodology AMS-I.D version17. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

AMS-III.AO, version01:

- Parameters monitored in-line with AMS-III.AO version01. QA/QC and data archiving is defined at the end of the table.

Table 18: Parameters Monitored ex-post

Sl. №	Parameter	Value used for ER calculation (unit)	Justification
01	$Q_{i,y}$ Amount of waste type *i* (poultry litter, agricultural wastes & cow dung) used at the plant.	37,000 (tonnes poultry litter) 58,000 (agri waste) 1,825 (cow dung)	**Requirement**: - This is in-line with para21 of the AMS-III.AO version01 and hence, considered appropriate. **Measurement**: - The parameter is measured as and when the waste is being brought at the project site using calibrated weighbridge. The same is measured as a difference of loaded truck and empty truck. **Source**: - The data is recorded on daily basis in form a log book. Hence, internal records i.e. daily log books maintained by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
02	$Q_{res\ waste,y}$ Amount of treated residue (compost) shipped off.	22,706 (tonnes/y)	**Requirement**: - This is in-line with para21 of the AMS-III.AO version01 and hence, considered appropriate. **Measurement**: - The parameter is measured on continuous basis as and when the treated residue (compost) is sent out of the project site using calibrated weighbridge. The same is measured as a difference of loaded truck and empty truck. **Source**: - The data is recorded on daily basis in form a log

Table 18: Parameters Monitored ex-post			
Sl. №	**Parameter**	**Value used for ER calculation (unit)**	**Justification**
			book. Hence, internal records i.e. daily log books maintained by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
i	**Weighbridge Calibration**: ➪ In-line with para21 of AMS-III.AO, version01, PP has opted to calibrate the weigh bridge as per manufacturer's specification. Since, the project is yet to be implemented and hence, PP has also, specified that weigh bridge would be calibrated at least once in 3 years. This is in-line with the general guidelines to SSC CDM methodologies (version17) and hence, considered appropriate.		
03	w_{CH4} Methane content in the biogas.	60 (%)	**Requirement**: ➪ Para21 of the AMS-III.AO version01 requires PP to refer to relevant procedures of AMS-III.H latest version 16. PP has included the same and hence, considered appropriate. **Measurement**: ➪ The parameter is directly measured on continuous on dry basis and averaged hourly using gas analyzer. PP has opted for 30 minutes of interval, since, the same provides precision level higher than 90/10. The same was cross checked with the sampling procedure described in PDD and hence, considered appropriate. **Source**: ➪ The data is recorded every 30 minutes. The same is transformed into internal records i.e. monthly log books maintained by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
ii	**Gas analyzer Calibration**: ➪ PP has opted to calibrate the gas analyzer as per manufacturer's specification. Since, the project is yet to be implemented and hence, PP has also, specified that analyzer would be calibrated at least once in 3 years. This is in-line with the general guidelines to SSC CDM methodologies (version17) and hence, considered appropriate.		
04	$FV_{RG,h}$ Volumetric flow rate of the residual gas in dry basis at normal conditions in	912 (m^3/h)	**Requirement**: ➪ The monitoring of this parameter is in-line with "*Tool to determine project emissions from flaring gases containing methane*" (version 01) and hence, considered appropriate. **Measurement**: ➪ In-line with the tool, PP has opted to measure

Table 18: Parameters Monitored ex-post			
Sl. №	**Parameter**	**Value used for ER calculation (unit)**	**Justification**
	hour *h*.		the parameter continuously on dry basis using calibrated thermal mass flow meter. **Source**: ↳ The data is recorded every 30 minutes. The same is transformed into internal records i.e. monthly log books maintained by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
iii	**Thermal mass flow meter**: ↳ PP has opted to calibrate the thermal mass flow meter as per manufacturer's specification. Since, the project is yet to be implemented and hence, PP has also, specified that meter would be calibrated at least once in 3 years. This is in-line with the general guidelines to SSC CDM methodologies (version17) and hence, considered appropriate.		
05	**$BG_{combusted,y}$** The total amount of the biogas combusted, measured on a dry basis.	7,186,328 (Nm^3/y)	**Requirement**: ↳ This is in-line with the AMS-III.AO version01 and hence, considered appropriate. The data has been sourced from the Energy & Mass balance spreadsheet[/28/] for the purpose of ex-ante estimation of emission reductions. The same has been validated by the technical expert and found to be appropriate. **Measurement**: ↳ The parameter will be directly measured on continuous basis using calibrated flow meter. The meter will have accuracy class of ±0.1% **Source**: ↳ The data is recorded on monthly basis in form a log book. Hence, internal records i.e. monthly log books maintained by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
06	**$BG_{flared,y}$** The amount of biogas generated that is flared on a dry basis.	798,481 (Nm^3/y)	**Requirement**: ↳ This is in-line with the AMS-III.AO version01 and hence, considered appropriate. **Measurement**: ↳ The parameter is directly measured on continuous basis using calibrated flow meter. **Source**: ↳ The data is recorded on monthly basis in form a log book. Hence, internal records i.e. monthly

Table 18: Parameters Monitored ex-post			
Sl. №	**Parameter**	**Value used for ER calculation (unit)**	**Justification**
			log books maintained by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
	Flow meters calibration: ➪ PP has opted to calibrate the flow meters as per manufacturer's specification. Since, the project is yet to be implemented and hence, PP has also, specified that meters would be calibrated at least once in 3 years. This is in-line with the general guidelines to SSC CDM methodologies (version17) and hence, considered appropriate.		
07	**Frequency of tilling** Number of times each batch is tilled.	Once per day	**Requirement**: ➪ This is required to improve the porosity and oxygen content of the digester sludge piles to ensure that solids are aerobically handled. **Measurement**: ➪ The same is being done once per day. Each batch is dried for 12-13 days. **Source**: ➪ The data is recorded for each tilling and when the sludge is removed which is converted into report on monthly basis. Hence, internal records i.e. monthly reports maintained by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
08	**FC_{Diesel}** Amount of diesel consumption for operation at site for e.g. tillers and diesel generator set.	0 (Litres)	**Requirement**: ➪ Diesel would be consumed for operation of tillers and gen sets and hence, considered appropriate. **Measurement**: ➪ The same would be calculated based on the monthly stock balance for the crediting period. This can again be cross verified with the Diesel purchase receipts. **Source**: ➪ The data is recorded on monthly basis in form a log book. Hence, internal records i.e. monthly log books maintained by stores personnel and submitted to CDM coordinator is used as the source of data and considered appropriate.
09	**T_{flare}** Temperature in the exhaust gas of the flare.	> 500 (°C)	**Requirement**: ➪ The monitoring of this parameter is in-line with "*Tool to determine project emissions from flaring gases containing methane*" (version 01)

Table 18: Parameters Monitored ex-post			
Sl. №	**Parameter**	**Value used for ER calculation (unit)**	**Justification**
			and hence, considered appropriate. **Measurement**: ➪ In-line with the tool, PP has opted to measure the temperature of the exhaust gas stream in the flare on continuous basis by a Type N thermocouple. **Source**: ➪ The data is recorded every 30 minutes. The same is transformed into internal records i.e. monthly log books maintained by operator and submitted to CDM coordinator is used as the source of data and considered appropriate.
	Calibration of Type N Thermocouple: ➪ In-line with the tool PP has opted to calibrate thermocouple every year as per the manufacturer recommendations or it will be replaced every year.		
10	$N_{LT,y}$ Livestock population.	2,500,000	**Requirement**: ➪ The parameter is required to determine the ex post baseline emissions and is in-line with para19 of AMS-III.AO, version01. **Measurement**: ➪ This parameter is back calculated based on the design capacity and average generation data i.e. 40 g / head / day. This exercise would be done once every year. **Source**: ➪ As explained above this parameter is back calculated based on the design capacity and average generation data i.e. 40 g / head / day.
11	$DAF_{w,i}$ Average incremental distance for waste type *i* (poultry litter, agri waste and cow dung) transportation.	25 (km/truck)	**Requirement**: ➪ The monitoring of this is in-line with para21 of AMS-III.AO, version01. **Measurement**: ➪ PP has estimated the value based on the round trip distances between the sources of wastes and facility. The calculation provided in the DPR approved by third party have been reviewed by PJRCES and found to be conservative and thus, considered appropriate. **Source**: ➪ PP would be keeping the records of each trip for transportation of waste from source to the

Table 18: Parameters Monitored ex-post			
Sl. №	**Parameter**	**Value used for ER calculation (unit)**	**Justification**
			facility and back to the source in form of TRIPSHEET.
12	**$DAF_{res\ waste}$** Average incremental distance for compost transportation.	50 (km/truck)	**Requirement**: ➪ The monitoring of this is in-line with para21 of AMS-III.AO, version01. **Measurement**: ➪ PP has estimated the value based on the round trip distances between the facility and destination of the residual waste sold. The calculation provided in the DPR approved by third party have been reviewed by PJRCES and found to be conservative and thus, considered appropriate. **Source**: ➪ PP would be keeping the records of each trip for transportation of waste from source to the facility and back to the source in form of TRIPSHEET. The destination details would be cross checked against the sales records.
13	**APP_{comp}** Proper application of compost	100 (%)	**Requirement**: ➪ This parameter is included in the monitoring plan to ensure that a proper soil application is carried to ensure proper application of compost in order to confirm that it does not lead to any emissions during the crediting period and hence, considered appropriate. **Measurement**: ➪ PP has opted to measure the same through 3rd party annual sampling. **Source**: ➪ A third party sampling report shall be used to confirm that the soil application has been under aerobic conditions and the same would be used as source of the document and hence, considered appropriate.
14	**$EC_{PJ,y}$** Net electricity imported from the grid in case the Power units are not	0 (GWh/y)	**Requirement**: ➪ This parameter is included in the monitoring plan to ensure that any electricity consumption from grid in the absence of operations of power units during the crediting period is monitored and the project emissions are accounted and

Table 18: Parameters Monitored ex-post			
Sl. №	**Parameter**	**Value used for ER calculation (unit)**	**Justification**
	operating		hence, considered appropriate. **Measurement**: ➪ PP has opted to measure the same through energy meter. **Source**: ➪ TANGEDCO officials will record the reading from the meter and will issue monthly consumption statement. Same is used as the primary source of information. PP will also, maintain a log book and record the electricity consumed by the facility on monthly basis which can be used for cross checking the generation statements.
	Calibration of energy meter: ➪ PP has opted to calibrate the energy meter annually. Since, the calibration is beyond PP's control PP will ensure that it is calibrated at-least once in 3 years. This is in-line with the § 17.c of the general guidelines to SSC CDM methodologies (version 17) and hence, considered appropriate.		

QA/QC Procedures:

➪ Flow meters, sampling devices, gas analyzers and thermocouples shall be subject to regular maintenance, testing and calibration to ensure accuracy as confirmed in the table above;

Data archiving:

➪ Project participant has provided for archiving in electronic form of all the monitored data. This is stated transparently in section B.7.1 of the final PDDversion5.2. Project participant has provided for keeping the data records for 2 years after the end of the last crediting period.

Data Integration:

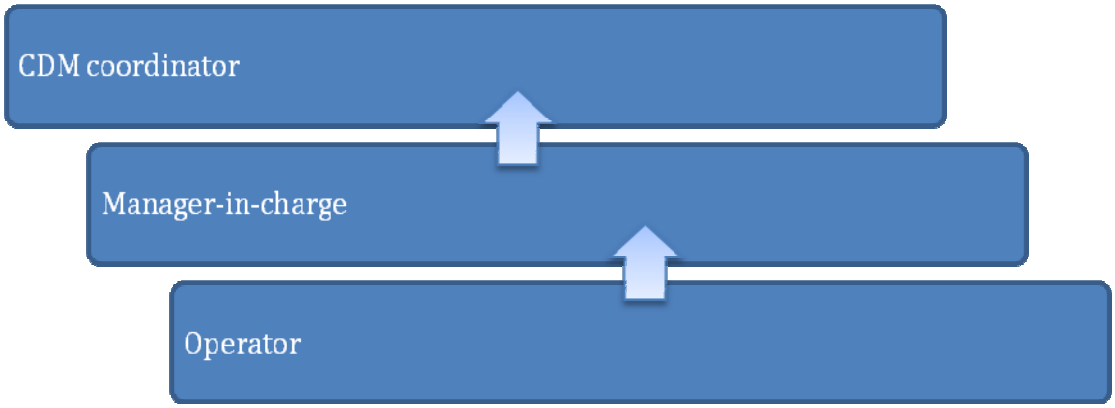
➪ The data integration for the parameters Methane content in biogas, total biogas flared, total biogas generated and temperature in the flare is conducted at an interval of half hour. Based on the values monitored the Flare efficiency is determined as per the procedures defined in the Section B.6.2 of the PDD. These values are used for the calculation of the methane destroyed in accordance with AMS-III.AO version01.

➲ The monitoring plan is in line with the approved monitoring methodology AMS-III.AO version01. The monitoring plan will give opportunity for real measurements of achieved

emission reductions.

4.9.3 MANAGEMENT SYSTEM AND QUALITY ASSURANCE

- PP has identified an organizational level operational and management structure to implement the monitoring plan as follows.



- Details of the data to be collected, the frequency of data recording and its format, responsibilities and authorities for project management, procedures for monitoring and reporting, QA/QC procedures, procedures for calibration of metering equipment and procedures for training and maintenance have been elaborated in the monitoring plan defined in the final PDD version5.2. All indicators of importance for controlling and reporting of project performance are incorporated in the monitoring plan.

- PP would also provide necessary training through the equipment supplier. Depending on the parameters a daily or monthly reports would be prepared by the operator which would then be submitted to CDM coordinator for the further review before submitting the same to verifier during verification activity.

- The monitoring is considered to meet the current good practice in the industry and it is judged that the use of monitoring methodology is appropriate.

- All data will be archived electronically and will be kept at least for 2 years after the end of the last crediting period. The operator will collect the data for the monitoring plan and the plant manager will verify the correct application of the operating procedures as given in the monitoring plan.

- The validation team evaluated the relevant monitoring procedures provided in PDD with the requirements of the monitoring methodologies and applicable tools. The monitoring arrangements described are feasible within the project design and PJRCES confirms the

ability of the PP to implement the monitoring plan. The institutional arrangement with respect to data collection and archiving was confirmed during the site visit.

- The application of the monitoring methodology is transparent and PJRCES considers that the project participants are able to implement the monitoring plan.

4.10 CALCULATIONS OF GHG EMISSION REDUCTIONS

AMS-I.D version01:

- The emission reduction (ER_y) by the project activity during the crediting period is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (L_y). The calculations and formulae as addressed in the approved baseline and monitoring methodology AMS-I.D version17 have been applied. All aspects related to the direct and indirect GHG emissions as relevant to the project activity have been addressed and are presented in a transparent manner, in line with the approved methodology.

Baseline emission:

- As defined by the applied methodology, AMS-I.D, Version 17, the baseline emissions are calculated as product of net energy delivered by the project activity to the grid and its corresponding grid emission factor.

- The *ex-ante* estimation of net energy delivered to the grid ($EG_{BL,y}$) calculated based on the 86% gas engine PLF[/24/] (sourced from third party report), gas engine capacity 2.4 MW[/26/] (based on the purchase order) and Auxiliary consumption 26,029 MWh/y[/56/] (calculated based on the load of the electrical equipments to be installed in the plant) and 8,760 running hours is 15,477 MWh.

- As per the methodology AMS-I.D, version17, para12, the grid emission factor was calculated as a combined margin consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in "Tool to calculate the grid emission factor of an electricity system", version2.2.1. The combined margin for Southern grid of India, as discussed under Section 4.9.1, has been calculated as 0.865 tCO_2/MWh has been sourced from Central Electricity Authority dated version06. The combined margin is fixed ex-ante for the entire crediting period of ten years with the latest data available for grid emission factor from CEA at the time of PDD webhosting. The project is expected to result in baseline emissions of **13,318 tCO_2** per year during the crediting period.

Project Emissions:

- The project is a renewable energy project and hence as per the applied methodology AMS-I.D version17, the project emissions are zero. This is in-line with para20 of AMS-I.D, version17.
- There is an on-site consumption of fossil fuel as confirmed during project site visit. The same have been covered in the emissions under the AMS-III.AO version01 below.

Leakage Emissions:

- As defined by the applied methodology, AMS-I.D, version17, there is no leakage emissions associated with the type of technology adopted in the project activity.

Emission reductions accruable from the project activity are calculated as:

Emission reductions (ER_y)	=	**Baseline Emissions (BE_y) – Project Emissions (PE_y) – Leakage Emissions (L_y)**
	=	**13,318 – 0 – 0**
	=	**13,318 tCO_2e per annum**

Hence emission reductions from the project activity as per AMS-I.D, version17 are **13,318 tCO_2e/annum**

AMS-III.AO, version01:

Baseline emissions:

- As per the applied methodology "*the baseline emissions are the amount of methane emitted from the decay of the degradable organic carbon in the biomass and other organic matter. Baseline emissions shall exclude emissions of methane that would have to be captured, fuelled or flared or gainfully used to comply with national or local safety requirement or legal regulations.*" The calculation presented here are for the purpose of ex-ante estimation of emissions reductions. During the verification PP would monitor the values as confirmed in the section 4.8 above to estimate the actual emission reductions achieved by the project activity.

- As per para 1(c) of applied methodology "*If for one or more sources of substrates, it cannot be demonstrated that the organic matter would otherwise been left to decay anaerobically, baseline emissions related to such organic matter shall be accounted for as zero*" and thus, PP has excluded the emissions arising from Agriculture biomass residue (starch & sugar industry) and cow dung from baseline emissions. In-line with the applied methodology this is considered to be conservative.

  Total Baseline emissions are calculated using following formula

$$BE_y = BE_{SWDS,y} + BE_{ww,y} + BE_{manure,y} - MD_{reg,y} * GWP_{CH_4}$$

$BE_{SWDS,y}$	=	yearly methane generation potential of the solid waste anaerobically digested by the project activity during the year *x* from the beginning of the project activity (*x*=1) up to the year As confirmed in section 4.7 above PP is claiming the baseline emissions due to avoidance of methane emission from Poultry litter only and hence, this is not applicable.
$BE_{manure,y}$	=	Where applicable, baseline emissions from the manure co-digested by the project activities, calculated as per the relevant procedures of AMS-III.D As confirmed in section 4.7 above PP is claiming the baseline emissions due to avoidance of methane emission from Poultry litter only this has been discussed in detail below.
$BE_{ww,y}$	=	Where applicable, baseline emissions from the wastewater co-digested, calculated as per the procedures of AMS-III.H As confirmed in section 4.7 above PP is claiming the baseline emissions due to avoidance of methane emission from Poultry litter only and hence, this is not applicable.
$MD_{reg,y}$	=	Amount of methane that would have to be captured and combusted in the year *y* to comply with the prevailing regulations (tonne) This has been discussed in detail below
GWP_{CH4}	=	*GWP for CH4 (value of 21 is used)* – this is in accordance with the applied methodology.

- **Baseline emissions from manure**: calculated using following formula in accordance with the AMS-III.D version18 (AMS-III.AO version01 refers to the same).

$$BE_{manure,y} = GWP_{CH4} * D_{CH4} * UF_b * \sum_{j,LT} MCF_j * B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{Bl,j}$$

Parameter	Value applied (unit)	Source
GWP_{CH4} Global warming potential of Methane	21	As confirmed in section 4.9.1 above
D_{CH4} Density of methane	0.67 (kg/m³)	As confirmed in section 4.9.1 above
UF_b Model correction factor to account for model uncertainties	0.94	As per AMS-III.D version18
MCF_j Annual methane conversion factor (MCF) for the baseline	22.84 (%)	As confirmed in section 4.9.1 above

animal manure management system *j*		
$B_{0,LT}$ Maximum methane producing potential of the volatile solid generated for animal type LT	240 (m^3 CH_4/t)	As confirmed in section 4.9.1 above
$N_{LT,y}$ Annual average number of animals of type *LT* in year *y*	2,500,000 (number of birds)	As confirmed in section 4.9.2 above
$VS_{LT,y}$ Volatile solids for livestock *LT* entering the animal manure management system in year *y*	7.3 (kg/y)	➪ Calculated as follows $VS_{LT,y} = \{ (W_{site}/ W_{default}) * VS_{default} * nd_y \}$[20] $VS_{LT,y} = (1/ 1) * 0.02 * 365$ $VS_{LT,y} = 7.3$ Assuming the W_{site} as 1 (IPCC value) would ensure conservativeness in estimating the baseline emissions.
$MS\%_{Bl,u}$ Fraction of manure handled in baseline animal manure management system *j*	100 (%)	As confirmed in section 4.9.1 above
$BE_{manure,y} = GWP_{CH4} * D_{CH4} * UF_b * \sum_{j,LT} MCF_j * B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{Bl,j}$		
$BE_{manure,y}$ = 13,231 tCO_2e/y		

Project emissions:

➲ PP has included the calculation of project emissions in-line with para13 of applied methodology AMS-III.AO, version01 that consists of following:

(a) CO_2 emissions due to incremental transportation distances;

(b) CO_2 emissions from electricity and/or fossil fuel consumption by the project activity facilities;

(c) In case the residual waste from the digestion is stored under anaerobic conditions and/or delivered to a SWDS, or treated in a WWTS: the methane emissions from the disposal/storage/treatment of these residual waste;

(d) Methane emissions from physical leakages of the anaerobic digester;

(e) Methane emissions due to flare inefficiency;

[20] From IPCC 2006 guidelines[/45/] no $W_{default}$ is given for developing countries, so project cannot adjust VS for site-specific average animal weigth; so $W_{site}/W_{default}$ =1
$VS_{default}$ is sourced from IPCC 2006 guidelines[/45/]
nd_y as confirmed in section 4.9.2 of this report

$$PE_y = \begin{Bmatrix} PE_{transp,y} + PE_{power,y} + PE_{res\ waste,y} \\ + PE_{phy\ leakage,y} + PE_{flaring,y} \end{Bmatrix}$$

- **Emissions due to transportation ($PE_{transp,y}$)**: calculated using following formula

$$PE_{transp,y} = (Q_y / CT_y) * DAF_w * EF_{CO2,transport} + (Q_{res\text{-}waste,y} / CT_{res\text{-}waste,y}) * DAF_{res\text{-}waste} * EF_{CO2,transport}$$

Parameter	Value applied (unit)	Source
Q_y Quantity of raw waste/manure treated and/or wastewater co-digested in the year *y* (tonnes)	96,825	As confirmed in section 4.9.2 above
CT_y Average truck capacity for transportation	8 (tonnes/truck)	Confirmed by reviewing the quotation from the transport company/47/
DAF_w Average incremental distance for raw solid waste/manure and/or wastewater transportation.	25 (km/truck)	As confirmed in section 4.9.2 above
$EF_{CO2,transport}$ CO_2 emission factor from fuel use due to transportation	0.326 ($kgCO_2$/km)	As confirmed in section 4.9.1 above
$Q_{res\text{-}waste,y}$ Quantity of residual waste produced in year *y*	22,706 (tonnes/y)	As confirmed in section 4.9.2 above
$CT_{res\ waste,y}$ Average truck capacity for residual waste transportation	8 (tonnes/truck)	Confirmed by reviewing the quotation from the transport company/47/
$DAF_{res\ waste}$ Average distance for residual waste transportation	50 (km/truck)	As confirmed in section 4.9.2 above
$PE_{transp,y} = (Q_y / CT_y) * DAF_w * EF_{CO2,transport} + (Q_{res\text{-}waste,y} / CT_{res\text{-}waste,y}) * DAF_{res\text{-}waste} * EF_{CO2,transport}$		
$PE_{transp,y} = PE_{y,transp,litter} + PE_{y,transp,treatment} =$ 149.36 tCO_2e/y		

- **Project emissions from electricity and/or fossil fuel consumption ($PE_{power,y}$):** is calculate using following formula

$$PE_{power} = PE_{power\_own\ gen} + PE_{power\_elec} + PE_{power\_DG}$$

Parameter	Value	Source

	applied (unit)	
$PE_{power\_own\_gen}$ Power utilized for meeting auxiliary demand through recovered biogas	0 (tCO_2e)	In-line with para15 of the applied methodology PP has considered the same to be zero and hence, acceptable.
PE_{power_elec} Project emissions due to power imported from Grid.	0 (tCO_2e)	PP is monitoring the amount of electricity that will be imported by project activity and has considered 0 for the estimation of emissions reductions during the validation and hence, acceptable. The same will be calculated using the *"Tool to calculate baseline, project and/or leakage emissions from electricity consumption"* (Version 01). Since, the project activity will be drawing electricity from the grid only and hence, falls under scenario A given by the tool. Thus, PP has opted to calculate the project emissions due to electricity import from grid using following formula $PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{i,y})$ Also, in-line with Option A1 of the Tool, PP has calculated the $EF_{EL,j,y}$ (i.e. combined margin emission factor) using "*Tool to calculate the emission factor for an electricity system*- version 02.2.1" In-line with the tool PP chose to use the default values for $TDL_{j,y}$ (Average transmission and distribution losses) i.e. 20% and hence, acceptable.
$PE_{power\_DG} = PE_{FC,j,y}$ Project emissions due to diesel consumption.	0 (tCO_2e)	PP has opted to calculate the same in-line with "*Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion*" (version02). The same is calculated using following formula $PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$ PP monitors $FC_{i,j,y} = FC_{Diesel}$ i.e. quantity of fuel type I (i.e. diesel) combusted in process j during the year y. $COEF_{i,y} = EF_{CO2,diesel,y}$ i.e. CO_2 emission coefficient of fuel type i (i.e. Diesel) is sourced from IPCC 2006 guidelines and fixed ex-ante as 74.8 tCO_2/TJ; in-the

		absence of country specific data IPCC values are considered appropriate. In addition to above parameters PP also fixed the NCV and Density of diesel which are required to calculate Project emissions due to diesel consumption.

➲ **Project Emissions due to physical leakage of biogas in the year y ($PE_{phy\ leakage,y}$):**

Parameter	Value applied (unit)	Source
$BG_{total,y}$ The total amount of the biogas generated ($BG_{flared,y}$ + $BG_{combusted,y}$) on a dry basis.	7,984,808 (m^3/y)	As confirmed in section 4.9.2 above
Biogas leakage Biogas leaked / m^3 biogas	0.05 (Biogas leaked / m^3 biogas)	As per para17 of AMS-III.AO versio01
w_{CH4} Methane content in the biogas	60 (%)	As confirmed in section 4.9.2 above
$\rho_{CH4,n}$ Density of methane	0.67 (kg/m^3)	As confirmed in section 4.9.1 above
CH_4 leaked	239,544 (m^3/y) 160.49 (tonnes/y)	Calculated = 7,984,808 x 0.05 x 0.60 = 239,544 = 239,544 x 0.67 / 1000 = 160.49
GWP_{CH4} Global warming potential of methane	21	As confirmed in section 4.9.1 above
$PE_{phy\ leakage,y}$ = methane leaked (t/y) * GWP		
$PE_{phy\ leakage,y}$ = 3,370 tCO_2e/y		

➲ **Project Emissions due to flaring ($PE_{flare,y}$):**

Parameter	Value applied (unit)	Source
$FV_{RG,h}$ Volumetric flow rate of the residual gas in dry basis at normal conditions in hour *h*.	912 (m^3/h)	As confirmed in section 4.9.2 above
$fv_{CH4,RG,h}$ Volumetric fraction of CH_4 in the residual gas in the hour h.	60 (%)	As confirmed in section 4.9.1 above

$\rho_{CH4,n}$ Density of methane	0.67 (kg/m³)	As confirmed in section 4.9.1 above
$TM_{RG,h} = FV_{RG,h} \times fv_{CH4,RG,h} \times \rho_{CH4,n}$		
$TM_{RG,h}$= 366 kg/h		
$\eta_{flare,h}$ Flare efficiency in hour h based on measurements or default values	90 (%)	As confirmed in section 4.9.1 above
GWP_{CH4} Global warming potential of methane	21	As confirmed in section 4.9.1 above
Time flare is burning	876 (h)	For the purpose of calculation of ex-ante emission reductions PP has assumed the operation of flare for 10% of the time during a year. During crediting period the same is monitored through parameter FE_y.
$PE_{flare,y} = \sum_{h=1}^{8760} TM_{RG,h} * (1-\eta_{flare,h}) * \frac{GWP_{CH4}}{1000}$		
$PE_{flare,y}$ = 674.08 tCO_2e/y		

➲ **Project Emissions due to storage ($PE_{storage,y}$)**:

Para16 of the applied methodology AMS-III.AO, version01 requires PP to calculate Methane emissions from anaerobic storage and/or disposal in a landfill of the residual waste from the digestion. PP has claimed that PP is applying 100% of the residual waste to proper soil application and will monitor the same through monitoring parameter APP_{COMP} i.e. proper application of compost (i.e. residual waste), and hence, no emissions are considered. In the absence of the proper application PP would calculate the project emissions due to storage following latest version of the tool "*Emissions from solid waste disposal sites*" (version 06.0.1). Since, the same is in-line with para16 of the applied methodology and hence, considered appropriate.

The emission reductions achieved by the project activity will be determined ex post using following formula in accordance with para19(a) of AMS-III.AO version01.

$$ER_{y,ex\,post} = min\left[\begin{array}{l}(BE_{y,ex\,post} - PE_{y,ex\,post} - LE_{y,ex\,post}),(MD_y - PE_{y,power,ex\,post} - \\ PE_{y,transp,ex\,post} - PE_{y,res\,waste,ex\,post} - PE_{y,phy\,leakage,ex\,post} - LE_{y,ex\,post})\end{array}\right]$$

Where:

$ER_{y,ex\ post}$	Emission reductions achieved by the project activity based on monitored values for year *y* (tCO_2e)
$BE_{y,ex\ post}$	Baseline emissions calculated using *ex post* monitored values (e.g. Q_y) (tCO_2e)
$PE_{y,ex\ post}$	Project emissions calculated using *ex post* monitored values (e.g. Q_y, transport distances, the amount of electricity/fossil fuels used, emissions from anaerobic storage). This calculation shall include project emissions from physical leakage (tCO_2e)
$LE_{y,ex\ post}$	Leakage emissions calculated using *ex post* monitored values (tCO_2e)
MD_y	Methane captured and destroyed or used gainfully by the project activity in year *y* (tCO_2e)
$PE_{y,transp,ex\ post}$	Emissions from incremental transportation based on monitored values in the year *y* (tCO_2e)
$PE_{y,power,ex\ post}$	Emissions from the use of fossil fuel or electricity for the operation of the installed facilities based on monitored values in the year *y* (tCO_2e)
$PE_{y,res\ waste,ex\ post}$	Methane emissions from the anaerobic decay/treatment of the residual waste/products based on monitored values in the year *y* (tCO_2e)
$PE_{y,phy\ leakage,ex\ post}$	Methane emissions from physical leakages of the anaerobic digester based on monitored values in year *y* (tCO_2e)

According to paragraph 19 (b) of AMS-III.AO (Version 01): flaring/combustion MD_y will be measured using the conditions of the flaring process and calculated using following formula:

$$MD_y = BG_{burnt,y} * w_{CH4,y} * D_{CH4} * FE * GWP\_CH_4$$

Where:

$BG_{burnt,y}$	Biogas[21] flared/combusted in year *y* (m^3)
$w_{CH4,y}$	Methane content in the biogas in the year *y* (volume fraction)
D_{CH4}	Density of methane at normal conditions (20^oC at 1 atmosphere) ($tonnes/m^3$)
FE	Flare efficiency in the year *y* (fraction). If the biogas is combusted for gainful purposes, e.g. fed to an engine, an efficiency of 100% may be applied.

The method for integration of the terms to calculate MD_y to obtain the results for one year of measurements within the confidence level, as well as the methods and instruments used for metering, recording and processing the data obtained, have been transparently described in the PDD and confirmed in section 4.9 above.

Since, PP has kept a provision of flaring the biogas the MD_y will be derived using following amended formula

$$MD_y = \left(BG_{flared,y} * w_{CH4,y} * D_{CH4} * FE * GWP\_CH_4\right) + \left(BG_{combusted,y} * w_{CH4,y} * D_{CH4} * GWP\_CH_4\right)$$

[21] Biogas and methane content measurements shall be on the same basis (dry).

$ER_y = BE_y – PE_y – LE_y$

Emissions reductions:			
$ER_y=BE_y–PE_y$			
Parameter	**Description**	**Value**	**Unit**
$\mathbf{BE_{Elec,y}}$	Baseline emissions from electricity generation	*13,318*	tCO_2e/yr
$\mathbf{BE_{manure,y}}$	Baseline emissions from poultry litter	*13,231*	tCO_2e/yr
$\mathbf{PE_{transp,y}}$	Project emissions due to transportation of substrates and wastes	*149.36*	tCO_2e/yr
$\mathbf{PE_{power,y}}$	Project emissions from electricity and/or fossil fuel consumption	*0*	tCO_2e/yr
$\mathbf{PE_{phy\ leakage,y}}$	Project Emissions due to physical leakage of biogas	*3,370*	tCO_2e/yr
$\mathbf{PE_{flare,y}}$	Project Emissions due to flaring	*674*	tCO_2e/yr
$\mathbf{ER_y}$	Emission reduction in year *y*(tCO_2e/yr)	***22,355***	tCO_2e/yr

In summary, the GHG calculations are complete and transparent, and their accuracy has been verified. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found.

4.11 ENVIRONMENTAL IMPACTS

- The proposed project activity contributes to generation of green power and is expected to benefit the economic development of the region. Thus, the project activity is expected to have only beneficial impacts and no adverse impacts are foreseen. There is no mandatory legal requirement from Ministry of Environment & Forests (MoEF) for carrying out EIA for biogas projects, which was verified by means of the Schedule 1 of the EIA notification22 1994 given by the Ministry of Environment and Forests under Environment (Protection) Act 1986. This was further confirmed by the Environment Impact Assessment Notification S.O. 1533 dated 14 September 2006 issued by the MoEF[23].

- However PJRCES has verified all the clearances like statutory clearances/23/, valid air/51/ and water/52/ consents and power purchase agreements for facility. The validation team concludes that all the clearances obtained are in accordance with the procedures required by the host Party (India).

4.12 COMMENTS BY LOCAL STAKEHOLDERS

- PP conducted the local stakeholder consultation/53/ at the proposed location of its 2.4MW power plant in order to reach out to the relevant stakeholders. The local stakeholders' consultation meeting was conducted prior to the publication of PDD on the UNFCCC

[22] http://envfor.nic.in/divisions/iass/notif/eia.htm
[23] http://envfor.nic.in/legis/eia/so1533.pdf

website. The stakeholders identified by PP were local villagers who are the major population of the particular area where the project is located.

- Thattayangarpatti Village, Pudhuchatram, Namakkal District, Tamil Nadu, India.
  - The meeting was organized on 18 March 2011.
  - The villagers were invited through public notice dated 10 March 2011 and through local news paper notice dated 16 March 2011.
  - PP opted for open house discussions. The same was cross checked by PJRCES during the site visit by interviewing some of the stakeholders and found to be acceptable.

- The validation team verified the list of participants[/53/] who attended the stakeholder meeting and confirms that stakeholder's 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 stakeholders during the site visit. The validation team is of the opinion that the local stakeholder's consultation process was adequate giving fair opportunity for the participation by local stakeholders. The project has not received any adverse comments.

- PJRCES considers the local stakeholder consultation carried out as adequate and follows the local practices.

4.13 COMMENTS BY PARTIES, GLOBAL STAKEHOLDERS AND NGOS

- PDD dated 30 June 2011 was made publicly available on UNFCCC website (https://cdm.unfccc.int/Projects/Validation/DB/O48X2OYZJE0Z9GM5X1PUXX8JD9MM83/view.html) and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 01 July 2011 to 30 July 2011.

- Two comments were received and is given (in unedited form) in the below text box.

Comment by: sud, sudcdm3@gmail.com ☐ Accredited NGO ☐ Party ☒ Stakeholder **Inserted on**: 02 July 2011 **Subject**: Additionality, Feasibility study report **Comment**:
DOE to be more careful so that this is a genuine CDM project. What is the exact project cost? The project cost is covering what? Each value considered must be validated with proof. The machinery is second hand purchased or fresh and new from an OEM? In either case DOE to check all the quotations, proposals, purchase orders, invoices, way bills, transport bills, proof of payments like bank statements. DOE to check with banks by way of written confirmation the amount transacted, to whom the money is paid, when the money is

paid, is the party paid is the correct party as shown in the purchase orders. It may so happen that the values, party names, dates are fabricated and misrepresented in this project. DOE should terminate their contract for this project immediately. This is the only way out to protect the value of CDM process. If the PP is purchasing second hand or second quality equipment and inflating the purchase order values and invoices, this must be probed thoroughly and real values to taken for additionality calculation. Then I'm sure the additionality is not there at all in such a situation.

How is the base line defined in this project? Is Base line hypothetically defined with no proper evidences and proper justification? In such case, DOE cannot take the base line as suggested by the PDD. Please check that there are real emission reductions beyond the real and factual base line. It may so happen that this project qualifies for no CER's. DOE cannot assume values and things as giving by this PP. Whatever values are considered throughout the project in all documents including the real DPR (not the one prepared for CDM, the one given to the banks and others), they must be validated, verified and double checked. Do not ask PP for DPR. Ask the parties who have been given DPR by the PP. Get directly from the bank and others by each page of the DPR and Feasibility report signed. Such document can be considered as a real DPR or FR. UNFCCC CDM process cannot be degraded by fabricating and misinterpreting the project base line and additionality.

Has the PP considered the CDM revenues while envisaging the project? Without CDM the project was not viable, is it right? This project is having a debt component? Then how bankers or lenders gave the loan? Have the bankers or lenders considered the CDM revenues while agreeing to give loan to this projects? If not this project should be rejected right away by DOE by terminating the contract forthwith. If yes, where is the proof? What is the date of the evidence document from bank? Is this document printed now a days or earlier. DOE to independently check the same. If the document is available from Bank it must be checked from all angles so that it is genuine and not forged and date changed by putting back dated. This is normally done, DOE to be aware of this please. Please check the communication the PP had during that time with banks, emails and postal receipts and the weights and dates mentioned on the receipts. Do not believe in courier bills and receipts since these can be cooked up easily. Insist on government owned postal service receipts only. If the project is fully equity project then on what basis the PP has invested full equity in to the project while considering the CDM revenue? DOE to check the same in detail and bring out the facts. Is there any past record of this PP to invest or not to invest at returns what he is talking about in this project? Proper evidences must be reviewed and digged out by the DOE and take decision on the project based on established facts. Do not ask documents from PP, DOE to collect the same from different sources to do independent evaluation.

Is the project equipment purchased second hand equipment or sourced from cheap foreign sources? If yes, the issue must be probed by DOE since invoices will invariably be inflated

and forged. Total project costs mentioned by PP will not be the same as originals. Hence no additionality. These facts must be probed in full by DOE by checking all documents and money transactions along with bank statements and certified accounts by a legally acceptable financial analyst.

From DOE side which auditor has done marketing and business development for acquiring this business of validating this project? With whom he or she was co-ordinating at PP or CER buyer? The same person who has done the marketing and business development to acquire the business do validation or participate in any manner what so ever in the validation process? One cannot do like that. It is against the accreditation rules and norms followed since ages. DOE should send auditors from different offices or countries to do this validation audit. DOE must take care of impartiality and accreditation rules. Due to the targets set by the DOE managements auditors are doing marketing and meeting clients and giving promises that the project will be taken care. Is it acceptable and fair? This must be stopped. No auditor should do marketing. Only non-auditing staff should do marketing. DOE to ensure the same please.

If applicable only: Is these machines, equipment was a part of any bundle of CDM activity envisaged and developed earlier. DOE to check the same through independent sources also. Once some bundles are non-additional and getting negative validation from a DOE, PP is rolling out the same project as an individual project which is not a CDM project at all. DOE to verify the same from independent sources and also take undertaking in the form of an affidavit from the PP's that any misrepresentation or false statement with respect this would attract strict legal action from UNFCCC and DOE. Furthermore the registered project must be de-registered in case of any future findings contradicting the submissions made by the project owner.

DOE to ensure that the PDD values are consistent and ensure that the CDM project is a genuine project
DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also.
Careful study must be done so that the DPR/FR is not in different versions made and submitted with different purposes to different agencies, which is totally unacceptable, illegal and unethical.
Project owner should show some undertaking letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE at face value, but must be checked independently. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE.

DPR/FR values must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes. Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts. DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant. DOE must not entertain this project any more if found the DPR/FR is tamprered with at any point in time. PP cannot give different DPR's and FR's. They must submit only the one given to Banks and other agencies while obtaining loans and decision making time.

Comment by: Karthikeyan, carthik2010@gmail.com ☐ Accredited NGO ☐ Party ☒ Stakeholder **Inserted on**: 30 July 2011 **Subject**: Additionality, Feasibility study report **Comment**:
1.On what basis internal benchmark is used for this project? 2.When the project is financed by both equity and debt and debt accounts for 70% of the project cost, on what basis the consultant thinks that equity IRR is correct financial indicator? It does not comply with Additionality Tool. It should be project IRR only 3.The O&M cost works out to 20% of investment. Which ERC order allows this? It is extremely high. 4.The project cost is very high for a capacity of 2.4 MW. Compare the cost with other projects and it will come to light that it is atleast 5 times higher. 5.Auxiliary consumption is very high 6.This project is eligible for 100% depreciation and also tax holiday. DOE should ensure that the tax savings is taken into account in calculating IRR.

- Also, in-line with guidance available at paragraph 40 (a) and (b) of the modalities and procedures for the CDM and paragraph 92 of EB25, amended PDD dated 02 December 2011 was again made publicly available on UNFCCC website (https://cdm.unfccc.int/Projects/Validation/DB/G3WO8B7ORRKL2GC0109MBN4AF65MCF/view.html) and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 06 December 2011 to 04 Jan 2012.

How DOE has considered the comments received in its validation:
All the comments received during global stakeholder consultation process have been taken into account during the project validation and addressed in the validation report. The clarifications

have been sought from PP based on the comments received which has been successfully closed. Please refer to the Table 3 (Resolution of issues identified in table2 of the validation protocol) of the validation report.

5 VALIDATION OPINION

Perry Johnson Registrar Carbon Emissions Services, Inc (PJRCES) has performed a validation of the "IOT Mabagas Limited power plant, Pudhuchatram" in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DOE with sufficient evidence to determine the fulfilment of stated criteria.

The host country is India and Netherlands as Annex I country is identified. The host country fulfils the participation criteria and has approved the project and authorized the project participants. The DNA from India confirmed that the project assists in achieving sustainable development. The DNA from Netherlands has confirmed its voluntary participation.

The project correctly applies approved baseline and monitoring methodologies "AMS-I.D version17 (Grid connected renewable electricity generation)" and "AMS-III.AO version01 (Methane recovery through controlled anaerobic digestion)". The project involves avoidance of methane emissions by recovering biogas and using it for power generation. The project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 22,355 tCO_2e per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is in PJRCES's opinion that the IOT Mabagas Limited power plant, Pudhuchatram" in India, as described in the PDD version5.2 of "03 November 2012", meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS-I.D version17 and AMS-III.AO version01. DOE thus requests the registration of the project as a CDM project activity.

6 REFERENCES

/01/	Letter of Approval 1. LoA ref No: 4/6/2012-CCC dated 14 September 2012 issued by National CDM Authority, Ministry of Environment & Forests, Government of India 2. LoA ref No: ANL2011-515 dated 02 April 2012 issued by National CDM Authority, Ministry of Infrastructure and the Environment, Netherlands.
/02/	Final PDD version5.2, dated 03 November 2012 and earlier versions
/03/	Web hosted PDD version01.5 dated 30 June 2011 and earlier versions https://cdm.unfccc.int/Projects/Validation/DB/O48X2OYZJE0Z9GM5X1PUXX8JD9MM83/view.html
/04/	Re web hosted PDDversion02.2 dated 02 December 2011 and earlier versions https://cdm.unfccc.int/Projects/Validation/DB/G3WO8B7ORRKL2GC0109MBN4AF65MCF/view.html
/05/	AMS-I.D, version17, Grid connected renewable electricity generation https://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X/view.html
/06/	AMS-III.AO, version01, Methane recovery through controlled anaerobic digestion https://cdm.unfccc.int/methodologies/DB/F5U41CTG7ENWK9RSSL5BV1LUPDG76W/view.html
/07/	AMS-III.D, version17, Methane recovery in animal manure management systems https://cdm.unfccc.int/methodologies/DB/0IB37O8ROJ5JRJXIUWQAJRCDUFKJP2/view.html
/08/	AMS-III.D, version18, Methane recovery in animal manure management systems https://cdm.unfccc.int/methodologies/DB/0IB37O8ROJ5JRJXIUWQAJRCDUFKJP2/view.html
/09/	Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion, version02. https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf
/10/	Emissions from Solid waste disposal site, version06.0.1 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-04-v6.0.1.pdf
/11/	Tool to determine project emissions from flaring gases containing methane, version01 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-06-v1.pdf
/12/	Tool to calculate the emission factor for an electricity system version02.2.1 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf
/13/	General Guidelines to SSC CDM methodologies version17 http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf
/14/	Attachment A to Appendix B, latest version08 and previous version07 https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid05.pdf
/15/	Non-binding best practice examples to demonstrate additionality for SSC project activities https://cdm.unfccc.int/EB/035/eb35_repan34.pdf
/16/	Project Design Document Form (CDM-SSC-PDD) - version03
/17/	Guidelines for completing the simplified Project Design Document (CDM-SSC-PDD) version05 https://cdm.unfccc.int/EB/034/eb34_repan09.pdf
/18/	Resource Assessment study for Agro-industrial waste and Livestock-waste India, January 2010, Published by Federation of Indian Chambers of Commerce and Industry (FICCI)

	http://www.globalmethane.org/Data/292_5_ficci_resource_assess_jan_10.pdf
/19/	Lifecycle of Compost from production center to its final use and procedures to monitor proper soil application, dated November 2010, prepared by Tide Technocrats Pvt. Ltd.
/20/	Technical Specifications 1. Flow meter technical specification sheet 2. Gas Analyser technical specification sheet
/21/	Declaration from PP on geo graphical co-ordinates, dated 17 October 2012
/22/	Energy Purchase Agreement (EPA) dated 09 February 2011 between Tamil Nadu Generation and Distribution Corporation Ltd (TANGEDCO) and IOT Mabagas Ltd (IML)
/23/	1. Approval for setting up of 2MW poultry litter/other organic waste based Biogas power plant at Namakkal, ref. No: Lr.No.1188/BE/TEDA/2010 dated 03 August 2010. 2. TNEB approval through Lr.No. /NCES/SE/EE/WCB/AEE-1/F.M/s. IOT Mabagas Ltd, dated 17 September 2010. 3. TEDA letter to TANGEDCO for capacity increase from 2 to 2.4 MW dated 14 November 2011. 4. Letter from IML to TNPCB for amendment of consent 2 to 2.4 MW dated 08 February 2012. 5. Letter from TANGEDCO for amendment of EPA from 2 to 2.4 MW dated 13 February 2012.
/24/	Green Power International (P) Ltd offer for Bio Gas Genset based Captive Power Generation Plant dated 22 February 2011.
/25/	Detailed project report of 2.0 MW biogas to power generation project at Puduchatram, dated 13 December 2010, prepared by IML
/26/	Purchase order by PP dated 22 July 2011, issued towards Green Power International (P) Ltd, dated 22 July 2011.
/27/	Biomass tariff order dated 27 April 2009, issued by Tamil Nadu Electricity Regulatory Commission
/28/	SD_16 Financial Analysis dated 03 November 2012
/29/	"*CO_2 Baseline Database for the Indian Power Sector*" version06 published by the Central Electricity Authority (CEA), Ministry of Power, Government of India
/30/	Capital subsidy approval letter issued by MNRE dated 20 March 2012.
/31/	Environmental Standards in India 1. http://envirocare.co.in/environmental-standards-in-india.htm 2. http://www.methanetomarketsindia.com/htm/indian-regulation.htm 3. http://cpcb.nic.in/Industry_Specific_Standards.php 4. http://cpcb.nic.in/Industry-Specific-Standards/Effluent/453-1.pdf
/32/	Green Energy from Wastes – "*Biomethanation Projects for Urban and Industrial Wastes set up under UNDP/GEF assisted Project on Development of High Rate Biomethanation Processes as means of Reducing Greenhouse Gases Emission*", issued by Ministry of Non-conventional Energy Sources, Government of India, dated March

	2006. http://www.sswm.info/sites/default/files/reference_attachments/UNDP%20206%20Green%20Energy%20from%20Waste.pdf
/33/	Average Yield on State Government Securities as provided in the Annual report of the Reserve Bank of India for the year ended June 30, 2011. (see table VII.6) http://www.rbi.org.in/scripts/AnnualReportPublications.aspx?Id=1004
/34/	TNERC tariff order dated 27 April 2009 http://tnerc.tn.nic.in/orders/Tariff%20Order%202009/Bio%20Mass%20Order%2027.04.4009.pdf
/35/	IRR Annex 1 Letter of Intent for lump sum EPC execution dated 16 August 2011 by IOT Mabagas Limited towards IOT Infrastructure & Energy Services Limited
/36/	IRR Annex 2 Deed of sale dated 22 September 2010 between Mr. P Sekar and IOT Mabagas Limited
/37/	IRR Annex 3 O&M Termsheet with Greenpower Int
/38/	Financing Renewable Energy in the European Energy Market, dated 02 January 2011, issued by ECOFYS. http://ec.europa.eu/energy/renewables/studies/doc/renewables/2011_financing_renewable.pdf
/39/	Biomass for Heat and Power, dated May 2010, issued by IEA http://www.iea-etsap.org/web/E-TechDS/PDF/E05-Biomass%20for%20HP-GS-AD-gct.pdf
/40/	Tide Technocrats Private Limited, Bangalore, Assessment report of feedstock availability and market for Biomethanation Solids, December 2010.
/41/	As per companies act http://www.incometaxindiapr.gov.in/incometaxindiacr/contents/forms2010/pamphets/COMPANIES_2012_13.htm
/42/	Income tax act 1961 http://www.deloitte.com/assets/Dcom-Global/Local%20Assets/Documents/Tax/dtt_corporate_tax_rates_2011.pdf
/43/	Central Electricity Regulatory Commission regulations 2009 (Terms and Conditions for Tariff determination from Renewable Energy Sources) http://www.cercind.gov.in/2010/November/Signed_Order_256-2010_RE_Tariff_FY_11-12.pdf
/44/	SD_61 Letter from TEDA dated 13 May 2010 for DPR approval
/45/	2006 IPCC Guidelines, Volume 1 to 5.
/46/	1. "*Methane Emission Potential of Poultry Litter*" prepared by Department of Bioenergy, Tamil Nadu Agricultural University (TNAU) dated October 2011. 2. Survey report of poultry birds for spacing in selected farms, prepared by Department of Bioenergy, Tamil Nadu Agricultural University (TNAU) dated 29 November 2011.
/47/	SD_28 Feedstock Transport Quotation from Jai Shakthi Enterprises dated 06 September 2010
/48/	"Tool to calculate baseline, project and/or leakage emissions from electricity consumption" version01. (EB39, Annex07) http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf
/49/	SD_29 Training of personnel declaration by IOTM dated 03 November 2011.
/50/	Project and leakage emission from composting, version01 (EB65 annex09)

	http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-13-v1.pdf
/51/	TNPCB Air consent order no.5554 dated 08 August 2011
/52/	TNPCB Water consent order no.5614 dated 08 August 2011
/53/	Local Stake holder consultation docs 1. Public notice dated 10 March 2011 2. News paper advertisement dated 16 March 2011 3. Attendance sheet dated 18 March 2011 4. Photographs of stakeholder consultation dated 18 March 2011 5. Minutes of meeting dated 18 March 2011
/54/	SD_68_Beta_Explanation (*http://www.bseindia.com/indices/IndexArchiveData.aspx?expandable=3*) 1. BSE Power Index Fertilizer Sector Companies 2. Coromandel International Ltd 3. Chambal Fertilizers & Chemicals Ltd 4. Deepak Fertilizers & Petrochemicals Corporation Ltd 5. Gujarat Narmada Valley Fertilizers Co Ltd 6. Gujarat State Fertilizers & Chemicals Ltd 7. Mangalore Chemicals & Fertilizers Ltd 8. National Fertilizers Ltd 9. Rashtriya Chemicals & Fertilizers Ltd 10. Southern Petrochemicals Ind Ltd 11. TATA Chemicals Ltd 12. Nagarjuna Fertilizers & Chemicals Ltd 13. Zuari Industries Ltd
/55/	Board Resolution 14. Board Resolution dated 28 January 2011 for 2.0MW capacity by PP 15. Board Resolution dated 12 May 2011 for 2.4MW capacity by PP
/56/	Load List of the electrical equipments to be installed under the project activity at the project site.
/57/	Guidelines on the assessment of Investment analysis version05 (EB62, annex05)
/58/	Standard for sampling and surveys for CDM project activities and programme of activities (Version 2.0)
/59/	Formal Sanction of Credit facilities by Karur Vysya Bank dated 15 October 2011.
/60/	Declaration on Non-use of Official development assistance dated 05 November 2012 submitted by PP and attested by independent Chartered Accountant.

APPENDIX A
VALIDATION PROTOCOL

Table: 1 – Mandatory Requirement's for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	Netherlands has been identified as Annex-I country
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	~~CL#03~~ OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	~~CL#03~~ OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	~~CL#03~~ OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK.
9. The participating Annex I Party shall have in place a national system for	CDM Modalities and	OK

Requirement	Reference	Conclusion
estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	Procedures §31b	
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~CAR#11~~ ~~CL#04~~ ~~CL#11~~ OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	~~CAR#08~~ ~~CAR#09~~ ~~CAR#14~~ ~~CL#08~~ OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	NA
About small-scale project activities (if applicable)		
13. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK
14. The proposed project activity shall confirm to one of the project categories	Simplified Modalities and	OK

Requirement	Reference	Conclusion
defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Procedures for Small Scale CDM Project Activities §22e	
15. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK
About stakeholder involvement		
16. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
17. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
19. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies & circumstances.	CDM Modalities and Procedures §45c,d	~~CAR#07~~ ~~CAR#08~~ ~~CAR#08~~ ~~CAR#10~~ OK
20. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
21. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
22. Provisions for monitoring, verification and reporting shall be in accordance	CDM Modalities and	~~CAR#12~~

Requirement	Reference	Conclusion
with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	Procedures §37f	~~CL#08~~ OK

Table: 2 – Requirements Checklist

CDM Validation Requirement	*Remarks*	*Evidence*	*Conclusion*
General Requirements			
A.1. Project Description and PDD			
A.1.1 Does the PDD sufficiently cover all the relevant elements of the project activity, is accurate as per the planned and/or implemented scheme, and provides a clear understanding of the nature of the project activity?	*Description*: PJRCES has reviewed section A.2, A.4.2, and A.4.3 of the PDD. • Section A.2 – The PDD explains the purpose of the project activity, how the Project Activity (PA) reduces GHG emissions and technology employed. It also provides PP's view on contribution to sustainable development. • Section A.4.2 – The PDD Specifies the type and category of the PA using Appendix B. • Section A.4.3 – The PDD is complete with respect to A.4.3. • The project description is giving an overview of the project activity. The PP intends to utilize poultry litter, as well agricultural waste water from the local starch and biomass waste from sugar industry. • The same are being fed to an anaerobic digester plant for capturing methane and then destroying it in combustion gas engines for power generation. • The electricity generated is fed to southern grid.	→ PDD → EB34, Annex9	~~CAR#01~~ ~~CL#01~~ ~~CL#02~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• Yes, the technology implemented that is bio-methanation of poultry litter using anaerobic digestion and power generation is environmentally safe. • PJRCES has reviewed the MOU' signed between the Poultry farms and transportation agency and also interviewed the personnel during the site visit and confirms that project activity will result into creating job opportunity for local people surrounding the location of PA. *Open Issues*: • PP is requested to differentiate between purpose of the PA and Pre-project scenario under separate headings. Also, include a brief description about post-project scenario • Background of PP is not provided. It is unclear whether PP has any past experience in developing a similar type of CDM project or not within the host country. • PP needs to include details of the pilot projects, R&D efforts done, quantity of waste handled and biogas generated, number of equipment and their details, specifications of the digesters, quantity of power generation, explanation regarding		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	uncontrolled poultry litter storage and manure generation. • PP needs to include the Sectoral Scope applicable to the project activity. • PP needs to mention the technical specifications of digesters, engines, pumps and other key equipment in the project boundary and also the flare. Indicate the capacity of the engines. • Please clarify what is the capacity of the project activity. The Energy purchase agreement (EPA) states that the capacity of the project is 2MW whereas PDD states it is 2.5MW. • PP needs to clarify on types of biomass used for the project activity. • PP is requested to include schematic of the project activity. • PP needs to include the details of technology transfer in relevant section A.4.2 of SSC PDD. • Please clarify what is the capacity of the biomethanation plant i.e. how much feed mixture can be handled per day? • What is the amount of non-biodegradable solids in the litter fed into the system and how it affects the operation of the digester? • What is the expected quantity of liquid effluent as		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	discharge? • Also, additional clarifications are requested in CL#01 and CL#02.		
A.1.2 Is the project a new installation and already commissioned, or does the project involve alteration of existing installation or process?	*Description:* • The PDD confirms that the project activity is Greenfield activity supplying electricity to national/regional grid, which is in-line with applicability criteria 3 of AMS I.D. During the site visit it was confirmed that the project is a new installation and it is yet to be commissioned. • Also, the PDD confirms that the PA is installation of new facility, which is in-line with applicability criteria 7 & 8 of AMS I.D. *Open Issues*: • PP is requested to clarify whether there are any anaerobic digesters operational prior to the start of project activity. • Please further clarify where this project activity will be installed. • Please clarify what will happen to the electricity generated. • The same needs to be checked and confirmed during site visit.	PDD Site visit	~~CL#02~~ OK
A.1.3 What category does the project activity	*Description*:		

CDM Validation Requirement	Remarks	Evidence	Conclusion
fall under: a. Large scale CDM project b. Non-bundled small scale CDM project with annual emission reductions more than 15,000 tonnes c. Bundled small scale with annual emission reductions more than 15,000 tonnes d. Small scale CDM project activity with annual emission reductions less than 15,000 tonnes Has a site visit been carried out for the project activity? If not, pl justify.	• The Project is Non-bundled small scale CDM project with annual emission reductions more than 15,000 tonnes. • The site visit was conducted on 07th & 08th September 2011.	PDD. Site Visit	OK
A.1.4 Is the PDD prepared in accordance with the latest guidance from the CDM EB available on the UNFCCC website?	*Description:* • The PDD version01 dated 24/05/2011 did not meet the requirements of the latest version05 of "Guidelines for completing the simplified project design document (CDM-SSC-PDD) and the form for proposed new small scale methodologies (CDM-SSC-NM)". • The same was brought out during the completeness check evaluation by PJRCES before webhosting the PDD for global stakeholder consultation and communicated to the client (F-06.14). The PP addressed the concerns and the revised PDD	→ Completeness check of PDD version01 dated 24/05/2011 done by PJRCES, → Annex9, EB34 → F-06.14 → Site Visit.	~~CAR#02~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	version01.5 dated 30/06/2011, was then submitted for global stakeholder consultation. • The geographical co-ordinates were checked during and the site visit and found correct. *Open Issues:* • PP is requested to make the project category(ies) in-line with the Appendix B to *simplified modalities and procedures for small-scale CDM project activities.* • PP is requested to provide the exact location of the project activity in-line with EPA. • PP is requested to support the geographical co-ordinates with document.		
A.2. Participation and Approval			
A.2.1 Please include and confirm the details of the participating project participants and the Parties involved.	*Description:* • The project participants are listed in tabular form in section A.3 and this is consistent with contact details provided in Annex-1 of the PDD. • The PDD identifies INDIA as host party. • The Netherlands has been identified as Annex-I Party. • The party identified as Private entity from the host Party India is IOT Mabagas Limited (IML) • The party identified as Private entity from the	PDD	~~CL#03~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	Annex-I Party Netherlands is Mabanaft Carbon B.V. *Open Issues:* • Letter of approval and voluntary participation from India and Netherlands is yet to be reviewed by PJRCES.		
A.2.2 Has the participation of each project participant been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation?	*Description:* • The PDD does not identify any other Party or any entity in a Party as project participant. • The PDD indicates that the Project owners and/or Project Developer are different than the Private entities. *Open Issues:* • PP is requested to submit Letter of Approval from Host Party and Annex-I party. • A clarification is requested on the relation of Private entities identified in the PDD.	PDD	~~CL#03~~ OK
A.2.3 Has the letter of approval (LoA) been submitted and reviewed by the DOE? Please confirm if the same was provided by the PP or directly by the DNA of the Party involved?	*Description:* • PJRCES is yet to receive the Letter of Approval.	PDD	~~CL#03~~ OK
A.2.4 Does the LoA confirm the following:	*Description:*		

CDM Validation Requirement	Remarks	Evidence	Conclusion
- Ratification of the Kyoto Protocol - Voluntary participation - The CDM project activity contributes to Host country's sustainable development - Title of the project activity is same as the PDD sent for registration	• PJRCES is yet to receive the Letter of Approval. • India has ratified the Kyoto Protocol on 26/08/2002. • Netherlands has ratified the Kyoto Protocol on 31/05/2002. *Open Issues*: • The CDM PA's contribution to sustainable development is yet to be confirmed by Party (ies).	→ http://maindb.unfccc.int/public/country.pl?country=NL → http://maindb.unfccc.int/public/country.pl?country=IN	~~CL#03~~ OK
A.2.5 Is the LoA conditional to a specific version of PDD or the validation report?	*Description:* • PJRCES is yet to receive the Letter of Approval.	PDD	~~CL#03~~ OK
B. Baseline and monitoring methodology			
B.1. Methodology applicability			
B.1.1 Has the project proponent applied the relevant baseline and monitoring methodology that has been previously approved by the CDM Executive Board?	*Description:* • The PDD refers to following methodologies. **Methodology:** AMS I.D / AMS III.D / AMS III.F **Version:** [17] / [17] / [10] **Sectoral Scope:** 01 / 15 / 13 All the methodologies are previously approved by CDM EB. • PP has used AMS III.F for calculating the project emissions resulting from transportation of biomass. • The versions of the methodologies are valid – the same was confirmed by visiting at –	PDD	~~CAR#02~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	http://cdm.unfccc.int/methodologies/SSCmethodologies/approved Open Issues • The reference to the applied methodologies is not available. • During the site visit it was confirmed that the PA is co-digestion of Poultry Litter, Waste water from Starch industry, Press mud from Sugar Industry and Cow dung. Hence, as per AMS-III.D V17 applicability criteria no. 3 PP needs to use latest version of AMS-III.AO. PP needs to apply the relevant baseline and monitoring methodology. Also, in-line with guidance available at paragraph 40 (a) and (b) of the modalities and procedures for the CDM and paragraph 92 of EB25, the amended PDD shall be made publically available for a period of 30 days. • In-line with the above it would be appropriate to use the latest version-18 of AMS-III.D.		
B.1.2 Does the project activity meet all of the applicability criteria defined in the approved methodology? Pl clarify	*Description:* As described in section B.2 of the PDD, the applicability criteria of the approved methodologies AMS I.D Ver17 & AMS III.D Ver17 are as below.	→ PDD → AMS I.D V17 → AMS III.D V17	~~CAR#02~~ ~~CAR#03~~ ~~CAR#04~~ ~~CAR#05~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	AMS I.D Ver17 **Applicability Criteria No. 1** The project activity comprises generation of electricity from renewable biomass and supplying it to southern region grid of India. *Open Issues*: • PP needs to justify that the project activity will use only renewable biomass as defined by Glossary of CDM terms latest version. • PP needs to include the details on generation source of electricity. • PP needs to include the name of the national or regional grid. **Applicability Criteria No. 2** PA supplies electricity to national/regional grid. Hence, this applicability criterion is met as per Table: 2 of the AMS I.D Ver17. Open Issues: • Clarify, is generated electricity sold to EB or used for Captive purpose? **Applicability Criteria No. 3** The project activity is a Greenfield project and is not an addition / retrofit / replacement of any units to		OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	existing generation facility. Same was also confirmed during the site visit and hence, the criterion is met **Applicability Criteria No. 4** The PA is not a Hydro power plant. Hence, this is not applicable. **Applicability Criteria No. 5** The unit has only a renewable component and does not exceed 15MW. During the site visit it was confirmed that the project activity will convert bio-gas into electricity using gas engines. *Open Issues*: • Please clarify what is the maximum output capacity of the project activity? • PP is requested to demonstrate that the capacity will not exceed the specified limit of small scale category. **Applicability Criteria No. 6** The project activity will convert bio-gas to electricity using gas engines, and hence cannot be classified as a co-generation system. The same was also confirmed during site visit.		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	Applicability Criteria No. 7 The project activity comprises a Greenfield project, hence this criterion is not applicable **Applicability Criteria No. 8** The project activity envisages the installation of a new facility with a power generation potential of less than 15 MW. This criterion is therefore not applicable. **AMS III.D Ver17 (As required by AMS-III.AO Ver1)** **Applicability Criteria No. 1** a. Meth requires PP to demonstrate that "The poultry population at the farms supplying to the project activity is managed under confined conditions." *Open Issues*: • Details of the facilities from where livestock is sourced. • Please justify the confined conditions applicable to these sources. b. The generated manure will be treated as an organic fertilizer and sold to farmers. *Open Issues*: • PP needs to demonstrate that the generated manure is treated as organic fertilizer and sold		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	to farmers. • Please clarify is there any liquid discharge associated with the project activity? If, yes please include the details how is it treated? c. It is claimed that the ambient temp. is never below 5°C. The link provided is not working. *Open Issues*: • The link is not working. • PP is requested to justify the applicability in detail and provide exact reference. d. PDD claims that the retention time of manure waste in the baseline scenario is more than 1 month for anaerobic treatment. Also, the PDD claims that no lagoons are used. To be checked during site visit. The reference i.e. Anna University report (dated December 2007) prepared for Subhashri Bio Energies Pvt. Ltd is submitted to PJRCES. It suggests that it is kept for 6 months. *Open Issues*: • PP is requested to provide the study specific to the project activity. • Please clarify the statement made "The manure waste will be in the anaerobic conditions for		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	more than one month" – The applicability condition is referring to baseline scenario. e. PDD confirms that in baseline scenario no methane recovery or destruction takes place at the farms from which the poultry litter is sourced. The same was confirmed during the site visit and hence, acceptable. *Open Issues*: • PP is requested to clearly describe how the manure waste has been treated in the baseline scenario? **Applicability Criteria No. 2 (c)** a. Please confirm what the storage time of the manure is (after removal from the animal barns, including transportation) before being fed into the anaerobic digesters? b. Please clarify how it is ensured that the storage time of manure does not exceed the specified time limit? c. Please clarify what is the dry matter content of the manure when removed from the animal barns? **AMS III.AO V1**		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	Additional points are included in CAR#05 a. PP needs to justify the each and every applicability criteria. Also, state the reason for non applicability of the criterion. b. For all the sources of substrates demonstrate that organic matter would otherwise have been left to decay anaerobically. c. For "Competing use for the biomass" demonstrate conformance to Attachment C "General guidance on leakage in biomass project activities" to Appendix B latest Ver03. d. Demonstrate that the Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually. e. In-line with the guidance provided under §03 for co-digestion demonstrate conformance to the requirements under §§ 1 and 2(c) of AMS-III.D latest Version. f. Identify the stockpiles that are expected to accommodate each type of waste to be used for project activity for the duration of crediting period. Alternatively demonstrate that it is a common practice to dispose-off the waste in solid waste disposal site. g. PP needs to clearly define the geographical boundary in-line with guidance provided under		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	§§ 3(b), 4 and 11. h. Please clarify how the residual waste from the digestion is handled. PP needs to respond in-line with §§ 5-7 of AMS-III.AO Ver1. i. PP needs to clarify is there any discharge to a subsequent wastewater treatment system or to the natural water receiving body. j. Confirm that all the biogas captured from digester shall be combusted and/or flared. k. Clarify, is recovered biogas used for auxiliary consumption? l. In-line with §10 PP needs to justify the applicability of §3 of AMS-III.H latest Ver16.		
B.1.3 Does the project activity involve any emissions within the project boundary that contribute to more than 1% of the total expected annual average emission reductions which are not addressed/considered in the methodology? Pl explain, if any	*Description:* • Site visit had been conducted on 7th & 8th September 2011. The site visit also did not reveal any emissions sources which contribute to more than 1% of the total expected annual average emission reductions.	PDD Site Visit	OK.
B.1.4 Does the project boundary defined include all emission sources and the clear demarcation on the physical and geographical boundary of the proposed CDM project activity? Is the selection of all emission sources	*Description:* • PJRCES has reviewed the PDD. *Open Issues*: • The project boundary depicted in the PDD is not in accordance with §09 of AMS I.D V17.	→ PDD → AMS I.D V17 → AMS III.D V17	~~CAR#06~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
(baseline, project and leakage) been justified?	• PP needs to define the project boundary in-line with §11 of AMS-III.AO Ver1. • Please clarify what electricity system has been considered for project activity. • PP has not justified the selection of all emission sources within the project boundary.		
B.2. Baseline selection			
B.2.1 Does the methodology define a specific baseline directly for the project type, or does it refer to a tool for arriving at the baseline for the project activity?	*Description:* AMS I.D V17 • The methodology defines a specific baseline. As per §10 of the methodology the baseline scenario is that the "*electricity delivered to grid*" by project activity would otherwise been generated by operation of grid-connected power plants and by the addition of new generation sources into the grid. PP has used the same para to define baseline and hence, acceptable. AMS III.D V17 & AMS-III.AO V1 • §09 of the AMS-III.D define the baseline for avoidance of "*methane emission from anaerobic decay of biomass*". However PP needs to define the baseline in-line with §12 AMS III.AO V1. • The baseline identification is missing. Exact reference for determination of baseline emissions is	→ PDD → AMS I.D V17 → AMS III.D V17	~~CAR#07~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	missing. *Open Issues:* AMS I.D V17 • PP is requested to clearly identify the paragraphs referred for baseline identification and also, clearly state the options chosen to determine the baseline in-line with the applied methodologies. • PP is requested to include the key parameters used for calculation of combine margin emission factor. AMS III.D V17 & AMS-III.AO V1 • PP is requested to include description on baseline scenario identification. • It is stated that Methane emissions are claimed only for poultry litter. Please clarify how methane emissions are measured when all waste is fed into same digesters? • Please clarify how is it ensured that the transferred litter is stored under anaerobic conditions? • Please justify "there is no regulatory requirement to recover or flare methane originating from the poultry litter management system" • Please clarify that the starch industry from where the waste water is sourced is not required to do the		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	methane recovery in the baseline scenario. PP needs to include the details on regulatory requirements to be followed by starch industry for treating waste water. • Please clarify the conditions under which the waste water has been treated in the baseline. • Also, clarify the regulatory requirements to be followed by the sugar industry from where the Press mud originates. • PP is requested to include the list of poultry farms, starch industry, sugar industry & cow farms and provide locations details and distance from the facility. • PP needs to determine the baseline in-line with the guidance provided under §12, AMS-III.AO V1. • Please clarify how the waste from sugar industry was treated in the baseline scenario? Following information is missing from PDD • PP is requested to provide "Assessment report on feedstock availability and market for Biomethanation Solids", March 2011. • For determination of baseline for avoidance of methane emissions from other organic matter please demonstrate conformance to Para 22 of		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	AMS-III.E ver16.		
B.2.2 Has the CDM project activity considered all alternatives available to the project proponent?	*Description:* • The project activity has been implemented as renewable energy sources based electricity generation. • Since the project activity is a small scale project and as per AMS.ID the PP is not required to consider all the alternatives. • For Greenfield projects §5 of AMS.IIID, requires PP to comply with latest requirements of "General Guidelines to SSC CDM methodologies". PP has not complied with this requirement. *Open Issues* • In-line with §19 of "General Guidelines to SSC CDM methodologies" Ver17, PP is requested to demonstrate the most plausible baseline scenario for this project activity	PDD	~~CAR#07~~ OK
B.2.3 Is the documentation of the baseline determination clear w.r.t. the following: - All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. - All Documentation is relevant as well	*Description:* PJRCES has reviewed relevant sections B.4 and B.6.1 of the PDD. *AMS I.D V17* • PP has chosen baseline in accordance with §10 of the methodology.	→ PDD → "*Tool to calculate the emission factor for an electricity system*" V2.2.0	~~CAR#07~~ ~~CAR#08~~ ~~CAR#09~~ ~~CAR#10~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
as correctly quoted and interpreted - Assumptions and data can be deemed reasonable. - Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD and the same has been confirmed. - The methodology is correctly applied to identify what would have happened in the absence of the CDM project activity proposed.	• PP has correctly used the V2.2.0 of "*Tool to calculate the emission factor for an electricity system*" • PP has correctly identified Southern regional grid of India as relevant electricity system. • PP has chosen to include only grid power plants for calculation of OM&BM. • PP has chosen Simple Operating Margin method to calculate OM. *AMS III.AO V1* • PP has opted to determine the baseline in accordance with §9(a) of AMS-III.D V17. PP needs to define the baseline in-line with §12 of AMS-III.AO V1. *Open Issues:* • The open issues are included in the CAR# 07, 08 and 09. • PP needs to include chronology of activities related to CDM Project activity in the section B.5 of the PDD. • Latest version 6.0 of CEA database refers to version 2.0 of Tool to calculate emission factor for an electricity system while the latest version	→ CO_2 Baseline Database for the Indian Power Sector. → 2006 IPCC guidelines V4_Ch10_Emissions from Livestock and manure management.	

CDM Validation Requirement	Remarks	Evidence	Conclusion
	02.2.1 of Tool to calculate emission factor for an electricity system is available. PP is requested to update the PDD with the latest version of the tools and also needs to explain how the conservativeness of the emission factor calculation (based on latest version 2.2.1 of the tools) is ensured while upgrading to latest version. • Relevant National and sectoral policies are not discussed. • PP is requested to include the list of poultry farms and provide locations details and distance from the facility. • PP is requested to justify the "Average incremental distance for raw solid waste/manure and/or wastewater transportation" as 25 kM/truck. • PP needs to demonstrate in the PDD the incremental distance for collection points of biomass and/or manure and the compost treatment site as compared to the baseline waste disposal site or manure treatment site. • Also, the same needs to be demonstrated for collection points of wastewater and treatment site as compared to baseline wastewater		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	treatment site. • Also, Incremental distance for Treatment sites and sites for soil application and further treatment of the produced compost needs to be demonstrated in the PDD. • The PDD does not discuss about the scenarios in the absence of the Project activity. PP needs to include details keeping in mind the source of wastes i.e. poultry litter, waste from sugar industry, waste water sourced from starch industry and cow dung collected. • AMS-III.H ver16: In-line with para 13 – The location of the wastewater treatment plant as well as the source generating the wastewater shall be uniquely defined and described in the PDD.		
B.2.4 Have all the assumptions, calculations, rationale and other sources described in the PDD been verified to determine if the baseline scenario identified is reasonable.	*Description:* • PJRCES has reviewed the PDD and relevant section B.4 and B.6.1 of the PDD. *Open Issues:* • The open issues are included in the CAR#07 and CAR#08. • PP needs to identify the baseline scenario in-line with applicable methodology i.e. AMS-	PDD	~~CAR#07~~ ~~CAR#08~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	III.AO V1 and Para 19, Annex21, EB61.		
B.2.5 Cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if available	*Description:* • PJRCES has reviewed the PDD and relevant section B.4 and B.6.1 of the PDD. *Open Issues:* • The open issues are included in the CAR#07 and CAR#08.	PDD	~~CAR#07~~ ~~CAR#08~~ OK
B.3. ADDITIONALITY			
B.3.1 Is the tools applied to discuss additionality in line with the CDM tools and documents provided CDM EB and the specific methodology applied for the project activity?	*Description:* • PP has chosen *Attachment A to Appendix B* to demonstrate the additionality of the project. The same is in line with the guidance provided by CDM EB and is specific to the project activity. • Further to that PP has opted to demonstrate additionality by demonstrating Investment as barrier. PP has applied Benchmark analysis using "*Tool for demonstration and assessment of additionality*", Annex10, EB39. • PP has also referred to "*Guidance on the Assessment of Investment Analysis*" EB51, Annex58. *Open Issues:*	→ PDD → Attachment A to Appendix B, Ver08 → Tool for demonstration and assessment of additionality → Guidance on the Assessment of	~~CAR#11~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• A latest ver08 of Attachment A to Appendix B is available. PP is requested to use the same. • Since, the PDD would be re-webhosted and a latest ver05 (EB62, Annex5) of "Guidance on investment analysis is available, it would be appropriate to use the latest version. • PP is requested include the justification for selection of appropriate analysis method to demonstrate additionality using investment barrier. • PP has not justified the selection of IRR as appropriate financial indicator and subsequently selection of Equity IRR as suitable financial indicator. • PP has not provided the justification of selecting 15% Return on Equity as benchmark. PP is requested to justify the selected benchmark value of 15% ROE in-line with §§13 to 18, Annex5, EB62	Investment Analysis ver05	
B.3.2 If the start date of the project activity prior to the date of publication of the PDD for stakeholder comments it shall be demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM	*Description:* • Starting date of project activity i.e. 01/05/2012 is after the date of publication of the PDD for stakeholder comments. • PP has also communicated to UNFCCC and DNA of host country regarding the intention to seek	PDD	~~CL#04~~ ~~CL#11~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
project activity in line with the "Guidance on the Demonstration and Assessment of prior consideration of the CDM"?	CDM. DOE has visited the UNFCCC website and found that the PP has submitted the prior consideration. The date displayed on UNFCCC website is 28/02/2011, which is prior to start date of project activity. However, the PDD has been published for global stakeholder comments prior to the start of the project activity and hence, in-line with EB62, Annex13 such notifications are not required. *Open Issues:* • However, PO was placed on 23/02/2011 ref: IML/EPC/23022011 for design, supply, transportation and erection and commissioning of equipment and components of biogas power plant of 2 MW capacities. Justify the start date in-line with Para 67, EB41. • PP is requested to include the chronology events related to CDM project activity.		
B.3.3 Does the PDD identify all credible alternatives to the project activity in order to assess additionality, if applicable?	*Description:* • Since the project is small scale and the baseline demonstration is in-line with the §10 of the applicable methodology AMS I.D V17.	→ PDD → AMS I.D V17 → AMS III.AO V17	OK
B.3.4 What are the barriers applicable to the	*Description:*	PDD	OK.

CDM Validation Requirement	Remarks	Evidence	Conclusion
project activity that have been discussed to prove the project additionality?	• PP has used *Attachment A to Appendix B* and identified Investment as barrier to the project activity. PP has opted for comparison of financial indicator with benchmark to prove the project additionality.		
B.3.5 ***Investment Analysis***: a. In case of investment cost analysis, pl confirm if a suitable indicator has been considered for the remaining alternatives available to the project activity. b. In case of Benchmark analysis, pl confirm whether the benchmark applied is relevant to the type of the financial indicator c. Is the period of assessment considered for the financials in line with the guidance? d. Are the input values considered in the investment analysis are valid and applicable at the time of the investment decision taken by the	*Description:* a. PP has considered benchmark analysis and IRR is identified as appropriate financial indicator, which is in-line with guidance provided under Sub-step 2(b), Option III, Annex10, EB39. b. PP has applied Return on Equity as benchmark to equity IRR which is in-line with §12, Annex5, EB62. However PP needs to justify the suitability of benchmark in-line with §13 to 18, Annex5, EB62. c. From the PDD and spreadsheet it is confirmed that PP has considered 15 years as period of assessment, which is expected life time of the project activity and hence, it is in-line with §3, Annex5, EB62. Please respond to additional comments raised in CL#05. d. PJRCES has requested the documents for the values assumed in the analysis through CL#06.	PDD	~~CAR#10~~ ~~CL#05~~ ~~CL#06~~ ~~CL#15~~ ~~CL#16~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
project participant?			
e. In cases where the financials source any input value from Feasibility Study Reports (FSRs) approved by National authorities ensure that the same is in line with the guidance in the VVM. (Paragraph 111 of VVM, ver 01.1)	e. PP needs to submit DPR approved by the financial institution.		
f. Have any sunk costs, if any, been used for the financials?	f. PP has conducted the pilot plant testing prior implementing the project and the same are not considered by PP, hence acceptable.		
g. Has the fair value/salvage value been considered at the end of the assessment period? Is the value considered for fair value in line with the guidance?	g. PP has not considered any salvage value. PP is requested to justify for not applying the salvage value in-line with §4, Annex5, EB62.		
h. Has the depreciation and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, are added back to net profits for the purpose of calculating the financial indicators (e.g. IRR, NPV)	h. Yes PP has added back the depreciation to net profits, which have been deducted in estimating gross profits on which tax is calculated, this is in-line with §5, Annex5, EB62.		
i. Have any cost of financing expenditures (i.e. loan repayments and	i. Not applicable. PP has selected Equity IRR.		

CDM Validation Requirement	Remarks	Evidence	Conclusion
interest) included in the calculation of project IRR? Pl ensure the same is not considered in IRR calculation. j. In case the project involves calculation of equity IRR, pl ensure that only the portion of investment costs, which is financed by equity is considered as the net cash outflow. k. Has the financials been presented transparently in a separate spreadsheets with formulas readable for the DOE? l. Sensitivity analysis: - Have all variables that constitute more than 20% of either total project costs or total project revenues subjected to reasonable variation? - Have the results of this variation presented in the PDD and the spreadsheets (reproducible manner)? - Has a reasonable variation been considered in the sensitivity analysis in the project context?	j. From the review of financial spreadsheet, PP has considered only the equity portion of investment costs as net cash outflow. Additional Comments are included in the CL#06. k. Yes, the financials are presented in transparent manner in separate spreadsheets l. Sensitivity. • PP has considered sensitivity for Capital Cost, O&M Cost and Fertilizer Revenue. • Yes, the results of this variation are presented in the PDD and the spreadsheets. The same can be reproduced. • PP has considered reasonable variation of 10%., which is as per §21, Annex5, EB62. Also, since the total O&M cost estimated is approx. 8% of the capital cost revenue from sale of fertilizer is 32% of revenues and hence, sensitivity is considered by PP, which is acceptable. Also, in-line with the guidance PP		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	has considered +/-10% variation in above parameters and which is acceptable. • Also, the feedstock cost sensitivity is not presented. • Since, the tariff rate is fixed for 20 years the sensitivity on the power revenue is not considered and hence, acceptable. Open Issues: • In the PDD PP has considered the sensitivity on fertilizer revenue including feedstock cost. This is not in-line with the spreadsheet submitted. • PP needs to include the sensitivity on feedstock cost separately. • PP is requested to include the scenarios under which the IRR crosses the benchmark and justify the probability of occurrence of these scenarios. • PP needs to justify for inflating the fertilizer revenue by 5% in the spreadsheet.		
B.3.6 Have the data, rationales, assumptions, justifications and documentation provided by Project Participants to demonstrate the additionality of the project been assessed and verified for the reliability and credibility? Assess the presented evidence	*Description:* • PJRCES has reviewed the PDD and documents submitted. Additional set of documents are requested. • PJRCES has raised additional points in the form of CL#06 & 07.	PDD	~~CL#06~~ ~~CL#07~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
using local knowledge and sectoral and financial expertise.			
B.3.7 ***Barrier Analysis***: a. Has it clearly been demonstrated that the issues identified in project implementation prevent a potential investor from pursuing the implementation of the proposed project activity without the project being registered as a CDM project activity? b. Do any of the issues identified have a clear direct impact on the financial returns of the project activity, except in cases of issues related to risk (like technical risks), or barriers related to unavailability of sources of finance, been discussed? c. Pl conclude if the barriers discussed are 'real and prevent the implementation of the project but not prevent at least one of the possible alternatives'?	*Description:* • PP has not considered barrier analysis for the project activity, as this is a small scale project activity and hence not required to do so.	PDD	OK.
B.3.8 ***Common practice analysis***: Has a common practice analysis been carried out as a credibility check of the other	*Description:* • PP has not carried out any separate "common practice analysis", as this is a small scale project	PDD	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
available evidence used by the project participants to demonstrate additionality, in case of large-scale CDM project activities (unless the proposed project type is first-of-its kind). Pl confirm this is in line with the VVM and the additionality tools.	activity and hence not required to do so.		
B.4. EMISSION REDUCTION CALCULATION			
B.4.1 BASELINE EMISSIONS			
B.4.1.1. Are correct equations and parameters used in accordance with the approved methodology selected in calculating the baseline emissions?	*Description:* AMS I.D V17 • The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor, which is in-line with §10 of the methodology. AMS III.D V17 & AMS-III.AO V1 • PP has correctly applied the parameters in-line with §9(a) of the methodology. • §11 provides the formulae for determination of baseline emissions. • §11 has been referred for baseline emissions calculation, which is in-line with methodology and hence acceptable.	PDD	~~CAR#14~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• §12(a) has been opted for determination of Combined Margin emission factor, which is in-line with methodology. • PP has used "Tool to calculate emission factor for an electricity system – V2.2.0" for calculation of combined margin emission factor. Also, it is fixed ex-ante. Hence, acceptable. • In-line with latest version 2.2.1 of the tool PP is requested to revise the calculation of combined margin emission factor. Please justify the conservativeness of the revised combined margin. • However PP needs to use AMS-III.AO V1 and apply the correct equations and parameters for determination of baseline emissions. • For Baseline emissions from methane avoidance from waste water – PP needs to demonstrate conformance to para 32 to 36 of AMS-III.H latest ver16.		
B.4.1.2. In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are	*Description:* AMS I.D V17 • PP has chosen Combined Margin as the data which will remain fixed thorough out the crediting period. AMS III.D V17 • PP has correctly applied the parameters in-line	PDD	~~CAR#08~~ ~~CAR#09~~ ~~CAR#14~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (less baseline emissions)	with §9(a) of the methodology. • PP has chosen following parameter which will remain fixed for the crediting period. GWP of Methane, Density of Methane, Model correction factor, Methane conversion factor for manure management, Maximum Methane production potential, NCV of Diesel, Density of Diesel, EF for Diesel, etc. *Open Issues*: AMS I.D V17 • Simple OM and BM are also fixed throughout the crediting period. The same needs to be included in the PDD AMSIII.D V17 • In-line with §10(g) PP is requested to add details and bring clarity on animals of type LT (livestock) associated with project activity. Further also, clarify how the value for $\mathbf{N_{LT,y}}$ is arrived at. • **Parameter $\mathbf{D_{CH4}}$** – The value used is incorrect. The values in the PDD and Spreadsheet are not consistent internally. Also, PP is requested to maintain consistency in defining parameter. • **Parameter $\mathbf{B_o}$** – value refers to which type of		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	species is not specified. • Please clarify the basis for considering the IPCC value for $\mathbf{B_o}$ – PP is requested to justify the same keeping in view §10(d) of the methodology. • Please clarify the basis for calculating the $\mathbf{VS_{LT,y}}$. It is stated that IPCC values will be used. Please demonstrate confirmation to §10(c). • Please justify for considering the days of operation as 365. • **Parameter $\mathbf{MCF_j}$** – The value is referred from a report "Estimation of methane emissions from chicken litter", December 2007. Please justify the value considered with respect to project activity start date. • **MCF** – For methane recovery from waste water – PP needs to demonstrate conformance to para 21of AMS-III.H latest ver16. • **MCF** – For methane avoidance from other organic matter demonstrate conformance to • What is the maximum quantity of Feed that can be treated by the system? • What is the feed handling capacity of both the digesters? • Provide the basis and justification of poultry litter processed.		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• Provide basis and justification of plant load factor. AMS-III.AO V1 • PP needs to include parameters in-line with §12 and the guidance referred therein.		
B.4.2 PROJECT EMISSIONS			
B.4.2.1. Are correct equations and parameters used in accordance with the approved methodology selected in calculating the project emissions?	*Description:* AMS I.D V17 • As per §20 of the methodology – project emissions are considered zero. • As per §20 of the methodology – Project emissions from fossil fuel and power consumption at the project facilities ($PE_{power,y}$) calculated using the latest version of the "*Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion – V2*" AMS III.D V17 • PP has referred to §12 (a) to (e) to calculate Project activity emissions. • As per §12(c) PP has referred to "*Tool to determine project emissions from flaring gases containing methane – V1*" for Project emissions from flaring the biogas stream in the year y ($PE_{flare,y}$)	PDD	~~CAR#14~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• However PP needs to use §§ 13 – 17 of AMS-III.AO V1 to calculate project emissions. • PP needs to demonstrate conformance to Para 29 and 30 of AMS-III.H latest ver16. AMS III.F V16 • Project emissions from transportation ($PE_{transp,y}$) are calculated in line with §12. The same needs to be calculated in-line with §14 of AMS-III.AO Ver1		
B.4.2.2. In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (higher project emissions)	*Description:* AMS I.D V17 • PJRCES has reviewed the PDD and found that no data or parameter related to project emission that needs to be monitored. AMS III.D V17 • PP has correctly applied the parameters in-line with §9(a) of the methodology. • PP has considered 0.05 m³ biogas leaked/m³ biogas as leakage emissions. This is acceptable and as per §13(b). • PP has not included the stepwise procedure to determine the flare efficiency. • PP has stated that power required for project activity will be taken from own generation and	PDD	~~CAR#14~~ ~~CL#08~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	hence considered as zero. The same is in-line with §16 and is acceptable. • Further PP has stated that in case of auxiliary consumption and/or Grid The formula for calculation of emission from fossil fuel consumption is missing. AMS III.AO V1 • PP needs to use §§ 13 – 20 of AMS-III.AO V1 and guidance referred therein to calculate project emissions and correct the parameters in the PDD. *Open Issues*: AMS I.D V17 • Simple OM and BM are also fixed throughout the crediting period. The same needs to be included in the PDD. • PP needs to correct the definition of $EG_{gross,y}$ as defined in the equation 10 in the PDD and make it in-line with AMS-I.D latest ver17. • Please clarify does auxiliary consumption include the power generation from the project activity and import from grid? Further please clarify how the same is being monitored? • Also, the dry matter content needs to be clarified		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	in-line with CAR#04. AMS III.D V17 • PP is requested to indicate the option chosen for flare efficiency. Also, accordingly the parameter should be updated in the subsequent section B.6.2. • PP is requested to include the stepwise procedure to determine project emissions from flaring. • Provide the basis and justification of auxiliary consumption. • PP is requested to provide the formula to calculate emission from fossil fuel consumption and describe in detail. • PP is requested to justify for not accounting the project emissions due to storage. Submit the reports justifying the claim that dry matter content of the manure when removed from barns is greater than 20%.		
B.4.3 LEAKAGE EMISSIONS			
B.4.3.1. Are correct equations and parameters used in accordance with the approved methodology selected?	*Description:* AMS I.D V17 • PJRCES has reviewed the PDD and §22 of methodology AMD I.D V17 to calculate leakage emissions and it has been considered zero.	PDD	~~CL#12~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	AMS III.D V17 • In-line with §17 of the methodology No leakage calculation is required. AMS III.AO V1 • PP needs to explain the Leakage calculation in-line with AMS-III.AO V1.		
B.4.3.2. In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (less baseline emissions)	*Description:* • PJRCES has reviewed the PDD and found no data or parameter related to leakage emissions that needs to be monitored Leakage • PP needs to include the description on leakage in-line with AMS-III.AO. The methodology refers to general guidance on leakage in biomass project activities (attachment C to Appendix B).	PDD	~~CL#12~~ OK
B.4.4 Pl mention the expected emission reductions generated from implementation of the project activity.	*Description:* • PJRCES has reviewed the baseline emissions and emission reductions calculation and expected emission reduction would be 23,294 tonnes of CO_2	PDD, CER calculation spreadsheet	

CDM Validation Requirement	Remarks	Evidence	Conclusion
	annually.		
B.5. MONITORING PLAN.			
B.5.1 Does the monitoring plan defined in the PDD; contain all necessary parameters required for calculating 'baseline emissions' in line with the methodology?	*Description:* AMS I.D V17 • PJRCES has reviewed the PDD and §24 of methodology AMD I.D V17 for parameters to be monitored during crediting period. • PDD states that Gross Electricity, net Electricity and Diesel Consumption will be monitored during crediting period • Whereas, CO_2 emission factor for diesel and NCV of diesel will remain fixed for entire crediting period. AMS III.D V17 • PJRCES has reviewed the PDD and §§ 18–31 of methodology AMD III.D V17 for parameters to be monitored during crediting period. PP is requested to respond to open issues. • PP is requested to respond to additional comments raised in CAR#12. *Open Issues*: • **Parameter D_{CH4}** – The value used is incorrect. The values in the PDD and Spreadsheet are not	→ PDD → AMS I.D V17 → AMS III.D V17	~~CAR#12~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	consistent internally. Also, PP is requested to maintain consistency in defining parameter. • **Parameter B_o** – value refers to which type of species is not specified. • Please clarify the basis for considering the IPCC value for B_o – PP is requested to justify the same keeping in view §10(d) of the methodology. • Please clarify the basis for calculating the $VS_{LT,y}$. It is stated that IPCC values will be used. Please demonstrate confirmation to §10(c). • **Parameter MCF_j** – Please clarify the values selected is only for poultry litter? • Calculation sheet for MCF_i should be provided with the appropriate source. • The value is referred from a report "Estimation of methane emissions from chicken litter", December 2007. Please justify the value considered with respect to project activity start date. • Please justify the 90% flare efficiency in-line with §24 of AMSIII.D V17. AMS-III.AO V1 • PP needs to revise the monitoring plan and make it in-line with the monitoring methodology AMS-III.AO V1.		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• In-line with Para 19 of AMS-III.AO ver1 and keeping in view that a co-digestion will take place – PP is requested to clarify how minimum of monitored values for biogas captured and biogas flared would be applied in the equation (4) of the methodology since, both are not comparable.		
B.5.2 Does the monitoring plan defined in the PDD; contain all necessary parameters required for calculating 'project emissions' in line with the methodology?	*Description*: • As diesel operated tillers, generator(s) and/or electricity from grid are being used for the operation of the facility, the same are accounted as project emissions. • PP has referred to am-tool-06 V1 for calculating project emissions from flaring of gases. Open Issues • $EG_{gross,y}$ – It is unclear how the Gross energy generated is logged. Please complete the description. • $EG_{BL,y}$ – Please clarify how it is monitored. Source of data is incomplete. Also, it cannot be measured directly. • Please clarify how meter readings are reported to TNEB. PP is requested to submit the sample monthly invoices and acknowledgement of the same by TNEB.	→ PDD → AMS I.D V17 → AMS III.D V17	~~CAR#12~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• $fv_{CH4,RG,h}$ – The measurement frequency is not in-line with Tool to calculate project emissions from flaring gases containing methane. Correct the same. • $FV_{RG,h}$ – measurement method in incomplete. Please demonstrate confirmation to Tool to calculate project emissions from flaring gases containing methane. • $BG_{flared,y}$ – in-line with the methodology the same needs to be monitored separately. During the site visit it was observed that the same was being calculated from the monitored value of biogas used for electricity generation. PP needs to comply with the methodology requirement and confirm that the same will be monitored separately. • T_{flare} – PP is requested to demonstrate the daily measurement is in-line with the Tool to calculate project emissions from flaring gases containing methane. • $MS\%_{,i,y}$ – PP needs to include the QA/QC procedure in-line with the Methodology AMS-III.D Ver17. • In-line with para 27 of AMS-III.D ver17 PP needs to include monitoring of interval between manure collection and commencement of treatment in		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	anaerobic digester (AI_l). • PP needs to demonstrate conformance to Para 30 of AMS-III.D ver17. • PP needs to include all the parameters required to monitor the baseline emissions in-line with para 37 of AMS-III.H ver16.		
B.5.3 Does the monitoring plan defined in the PDD; contain all necessary parameters required for calculating 'leakage emissions' in line with the methodology?	PJRCES has conducted physical site visit between 7th and 8th September 2011. PP needs to revise the monitoring plan in line with the applicable monitoring methodology AMS-III.AO V1	→ PDD → AMS I.D V17 → AMS III.D V17	~~CAR#12~~ OK
B.5.4 Has the feasibility of the monitoring arrangements within the project design been confirmed through interviews and physical visits to the site, where required?	PJRCES has conducted physical site visit between 7th and 8th September 2011. PP needs to revise the monitoring plan in line with the applicable monitoring methodology AMS-III.AO V1	→ PDD → AMS I.D V17 → AMS III.D V17	~~CAR#12~~ OK
B.5.5 The implementation of the monitoring plan, quality assurance and quality control procedures are verifiable	PP has defined the structure for maintaining accuracy of the monitoring system. Where a CDM Team member shall be responsible for data collection, measurement and preparation of daily & monthly reports. Manager-in-charge is responsible for monthly & annual reporting. CDM coordinator is responsible for data verification, ER calculations and data archiving for verification. Open Issues: • Calibration frequency of the equipments used	PDD	~~CL#08~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	for monitoring is not clear. PP is requested to demonstrate the confirmation to §17, Annex21, EB61.		
CREDITING PERIOD			
C.1. Has the start date of the project activity been defined in line with the latest EB guidance? What has been defined as the start date of the project activity?	*Description:* • PP has defined the start date of the project activity as 01/05/2012, *Open Issues*: • PP is requested to demonstrate that the star date is in-line with EB41, §67 and the guidance referred therein.	PDD	~~CL#11~~ OK
C.2. Has a crediting period been clearly defined in the PDD?	*Description:* • Crediting Period is clearly defined in the PDD. PP has chosen fixed crediting period of 10 years. • The staring date of the crediting period is 01/08/2012. *Open Issues*: • The starting date of the crediting period in not in-line with the latest guidelines available i.e. Para 25 Annex12, EB59	PDD	~~CAR#12~~ OK
LOCAL STAKEHOLDER CONSULTATION			
D.1. Have all relevant stakeholders been identified for the project activity?	*Description*: Following have been identified as concerned	PDD	~~CL#13~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
	stakeholders. 1. Village public 2. Panchayat Officials 3. Poultry Farm owners & association officials 4. Sago Factory owners& association officials 5. Sugar farmers (suppliers of press mud) 6. Tamilnadu pollution control board officials 7. Tamilnadu Electricity generation and distribution company, Namakkal circle office officials 8. District Industrial Centre, Namakkal officials 9. Village administration officer (Puduchatram Panchayat union) 10. Revenue department 11. Salem Cooperative Sugar mills officials 12. Jai shakti enterprises owner (logistics company) *Open Issues*: • PP is requested to submit the invitation letters to local villagers, direct stakeholders and government officials and acceptance of invitation letters.		OK
D.2. What means have been used for the inviting comments from the stakeholders?	*Description*: • PP has opted for open house discussion for inviting comments. PDD states that the comments have been recorded in the form of stakeholder's minutes of the meeting report.	PDD Site Visit	OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
	• PJRCES has reviewed the stakeholder's minutes of the meeting report, the Photographs of the proceedings and attendance sheet as the proof of the meeting. • PJRCES also interacted with the stakeholders during the site visit and confirmed the meeting regarding the CDM Project activity was conducted and an open house discussion was held for discussing the project		
D.3. Does the PDD include a summary of the comments received from the stakeholders?	*Description*: • The PDD includes a summary of the comments received from the stakeholders. • PJRCES has also reviewed the minutes of the meeting and interacted with stakeholders during site visit and found that the PDD includes the necessary details.	PDD Site visit	OK
D.4. Has a report on the due account taken of any comments received been described clearly in the PDD?	*Description*: • As per PDD PP has included the summary of comments and based on the comments no action was required to be taken by the PP. The same was also cross checked during site visit and found to be in order.	PDD Site Visit	OK
ENVIRONMENTAL IMPACTS ASSESSMENT			
E.1. Have the project participants undertaken an analysis of environmental impacts and	• As discussed in the PDD, PP needs to submit the necessary environmental clearances for the project	→ PDD, → S.O. 1533(E),	~~CL#14~~ OK

CDM Validation Requirement	Remarks	Evidence	Conclusion
if the host country requires and environmental?	activity.	[14/09/2006] http://envfor.nic.in/legis/eia/so1533.pdf	
E.2. Does the project create any adverse environmental effects? Have the same been recorded in the PDD?	*Description:* • PJRCES has reviewed the PDD identified no adverse environmental effects of the project activity is reported. • The comments in the section E.1 would be applicable here as well.	→ PDD, → Site visit to be conducted	~~CL#14~~ OK
E.3. Does the project comply with environmental legislation in the host country?	• Project activity is complying with host country India environmental legislation. • However the comments in section E.1 would be applicable here as well.	→ PDD → Ministry of Environment and Forest, Government of India http://envfor.nic.in/legis/eia/so1533.pdf	~~CL#14~~ OK

Table: 3 – Resolution of issues identified in Table: 2 of the validation protocol

Draft report clarification requests, corrective action requests and forward action request	*Reference*	*Summary of project owner response*	*Validation team conclusion*
CAR#01 PP is requested respond to following: a. PP is requested to differentiate between purpose of the PA and Pre-project scenario under separate headings. Also, include a brief description about post-project scenario.	/A.1.1/ /PDD/[A.2/A.4.2/A.4.3] /EB34/[Annex9/]	Section A.2 rewritten. a. Done: Project Activity, pre-project scenario and post-project scenario are differentiated in different paragraphs in section A.2.	Assessment of DVRv01.1 responses. a. Revised PDDv02.2 includes necessary details on pre-project scenario, post-project scenario. PJRCES visited the project site confirmed the pre-project scenario. Also, PJRCES has visited the references/[FN/1/2/3/] provided by the PP and cross-checked information provided and hence, this issue is now closed.
b. Background of PP is not provided. It is unclear whether PP has any past experience in developing a similar type of CDM project or not within the host country.		b. Background provided in A.2	b. PP has provided background information of PP in PDDv02.2. However the information is still silent on the PP's past experience in developing CDM projects within the host country. Issue, is still open.
c. PP needs to include details of the pilot projects, R&D efforts done, quantity of waste handled and bio gas generated, number of equipment and		c. Provided in A.2.	c. PJRCES has reviewed revised PDDv02.2; PP has included details on quantity of waste handled, biogas generated, number of equipments,

their details, specifications of the digesters, quantity of power generation, explanation regarding uncontrolled poultry litter storage and manure generation.			digester specifications, quantity of power generation, uncontrolled poultry litter storage and manure generation; PP has not included details on R&D efforts done. Issue is still open.
d. PP needs to include the Sectoral Scope applicable to the project activity.		d. Sectoral scopes included under section A.4.2 of PDD.	d. Section A.4.2 of PDDv02.2 includes correct sectoral scope and hence, issue is now closed.
e. PP needs to mention the technical specifications of digesters, engines, pumps and other key equipment in the project boundary and also the flare. Indicate the capacity of the engines.		e. Provided in revised A.4.2.	e. PP has included the necessary details in the section A.4.2 of PDDv02.2; PP is requested to include the source for technical specifications of the equipments and submit the same to DOE. Issue is still open.
f. Please clarify what is the capacity of the project activity. The Energy purchase agreement EPA states that the capacity of the project is 2MW whereas PDD states it is 2.5MW.		f. It is now indicated in the PDD that capacity will be 2.4MW and that this is less than the small scale threshold of 15MW. See Supporting documents SD_17, 18 & 19.	f. PJRCES has reviewed supporting documents SD_17, 18 & 19. SD-17 & 18 does not have acknowledgment from TEDA. As referred in SD_19 PP is requested to submit the documents cited as Ref 1, 2 & 3. Issue is still open.
g. PP needs to clarify on type of biomass used for the project activity.		g. See table 4 AMS-III.AO, Applicability conditions, criterion 1.c.	g. Table 4 includes details on the type of biomass used by project activity. Issue is now closed.
h. PP is requested to include schematic of the project activity.		h. Included in PDD (figure 2) see also mass balance (SD_14)	h. PP has included the same. Document have been cross-checked and found acceptable and hence, issue is now

			closed.
i. PP needs to include the details of technology transfer in relevant section A.4.2 of SSC PDD.		i. Text added to bottom of section A.4.2 and section B.5. technology barrier	i. PJRCES has reviewed sections A.4.2 & B.5 of PDDv02.2 and SD_29. Necessary details are included in the PDD and hence, issue is now closed.
j. Please clarify what is the feed mixture?		j. See g.	j. In-line with the assessment of CAR#01(g), issue is now closed.
k. Please clarify what is the capacity of the biomethanation plant i.e. how much feed mixture can be handled per day?		k. SD_20 technical note on capacity and SD_04 Mass balance	k. PP is requested to provide response here as well. Also, clarify the supporting documents for 97% of maximum retention time and 91% PLF. Issue is still open.
l. What is the expected bio-solids generation?		l. The bio-solids generation in the proposed project activity = compost = $Q_{treatment}$ = 21.723t/y, as provided in parameter box in PDD.	l. PJRCES was not able to locate the same in PDDv02.2. Issue is still open.
m. What is the expected quantity of liquid effluent discharge?		m. Approx 85,000 t/y of which 50% is re-circulated and 50% is sprayed as liquid fertilizer on drying compost. No effluent is discharged.	m. Please clarify the supporting document for the same. Issue is still open. Refer 2nd Assessment.
2nd Assessment		Second response:	Assessment of DVRv02 responses.
b. PP has provided background information of PP in PDDv02.2. However the information is still silent on the PP's past experience in developing CDM projects within the host country.		b. Project participants IOT Mabagas Limited and Mabanaft Carbon B.V. do not have past experience in developing CDM projects within the host country India and hence PP has no information to add on prior CDM	b. Explanation is accepted PJRCES also visited UNFCCC website and confirmed same and hence, issue is now closed.

		experience in India in the PDD.	
c. PJRCES has reviewed revised PDDv02.2; PP has included details on quantity of waste handled, biogas generated, number of equipments, digester specifications, quantity of power generation, uncontrolled poultry litter storage and manure generation; PP has not included details on R&D efforts done.		c. PP have a research lab in Mumbai conducting experiments on Continuous Stirred Tank Reactor (CSTR) models of digesters to simulate operating conditions of a prototype of biogas plant, which is envisaged in Namakkal project. So far around 10 batch tests are successfully conducted. Also the PP have been sending samples of solid and liquid fertilizers to other reputed labs for substantiations of results. The supporting documents have been validated by the DOE.	c. Revised PDDv03 includes necessary details on R&D efforts done. Also, the same was verified with the DPR submitted by third party and hence, issue is now closed.
e. PP has included the necessary details in the section A.4.2 of PDDv02.2; PP is requested to include the source for technical specifications of the equipments and submit the same to DOE. Issue is still open.		e. The process design - incl. the selection of key components - is based on Mabagas intellectual property. The original documentation has been shown to the DOE and will be treated as confidential.	e. PJRCES has reviewed the supporting documents and confirms that necessary details have been verified, hence, issue is now closed.
f. PJRCES has reviewed supporting documents SD_17, 18 & 19. SD-17 & 18 does not have acknowledgment from TEDA. As referred in SD_19 PP is requested to submit the documents cited as Ref 1, 2 & 3. Issue is still open.		f. <u>Acknowledgement of SD_17 by TEDA</u>: PP have now made available to DOE supporting document SD_40 (=letter by TEDA dated 14 November 2011 addressed to TANGEDCO), which	f. SD_17: PJRCES has reviewed SD_40 for cross verification of SD_17 found acceptable.

		mentions SD_17 as Reference letter #4. <u>Acknowledgement of SD_18 by TEDA</u>: SD_18 was already mentioned as Reference letter #4 in SD_19. <u>Reference letter #2 in SD_19</u> PP have now made available to DOE supporting document SD_61 (= letter by TEDA dated 13 May 2010). <u>Reference letter #3 in SD_19</u> PP have now made available to DOE supporting document SD_57 (= letter by TEDA dated 16 August 2010 addressed to TNEB). <u>Reference letter #1 in SD_19</u> PP could not locate copy of this letter, which was a cover letter to their submission to TEDA dated 27 April 2010. However, the underlying question from DOE is to establish the chronology of the originally anticipated capacity of 2MW and the subsequent change to capacity of	SD_18: SD_19 is verified for reference of SD_18 and found acceptable. Ref#2: PJRCES has verified the SD_61 and found acceptable. Ref#3: PJRCES has reviewed SD_57 and found the same acceptable. Ref#1: PJRCES has verified SD_61 and other supporting documents as referred above and hence, explanation is accepted issue is now closed.

		2.4MW. In this regard, PP have now provided to DOE as SD_61 a copy of the Reference letter #2, which is the reply from TEDA dated 13 May 2010 to the letter by PP of 27 April 2010. The letter from TEDA dated 13 May 2010 clearly states the content of the letter of 27 April 2010 from PP as a request regarding 2MW power project. Therefore, PP believe that – together with the supporting documents provided on the subsequent correspondence with TEDA and TANGEDCO – the chronology of the capacity of the proposed project has now been sufficiently documented.	
k. PP is requested to provide response here as well. Also, clarify the supporting documents for 97% of maximum retention time and 91% PLF. Issue is still open.		k. The load factor for the digesters depends on the Hydraulic Retention Time (HRT). Taking the Hydraulic Retention Time in consideration, the plant is running on 97% of the maximum feed handling capacity. The HRT for a bio gas plant shall not be lower than 35 days. If it is lower the bacteria do not have enough time for growing and may get wash out. HRT is defined by working volume of	k. HRT is calculated as total volume of the digester divided by volume of input added daily. Since, the rate of gas generation is initially high and then gradually declines, as the digestion approached completion. Thus, time required for complete digestion varies. The same is also, confirmed through chapter 8.2 of DPR submitted by PP which confirms that 35 days of HRT is required. Also,

		the digester system / daily loading rate: HRT = Vdigester [m³]/ VFeed [m³/d] = [d]. • This Retention time should not be below 35 days for stable operation of the plant. • 210 t of solids is equal to 247 m³ of solids. • 199t of liquid are equal to 199 m³ of liquid. • Total input is 446 m³/d. • Working volume of the digesters is 16.115m³. • HRT = 16.115 m³ / 446 m³/d = 36,13 days. 36,13 days is 97% of the limit of 35 days (100%). If the retention time is lower the plant load factor is over hundred percent. There are two critical load factors (i.e. the retention time - see above) and the CHP load factor. Since they are not related 97% does not lead to 91% - they are two different things.	calculation given by PP is found acceptable. PJRCES has also reviewed O&M agreement for 91% of plant load factor. Also, the specifications of the Hopper pumps were checked by technical expert during the site visit conducted and the explanation is acceptable. Hence, issue is now closed.

		IOTM has got a O&M agreement for 2000 hours per quarter, which gives IOTM 4 x 2000 h = 8000 h a year, hence 8000h / 8760h = 91% plant load factor. There are various limitations in a bio gas plant for the maximum feed rate. The maximum feeding rate depends on the feeding rate of the scraper floors, the pumps, the digester volume, gas blowers and CHP. Among these the pumps are the limiting factor. The Hopper pump system runs on 83% load. It is planned that the Hopper pumps will run for 15 hours, max. Reasonable time is 18 hours per day, hence 15 hours of 18 hours is equal to 83%.	
l. PJRCES was not able to locate the same in PDDv02.2. Issue is still open. m. Please clarify the supporting document for the same. Issue is still		l. The value for $Q_{treatment}$ = $Q_{res\ waste}$ has been corrected in the parameter box in section B.7.1 of the PDD as 21.723t/y. m. The supporting document for this issue is SD_14, Mass balance.	l. PJRCES has reviewed revised PDDv03, section B.7.1., ID.20./$Q_{res\ waste,y}$ and found that no correction has been made. Even the SD_16 is not corrected. Issue is still open. m. PJRCES has reviewed the SD_14 and hence, issue is now closed.

open. 3rd Assessment l. PJRCES has reviewed revised PDDv03, section B.7.1., ID.20./$Q_{res\ waste,y}$ and found that no correction has been made. Even the SD_16 is not corrected. Issue is still open.		Third Response: l. Value of $Q_{treatment}$ = $Q_{res\ waste}$ is 22706 t/y as per SD_14. So the value in PDD is corect and DVR was mistaken.	Refer 3rd Assessment. Assessment of DVRv03 responses 1. PP to refer to the responses given to DVRv01.1 and then DVRv02, where PP has stated "*the value for for $Q_{treatment}$ = $Q_{res\ waste\ has}$ been corrected in the parameter box in section B.7.1 of the PDD as 21.723t/y.*" There was no mistake in DVR. PP to check their own responses before commenting on DVR. There is a clear difference in the response and the spreadsheet, PDD submitted. Since, now the, response, PDD and spreadsheet are internally consistent and hence, issue is now closed. CAR#01 is now closed.
CAR#02 a. PP is requested to make the project category(ies) in-line with the Appendix B to *simplified modalities and procedures for small-scale CDM project activities.* b. PP is requested to provide the exact location of the project activity in-line with EPA.	/A.1.4/ /B.1.1/ /PDD/A.4.2/ B.1/	a. Corrected. b. EPA location description added to section A.4.1.4.	Assessment of DVRv01.1 responses. a. Project categories are now corrected in the PDDv02.2 and hence, the issue is now closed. b. In PDDv02.2 PP has corrected the location of project activity in line with EPA and hence, Issue is now

			closed.
c. In PDD the reference to the applied methodologies is not available.		c. PDD now refers to the correct methodologies AMS-I.D. and AMS-III.AO and provides reference to the CDM website for both methodologies.	c. Section B.1, PDDv02.2 still does not include the reference for the applied methodologies. Issue is open.
d. During the site visit it was confirmed that the PA is co-digestion of Poultry Litter, Waste water from Starch industry, Press mud from Sugar Industry and Cow dung. Hence, as per AMS-III.D V17 applicability criteria no. 3 PP needs to use latest version of AMS-III.AO. PP needs to apply the relevant baseline and monitoring methodology. Also, in-line with guidance available at paragraph 40 (a) and (b) of the modalities and procedures for the CDM and paragraph 92 of EB25, the amended PDD shall be made publically available for a period of 30 days.		d. PDD rewritten to AMS-III.AO.	d. PP has amended the PDD with AMS-III.AO ver01. Also, in-line with guidance available at paragraph 40 (a) and (b) of the modalities and procedures for the CDM and paragraph 92 of EB25, the amended PDD in-line with guidance available at paragraph 40 (a) and (b) of the modalities and procedures for the CDM and paragraph 92 of EB25, the amended PDD was made publically available for period of 30days on 06-Dec-2011 (Ref: https://cdm.unfccc.int/Projects/Validation/DB/G3WO8B7ORRKL2GC0109MBN4AF65MCF/view.html) and hence, the issue is now closed.
e. In-line with the above it would be appropriate to use the latest version 18 of AMS-III.D.		e. Version 18 used.	e. PP has revised the PDD with latest ver18 of AMS-III.D and hence, issue is now closed.

2nd Assessment c. Section B.1, PDDv02.2 still does not include the reference for the applied methodologies. Issue is open.		Second response: c. The reference web-link to the PDF version of the methodology AMS-I.Dv17 and the PDF version of the methodology AMS-III.AOv01 have now been provided in section B.1 of the PDD.	Assessment of DVRv02 responses c. PJRCES has reviewed revised PDDv03, section B.1., and found that PP has provided corrected references and hence, issue is now closed. CAR#02 is now closed.
CAR#03 **General** a. PP is requested to modify the section B.2 and provide the justification for each applicability criteria for both the applied methodologies. **For AMS I.D V17 applicability criteria:** b. **C-1** – The justification provided is not sufficient to conclude that the criterion is applicable to project activity. i. PP needs to justify that the project activity will use only renewable biomass as defined by Glossary of CDM terms latest version. ii. PP needs to include the details on generation source of	/B.1.2/ /PDD/B.2/ /AMS I.D/V17/	a. B.2. modified. Justification for each applicability criterion provided in tables 3 and 4. b. (i) Justified in point 2 of table 3 Applicability conditions AMS-I-D. (ii) added to the PDD: Southern Grid	Assessment of DVRv01.1 responses. a. PP has now included justification against the each applicability criteria for both the methodologies and hence, the issue is now closed. b. i. PP has stated that the project will utilize biogas originating from renewable biomass as defined by Glossary of CDM terms ver05 and hence, acceptable. ii. Southern Grid is acceptable. Issue is now closed.

electricity. iii. PP needs to include the name of the national or regional grid. c. **C-2** – Clarify is generated electricity sold to EB or used for Captive purpose? d. **C-5** – Please clarify what is the maximum output capacity of the project activity? e. **C-5** – PP is requested to demonstrate that the capacity does not exceed the limit specified in the criterion.		(iii) Done, regional grid name included. c. Generated electricity is supplied to the Southern Grid; Biomass Energy Purchase Agreement available to validator. d. See response to CAR#01 g. e. See response to CAR#01 f.	iii. It is true that there are two grids in India and one is southern grid. However, the name of the other grid is not correct. Issue is still open. c. In line with EPA PP is requested to clearly state in the PDD that generated electricity is sold to EB. Issue is still open. d. Response should be in-line with the AMS-I.D criteria. Justification in the PDDv02.2 under states that capacity of the project activity is 2.4MW and hence, the issue is now closed. e. In-line with response provided under CAR#01(f), SD_01, 17, 18 & 19 and Table 3: Justification against criteria#05 issue is now closed. Refer 2nd Assessment.
2nd Assessment b. iii. It is true that there are two grids in India and one is southern grid. However, the name of the other grid is not correct. Issue is still open.		Second response: b. (iii) The name of the other grid has been corrected as "NEWNE grid" at the referred location in the PDD.	Assessment of DVRv02 responses b. iii. Revised PDDv03, Section B.2, table: 3, justification for point#1 has been verified and found that necessary corrections have been made and hence, issue is now

c. In line with EPA PP is requested to clearly state in the PDD that generated electricity is sold to EB. Issue is still open.		c. It has now been noted in the PDD that generated electricity is sold to the Southern Grid.	closed. c. Revised PDDv03, Section B.2, table: 3, justification for point#2 has been verified and found that necessary corrections have been made and hence, issue is now closed. CAR#03 is now closed.
CAR#04 **For AMS III.D V17 applicability criteria:** **Applicability criteria No. 1** a. **C-1(a)** – PP is requested to respond to following. i. PP is requested to include the details of the facilities from where livestock is sourced. ii. Please justify the confined conditions applicable to these sources. b. **C-1(b)**	/B.1.2/ /PDD/[B.2] /AMS IIID/[V17/]	a. (i) pls refer to DPR pages 53 through 63 (SD_03) also baseline description has been improved in B.4 step 4. (ii) In table 5, Applicability conditions of AMS-III.D, reference is made to PDD section B.4 step 4 where a description of the poultry farms is given. b.	Assessment of DVRv01 responses. a. i. Source of data for Table: 2 & 3 is not clear. Also, conclusion is missing in PDDv02.2. Issue is still open. ii. PJRCES did not find any description under Step: 4 in section B.4, PDDv02.2. However, the description is provided under title "**Baseline for avoidance of methane production from biomass**" and conditions provided were cross-checked during the site visit and hence, the issue is now closed. b.

i. PP is requested prove that the generated manure is treated as organic fertilizer and sold to farmers. ii. Please clarify is there any liquid discharge associated with the project activity? If, yes please include the details how is it treated?		(i) SD_31 Tide Report on Compost use, table 4 §6. (ii) See CAR#01.m.	i. No SD_31 is made available to DOE. PP is requested to submit the same. Issue is still open. ii. It is claimed that 50% of liquid fraction is recalculated in the plant and 50% is sprayed as liquid fertilizer on drying compost. Please clarify how it will be ensured that the liquid effluent is not discharged in to natural water resources. Issue is still open.
c. **C-1(c)** i. The link is not working. ii. PP is requested to justify this criterion in detail and provide exact reference.		c. (i) Link restored. (ii) Justification & exact reference provided in table 5. Applicability conditions AMS-III.D, in the box regarding paragraph §1 (c) of AMS-III.D.	c. i. PP has provided a different link. PP is requested to provide the exact link or include a stepwise procedure to obtain the necessary information required from the link provided. Issue is still open. ii. Exact reference is still not available. Also, it is not clear the period referred for demonstrating the applicability? Issue is still open.
d. **C-1(d)** i. PP is requested to provide the study specific to the project activity. I.e. included poultry farms from where project activity		d. (i) Please refer to TNAU report (SD_04).	d. i. SD_04: Open issues regarding SD_04 are discussed in CAR#04.1. Issue will be closed upon closure of CAR#04.1.

sources the litter. ii. Please clarify the statement made "The manure waste will be in the anaerobic conditions for more than one month" – The applicability condition is referring to baseline scenario. iii. Please clarify – in baseline scenario what is the retention time of manure waste in the anaerobic treatment system.		(ii) Reference is made to TNAU report (SD_04): 6 months average, hence more than 1 month. (iii) idem	ii. As discusses above Issue will be closed upon closure of CAR#04.1. iii. As discusses above Issue will be closed upon closure of CAR#04.1.
e. **C-1(d)** i. Please clarify the statement made "The manure waste will be in the anaerobic conditions for more than one month" – The applicability condition is referring to baseline scenario. ii. Please clarify – in baseline scenario what is the retention time of manure waste in the anaerobic treatment system.		e. (i) see A.2. "pre-project scenario". (ii) see A.2. "pre-project scenario".	e. i. PP has provided the necessary information in the section A.2 and in Table: 5 in section B.2 of PDDv02.2. the same was also checked during the site visit and hence, issue is now closed. ii. PP has provided the necessary information in the section A.2 and in Table: 5 in section B.2 of PDDv02.2. the same was also checked during the site visit and hence, issue is now closed.
f. **C-1(e)** – PP is requested to clearly describe how the manure waste has been treated in the baseline scenario?		f. See A.2. "pre-project scenario".	f. PP has included the details in section A.2 and Table: 5underc section B.2. Amended PDDv02.2 still does not provide clarity on how the waste is

Applicability Criteria No. 2(c) g. Please confirm what the storage time of the manure is (after removal from the animal barns, including transportation) before being fed into the anaerobic digesters? h. Please clarify how it is ensured that the storage time of manure does not exceed the specified time limit? i. Please clarify what is the dry matter content of the manure when removed from the animal barns?		g. see A.2. "post-project scenario": 10 – 15 days. h. See A.4.2 "project description" i. We use default values of IPCC. 20gr. Of VS per bird per day. TNAU report chicken produces 35-40gr per day, hence at least 50% of dry matter. In addition: Any value below 20% would be liquid. During site visit it was visible that the litter was not liquid. Hence dry matter was more than 20%.	handled in baseline scenario. Issue is open. g. Storage time of the manure was cross-checked during the site visit. PP is requested to include the details under Table: 5, section B.2. Issue is open. h. PP is requested to provide summary of response here itself. Issue is open. i. Response is not explicitly answering the query. The applicability criterion requires PP to demonstrate that the dry matter content of manure when removed from animal barns is larger than 20%. Instead PP has directly applied the default value and the same is not justified. Queries related to TNAU report are detailed under CAR#04.1. Refer 2nd Assessment.
2nd Assessment a. i. Source of data for Table: 2 & 3 is not clear. Also, conclusion is missing in PDDv02.2. Issue is still open.		Second response: a. (i) Source of data for Table 2 and 3 in the Detailed Project Report is as per the TIDE technocrat report submitted to DOE (ref SD_02 and SD_31).	Assessment of DVRv02 responses a. i. PJRCES has reviewed the acknowledged by TIDE and found the same acceptable. SD_60 is not relevant here.

		Also, PP refer to SD_60 containing an addendum to DPR explicitly explaining that referenced distances are "to-and-fro-distances". The justification for condition 1 of AMS-III.Dv18 has been elaborated and the conclusion has been added. The justification now reads as follows in the PDD: "In the typical poultry farm from which the proposed project activity will obtain the poultry litter, the birds (egg layers) are housed in cages. The cages are built in rows, with each cage containing 3 to 5 egg layers and each entire row (barn) containing between 25,000 and 50,000 birds. Large poultry farms will have up to several dozens of these barns. Cages are built at a maximum height of approximately 1.8 – 2.5 meters above the ground. Cages have openings in the bottom so that the poultry litter accumulates as droppings below. Hence, the livestock population in the farms from which the proposed project activity obtains poultry litter, is managed under confined	Furthermore PJRCES has revised the Table: 5 of revised PDDv03. PP has provided the justification for applicability of condition 1(a) for AMS-III.Dv18. PJRCES reviewed the same. Information was checked during the site visit and cross verified with DPR submitted and found that the explanation is acceptable. Issues are now closed.

		conditions. Therefore, the proposed project activity complies with this requirement".	
b. i. No SD_31 is made available to DOE. PP is requested to submit the same. Issue is still open.		b. (i) SD_32 Compost Report has now been made available to DOE.	b. i. PJRCES has reviewed SD_32 dated November 2011. As indicated in section 5 "Conclusion" of the report, it is clear that the report is not relevant to the query, where PP is requested to prove "that the generated manure is treated as organic fertilizer and sold to farmers." Issue is still open.
ii. It is claimed that 50% of liquid fraction is recalculated in the plant and 50% is sprayed as liquid fertilizer on drying compost. Please clarify how it will be ensured that the liquid effluent is not discharged in to natural water resources. Issue is still open.		(ii) The biogas plant received consent to establish from the Tamil Nadu Pollution Control Board after the PP submitted the DPR to the TNPCB Board. The plant is a zero liquid discharge plant as defined in the DPR Chapter 12.	ii. PJRCES has reviewed the consent to establish from TNPCB and the same confirms that the plant will have zero liquid discharge and hence, it is acceptable. PP to submit the scan copy of CTE & CTO. Issue is still open.
c. i. PP has provided a different link. PP is requested to provide the exact link or include a stepwise procedure to obtain the necessary information required from the		c. (i) PP has now provided link with annual average temperature of baseline site where anaerobic treatment facilities are located. The link for annual temperature and	c. i. PJRCES has reviewed the revised PDDv03, Table: 5, justification for point#3. PJRCES has also, visited the web link provided by PP and found that the annual

link provided. Issue is still open. ii. Exact reference is still not available. Also, it is not clear the period referred for demonstrating the applicability? Issue is still open. d. i. SD_04: Open issues regarding SD_04 are discussed in CAR#04.1. Issue will be closed upon closure of CAR#04.1. ii. As discusses above Issue will be closed upon closure of CAR#04.1.		rainfall is provided in the link below. The data can be located for SALEM as the site is 30 kms from SALEM, which is applicable. http://www.tn.gov.in/deptst/climateandrainfall.pdf http://www.myweather2.com/City-Town/India/Namakkal/climate-profile.aspx?month=4 (ii) The value of the minimal average annual temperature of baseline site indicated in the link provided above is above 20°C which is above 5°C required by methodology AMS-III.Dv18, applicability criterion 1 (c). The period referred is 2009 and 2010. Please refer to the links provided above for the same. d. (i) (ii) PP would like to note the following to DOE: PP discovered that the baseline parameter **$MS\%_{Bl,j}$** which – from the start – has been part of the list of baseline parameters in PDD	average temperature for the region is higher than 5ºC and hence, issue is now closed. ii. In-line with the above web-link has been verified and found that the period considered is consistent with the start date considered and hence, issue is now closed. d. i. PP has submitted study specific to project activity and issues are discussed in Car#04.1 and this point is now closed. ii. PJRCES has noted the same and verified section B.7.1 of PDDv03 and the same has been included as ID. 1./ $MS\%_{Bl,j,y}$, since, the same is in-line with AMS-III.AOv01, it

		section B.6.2 was also accidentally and mistakenly included in PDD section B.7.1. PP have now corrected this error by deleting parameter $MS\%_{Bl,j}$ from section B.7.1. Also, in the parameter box for $MS\%_{Bl,j}$ in PDD section B.6.2, PP have added a reference to Department of Bioenergy, Tamil Nadu Agricultural University (Tamil Nadu), Methane Emission Potential of Poultry Litter (October 2011). This report has been made available to the DOE as SD_04.	is acceptable. Also, under section B.7.1 (and not B.6.2 as indicated in response) PP has provided reference to TNAU study. Hence, issue is now closed.
iii. As discusses above Issue will be closed upon closure of CAR#04.1.		(iii)	iii. PP has not provided any response however, in-line with Point CAR#01(k) this issue is now closed.
f. PP has included the details in section A.2 and Table: 5 under section B.2. Amended PDDv02.2 still does not provide clarity on how the waste is handled in baseline scenario.		f. For condition 1(e) of AMS-III.Dv18, which requires that no methane recovery and destruction by flaring, combustion or gainful use takes place in the baseline scenario, the justification has been expanded in the PDD, as follows: For <u>poultry litter</u>:	f. PJRCES has reviewed PDDv03, Table; 5 for condition 1(e) of AMS-III.Dv18, for Poultry litter and cow dung. The justification provided by PP was verified during site visit and found that in poultry farms the droppings were accumulated and were lying there for period of 6-12 months before being sold to the

		In the typical poultry farm from which the proposed project activity will obtain the poultry litter, the birds (egg layers) are housed in cages. The cages have openings in the bottom so that the poultry litter accumulates as droppings below. Typically, the litter is left as such to accumulate for periods up to six months or more before it is cleared away manually to another area on the farm, awaiting removal by trucks outside the farm but within the project boundary. As a layered pile, with continuous fresh manure being dropped on top, the poultry litter it maintains a largely semi-solid consistency. This leads to natural decomposition of the poultry litter and methane is emitted into the atmosphere. Hence, in the baseline, regarding poultry litter no methane recovery and destruction by flaring, combustion or gainful use takes place. For cow dung, PP is not required to demonstrate that in the baseline no	farmers. During this period it formed a later pile, leading to decomposition. Also, in case of cow dung in-line with §03 of AMS-III.AOv01, PP is not required to demonstrate the same and hence, acceptable. Hence, issue is now closed.

		methane recovery and destruction by flaring, combustion or gainful use takes place. This is because PP have clearly stated in the PDD that for the proposed project activity, methane emissions are claimed only for poultry litter and not for biomass residues or cow dung because PP cannot demonstrate that the organic matter would otherwise been left to decay anaerobically. Hence, PP accounts baseline emissions for cow dung as zero, as per AMS-III.AOv01, §3 which states that if for one or more sources of substrates, it cannot be demonstrated that the organic matter would otherwise been left to decay anaerobically, baseline emissions related to such organic matter shall be accounted for as zero. In light of the above, the proposed project activity complies with this requirement.	
g. Storage time of the manure was cross-checked during the site visit. PP is requested to include the details under Table: 5, section B.2. Issue is		g. The storage time (including transportation) of 10-15 days has been added to the justification for condition 2(c).	g. Revised PDDv03, table: 5 have been verified. It is found that, as observed during the site visit, storage time of manure after removal from the animal

open. h. PP is requested to provide summary of response here itself. Issue is open.		h. The following has also been added to the justification for condition 2(c): As described in PDD-section A.4.2 (under Process Description) it is explained that the storage area of the plant has a capacity of 1.950 m³ and the daily input of substrate will be 210 metric tonnes (300 m³) hence the storage area is able to store substrate for 6.5 days. Given the timeframe specified above, it is ensured that the storage time of the manure will not exceed 45 days.	barns, including transportation is 10-15 days. Since, the storage area can handle the storage for 6.5 days, it still remains within the specified limits of 45 days and hence, issue is now closed. h. In-line with the explanation above the justification acceptable and hence, issue is now closed. Refer 3rd Assessment.
3rd Assessment b. i. PJRCES has reviewed SD_32 dated November 2011. As indicated in section 5 "Conclusion" of the report, it is		Third Response: b. (i) PJR has explained to PP that its original question, i.e. the first version of CAR#04(b) (i) was raised based on PP's justification against	Assessment of DVRv03 responses b. i PJRCES has reviewed the, SD_32, where PP claims that the compost produced would be dewatered and stored for

clear that the report is not relevant to the query, where PP is requested to prove "that the generated manure is treated as organic fertilizer and sold to farmers."		applicability condition 1(b) of AMS-III.D, which reads: *Manure or the streams obtained after treatment are not discharged into natural water resources (e.g. river or estuaries), otherwise AMS-III.H "Methane recovery in wastewater treatment" shall be applied;* PP's justification in the first web hosted PDD v01.5 dated 30/06/2011 was as follows: '*The generated manure will be treated as an organic fertilizer and sold to farmers. Hence this condition is satisfied'*. In the second webhosted PDD, version 2.2, dated 02/12/2011, PP revised the justification against applicability condition 1(b) of AMS-III.D as follows: *The material resulting from the co-digestion process can be divided into residual waste and leachate. Neither will be discharged into natural water resources (e.g. river or estuaries). Of the expected liquid fraction, 50% is re-circulated into the project plant system and 50% is sprayed as liquid fertilizer on drying compost.*	subsequent sale. The procedure for demonstration on how the compost would be treated is provided under section 3 of the SD_32. This will be further cross checked during the time of Verification and hence, this issue is now converted into Forward action request (FAR#01).

		Therefore the proposed project activity complies with this requirement. This justification was further substantiated by PP – and accepted by DOE PJR – their answer to CAR#04(b) (ii), in DVRv2.0, where PP stated: *The biogas plant received consent to establish from the Tamil Nadu Pollution Control Board after the PP submitted the DPR to the TNPCB Board. The plant is a zero liquid discharge plant as defined in the DPR Chapter 12.* As for PJR's original request (in DVR1.0) to PP to prove that the generated manure is treated as organic fertilizer and sold to farmers, in their FIRST response PP mistakenly referred to SD_31, where they should have referred to SD_32. Subsequently, in DVR2.0, under CAR#04(b) (i) PJR requested PP to submit SD_31. In their SECOND response, PP correctly referred to and provided PJR with a copy of SD_32,	

		which is a report by Tide Technocrats, of which the full title reads: '*Lifecycle of compost from production center to its final use and procedures to monitor proper soil application*'. As reiterated by PP in discussion with PJR on 26/4/2011: in SD_32 PP explain how they will prove that the generated manure is treated as organic fertilizer and sold to farmers in the framework of the proposed project activity.	
ii. PJRCES has reviewed the consent to establish from TNPCB and the same confirms that the plant will have zero liquid discharge and hence, it is acceptable. PP to submit the scan copy of CTE & CTO.		(ii) PP had already submitted SD_43 and SD_44 to DOE. These two documents constitute the Consent To Establish (CTE). But the Consent To Operate (CTO) is not given to a project before pre commissioning of the project. So at this stage no project – and hence also not the proposed project activity – will obtain CTO. Also CTO is not relevant at this stage of the project for CDM registration. As per the discussion with PJR on 26/04/2011, DOE will close this issue.	ii PJRCES has reviewed the SD_43 and SD_44. Also, the explanation is accepted as the project activity is not implemented and hence, the CTO is not available at this point. This will be checked during the first verification and hence, issue is now converted into Forward action request. CAR#04(b) (i) & (ii) are converted into FAR#01. CAR#04 is now closed.

CAR#04.1 a. PP is requested to submit acknowledged copy of SD_04 by TNAU. b. References or source of information is not clear for data provided under section 1.0 of the report. c. Power generation capacity mentioned is 2.2MW. Inconsistent with the PDDv02.2. d. There are no Figures 03, 04 & 05 present in the report as indicated in section 3 of the report.	/CAR#04/	a. The acknowledged copy of the final version of SD_04 by TNAU has been submitted to the DOE. b. As indicated at the end of section 1.0 of the TNAU report, reference is made to IPCC (2006). In the References-section of the TNAU report, IPCC (2006) is further specified as: IPCC Guidelines for National Greenhouse Gas Inventories- Chapter 10: Emission from Livestock and Manure Management. c. In the final version of SD_04, the TNAU report, that has now been provided to the DOE, Power generation capacity mentioned is 2.4MW, consistent with PDD. d. In the final version of the TNAU report now provided to the DOE, there is no link to figures (the figures were part of the working version report that was accidentally uploaded to the database of supporting documents, but they are not in the	Assessment of DVRv02 responses a. PJRCES has reviewed the SD_04 and also, verified the email communication from Dr. N.O. Gopal and hence, issue is now closed. b. PJRCES has reviewed SD_04, section 1 and found that reference has been provided as IPCC, 2006. Issue is now closed. c. Revised Report indicates a capacity of 2.4MW and hence, issue is now closed. d. Final report has been verified and found that PP has removed the references and consistency has been maintained and hence, issue is now closed.

e. Under section 4.3 PP is requested to clarify how the values of 0.0000649 g/m².s and 0.00015 g/m².s are calculated.		final version). e. The following information was included in the final version of the report by TNAU: Methane flux is calculated with the formula given in 4.2. page 14: $F = \frac{p\ V\ \Delta C}{A\ \Delta t}$ Where, F = Flux of gas (g/m2 .s) V = Volume of the chamber (m3) ΔC = Change in the concentration of the gas (%) Δt = Time interval over which the samples are taken (s) p = Density of the gas (g/m3) A= Surface that are enclosed by the chamber (m2) Flux(g/m2 .s) = $\frac{0.717\ kg/m3 \times 0.0714m^3 \times 0,011}{0.20098m^2 \times 43200\ s}$ = 0.0000649 g/m2 .s	e. Calculation for 0.0000649 g/m².s is acceptable. Also, the same is verified from Table: 6 of report and hence, issue is now closed.
f. Value of methane density in the report is inconsistent with PDDv02.2		f. The following information is included in the report TNAU:	f. PJRCES has verified the link provided by PP and explanation given

and source provided therein.		0.717 is the density at 0°C, under STP conditions, IPPC may use the density values under 20°C hence 0.67, see also http://cdm.unfccc.int/methodologies/inputsconsmeth/MGM_methane.pdf	is acceptable considering that the final report clarifies the same and hence, issue is now closed.
g. Please clarify how the average value of 0.0000935 g/m².s is calculated. Also, the same is not consistent throughout the report.		g. 0.0000935 is the average of the four measured values.	g. Table 6 of final report has been verified and hence, calculation of 0.0000935 is verified. It is wrongly mentioned under section 4.3 of report. Issue is still open.
h. PP has provided IPCC 2006 guidelines Chapter 10 as general refence#6. Under Table: 7 please clarify the exact reference for each parameter.		h. Under Table: 7 the exact reference for each parameter has been clarified.	h. Exact reference is still not provided for "Housing area for poultry birds at the site". Issue is still open.
i. Value of VS is not consistent with PDDv02.2 and reference given therein.		i. Value of VS is now consistent with PDD.	i. Value of VS i.e. 0.02 Kg/head/day is now consistent with PDDv03, "ID. 8./ $VS_{LT,y}$" and hence, issue is now closed.
j. Please clarify how value of 0.24 Kg of VS/m² is calculated.		j. The value is now corrected to 0.22. It is the product of the previous two values.	j. Explanation is accepted and hence, issue is now closed.
k. Value of B_0 is inconsistent throughout the report. The same is inconsistent with PDDv02.2 and reference given therein.		k. Value for B_0 is now corrected to 0.24.	k. Value of B_0 i.e. 0.24 m^3_{CH4}/kg is now consistent with PDDv03, "ID. 7./ $B_{o,LT}$" and hence, issue is now closed.
l. It is unclear how values of 0.00808 Kg of CH_4/m²/day and 0.01206 M³ of		l. The measured methane flux given in g/m2*s is transformed to kg/m²*day.	l. PJRCES has verified the calculation and found the explanation acceptable

$CH_4/m^2/day$ are calculated. m. Please clarify how value of 0.0548 M^3 of CH_4/kg of VS is calculated. n. MCF value is quoted inconsistently throughout the report. Please clarify how MCF value of 22.86% is arrived. Also, the same is not consistent with the PDDv02.2. o. It is stated in the section 5 that "studies revealed that the volatile solid (VS) content of the poultry litter varied 51.3 to 27.0 per cent of the total solids with an average value of 54 ± 0.3 per cent" Please clarify how the average is calculated as 54 ± 0.3 per cent when, the highest value is 51.3%.		Then the value is divided through the density. m. The previous value is divided through the third value in table 7. n. Value is now corrected to 22.84% now value is consistent. o. The VS content in table 5 varies from 51.7 to 56.3; average value is calculated as 54.03 from the average value of the four samples.	and hence, issue is now closed. m. Calculation is verified and hence, issue is now closed. n. Section 4.3 is still not corrected. Issue is still open. o. The revised report section provides only the average value of 54.04, which is not average of VS values of 51.7 to 56.3 as given in response. Issue is still open. Refer 3rd Assessment.
3rd Assessment g. Table 6 of final report has been verified and hence, calculation of 0.0000935 is verified. It is wrongly mentioned under section 4.3 of report. h. Exact reference is still not provided		Third Response: g. It was a typographical error, which was mentioned under paragraph 4.3. Now it is corrected to 0.0000935. The acknowledged and corrected version of the TNAU report has now been provided to the DOE as SD_04_b. h. In SD_4_b, table 7, the reference	Assessment of DVRv03 responses g. PJRCES has reviewed the corrected SD_04_b and found that the error has been corrected and hence, issue is now closed. h. PJRCES has reviewed the SD_04_b

for "Housing area for poultry birds at the site".		mentioned is the Poultry Standard, and for this further reference is given in TNAU survey Report of poultry birds for spacing in selected farms during 2010-11.PP5, which has now been made available to the DOE as SD_4c_TNAU_Survey_Report.	and found that PP has specified the source of the information for "Housing area for poultry birds at the site", which is again a TNAU survey report. Hence, the issue is now closed.
n. Section 4.3 is still not corrected.		n. For the description of how PP arrive at 22.84% (the number which is now consistent throughout the TNAU report), PP refer to SD_04d_Formula_description which has now been made available to the DOE.	n. PJRCES has reviewed the revised SD_04_b and SD_04_d_Formula_description and found that both are now consistent. Also, the calculation was found to be correct and hence, issue is now closed.
o. The revised report section provides only the average value of 54.04, which is not average of VS values of 51.7 to 56.3 as given in response.		o. PP refer to SD_4_b which they have now made available to the DOE, and especially refer to the revised section 4.1. in SD_4_b. Table 5a in section 4.1 provides calculation of average VS values and result of the average value of 54.0375 = 54.04.	o. PJRCES has reviewed the SD_4_b and found that the calculation of average value of VS is now correctly described and hence, issue is now closed. CAR#04.1 is now closed.
CAR#05 **AMS-III.AO Ver1** a. PP needs to justify the each and every applicability criteria. Also, state the reason for non applicability of the	/B.1.2/ /PDD/[B.2] /AMS III.AO/[V1/]	a. Provided in table 4 Applicability conditions of AMS-III.AO.	Assessment of DVRv01.1 responses. a. PJRCES has reviewed the revised PDDv02.2 and additional issues are raised in CAR#05.1 below.

criterion. b. For all the sources of substrates Demonstrate that organic matter would otherwise have been left to decay anaerobically.		b. As PP only claims emissions from poultry litter, only poultry litter baseline is described in detail. Table 4, Applicability conditions of AMS-III.AO, paragraph 3, PP have elaborated why PP cannot prove baseline emissions for cow dung, sago water and press mud. Also, in the same table cell, it is added that, hence, in line with paragraph 1 (c) of AMS-III.AO, baseline emissions of cow dung, sago water and press mud are accounted for as zero.	b. PJRCES has reviewed the revised PDDv02.2 and in-line with interviews conducted during the site visit the explanation is accepted, hence, issue is now closed.
c. For "Competing use for the biomass" demonstrate conformance to Attachment C "General guidance on leakage in biomass project activities" to Appendix B latest Ver03.		c. See table 4. Condition d.	c. PJRCES has reviewed the revised PDDv02.2 and additional issues are raised in CAR#05.1 below.
d. Demonstrate that the Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually.		d. See table 4, Applicability conditions of AMS-III.AO, condition 2.	d. Explanation provided is not adequate to conclude that project activity will not cross limits of emissions reductions specified by methodology. Issue is open.
e. In-line with the guidance provided under §03 for co-digestion demonstrate conformance to the requirements under §§ 1 and 2(c) of		e. See table 5, Applicability conditions of AMS-III.D.	e. Additional comments are raised in CAR#05.2 below. Issue is open.

AMS-III.D latest Version. f. Identify the stockpiles that are expected to accommodate each type of waste to be used for project activity for the duration of crediting period. Alternatively demonstrate that it is a common practice to dispose-off the waste in solid waste disposal site.		f. See table 4 Applicability conditions of AMS-III.AO §3 a & b.	f. PP is requested to respond in-line with CAR#5.1(e) and CAR#4.1(a). Issue is open.
g. PP needs to clearly define the geographical boundary in-line with guidance provided under §§3(b) and 4.		g. Corrected.	g. Justification provided against condition 3(b) is not clear about the geographical area referred for the proposed project activity. Also, PP is requested to respond in-line with CAR#5.1(e). It is unclear how the value of 25 Km as average incremental distance is arrived at. Issue is open.
h. Please clarify how the residual waste from the digestion is handled. PP needs to respond in-line with §§5-7 of AMS-III.AO Ver1.		h. Clarified in table 4 Applicability conditions of AMS-III.AO.	h. PP has stated that proper conditions will be ensured. It is however unclear what these proper conditions are? Also, please clarify how PP will ensure that farmers will spread the compost in thin layers when using it on their farms? Issue is open.
i. PP needs to clarify is there any discharge to a subsequent wastewater treatment system or to the natural		i. There is no discharge. Please refer to the Mass balance provided to the	i. PP is requested to respond in-line with CAR#05.2(b).

water receiving body. j. Confirm that all the biogas captured from digester shall be combusted and/or flared. k. Clarify, is recovered biogas used for auxiliary consumption?		DOE (SD_14). j. Confirmed in table 4, Applicability conditions of AMS-III.AO. k. On site (aux.) power source is biogas as described in PDD-section A.4.2. Under the subheading CHP (Combined Heat & Power) Unit. As per §15 of AMS-III.D, PE from AUX power = zero.	j. PP is requested to respond in-line with CAR#05.1(f). k. Query is related to biogas utilization for auxiliary consumption. However, during the site visit and interviews it was confirmed by PP that facility will also have a import flexibility from grid and hence, PP is requested to clarify for including only biogas as power source. Issue is open. Refer 2nd Assessment.
2nd Assessment d. Explanation provided is not adequate to conclude that project activity will not cross limits of emissions reductions specified by methodology.		Second response: d. As per the calculation using equation 4 from methodology AMS-III.AOv01, PP have to take the minimal value resulting from equation 4, which makes it impossible that emission reductions cross the 60kt CO_2 equivalent threshold. Additional demonstration that measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually has been provided to the DOE in SD_30. Therefore, the proposed project	Assessment of DVRv02 responses d. Explanation is accepted; however, as indicated in PDD no such information is found SD_20. Issue is still open.

		activity complies with this requirement.	
f. PP is requested to respond in-line with CAR#5.1(e) and CAR#4.1(a).		f. Please refer to pages 53 to 63 of the Detailed Project Report, listing sources of substrates for the proposed project activity, which are based on SD_02 Tide Technocrats Report, which has also been referenced in the PDD in a footnote to the justification provided by PP regarding requirement 3a of AMS-III.AOv01. The DPR has been consented by Pollution Control Board and copy has been handed over to the DOE PJRCDM.	f. PJRCES has reviewed the DPR and application submitted to TNPCB. Also, PJRCES has reviewed the report submitted by TNAU and hence, issue is now closed.
g. Justification provided against condition 3(b) is not clear about the geographical area referred for the proposed project activity. Also, PP is requested to respond in-line with CAR#5.1(e). It is unclear how the value of 25 Km as average incremental distance is arrived at.		g. The following has been added to the justification for condition 3(b): the geographical area for condition 3(b) is the region of Tamil Nadu, Republic of India. For the definition of the geographical boundary, PP have set the boundary to 200km as is now reflected in the referred location in the PDD. **<u>Average incremental distance for poultry litter, agri waste and cow dung transportation (DAF_w)</u>:**	g. PJRCES has reviewed the revised PDDv03; PP has included monitoring of average incremental distance for waste type i (ID. 31./$DAF_{w,i}$) and average incremental distance for compost transportation (ID. 32./ $DAF_{res\ waste}$). Also, PJRCES has reviewed the SD_64 (Sampling plan) and SD_64a calculation for sampling and found that the same is in-line with *"standard for sampling and surveys for CDM project activities and programme of activities (Version 2.0)"* and hence, issue is now closed.

		The incremental distance of 25 km is taken as a conservative average. This is as per SD_03, Detailed Project Report, pages 53 through 63 and also based on TIDE Technocrat report: the average incremental distance was determined based on all the distances provided in pages 53 through 63 of the DPR, which are based on SD_02 Tide Technocrats Report. The average distance is less, which is below 25 km. PP considering a conservative value of 25 KM, and therefore; the proposed project activity complies with this requirement. QA/QC procedures to be applied are as follows: Records (TRIPSHEETS) showing from which location the waste originates. Through statistically sound sampling the distance between those locations and the project (plant) site is determined and verified. PP refers to SD_64 Sampling Plan IOTM Pudhuchatram_v1 and SD_64a Sampling plan statistical calculations IOTM Pudhuchatram v1.	

		The PDD has been revised accordingly. **<u>Average incremental distance for compost transportation ($DAF_{res\ waste}$)</u>:** For the average incremental distance for compost transportation 50 km is taken as a conservative average. Based on SD_02 Tide Technocrats Report: the survey conducted for compost sales. The area covered for 50 kms radius distance from project site, the compost can be sold to farmers for agricultural purpose. PP refer to page 25 table 10 of the Tide Technocrats Private Limited (Bangalore), Assessment Report of feedstock availability and market for biomethanation solids (April 2011). Document made available to the DOE: PP refer to SD_02 and acknowledged copy in SD_31. QA/QC procedures to be applied are as follows: the location of each batch of compost sold will be registered and documented via sales records and TRIPSHEETS. A statistically sound	

		test sample land area totalling 20 hectares is determined from locations where soil application of the compost takes place (as per SD_32 Tide Compost Report made available to the DOE). The distances from the project (plant) site to these sample soil application locations of the compost are averaged and cross-referenced with the compost sales records. PP refer to SD_64 Sampling Plan IOTM Pudhuchatram_v1 and SD_64a Sampling plan statistical calculations IOTM Pudhuchatram v1. The PDD has been revised accordingly.	
h. PP has stated that proper conditions will be ensured. It is however unclear what these proper conditions are? Also, please clarify how PP will ensure that farmers will spread the compost in thin layers when using it on their farms?		h. PP refer to SD_32 Compost Report, which explains proper conditions and how PP will monitor. Refer to Annexure 3 of SD_32 (crop area covered). Per year up to 20 hectares will be surveyed.	h. PJRCES has reviewed the SD_32 and revised PDDv03. PDD does not identify any monitoring parameter with respect to the response. Issue is still open.
i. PP is requested to respond in-line with CAR#05.2(b).		i. PP has defined the condition of zero-liquid discharge in the DPR as has been consented by Pollution Control Board which copy has been handed over to the DOE PJRCDM.	i. As mentioned in CAR#04(b)(ii) PJRCES has reviewed the consent to establish from TNPCB and the same confirms that the plant will have zero liquid discharge and hence, issue is

j. PP is requested to respond in-line with CAR#05.1(f). k. Query is related to biogas utilization for auxiliary consumption. However, during the site visit and interviews it was confirmed by PP that facility will also have a import flexibility from grid and hence, PP is requested to clarify for including only biogas as power source.		j. As per the project activity PP put up a power generation unit where all the biogas is combusted. In emergency situations, where the power generation through the combustion of biogas is not happening, the biogas is diverted to an enclosed flare. So all the biogas is either combusted or flared. k. The facility will also have import flexibility from the grid. This would only be used in case of an emergency situation when the project activity would require electricity and such electricity could not be provided by the combustion of biogas.	now closed. j. Revised PDDv03 includes a justification that in case of emergencies the biogas will be flared. The same was confirmed during the site visit through interviews and cross verification of design specifications by technical expert and hence, issue is now closed. k. Since, the net electricity supplied to grid would comprise the imports from grid and hence, this issue is now closed. Refer 3rd Assessment.
3rd Assessment d. Explanation is accepted; however, as indicated in PDD no such information is found SD_20. h. PJRCES has reviewed the SD_32 and revised PDDv03. PDD does not identify any monitoring parameter with respect to the response.		Third response: d. In its Second Response, PP referred to SD_30, not SD_20. As the information is also to be found in SD_30, PP understands that PJR will now close this issue. h. Parameter APP_{Comp} has now been added to the PDD.	Assessment of DVRv3.0 response d. PJRCES has reviewed the SD_30 and found that the justification is consistent with SD_30 and hence, issue is now closed. h. Revised PDD includes the parameter and hence, issue is now closed. CAR#05 is now closed.

CAR#05.1 **AMS-III.AOv1.0** a. As required by applicability condition 1(d) PP is requested demonstrate compliance with the procedures laid in "General guidance on leakage in biomass project activities" latest version 03. b. Also, PP is requested to submit copy of "Assessment Report of feedstock availability and market for biomethanation solids" report acknowledged by TIDE Technocrats Private Limited.	/CAR#05/	a. The last part of the justification for condition 1(d) of AMS-III.AOv01 has been amended and now reads as follows: "The leakage referred to in General Guidance on leakage in biomass project activities (version 03), paragraph 18 is not applicable to the proposed project activity. The proposed project activity complies with the General guidance on leakage in biomass project activities. Hence the project complies with this requirement." b. PP has submitted to DOE copy of "Assessment Report of feedstock availability and market for biomethanation solids" report acknowledged by TIDE Technocrats Private Limited as SD_02 and PP has now also made available SD_31 'Tide Corrections Value Chain' with acknowledgement by Tide Technocrats.	Assessment of DVRv02 responses a. In-line with the justification provided against applicability conditions 1(d), on the use of Poultry litter, cow dung, press mud & starch water, issue is now closed. b. PJRCES has received SD_02 and SD_31 acknowledged by third party and hence, issue is now closed.

[24] SD_03, Detailed Project Report made available to DOE.
[25] As per SD_14, Mass balance, made available to the DOE.

c. Applicability condition 1(e) justification provided is not adequate.		c. The justification for condition 1(e) has been amended in the PDD and now reads as follows: "The proposed project activity involves co-digestion of animal manure and other organic matters and as per §3 of AMS-III.Dv18, the proposed project activity shall use the methodology AMS-III.AO "Methane recovery through controlled anaerobic digestion". Therefore, condition 1(e) is not applicable to the proposed project activity".	c. PJRCES has reviewed the revised PDDv03, table 4 and found that PP has adequately justified the applicability as proposed project activity is co-digestion due to which condition is not applicable to project activity is acceptable and hence, issue is now closed.
d. PP is requested to provide exact reference whenever referring to report provided by TIDE Technocrats Private Limited.		d. PP has now provided exact reference whenever referring to report provided by TIDE Technocrats Private Limited.	d. Revised PDD provides exact reference to TIDE report and hence, issue is now closed.
e. Please clarify and respond in-line with para 113 of VVMv1.2, Has PP submitted the report titled "Detailed Project Report of 2.0 Mw Biogas to Power Generation Project at Puduchatram, Namakkal, Tamil Nadu" to any national authority for approval?		e. PP refer to their responses to CAR#05(f) and CAR#05.1(i) and note that the DPR has been consented by Pollution Control Board and copy has been handed over to the DOE PJRCDM.	e. PJRCES has reviewed the DPR and application submitted to TNPCB. Also, PJRCES has reviewed the report submitted by TNAU and hence, issue is now closed.
f. Condition 8: response provided is not adequate to conclude applicability. Please further clarify and respond in-		f. The justification for condition 8 of AMS-III.AOv01 has been amended and now reads as follows: "PP has	f. Revised PDDv03, provides adequate justification and also, in-line with assessment of CAR#04(b)(ii) &

line with the requirement. Conclusion is missing.		defined the condition of zero-liquid discharge in the DPR as has been consented by Pollution Control Board which copy has been handed over to the DOE PJRCDM [24]. Expected volume of the liquid fraction is around 85,000 t/y of which 50% is recirculated into the project plant system and 50% is sprayed as liquid fertilizer on drying compost [25]. Therefore, condition 8 is not applicable to the proposed project activity".	CAR#05(i) issue is now closed.
g. Condition 9: Please clarify will PP use separate flow meters for combustion and flaring? Further it is not clear what technical measures are considered by PP to ensure that all biogas captures will be flared/combusted?		g. PP refer to their response to CAR#05(j). The justification to condition 9 of AMS-III.AOv01 in the PDD has been amended and now reads as follows: "As per the project activity PP put up a power generation unit where all the biogas is combusted. Only in emergency situations, when the power generation through the combustion of biogas is not happening, the biogas is diverted to an enclosed flare. Hence all the biogas is either combusted or flared. Therefore, the proposed project activity complies with this	g. In-line with assessment of CAR#05 (j) it is acceptable that PP will use the excess biogas only in case of emergencies. Also, question related to monitoring of gas flow to flaring through separate meter is not answered. Issue is still open.

3rd Assessment g. In-line with assessment of CAR#05 (j) it is acceptable that PP will use the excess biogas only in case of emergencies. Also, question related to monitoring of gas flow to flaring through separate meter is not answered.		requirement". Third Response: g. The gas flow to the combustion engines is not monitored but is *flared* minus *total* as per formula 20. PP will use two meters: $BG_{Total,y}$ and $BG_{flared,y}$.	Refer to 3rd Assessment. Assessment of DVRv3.0 responses g. PJRCES has reviewed the revised PDD. It is now clear that PP will monitor $BG_{Total,y}$ and $BG_{flared,y}$, as per the procedures defined in section B.7.2 of the PDD. PP will also use two separate meters for monitoring the above two parameters and the monitored values will be used to estimate $BG_{combusted,y}$. this is acceptable and hence, issue is now closed. CAR#05.1 is now closed.
CAR#05.2 **AMS-III.Dv18** a. Condition 1(a): justification provided is not adequate to conclude that conditions are confined. Also, under Table: 5, conclusion is missing.	/CAR#05/	a. The justification for condition 1(a) in the PDD now reads as follows in the PDD: "In the typical poultry farm from which the proposed project activity will obtain the poultry litter, the birds (egg layers) are housed in cages. The cages are built in rows, with each cage containing 3 to 5 egg layers and each entire row (barn) containing	Assessment of DVRv02 responses a. In-line with justification provided and assessment of CAR#4(a)(i), issue is now closed.

		between 25,000 and 50,000 birds. Large poultry farms will have up to several dozens of these barns. Cages are built at a maximum height of approximately 1.8 – 2.5 meters above the ground. Cages have openings in the bottom so that the poultry litter accumulates as droppings below. Hence, the livestock population in the farms from which the proposed project activity obtains poultry litter, is managed under confined conditions. Therefore, the proposed project activity complies with this requirement".	
b. Condition 1(b): PP is further requested to clarify how it will be ensured that the liquid effluent is not discharged in to natural water resources.		b. PP refer to their response to CAR#05.1(i) and note that PP has defined the condition of zero-liquid discharge in the DPR as has been consented by Pollution Control Board which copy has been handed over to the DOE PJRCDM.	b. Revised PDDv03, provides adequate justification and also, in-line with assessment of CAR#04(b)(ii), CAR#05(i) & CAR#05.1(f) issue is now closed.
c. Condition 1(c): Source link does not provide any exact values as required		c. Please refer to PP's Second Response to CAR#04 (c), where PP has	c. In-line with justification provided in revised PDDv03 and assessment of

[26] PP refer to the SD_03 Detailed Project Report, especially to pages 53 to 63 listing sources of substrates, including manure waste for the proposed project activity; also reflected in SD_02 Tide Technocrats Report. The DPR has been consented by Pollution Control Board and copy has been handed over to the DOE PJRCDM.

[27] Chapter 3 in Department of Bioenergy, Tamil Nadu Agricultural University (Tamil Nadu), *Methane Emission Potential of Poultry Litter* (October 2011). document made available to the DOE

by applicability condition. PP is requested provide exact source for the information to be specified.		provided source link with values as well as source for the information. The same has been provided in the PDD in the cell with the justification for applicability criterion 1(c) of methodology AMS-III.Dv18.	CAR#04(c) issue is now closed.
d. Condition 1(d): Please respond in-line with CAR#05.1(e).		d. The justification for condition 1(d) of AMS-III.Dv18 has been amended and now reads as follows: "As confirmed by the TNAU report, in the region of Tamil Nadu the current practice of poultry litter management involves open dumping of litter posing negative health impacts to the poultry. The poultry litter in open dumps decomposes over a period of about six months liberating methane, carbon dioxide and nitrous oxide into the atmosphere as a consequence of anaerobic digestion of the organic fraction of waste by naturally present microbial consortia. Hence, in the baseline scenario the retention time of manure waste in the anaerobic treatment system[26] is greater than one month[27]. The baseline scenario does not involve anaerobic lagoons. Hence the	d. PJRCES has reviewed the revised PDDv03 and found that PP has provided adequate justification and in-line with assessment of CAR#05.1(e) issue is now closed.

e. Condition 1(e): Conclusion is missing. Also, the justification is not adequate to conclude applicability. f. Condition 2(c): Description in section A.4.2 of PDDv02.2 discussed about the storage at facility end only and is silent on transportation. Also, please further clarify for how long manure is kept at the farms before it is removed from barns?		proposed project activity complies with this requirement. e. PP refer to their response to CAR#04(f). The justification to condition 1(e) of AMS-III.Dv18 in the PDD has been amended: f. PP refer to their second response to CAR#04(g) and CAR#04(h) and note that the justification to condition 1(e) of AMS-III.Dv18 in the PDD has been amended and now reads as follows: "As described in PDD-section A.2 (under Post-Project Scenario), the storage time of the manure after removal from the animal barns, including transportation is 10-15 days before being fed into the anaerobic digester. Furthermore, in PDD-section A.4.2 (under Process Description) it is explained that: the storage area of the plant has a capacity of 1.950 m³ and the daily input of substrate will be 210 metric tonnes (300 m³) hence the storage area is able to store substrate	e. PJRCES has reviewed the revised PDDv03 and in-line with assessment of CAR#04(f) issue is now closed. f. In-line with assessment of CAR#04(g) and (h) issue is now closed. CAR#05.2 is now closed.

		for 6.5 days. The timeframe specified above, ensures that the storage time of the manure will not exceed 45 days. Therefore, the proposed project complies with this requirement".	
CAR#06 a. PP is requested to justify the selection of all emission sources within the project boundary. (Baseline, project and leakage emission sources). b. The project boundary is not in-line with §09 of the applied methodology AMS I.D V17. c. PP needs to define the project boundary in-line with §11 of AMS-III.AO Ver1. d. Please clarify what electricity system is considered for project activity.	/B.1.4/ /PDD/[B.3/]	a. see table 6, Emission sources. b. Project boundary corrected. c. Project boundary has been modified. d. added to the PDD: Southern Grid	Assessment of DVRv01.1 responses. a. Revised PDDv02.2 includes the necessary details and hence, issue is now closed. b. Project boundary has now been revised & is in-line with §09 of the applied methodology AMS I.D v17, hence, issue is now closed. c. PP is requested to respond to CAR#06.1. d. Revised PDD includes the electricity system in-line with CEA and hence, issue is now closed. Refer 2nd Assessment.
2nd Assessment c. PP is requested to respond to CAR#06.1.		Second response: c. PP refers to their response to CAR#06.1.	Assessment of DVRv02 responses c. In-line with assessment of CAR#06.1 issue is now closed.

			CAR#06 is now closed.
CAR#06.1 a. Condition 11(a): Please clarify how the provided description is in-line with the requirement specified. b. Condition 11(b): the condition requires PP to demonstrate what happens to wastewater in the absence of project activity and accordingly the project boundary should be defined.	/CAR#06/	a. The justification for project boundary condition 11(a) of AMS-III.AOv01 has been amended: b. With reference to the justification for project boundary condition 11(a) in the PDD, it is noted that for sago water no baseline emissions are claimed. Furthermore, is noted that for sago water (as well as for cow dung and press mud) PP states in this PDD that PP can not demonstrate that this organic matter would otherwise have been left to decay anaerobically and that therefore, as per §1(c) of AMS-III.AOv01, baseline emissions related to such organic matter shall be accounted for as zero. Consequently, as PP has stated that PP cannot identify the baseline for sago water, PP cannot and is not required to include in the project boundary "where the wastewater would have been treated anaerobically in the	Assessment of DVRv02 responses a. Revised PDDv03 has been reviewed and explanation is accepted and hence, issue is now closed. b. Revised PDDv03 has been reviewed and in-line with §1(c) of AMS-III.AOv01 explanation is accepted and hence, issue is now closed.

[28] PP refer to SD_03 Detailed Project Report, especially to pages 53 to 63 listing sources of substrates for the proposed project activity. These sources are also identified in SD_02 Tide Technocrats Report. The DPR has been consented by Pollution Control Board and copy has been made available to DOE PJRCDM.

c. Condition 11(f): Description is inconclusive and not adequate. Clearly specify what has been covered as a part of project boundary.		absence of the project activity". Therefore, this project boundary condition is not applicable to the project activity. It is noted that the transport emissions from transporting the sago water from the sago industries sources to the project plant are included in the project boundary as stated in PP's justification for boundary condition 11(f) of AMS-III.AOv01 and as referenced in the Detailed Project Report made available to the DOE. c. The justification for project boundary condition 11(f) of AMS-III.AOv01 has been amended in the PDD and now reads as follows: "PP include in the project boundary, the itineraries between a, c, d and e, where the transportation of waste, wastewater, manure, residual waste after digestion, occurs[28]".	c. Revised PDD addresses the concerns and hence, issue is now closed. CAR#06.1 is now closed.
CAR#07 **For AMS I.D V17:**	/B.2.1/ /B.2.2/		Assessment of DVRv01.1 responses.

a. PP is requested to clearly identify the paragraphs referred for baseline identification and also, clearly state the options chosen to determine the baseline in-line with the applied methodologies. b. PP is requested to include the key parameters used for calculation of combine margin emission factor. **For AMS III.D V17 & AMS III.AO V1:** c. PP is requested to include description on baseline scenario identification. d. PP is requested to clarify which approach is followed to determine baseline for "*avoidance of methane emissions from anaerobic biomass decay*" Please describe it in-line with §11 of AMS III.AO V1. e. It is stated that Methane emissions are claimed only for poultry litter. Please clarify how methane emissions are measured when all waste is fed into same digester?	/PDD/[B.4/B.5/]	a. Done, see section B.4. b. Done. c. Done, see section B.4 d. Done, see section B.3. e. See SD_30 Response to CAR 07e.docx	a. PP has referred to correct paragraphs as per AMS-I.Dv18 and AMS-II.AOv1. b. PJRCES was not able to locate the key parameters in the revised PDDv02.2. Issue is open. c. PP is requested to respond in-line with CAR#07(l). d. Revised PDDv02.2 includes the description against para 11, however, corrected para for baseline as per AMS-III.AOv01 is 12 and PP is requested to justify the same. Issue is open. e. PP is requested include the justification in the PDD. Also, the formula (04) as per AMS-III.AOv01 talks about the Emissions reductions by "**project activity**" and hence, to assume that MD_y is only for poultry

[29] Assuming that the performance would not suffer from a mono-waste stream, which in practice it will as is shown in the PDD.

			litter is not in conformance with the methodology. Issue is open.
f. In-line with AMS-III.D Please clarify how is it ensured that the transferred litter is stored under anaerobic conditions?		f. See A.4.2 Process description 'Waste & Storage'	f. PP is requested to respond in-line with CAR#05.2(a).
g. Please clarify "there is no regulatory requirement to recover or flare methane originating from the poultry litter management system"		g. the PP has not identified any regulatory requirements (stated in B.4)	g. Mere statement cannot help in concluding that there is no regulatory requirement. PP is requested to demonstrate the same. Issue is open.
h. Please clarify that the starch industry from where the waste water is sourced is not required to do the methane recovery in the baseline scenario. PP needs to include the details on regulatory requirements to be followed by starch industry for treating waste water.		h. See Pre-Project Scenario in Section A.2. and Table 4.1.c.	h. Justification provided in Table: 4, point 1(c) and www.globalmethane.org/Data/292_5_ficci_resource_assess_jan_10.pdf it is still unclear what is the regulatory requirement to be followed. Issue is open.
i. Please clarify the conditions under which the waste water has been treated in the baseline.		i. See Pre-Project Scenario in Section A.2. and Table 4.1.c.	i. PP is requested to further clarify demonstrate that the practice described in Table: 4, 1(c) is followed at the site. Issue is open.
j. Also, clarify the regulatory requirements to be followed by the sugar industry from where the Press mud originates.		j. See Pre-Project Scenario in Section A.2. and Table 4.1.c.	j. The description it is still unclear about the exact regulatory requirement for baseline case. Issue is still open.

k. PP is requested to provide the "Assessment report on feedstock availability and market for Biomethanation Solids", March 2011. l. In-line with §19 of "General Guidelines to SSC CDM methodologies" Ver17, PP is requested to demonstrate the most plausible baseline scenario for this project activity. m. PP needs to determine the baseline in-line with the guidance provided under §12, AMS-III.AO V1		k. Please refer to SD_02 (Tide report) l. Corrected in line with paragraph 19 of "General Guidelines to SSC CDM methodologies" Ver17. m. Done, in B.6.1.	k. PP is requested to respond in-line with CAR#05.1(e). l. In-line with the General Guidelines to SSC CDM methodologies (Version 17), paragraph 19, under Step: 1, PP has identified alternatives only for poultry litter. Project activity also, co-digests substrates as well. PP is requested to include necessary details and revise subsequent steps. Issue is open. m. PP is requested to respond in-line with CAR#07(l). Refer 2nd Assessment.
2nd Assessment b. PJRCES was not able to locate the key parameters in the revised PDDv02.2. c. PP is requested to respond in-line with CAR#07(l).		Second response: b. PP have now included in the PDD, the key parameters used for calculation of combined margin emission factor and also highlighted them in the revised version of SD_13 made available to the DOE. c. For <u>poultry litter</u>, as stated in the PDD, section B.4, the baseline for avoidance of methane emissions is	Assessment of DVRv02 responses b. PJRCES was still not able to locate same. Also, no revised SD_13 is received along with second response by PP. Issue is still open. c. Revised PDDv03 has been reviewed by PJRCES. In-line with §1(c) of AMS-III.AOv01 and General

		identified as per the General Guidelines to SSC CDM methodologies (Version 17). For the other substrates this is not done, because as PP have explained in their justification regarding applicability condition 1(c) of AMS-III.AOv01, PP cannot establish the baseline for cow dung, sago water and press mud and are therefore not claiming baseline emissions and methane avoidance for those substrates and they are set to zero as per methodology AMS-III.AO §1(c). The same has been added to the PDD in a foot note in the text under step 1 under section B.4. The other substrates, together with poultry litter, are used in the process of generating electricity from biogas. PP are claiming avoidance of CO2 emissions related to the cleaner generation of electricity from combusting biogas than from obtaining it from the Indian electricity grid dominated by coal-	Guidelines to SSC CDM methodologies expiation is accepted and hence, issue is now closed.

		fired power plants. Therefore, the baseline for electricity, i.e. the alternative for electricity generation in the absence of the proposed project activity is identified as the Indian electricity grid as described in the PDD.	
d. Revised PDDv02.2 includes the description against para 11, however, corrected para for baseline as per AMS-III.AOv01 is 12 and PP is requested to justify the same.		d. In the PDD, the reference to paragraph 12 of AMS-III.AOv01 has been added.	d. Revised PDDv03, refers to para 12 and hence, issue is now closed.
e. PP is requested include the justification in the PDD. Also, the formula (04) as per AMS-III.AOv01 talks about the Emissions reductions by "**project activity**" and hence, to assume that MD_y is only for poultry litter is not in conformance with the methodology.		e. As clearly stated in the PDD and supporting documents, MDy is total biogas, not biogas from only poultry litter as seems to be suggested by DOE's second formulation of CAR#07(e) above. In its previous response to CAR#07(e), to further explain that PP are being conservative and complying with methodology AMS-III.AOv01 PP had provided supporting document SD_30, which states the following: "Baseline emissions (BE) are	e. In-line with §1(c) of AMS-III.AOv01 Explanation is accepted and hence, issue is now closed.

		discussed in table 4.1.c. in the PDD. Since PP cannot demonstrate the BE for agri waste or cow dung, the BE has been set to zero in line with the methodology (conservative approach). To further show that the methodology is conservative below argument shows that using formula (17) will always result in a conservative approach, in line with CDM. $ER_{y,ex\ post} = min\ [\ (BE_{y,ex\ post} - PE_{y,ex\ post} - LE_{y,ex\ post}),(MD_y - PE_{y,power,ex\ post} - PE_{y,transp,ex\ post} - PE_{y,res\ waste,ex\ post} - PE_{y,phy\ leakage,ex\ post} - LE_{y,ex\ post})\ ]$ **(17)** Based on the mass balance (supporting document SD_14) the MDy of the gas will be 7.5 mln m3 * density * methane content * 21 ~ 65,000 CERs. Formula (4) would result in ~ 13,200 CERs claimed (BEexpost), in which case ER would equal MIN (BEexpost, MDy) = 13,200 CERs.	

		BEexpost will basically always be more conservative than MDy: If Qchickenlitter,expost would be 100% of Qtotal then MDy would still be approx 65,000 BE would be approx 26,40029; Hence BEexpost would still be more conservative; If Qchickenlitter,expost would be 0%, then BEexpost would be 0 CERs. In every case BEexpost would be more conservative; hence project is in line with methodology".	
f. PP is requested to respond in-line with CAR#05.2(a).		f. PP ensures that litter is stored aerobically as follows: the storage area of the plant stores poultry litter, press mud and cow dung. Substrate will be handled on a "first in, first out" base to avoid rotting of the substrate in the storage area. Two bunkers are provided for two Digester lines. Each bunker, rectangular box type is designed for a storage capacity of 12 hours provided with load cells for weighing. These bunkers have a scraper floor	f. In-line with justification provided and assessment of CAR#4(a)(i) & CAR#05.2(a), issue is now closed.

		mechanism to transfer the feed to the Feed Hopper Pump.	
g. Mere statement cannot help in concluding that there is no regulatory requirement. PP is requested to demonstrate the same.		g. PP refer to the following web-link: http://www.methanetomarketsindia.com/htm/indian-regulation.htm In the abovementioned link in the second paragraph, it is very clearly mentioned that there are no regulations or policies by the Government of India to capture methane from agricultural sources or livestock sources. The exact text on the aforementioned website is: "*The Ministry of Agriculture, Government of India does not have regulations, policies or programmes, which would directly address and encourage recovery and use of methane as an alternate source for clean energy from agriculture and livestock*".	g. PJRCES has reviewed the link. However PP needs to include the justification in the PDD. Issue is still open.
h. Justification provided in Table: 4,		h. PP refer to the following web link:	h. PJRCES has verified the links

point 1(c) and www.globalmethane.org/Data/292_5_ficci_resource_assess_jan_10.pdf it is still unclear what is the regulatory requirement to be followed.		http://envirocare.co.in/environmental-standards-in-india.htm http://cpcb.nic.in/Industry_Specific_Standards.php http://cpcb.nic.in/Industry-Specific-Standards/Effluent/453-1.pdf From the above links, it is noted that there are no regulations from the Government of India for starch industry to recover methane from the waste water.	provided. PP is requested to include the justification in the PDD. Issue is still open.
i. PP is requested to further clarify demonstrate that the practice described in Table: 4, 1(c) is followed at the site.		i. Further clarification of PP is as follows: as PP have explained in their justification regarding applicability condition 1(c) of AMS-III.AOv01, and reiterated under sections B.3 and B.4 in the PDD, PP cannot establish the baseline for sago water and are therefore not claiming baseline emissions and methane avoidance for sago water and this is set to zero as per methodology AMS-III.AO §1(c).	i. In-line with §1(c) of AMS-III.AOv01 Explanation is acceptable and hence, issue is now closed.
j. The description it is still unclear about the exact regulatory requirement for baseline case.		j. PP refer to the following web-links: http://envirocare.co.in/environmental-standards-in-india.htm	j. PJRCES has verified the links provided. PP is requested to include the justification in the PDD. Issue is

		http://www.methanetomarketsindia.com/htm/indian-regulation.htm From the above links it is noted that there are no regulations from Government of India to recover methane from press mud of sugar industry, as it is a part of the agro-based industries.	still open.
k. PP is requested to respond in-line with CAR#05.1(e).		k. SD_02 Tide Technocrats Report is an acknowledged copy constituting the most recent relevant study available for the substrates for the project activity. SD_02 provided the basis for the Detailed Project Report, which has been consented by Pollution Control Board and copy has been handed over to the DOE PJRCDM.	k. In-line with assessment of CAR#05.1(e) issue is now closed.
l. In-line with the General Guidelines to SSC CDM methodologies (Version 17), paragraph 19, under Step: 1, PP has identified alternatives only for poultry litter. Project activity also, co-digests substrates as well. PP is requested to include necessary details and revise subsequent steps.		l. For poultry litter, as stated in the PDD, section B.4, the baseline for avoidance of methane emissions is identified as per the General Guidelines to SSC CDM methodologies (Version 17). For the other substrates this is not done, because as PP have explained in their	l. PJRCES has reviewed the revised PDDv03, section B.4, step: 1 and in-line with condition 1(c) of AMS-III.AOv01, the justification is acceptable and hence, issue is now closed.

		justification regarding applicability condition 1(c) of AMS-III.AOv01, PP cannot establish the baseline for cow dung, sago water and press mud and are therefore not claiming baseline emissions and methane avoidance for those substrates and they are set to zero as per methodology AMS-III.AO §1(c). The same has been added to the PDD in a foot note in the text under step 1 under section B.4. The other substrates, together with poultry litter, are used in the process of generating electricity from biogas. PP are claiming avoidance of CO2 emissions related to the cleaner generation of electricity from combusting biogas than from obtaining it from the Indian electricity grid dominated by coal-fired power plants. Therefore, the baseline for electricity, i.e. the alternative for electricity generation in the absence of the proposed project activity is identified as the Indian	

		electricity grid as described in the PDD.	
m. PP is requested to respond in-line with CAR#07(l).		m. PP refer to their second response to CAR#07 (l).	m. In-line with assessment of CAR#07(l) issue is now closed. Refer 3rd Assessment.
3rd Assessment b. PJRCES was still not able to locate same. Also, no revised SD_13 is received along with second response by PP. g. PJRCES has reviewed the link. However PP needs to include the justification in the PDD. h. PJRCES has verified the links provided. PP is requested to include the justification in the PDD. j. PJRCES has verified the links provided. PP is requested to include the justification in the PDD.		Third Response: b. b.Parameters ID.2 $\mathbf{EF_{grid,OM,y}}$ and ID.3 $\mathbf{EF_{grid,BM,y}}$ were added to section B.6.2. of version 3.0 onward of PDD. SD_13 has been updated to SD_13 Database_ver6.0_calculations_Do_120429 g. The justification has now been added in footnote to penultimate paragraph of section B.4. of the PDD. h. The justification has now been added to Table 4, 1 (c). j. The justification has now been added to Table 4, 1 (c).	Assessment of DVRv3.0 responses b. The parameters have been identified as ID.2 and ID.3. the value of both the parameters are consistent with the source document SD_13 Database_ver6.0_calculations_Do_120429 and hence, issue is now closed. g. PJRCES has reviewed the revised PDDv04 and found that the necessary justification has been provided and hence, issue is now closed. h. PJRCES has reviewed the revised PDDv04, and found that PP has provided necessary information in the Table: 4 and was found to be correct and hence, issue is now closed. j. In-line with the above, issue is now closed. CAR#07 is now closed.
CAR#08 a. Latest version 6.0 of CEA database	/B.2.3/ /B.2.4/	a. PDD has been updated with proper	Assessment of DVRv01.1 responses. a. PP has updated the PDD with latest

refers to version 2.0 of Tool to calculate emission factor for an electricity system while the latest version 02.2.1 of Tool to calculate emission factor for an electricity system is available. PP is requested to update the PDD with the latest version of the tools and also needs to explain how the conservativeness of the emission factor calculation (based on latest version 2.2.1 of the tools) is ensured while upgrading to latest version.	/B.2.5/ /PDD/ B.6.1/B.6.2/ /AMS I.D/V17/	version of the tool (02.2.1). The latest version of the CEA database refers to version 2 of the tool. Version 02.2.1 is available. The impact of the changes are marginal and do not affect calculations as the process for calculating uses the same formulas.	version of the tool i.e. 02.2.1 available at the time of re-webhosting of PDD. Also, in-line with the SD_13 submitted issue is now closed.
Simple OM:			
b. In-line with the Step:3 of "*Tool to calculate emission factor for an electricity system*" V2.2.0 – PP is requested to demonstrate that contribution of low-cost/must run resources is less than 50% of the total grid-generation.		b. According to the EF tool ver 02.2.1 this value needs to be average of the five most recent years, which is 25.2%. PDD updated. See file SD_13 Database_ver6.0_calculations_JM.xls	b. PP has made a statement that "the five most recent years average percentage contribution of low-cost/must run resource is 25.2%". PP is requested to demonstrate the same. Also, selection of Option is not clearly defined under step: 4. Issue is open.
c. PP is also requested to provide the complete data and reference used to demonstrate the same.		c. See excel file SD_13 Database_ver6.0_calculations_JM.xls	c. PP is requested to include the same in the PDD. Issue is open.
d. The data provided by the PP for calculation of Simple OM is not in-line with the source provided.		d. see SD_13 Database_ver6.0_calculations_JM.xls	d. PP is requested to include the same in the PDD. Issue is open.

e. PP is requested to provide the complete data used for calculation of Simple OM.		e. See SD_13 Database_ver6.0_calculations_JM.xls which contains all raw data provided by the CEA used to calculate Simple OM.	e. PP is requested to include the same in the PDD. Issue is open.
f. Please clarify – the PDD states that Simple OM is average of 3 years. How this is in-line with Step: 4 of the Tool.		f. In step 3, where the method is selected, it's stated that "For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation". In Step 4 the formulas on how to calculate OM are provided, and "y" in all formulas refers to data vintage selected in Step 3 (which is 3-years). Hence PDD is now in line with the tool.	f. In-line with the latest ver02.2.1 of the tool the justification is accepted and hence, issue is now closed.
g. Please provide a link for CEA Database V6.		g. Link provided in footnote 37 (old footnote 16): http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm	g. PP has provided the link in the revised PDDv02.2 and hence, issue is now closed.
h. Simple OM parameter is also available at the time of Validation.		h. See SD_13 Database_ver6.0_calculations_JM.xls	h. PP is requested to include the same under parameters available at the time of validation. Issue is open.
Build Margin: i. In-line with the description provided in the PDD, PP is requested to compare $AEG_{SET\text{-}5\text{-}units}$ to $AEG_{SET\geq 20\%}$		i. PDD updated see B.6.1. step 5 and SD_13 Database_ver6.0_calculations_JM.xls	i. SD_13, the plants provided in the document are only up to December 2009. PP is requested to further

and demonstrate that SET_{sample} equals $SET_{\geq 20\%}$. j. PP is requested to include the complete set of data referred for demonstrating the above. k. BM parameter is also available at the time of Validation. **Combine Margin:** l. **Parameter EF_y** – The description provided for Combine Margin emission factor is not adequate. Maintain consistency in defining parameter. m. Include reference link for CEA database. n. PP is requested to adequately justify the choice of data and description of measurement methods and procedures actually applied.		j. see SD_13 Database_ver6.0_calculations_JM.xls k. see SD_13 Database_ver6.0_calculations_JM.xls l. PDD updated B.6.1. step 6. m. Link is already provided in footnote 37 (old footnote 16). n. PDD updated B.6.1 step 6. As stated under Step 6 in B.6.1 in the PDD the "Tool to calculate the emission factor for an electricity system - version 02.2.1" states that option A is the 'preferred option' to calculate CM.	clarify and confirm that no power plants have been commissioned after December 2009 till the start date of project activity. Also, include the Step: 5 descriptions in the PDD as well. Issue is open. j. Data for Build margin is now included in revised PDDv02.2 and hence, issue is now closed. k. PP is requested to include the same under parameters available at the time of validation. Issue is open. l. Revised PDDv02.2 addresses the concern hence, the issue is now closed. m. Link is now provided, hence issue is now closed. n. Revised PDDv02.2 includes the necessary details and hence, issue is now closed. Refer 2nd Assessment.
2nd Assessment		Second response:	Assessment of DVRv02 responses

b. PP has made a statement that "the five most recent years average percentage contribution of low-cost/must run resource is 25.2%". PP is requested to demonstrate the same. Also, selection of Option is not clearly defined under step: 4.		b. PP has updated the value to 24% in line with the newest data from the CEA, version 7.0. To demonstrate, PP have added to the PDD the data table entitled "*Share of Must-Run (Hydro/Nuclear) (% of Net Generation)*" from the the Central Electricity Authority document "Baseline Carbon Dioxide Emission Database Version 7.0" and have also added the weblink reference for the document, which is: http://www.cea.nic.in/reports/planning/cdm_co2/database_7.zip In the latest version of SD_13, provided to the DOE, the following reference has been inserted in a new first tab labelled Source_Reference: "Data in SD_13 is sourced from the CO2 Emission Database Version 7.0, January 2012 by CEA" (CEA Database). The data can be accessed through the following link: http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm " Furthermore, regarding the definition	b. PP to clarify how selection of CEA database version 07 is in-line with Step 3, Ex-ante option of "*Tool to calculate the emission factor for an electricity system*" latest version 02.2.1. Furthermore, selection of option A under step 4 is not adequately justified. Clarify how the same is in-line with "*CO_2 Baseline Database for the Indian Power Sector – version 06*". Issue is still open.

		of the Option-selection under step 4, Option A is chosen. The definition of the Option-selection under step 4 has now been revised in the PDD.	
c. PP is requested to include the same in the PDD.		c. PP refers to their Second Response to CAR#08(b) which indicates the data and web link that have now been added to the PDD.	c. In-line assessment of CAR#08(b) above issue remains open.
d. PP is requested to include the same in the PDD.		d. With respect to calculation of Simple OM, the following data-tables from the Central Electricity Authority document "Baseline Carbon Dioxide Emission Database Version 7.0" have now been added to step 3 in the PDD: • Simple Operating Margin (tCO_2/MWh) (incl. Imports); • Net Generation in Operating Margin (GWh).	d. In-line assessment of CAR#08(b) above issue remains open.
e. PP is requested to include the same in the PDD.		e. PP refers to their Second Response to CAR#08(d).	
h. PP is requested to include the same under parameters available at the time of validation.		h. The Operating Margin has been added as parameter available at validation in PDD section B.6.2.	e. In-line assessment of CAR#08(b) & (d) above issue remains open.
i. SD_13, the plants provided in the			h. In-line assessment of CAR#08(b) above issue remains open.

document are only up to December 2009. PP is requested to further clarify and confirm that no power plants have been commissioned after December 2009 till the start date of project activity. Also, include the Step: 5 descriptions in the PDD as well.		i. PP has used the most recent available data from the designated authority from the Indian government: Central Electricity Authority document "Baseline Carbon Dioxide Emission Database Version 7.0" available at the weblink: http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm Regarding step 5, descriptions were already provided in the PDDv02.2.	i. Step 5, has been verified in the revised PDDv03. However, regarding use of version 07 of CEA database is open in-line with assessment of CAR#08(b) above. Issue is still open.
k. PP is requested to include the same under parameters available at the time of validation.		k. The Build Margin has been added as parameter available at validation in PDD section B.6.2.	k. In-line assessment of CAR#08(b) above issue remains open. Refer 3rd Assessment.
3rd Assessment b. PP to clarify how selection of CEA database version07 is in-line with Step 3, Ex-ante option of "*Tool to calculate the emission factor for an electricity system*" latest version 02.2.1. Furthermore, selection of option A under step 4 is not adequately justified. Clarify how the same is in-line with "*CO_2 Baseline Database for the Indian Power*		3rd Response b. PP reverted to version 06. Selection of option A under step 4 is justified: "As per tool PP choses option A as option B can only be chosen if the information under option A is not available. Hence PP has to opt for Option A (…)".	Assessment of DVRv3.0 responses b. Revised PDD and ER calculation has been conducted in-line with CEA database version06. PJRCES cross verified the calculations and found them acceptable and hence, issue is now closed.

Sector – version 06". c. In-line assessment of CAR#08(b) above issue remains open. d. In-line assessment of CAR#08(b) above issue remains open. e. In-line assessment of CAR#08(b) & (d) above issue remains open. h. In-line assessment of CAR#08(b) above issue remains open. i. Step 5, has been verified in the revised PDDv03. However, regarding use of version 07 of CEA database is open in-line with assessment of CAR#08(b) above. k. In-line assessment of CAR#08(b) above issue remains open.		c. PP reverted to version 06. d. PP reverted to version 06. e. PP reverted to version 06. h. PP reverted to version 06. i. PP reverted to version 06. k. PP reverted to version 06.	c. In-line with CAR#08(b) above issue is now closed. d. In-line with CAR#08(b) above issue is now closed. e. In-line with CAR#08(b) above issue is now closed. h. In-line with CAR#08(b) above issue is now closed. i. In-line with CAR#08(b) above issue is now closed. k. In-line with CAR#08(b) above issue is now closed. CAR#08 is now closed.
CAR#09 **AMS III.D V17:** a. In-line with §09 PP is requested to provide exact reference of the approach used. b. In-line with §10(a) PP is requested to clarify the types of species. Further also, clarify how the value for $\mathbf{N_{LT,y}}$ is arrived at? c. **Parameter $\mathbf{D_{CH4}}$** – The value used is	/B.2.3/ /B.2.4/ /B.2.5/ /PDD/[B.6.1/ B.6.2/] /AMS III.D/[V17/]	a. Exact reference provided in B.6.1. b. added in parameter table under B.7.1. c. corrected	Assessment of DVRv01.1 responses. a. Revised PDDv02.2 includes the necessary details hence, issue is now closed. b. PP has included the same as parameter and clarified for poultry and hence, issue is now closed. c. PP has used the value in-line with the

incorrect. The values in the PDD and Spreadsheet are not consistent internally. Also, PP is requested to maintain consistency in defining parameter.			source and also the same is now consistent with source and hence, issue is now closed.
d. **Parameter B_o** – value refers to which type of species is not specified.		d. Livestock indicated to be poultry, added to the parameter and the description in parameter box.	d. Revised PDDv02.2 addresses the concern and hence, issue is now closed.
e. Please clarify the basis for considering the IPCC value for B_o – PP is requested to justify the same keeping in view §10(d) of the methodology.		e. Done in B.6.1.	e. PJRCES was not able to validate the conditions as laid in §10(d) in the revised PDDv02.2. Issue is open.
f. Please clarify the basis for calculating the $VS_{LT,y}$. It is stated that IPCC values will be used. Please demonstrate confirmation to §10(c).		f. Done in B.6.1.	f. PP has not demonstrated conformance to §10(c), hence, issue is open.
g. **Parameter MCF_j** – Please clarify the values selected is only for poultry litter?		g. Value selected only for poultry litter, as now indicated in parameter box in section B.6.2.	g. Revised PDDv02.2 addresses the concern hence, issue is now closed.
h. Calculation sheet for MCF_i should be provided with the appropriate source.		h. Please refer to SD_04 TNAU report for MCF value of chicken litter	h. PP is requested to respond to CAR#04.1.
i. **Parameter MCF_j** – The value is referred from a report "Estimation of methane emissions from chicken litter", December 2007. Please justify the value considered with respect to project activity start date.		i. PP has replaced report. SD_04 (TNAU report).	i. PP is requested to respond to CAR#04.1.
j. Please justify the 90% flare			

efficiency in-line with §24 of AMSIII.D V17. k. What is the maximum quantity of Feed that can be treated by the system? l. What is the feed handling capacity of both the digesters? m. Provide the basis and justification of poultry litter processed. n. Provide basis and justification of plant load factor.		j. In line with § 22 of AMS-III v18 PP corrected flare eff. See formula's 14, 15, 16 and 17 in PDD. k. See SD_20 technical note on capacity. l. See SD_20 technical note on capacity. m. See SD_20 technical note on capacity and Process Description under A.4.2. n. The value for the plant load factor has been adjusted to 8000 hours per year as per the signed General Terms & Conditions of the O & M Contract, provided to the DOE (SD_15).	j. PP has not clarified type of flaring. PP has not justified for excluding Step 1 to 4. Issue is open. k. PP is requested to provide response in the "***Summary of project owner response***" column only. Provide supporting document for the same. Issue is open. l. PP is requested to provide response in the "***Summary of project owner response***" column only. Provide supporting document for the same. Issue is open. m. Query is related to quantity of poultry litter. Issue is open. n. Response is not clear. PP is requested to respond in-line with the query. Issue is open. Furthermore, 8000 hours per year is not traceable in the contract (SD_15). Refer 2nd Assessment.
2nd Assessment e. PJRCES was not able to validate the conditions as laid in §10(d) in the revised PDDv02.2.		Second response: e. PP's genetic source does not originate from an Annex 1 country. PP does not use formulated feed rations. PP cannot validate this, hence PP use the IPCC value.	Assessment of DVRv02 responses e. Revised PDDv03, section B.6.1 includes necessary explanation, further more it was confirmed during the site visit that the genetic source originates from host country only and

			hence, the justification is accepted and issue is now closed.
f. PP has not demonstrated conformance to §10(c).		f. AMS-III.Dv18 §10(c) states that: "**In case** default IPCC values for VS **are adjusted** for a site-specific average animal weight, it shall be well explained and documented. (…)" PP is not adjusting default IPCC values for VS, therefore, AMS-III.Dv18 §10(c) is not applicable to the proposed project activity. However, PP would like to note that with respect to AMS-III.Dv18 §10(a) and §10(b), PP have now added to their existing explanation for choosing IPCC values that PP's genetic source does not originate from an Annex 1 country. That PP does not use formulated feed rations. That PP cannot validate this, and hence PP uses the IPCC value.	f. Explanation is accepted for using IPCC default values. However, "*Baseline emissions from Poultry litter*" under section B.6.3 source for "W_{site}" is ex-ante, which is not clear. Justify for value applied. Issue is still open.
h. PP is requested to respond to CAR#04.1.		h. PP refer to their response to CAR#04.1.	h. PJRCES has reviewed the responses in CAR#04.1 and also, reviewed revised TNAU report and hence, issue is now closed.
i. PP is requested to respond to		i. PP refers to their response to	i. PJRCES has reviewed the responses

CAR#04.1.		CAR#04.1.	in CAR#04.1 and also, reviewed revised TNAU report and hence, issue is now closed.
j. PP has not clarified type of flaring. PP has not justified for excluding Step 1 to 4.		j. PP uses an enclosed flare. Hence PP skip step 1 to 4 of the tool and immediately start with step 5 of the tool. The same has been indicated in the PDD.	j. In-line with Tool PP is monitoring temp (ID. 28/T_{flare}) & flow rate (ID. 23/$FV_{RG,h}$) of residual gas to inlet of flare and hence, flare efficiency is not continuously monitored and hence, acceptable. However, justification for not applying steps 1 to 4 needs further elaboration in line with the Tool. Issue is still open.
k. PP is requested to provide response in the "***Summary of project owner response***" column only. Provide supporting document for the same.		k. PP refer to the mass balance document SD_14 provided to the DOE, in which the total fresh solid mass that can be handled by the system is provided as 210 MT of solid feed which will be handled through the scrapper floor + 55 m^3 of Sago water and 118 m^3 of recirculate in the feed mixing pump.	k. PJRCES has reviewed the SD_14 and verified the quantity of the feed mixture that can be handled and hence, issue is now closed.
l. PP is requested to provide response in the "***Summary of project owner response***" column only. Provide supporting document for the same.		l.	l. No response provided by PP. Issue is still open.
m. Query is related to quantity of poultry litter.		m. Poultry litter is sourced from nearby farms and it is utilised in the biogas production. Please refer to SD_20 for	m. PJRCES has reviewed SD_20 and also sought technical experts input during the site visit. Information was

		process description and technical note. PP sources the information on quantity of poultry litter from TIDE Technocrats report submitted to the DOE.	verified by Technical expert and hence, issue is now closed.
n. Response is not clear. PP is requested to respond in-line with the query. Issue is open. Furthermore, 8000 hours per year is not traceable in the contract (SD_15).		n. The 8000 hours came from 4x2000 hours as stated in SD_15 made available to DOE. <u>However</u>, for CHP plant load factor PP refer to EB48 Annex 11, Guidelines for the reporting and validation of plant load factors (Version 01), section II, paragraph 3 for determining the plant load factor stipulates the plant load factor that has been used for bank financing or determined by a third-party (e.g. engineering company) to be used. IOTM has used a plant load factor of 7500h/8760h in the DPR (i.e. SD_03 page 114) and has negotiated an MOU for an O&M contract over 8000h/8760 with Green Power International (please refer to supporting document "IRR Annex 3"). PP have henceforth taken the average of the two aforementioned operating hours of 7750h which is	n. PJRCES has reviewed the SD_15 submitted by PP; also, PJRCES has reviewed the DPR (SD_03, page 114) for the PLF used. PP has used the average of the two values as a PLF. Justify how the value of 8000 hours is in-line with EB48, Annex11. Issue is still open.

		equivalent to a PLF of 88%.	Refer 3rd Assessment.
3rd Assessment f. Explanation is accepted for using IPCC default values. However, "*Baseline emissions from Poultry litter*" under section B.6.3 source for "W_{site}" is ex-ante, which is not clear. Justify for value applied.		Third Response: f. In section B.6.3 of the PDD, in the table providing the overview of data used to determine the baseline emission related to avoidance of methane production, under the heading 'Source' PP have now added the following: *From IPCC no $W_{default}$ is given for developing countries, so project cannot adjust VS for site-specific average animal weight; so W_{site} is not adjusted and hence $W_{site}/W_{default}$ =1.*	Assessment of DVRv3.0 responses f. Explanation is acceptable and revised PDDv04 is made consistent with the explanation provided and hence, issue is now closed.
j. In-line with Tool PP is monitoring temp (ID. 28/T_{flare}) & flow rate (ID. 23/$FV_{RG,h}$) of residual gas to inlet of flare and hence, flare efficiency is not continuously monitored and hence, acceptable. However, justification for not applying steps 1 to 4 needs further elaboration in line with the Tool.		j. PP have now added the following to section B.6.1. of the PDD: *Steps 3 and 4 of the Tool to determine project emissions from flaring gases containing methane (Version 01) are only applicable in case of both enclosed flares and continuous monitoring of the flare efficiency. Since PP opts for option (a) of the tool (hence to use 90% default value) steps 3 and 4 are not*	j. PJRCES has reviewed revised PDDv04 and found that PP has provided adequate justification which is consistent with the response given and hence, issue is now closed.

l. No response provided by PP.		*applicable. Since steps 1 and 2 are only required to calculate data for steps 3 and 4, these steps are omitted as per tool.* l. Feed handling capacity of both digesters depends on the Hydraulic Retention Time. The plant runs at 97% of the maximum retention time. Taking the Hydraulic Retention Time in concern, the plant is running on 97% of the maximum feed handling capacity. The HRT for a bio gas plant shall not be lower then 35 days. If it is lower the bacteria do not have enough time for growing and may get wash out.□HRT is defined by working volume of the digester system / daily loading rate: HRT = Vdigester [m3]/ VFeed [m3/d] = [d] a. This Retention time should not be below 35 days for stable operation of the plant. b. 210 t of solids is equal to 247 m3 of solids. c. 199t of liquid are equal to 199 m3 of liquid. d. Total input is 446 m3/d	l. Response is cross checked with the information provided in the PDDv04 and supporting documents referred therein. It was observed that the response is consistent with the changes made in the PDD and hence, issue is now closed.

		e. Working volume of the digesters is 16.115m3 f. HRT = 16.115 m3 / 446 m3/d = 36,13 days g. 36,13 days is 97% of the limit of 35 days (100%). If the retention time is lower the plant load factor is over hundred per cent.	
n. PJRCES has reviewed the SD_15 submitted by PP; also, PJRCES has reviewed the DPR (SD_03, page 114) for the PLF used. PP has used the average of the two values as a PLF. Justify how the value of 8000 hours is in-line with EB48, Annex11.		n. Regarding the CHP plant load factor PP refer to EB48 Annex 11, Guidelines for the reporting and validation of plant load factors (Version 01), section II, paragraph 3 for determining the plant load factor stipulates the plant load factor that has been used for bank financing or determined by a third-party (e.g. engineering company) to be used. IOTM has used a plant load factor of 7500h/8760h in the DPR (i.e. SD_03 page 114). Hence this value (7500/8760h = 86%)is used as PLF. PP provides SD_15 the negotiated MOU for an O&M contract over (4 x 2000 =) 8000h/8760 with Green Power International (please refer to supporting document "IRR Annex 3"). PP has also revised PLF to 86%	n. Explanation is accepted as PP has used the PLF value provided by 3rd Party which is in-line with EB48, para11. PJRCES has reviewed the revised SD_16 and found that PP has used 86% PLF. Issue is now closed.

		in SD_16.	CAR#09 is now closed.
CAR#10 a. PP needs to include chronology of activities related to CDM Project activity in the section B.5 of the PDD. b. PP is requested to include discuss national and/or sectoral polices applicable to project activity. c. The PDD does not discuss about the scenario in the absence of the CDM Project activity. PP needs to clarify the pre-project activity with respect to waste water treatment, disposal of waste from sugar industry, and treatment of cow dung and manure. d. PP is requested to include the list of poultry farms and provide locations details and distance from the facility. e. PP is requested to justify the "Average incremental distance for raw solid waste/manure and/or wastewater transportation" as 25 kM/truck. f. PP needs to demonstrate in the PDD the incremental distance for	/B.2.3/ /PDD/B.5/	a. Table provided in B.5. b. included in B.5. c. Brief descriptions of the baselines of press mud, sago waste water & cow dung have been added to Table 4, Applicability conditions of AMS-III.AO, paragraph / condition 3. d. is available to DOE. Is competitive sensitive information. e. Distances justified in pages 53 through 63 of the DPR (SD_03) and in section B.2. of PDD; f. Distances justified in pages 53 through 63 of the DPR (SD_03) and	Assessment of DVRv01.1 responses. a. PP is also requested to include the investment decision date and events related to change in the project capacity in the chronology. Issue is open. b. No verifiable description is provided. Issue is open. c. Revised PDDv02.2 addresses the concern and hence, issue is now closed. d. PJRCES has received the information and hence, the issue is now closed. The same will be kept sensible. e. DPR does not specifically talk about the Average incremental distance. Moreover, PP needs to include the justification in the PDD. Issue is open. f. In-line with the above Issue is open.

collection points of biomass and/or manure and the compost treatment site as compared to the baseline waste disposal site or manure treatment site.		in section B.2. of PDD.	
g. Also, the same needs to be demonstrated for collection points of wastewater and treatment site as compared to baseline wastewater treatment site.		g. Distances justified in pages 53 through 63 of the DPR (SD_03) and in section B.2. of PDD.	g. In-line with the above Issue is open.
h. Also, Incremental distance for Treatment sites and sites for soil application and further treatment of the produced compost needs to be demonstrated in the PDD.		h. Reference made, see table 4 point 4. & supporting footnote to Tide Tech report page 25.	h. In-line with the above Issue is open. Refer 2nd Assessment.
2nd Assessment a. PP is also requested to include the investment decision date and events related to change in the project capacity in the chronology.		Second response: a. PP have now added the investment decision date as 28 January 2011 and refer to Board minutes contained in SD_59 made available to DOE. PP have also added information on letter and date of TNEB approval of 2MW (PP refer to SD_34) and of TANGEDCO for 2.4MW (PP refer to SD_40a).	Assessment of DVRv02 responses a. Chronology have been verified in revised PDDv03, section B.5. PP is requested to submit authorised copy of Board minutes. Issue is still open.
b. No verifiable description is provided.		b. • The sago water will be sourced from any of the starch factories as	b. Explanation provided in the response is acceptable. However, changes are not effected in the PDDv03. Issue is

		per the list provided in DPR pages 53 to 63; • Press mud will be sourced from either EID parry unit or Mohanur Sugar mill as per the final contract the PP will establish with the respective sugar mill. Refer details of the sugar mill in DPR pages 53 to 63. • The list of poultry farms is provided in the DPR. PP have also provided star marks against some of the poultry farms in the DPR pages 53 to 63; • Those farms will be contracted for supply of poultry litter. • The list of cow farms is provided in the DPR. pages 53 to 63; PP refer to the following web link: a. http://envirocare.co.in/environmental-standards-in-india.htm From the above link, it is noted that there are no regulations from the Government of India for starch	still open.

e. DPR does not specifically talk about the Average incremental distance. Moreover, PP needs to include the justification in the PDD. f. In-line with the above Issue is open. g. In-line with the above Issue is open. h. In-line with the above Issue is open.		industry to recover methane from the wastewater. e. PP kindly refer to their Second Response to CAR#05(g). f. PP kindly refer to their Second Response to CAR#05(g). g. PP kindly refer to their Second Response to CAR#05(g). h. PP kindly refer to their Second Response to CAR#05(g).	e. In-line with Assessment of CAR#05(g) issue is now closed. f. In-line with Assessment of CAR#05(g) issue is now closed. g. In-line with Assessment of CAR#05(g) issue is now closed. h. In-line with Assessment of CAR#05(g) issue is now closed. Refer 3rd Assessment.
3rd Assessment a. Chronology have been verified in revised PDDv03, section B.5. PP is requested to submit authorised copy of Board minutes. b. Explanation provided in the response is acceptable. However, changes are not effected in the PDDv03.		Third Response: a. PP have now made available to DOE SD_67, which contains a signed statement by PP that investment decision was taken during Board meeting of IOT Mabagas Limited on 28/01/2012 and that the statement is a true extract of the decision taken by the Board at the said Board meeting. b. In section B.5 of the PDD, under the heading 'National and/or sectoral policies applicable to project activity', PP have now stated the	Assessment of DVRv3.0 responses a. PJRCES has reviewed the SD_67 and confirms that the investment decision was taken on 28 January 2011 and not 28 January 2012 as given in the response. Considering that SD_67 is authorised by PP issue is now closed. b. PJRCES has reviewed the revised PDDv04 and explanation provided in the Table: 4, point 1(c) and also, reviewed the reference links provided. It was found that no such

		following: *No national and/or sectoral policies have been identified to be applicable to project activity as has been justified in table 4 1.c. in section B.2.*	policies are available and hence, issue is now closed. CAR#10 is now closed.
CAR#11 a. A latest ver08 of Attachment A to Appendix B is available. PP is requested to use the same. b. Since, the PDD would be re-webhosted due to change in the methodology and a latest ver05 (EB62, Annex5) of "Guidance on investment analysis is available, it would be appropriate to use the latest version of guidance. c. Please specify the tool used to demonstrate additionality using investment barrier.	/B.3.1/ /PDD/[B.5/]	a. Latest version is used. b. Latest version is used. c. As per "General Guidelines to SSC CDM methodologies" (Version 17), paragraph 7 (a), the project proponent refers to paragraph 1 (a) of "Non-binding best practice examples to demonstrate additionality for SSC project activities", EB 35, Annex 34 which lists best practice examples when making use of an investment barrier. From these examples, project	Assessment of DVRv01.1 responses. a. Revised PDDv02.2 addresses the concern and hence, issue is now closed. b. Revised PDDv02.2 addresses the concern and hence, issue is now closed. c. Justification and description provided in the PDD is acceptable and hence, issue is now closed.

d. PP is requested include the justification for selection of appropriate analysis method to demonstrate additionality using investment barrier.		proponent uses a benchmark analysis as per "Guidelines on the Assessment of Investment Analysis" (Version 05). d. The project proponent refers to the "General Guidelines to SSC CDM methodologies" (Version 17), paragraph 7 (a), which refers to "Non-binding best practice examples to demonstrate additionality for SSC project activities", EB 35, Annex 34. According to the "Non-binding best practice examples to demonstrate additionality for SSC project activities" (EB 35, Annex 34), project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers: investment barrier, access-to-finance barrier, technological barrier, barrier due to prevailing practice or other barriers. In this regard, the project proponent has chosen the option provided in paragraph 1 (a) of EB 35, Annex 34, namely: investment barrier. Best practice examples mentioned by name in paragraph 1 (a) of EB 35,	d. Justification and description provided in the PDD is acceptable and hence, issue is now closed.

		Annex 34 are investment comparison analysis, benchmark analysis and simple cost analysis. The project proponent uses a benchmark analysis as per "Guidelines on the Assessment of Investment Analysis" (Version 05).	
e. PP has not justified the selection of IRR as appropriate financial indicator and subsequently selection of Equity IRR as suitable financial indicator.		e. In section B5 it now states: "The Guidelines on the Assessment of Investment Analysis (Version 05), paragraph 12, states that "In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated." "Required/expected returns on equity (RoE) are appropriate benchmarks for equity IRR". Therefore the RoE of the Holding company is used as a benchmark value."	e. Justification and description provided in the PDD is acceptable and hence, issue is now closed.
f. PP to clearly justify the basis for assuming that the Board and its shareholders require a 15% return on equity. Also, PP needs to explain how the selected benchmark value of 15% ROE is in-line with Para 13 to 18, Annex5, EB62.		f. Section B5 rewritten and now reads "As per Guidelines on the Assessment of Investment Analysis (Version 05), paragraph 14, when applying internal company benchmarks /expected returns, it should be demonstrated that the expected return on equity has been used for similar projects with similar	f. In-line with para 13 of the guidelines and 14 where it states that "Internal company benchmarks should only be applied in cases where there is only one possible project developer" Please justify the selection of internal ROE in-line with the above. Furthermore, SD_05 is not conclusive enough for concluding the

		risks, developed by the same company. In this regard, reference is made to documentation of a project within Europe and to documentation of a project in India. These documents have been made available to DOE." See also supporting evidence SD_5, 22, 23, 24 and 25 (all mentioned in the footnotes in respective section too).	applicability of para 14 of the guidelines, also, the same needs acknowledgement by PP. It is unclear what PP wished to communicate through SD_22, 23, 24 & 25. Issue is open. Refer 2nd Assessment.
2nd Assessment f. In-line with para 13 of the guidelines and 14 where it states that "Internal company benchmarks should only be applied in cases where there is only one possible project developer" Please justify the selection of internal ROE in-line with the above. Furthermore, SD_05 is not conclusive enough for concluding the applicability of para 14 of the guidelines, also, the same needs acknowledgement by PP. It is unclear what PP wished to communicate through SD_22, 23, 24 & 25.		Second response: f. PP have now revised section B.5 of the PDD and added documented reference therein in line with CAR 11(f). Best practice examples mentioned by name in paragraph 1 (a) of EB 35, Annex 34 are investment comparison analysis, benchmark analysis and simple cost analysis. The simple cost analysis is not applicable for the proposed project because the project activity will produce economic benefit other than the CDM related income, notably from electricity sale. Instead, the Benchmark Analysis will	Assessment of DVRv02 responses f. PJRCES has verified the revised SD_16. PP to justify the following: 1. Justify benchmark selection i.e. WACC and/or Cost of equity is in-line with para 12 of "*Guidelines on assessment of Investment analysis*" latest version 05. In-line with the same if, WACC is slected justify for using Average base rate for six notifications. 2. Justify the choice of companies selected for BETA calculation. Furthermore justify considering beta values of M/s. BGR Energy

		be used. Paragraph 12 of the Guidelines on the Assessment of Investment Analysis (Version 05) states: "*In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. (…). Required/expected returns on equity are appropriate benchmarks for an equity IRR. (…)*". Paragraph 13 states: "*In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market. (…)*". The benchmark is therefore determined using the Capital Asset Pricing Model (CAPM). This model takes into account the non-diversifiable risk of the asset, the expected return of the market and the expected return of a risk-free asset.	Systems, M/s. Suzlon Energy Ltd, M/s. Nagarjuna Fertilizers and Chemicals and M/s. Zuari when these companies are not into power generation. Furthermore, justify for not considering the relevant power companies for BETA calculation. 3. PP to provide snapshots for BETA values from http://markets.ft.com. 4. Justification for selecting 13 years for calculating market return is not adequate. Justify for considering values up to 31-Mar-2011 when the investment decision was made on 28-Jan-2011. 5. Justify for using values up to 31-July-2011 for calculating risk free rate, when the investment decision was made on 28-Jan-2011. 6. PP to explain the parameters to determine cost of equity in the PDD. Refer 3rd Assessment.

3rd Assessment f. PJRCES has verified the revised SD_16. PP to justify the following: 1. Justify benchmark selection i.e. WACC and/or Cost of equity is in-line with para 12 of "*Guidelines on assessment of Investment analysis*" latest version 05. In-line with the same if, WACC is slected justify for using Average base rate for six notifications.		Third Response: f. 1. PP have now stated the following in section B.5 of the PDD: *Hence project participant opts to benchmark the equity IRR against the required/ expected returns on equity.* *As per § 15 it is stated that if "the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors".* *Hence the Capital Asset Pricing Model (CAPM) is used to determine the benchmark (cost of equity).*	Assessment of DVRv03 responses f. 1. The justification for selection of benchmark, return on equity has been justified in the revised PDD; issue is now closed.
2. Justify the choice of companies		2. The PP line of business is the design,	2. The explanation as to the type of

selected for BETA calculation. Furthermore justify considering beta values of M/s. BGR Energy Systems, M/s. Suzlon Energy Ltd, M/s. Nagarjuna Fertilizers and Chemicals and M/s. Zuari when these companies are not into power generation. Furthermore, justify for not considering the relevant power companies for BETA calculaiton.		engineering & construction (engineering and infrastructure sector) and operation of large-scale biogas plants (up to 2.5 MW), as well as the production, up-gradation, marketing and sales of organic fertilizer / compost. The two key revenue streams from operating a biogas plants are from the production and sale of electricity (power sector), as well as the sale of organic compost/fertilizer (fertilizer sector), but requires timely and cost effective construction of the plant. The biogas industry (renewable energy sector) in India is in its very early stages and there is no single company listed at the Indian stock-markets yet that develops and operates biogas plants alone. The project proponent has therefore selected companies that reflect the business sectors in which IOT Mabagas operates (i.e. power, fertilizer, construction and renewable energy sector).	companies chosen for beta value is accepted; however PP has provided attachment SD_66 for snapshots of beta and not SD_68; The time period considered in the snapshot is 5 days as per attachment SD_66. The SD_66 contains beta values for "EDCL" which is not used by PP. PP has provided Beta snapshot for Jaiprakash Hydro whereas, table provided in response refers Jaiprakash Assoc. Both are different companies. PP has not provided snapshot for GVK Power. PP to include justification for using average beta value in the PDD. Issue is still open.

Nr	Company	Sector	Beta*
1	Reliance Power	Power	1.267
2	Jaiprakash Assoc.	Power	1.641
3	GVK Power	Power	1.488
4	Zuari Industries	Fertilizer	1.233
5	Nagarjuna Fertilizer	Fertilizer	1.982
6	Suzlon Energy	Renewable Energy	1.781
7	BGR Energy	Engineering	2.000
Average			**1.627**

*The Beta has been calculated over a period of 103 weeks as can be seen in the snapshot of each Beta calculation (i.e. from 1st February 2009 to 23 January 2011). Note that the Beta is calculated weekly from Monday to Sunday and is hence the most up to date data at the time of the Board Decision which was held on 28th January 2011).

Reliance is engaged in the development, construction and operation of power generation projects

Jaiprakash is a diversified

		infrastructural industrial conglomerate in India. J. has executed hydropower projects spread across 6 states and the neighboring country Bhutan, generating 10,290 megawatts power. GVK Power is engaged in the generation, operation and maintenance services to the power plants; as well as other infrastructure projects in the oil and transport sector. Zuari is engaged in the manufacture, sale and trading of fertilizers, seeds and pesticides. It primarily operates in India and caters to the needs of the domestic market. It produces a range of fertilizers of various grades. Its products portfolio consists of fertilizers, fungicides, herbicides, specialty fertilizers, micronutrients, insecticide and organic manure. Nagarjuna Fertilizers and Chemicals Limited is a manufacturer and marketer of agri inputs.	

		Suzlon Energy is engaged in the business of design, development, manufacturing, supply, as well as operation and maintenance of wind turbine generators (WTGs) of a range of capacities and its components. BGR Energy operates in the power sector, as a manufacturer of power systems and equipment, and as a contractor for engineering procurement construction and balance of plant (BoP) projects. PP refer to SD_68_Beta_Explanation, which contains the above explanation, as well as snapshots for BETA values as per DOE request.	
3. PP to provide snapshots for BETA values from http://markets.ft.com. 4. Justification for selecting 13 years for calculating market return is not adequate. Justify for considering values up to 31-Mar-		3. PP refer to SD_68 Beta_Explanation, which includes snapshots for BETA values as per DOE request. 4. PP has now selected 15 years of calculating the market return (with the final data point being 28.1.2011). The 15 years were chosen to reflect	3. In-line with the assessment of point2 above this issue is open. 4. The revised return on equity calculations have been verified and PP has considered 15 years data in arriving at market returns which is

2011 when the investment decision was made on 28-Jan-2011. 5. Justify for using values up to 31-July-2011 for calculating risk free rate, when the investment decision was made on 28-Jan-2011. 6. PP to explain the parameters to determine cost of equity in the PDD.		the time-frame over which the assets are depreciated (i.e. the commercial life-time of the project). PP refer to the latest version of SD_16 spreadsheet made available to the DOE (which now includes the altered Beta Calculation as well). 5. PP changed last value to value of 27/1/2011, a day before the investment decision. See update of SD_16. 6. The parameters are explained in the formula above and are standard CAPM parameters. In addition references to the explanation had already been provided in the PDD.	also the lifetime of the project activity; issue is now closed. 5. The revised return on equity calculations has been verified and PP has now considered risk free rate up to 31 March 2010, issue is now closed. 6. The revised PDD has been verified and explanation is not adequate; issue is open. CAR#11-refer 4th Assessment.
4th Assessment f. Assessment 2. The explanation as to the type of companies chosen for beta value is accepted; however PP has provided attachment SD_66 for snapshots of beta and not SD_68; The time period considered in the snapshot is 5 days as per		f. 2. Justification has been provided in section B.5: "To obtain the most realistic beta relevant to the project activity (the beta that best indicates the risk profile of the project activity), the PP uses the average of the betas of the selected companies."	Assessment of DVRv04 responses f. 2. Attachment SD_68 has been verified and PP has considered a period of 103 weeks in estimating equity beta. The justification provided for average beta considered in the calculations is accepted and issue is now closed.

attachment SD_66. The SD_66 contains beta values for "EDCL" which is not used by PP. PP has provided Beta snapshot for Jaiprakash Hydro whereas, table provided in response refers Jaiprakash Assoc. Both are different companies. PP has not provided snapshot for GVK Power. PP to include justification for using average beta value in the PDD. 3. In-line with the assessment of point2 above this issue is open. 6. The revised PDD has been verified and explanation is not adequate;		3. Beta values provided in SD_68 6. The following has been added to the PDD section B.5: **Applicable Beta** Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. Beta is used in the CAPM model. Beta is calculated using regression analysis, and you can think of beta as the tendency of a security's	3. Attachment SD_68 has been verified and PP has considered a period of 103 weeks in estimating equity beta which is accepted and issue is now closed. 6. The revised PDD has been reviewed and PP has explained the parameters in determination of cost of equity; issue is now closed. CAR#11 is now closed.

		returns to respond to swings in the market. A beta of 1 indicates that the security's price will move with the market. A beta of less than 1 means that the security will be less volatile than the market. A beta of greater than 1 indicates that the security's price will be more volatile than the market. For example, if a stock's beta is 1.2, it's theoretically 20% more volatile than the market. Many utilities stocks have a beta of less than 1. Conversely, most high-tech Nasdaq-based stocks have a beta of greater than 1, offering the possibility of a higher rate of return, but also posing more risk. The line of business of the Project Participant is the design, engineering & construction (engineering and infrastructure sector) and operation of large-scale biogas plants (up to 2.5 MW), as well as the production, up-gradation, marketing and sales of organic fertilizer / compost. The two key revenue streams from operating a biogas plants are from the production and sale of electricity (power sector), as well as the sale of organic compost/fertilizer (fertilizer	

sector), but requires timely and cost effective construction of the plant.

The biogas industry (renewable energy sector) in India is in its very early stages and there is no single company listed at the Indian stock-markets yet that develops and operates biogas plants alone. The project proponent has therefore selected companies that reflect the business sectors in which IOT Mabagas operates (i.e. power, fertilizer, construction and renewable energy sector). To obtain the most realistic beta relevant to the project activity (the beta that best indicates the risk profile of the project activity), the PP uses the average of the betas of the selected companies.

No	Company	Sector	Beta*
1	Reliance Power	Power	1.267
2	Jaiprakash Assoc.	Power	1.641
3	GVK Power	Power	1.488
4	Zuari Industries	Fertilizer	1.233
5	Nagarjuna Fertilizer	Fertilizer	1.982
6	Suzlon Energy Renewable Energy	Power	1.781
7	BGR Energy	Power	2.000

	Engineering		
Average			1.63

*The Beta has been calculated over a period of 103 weeks as can be seen in the snapshot of each Beta calculation (i.e. from 1st February 2009 to 23 January 2011).

The following provides some background on the selected companies:

- Reliance is engaged in the development, construction and operation of power generation projects
- Jaiprakash is a diversified infrastructural industrial conglomerate in India. Jaiprakash has executed hydropower projects spread across 6 states and the neighbouring country Bhutan, generating 10,290 megawatts power.
- GVK Power is engaged in the generation, operation and maintenance services to the power plants; as well as other infrastructure projects in the oil and transport sector.
- Zuari is engaged in the

		manufacture, sale and trading of fertilizers, seeds and pesticides. It primarily operates in India and caters to the needs of the domestic market. It produces a range of fertilizers of various grades. Its products portfolio consists of fertilizers, fungicides, herbicides, specialty fertilizers, micronutrients, insecticide and organic manure. • Nagarjuna Fertilizers and Chemicals Limited is a manufacturer and marketer of agri inputs. • Suzlon Energy is engaged in the business of design, development, manufacturing, supply, as well as operation and maintenance of wind turbine generators (WTGs) of a range of capacities and its components. • BGR Energy operates in the power sector, as a manufacturer of power systems and equipment, and as a contractor for engineering procurement construction and balance of plant (BoP) projects. **Risk Free Rate** The risk free rate is the theoretical rate of return of an investment with zero risk.	

		The risk-free rate represents the interest an investor would expect from an absolutely risk-free investment over a specified period of time. In practice, however, the risk-free rate does not exist because even the safest investments carry a very small amount of risk. Thus, the average Yield on State Government Securities is used as the risk-free rate. **Market Return** To calculate the cost of equity, you must look at factors such as the return of the market as a whole, the rate you could get if you took on no risk (the risk free rate), and the overall cost of funding the project: the market return. The PP has analysed the average return of the SENSEX over a period of 15 years and taken this as an objective and verifiable value for the market return. **Market Risk Premium** The Market Risk Premium is a parameter required in the CAPM model. To obtain the value of this parameter the Risk Free Rate is subtracted from the Market Return.	

		Cost of Equity Hence the Cost of Equity equals the risk free return plus the product of the beta and the market risk premium: = 9% + 1.63 * (4.15%) = 15.95%	
CAR#12 a. PP needs to revise the monitoring plan and make it in-line with the monitoring methodology AMS-III.AO V1. b. In-line with Para 19 of AMS-III.AO ver1 and keeping in view that a co-digestion will take place – PP is requested to clarify how minimum of monitored values for biogas captured and biogas flared would be applied in the equation (4) of the methodology since, both are not comparable. c. $EG_{gross,y}$ – It is unclear how the Gross energy generated is logged. Please complete the description.	/B.5.1/ /B.5.2/ /PDD/[B.7.2]/ / am-tool-06/[V1]/	a. Done, see B.7.2 b. Explained in equations 14 to 17 in the PDD. c. In B.7.1 Eggross,y. added: logged on PLC.	Assessment of DVRv01.1 responses. a. PP has revised the PDD and made it in-line with the AMS-III.AOv1. Hence, the issue is now closed. b. It is unclear what PP wishes to communicate. PP is requested to provide summary of response, amendments made and clarify here. Question still remains unanswered, how PP is arriving at a value of biogas recovered from Poultry litter. Issue is open. c. Revised PDD addresses the concern. However, PP is further requested to clarify the purpose of monitoring this parameter in line with para 24 of

[30] Biogas and methane content measurements shall be on the same basis (wet or dry).
[31] Biomass Energy Purchase Agreement. Document made available to DOE.
[32] Biomass Energy Purchase Agreement. Document made available to DOE.
[33] Biomass Energy Purchase Agreement. Document made available to DOE.
[34] Biomass Energy Purchase Agreement. Document made available to DOE.

			AMS-I.Dv17. Accuracy class, type and calibration frequency of meter is not defined. Further clarification is requested on mode of archiving data. Issue is open.
d. $EG_{BL,y}$ – Please clarify how it is monitored. Source of data is incomplete.		d. Monitoring description expanded and footnote added linking to Biomass Energy Purchase Agreement. Document made available to DOE (SD_01)	d. Source of data is still missing in the PDDv02.2. Description of measurement method is not adequate. Please clarify for including cross checking procedure under measurement methods. Accuracy class, type and calibration frequency of meter is not defined. Further clarification is requested on mode of archiving data. Issue is open.
e. Please clarify how meter readings are reported to TNEB. PP is requested to submit the monthly invoices and acknowledgement of the same by TNEB.		e. Added to parameter description QA/QC procedures to be applied. Refer to SD_01 Biomass Energy Purchase Agreement.pdf	e. Response is not complete. Please address the query completely. QA/QC procedures to be incorporated in the relevant sections of PDD. Issue is open.
f. $\mathbf{fv_{CH4,RG,h}}$ – The measurement frequency is not in-line with Tool to calculate project emissions from flaring gases containing methane. Correct the same.		f. Corrected (see parameter box for fvCH4,RG,h).	f. Parameter is still not in conformance with the tool with respect to data unit, description, source of data and description of measurement methods. Also, QA/QC procedure is incomplete with respect to calibration

[35] Biomass Energy Purchase Agreement. Document made available to DOE.

			and check procedure. Submit supporting document for value used is PDD. Issue is open.
g. $\mathbf{FV_{RG,h}}$ – measurement method in incomplete. Please demonstrate confirmation to Tool to calculate project emissions from flaring gases containing methane.		g. Corrected (see parameter box for FVRG,h).	g. Source of data to be specified. Submit supporting document for value used in PDD. QA/QC procedure is incomplete with respect to calibration frequency and cross check procedure. Issue is open.
h. $\mathbf{T_{flare}}$ – PP is requested to demonstrate the daily measurement is in-line with the Tool to calculate project emissions from flaring gases containing methane.		h. Done in parameter table B.7.1.	h. PP has reproduced the text from the tool as is in the description of measurement methods. PP is requested to clarify the procedure to be followed as a part of project activity. Provide the value of data applied for calculating emissions reductions with supporting documents. Again QA/QC procedure PP is requested to clarify conditions under which the thermocouple will be replaced. Further, clarification is requested on mode of archiving. Description under Data/parameter column is not consistent with other parameters in the PDD. Issue is open.
			Refer 2nd Assessment.
2nd Assessment		Second response:	Assessment of DVRv02.0 responses

b. It is unclear what PP wishes to communicate. PP is requested to provide summary of response, amendments made and clarify here. Question still remains unanswered, how PP is arriving at a value of biogas recovered from Poultry litter.		b. PP would like to respond as explained in section B.7.2 in the PDD: Monitoring parameters to determine ex-post methane capture & destroyed (MDy) According to paragraph 19 (b) of AMS-III.AO (Version 01): flaring/ combustion MDy will be measured using the conditions of the flaring process: MDy = BGburnt,y * wCH4,y * DCH4 * FE * GWP_CH4 (18) Where: BGburnt,y = Biogas 30 flared/combusted in year y (m3). wCH4,y = Methane content in the biogas in the year y (volume fraction). DCH4 = Density of methane at the temperature and pressure of the biogas in the year y (tonnes/m3). FE = Flare efficiency in the year y (fraction). If the biogas is combusted for gainful purposes, e.g. fed to an engine, an efficiency of 100% may be	b. PJRCES has reviewed the revised PDDv03 section B.7.2. PP has included calculation of MDy based on monitoring parameter (ID. 22/w_{CH_4}) and parameter (ID. 14/$\eta_{flare,h}$). 1. However, PJRCES did not find any monitoring parameter for density of methane at temp. & pressure of biogas D_{CH_4}. 2. For Para 19(c): PP has simply reproduced the text as is from methodology. Please clarify how the same fulfils the requirements of methodology. 3. As per equation 19 & 20 under section B.7.2, PDDv03 please clarify are $BG_{burnt,y}$ & $BG_{total,y}$ same? 4. Parameters (ID. 24/$BG_{total,y}$) & (ID. 25/ $BG_{burnt,y}$), accuracy class of meters is not defined. 5. (ID. 25/ $BG_{burnt,y}$) – calibration frequency is not defined in-line with SSC CDM General guidelines. 6. PP has mentioned that (f) "*Flow meters, sampling devices and gas*

		applied. As per paragraph 19 (c) of AMS-III.AO (Version 01): the method for integration of the terms to calculate MDy to obtain the results for one year of measurements within the confidence level, as well as the methods and instruments used for metering, recording and processing the data obtained, shall be described in the project design document and monitored during the crediting period. As per paragraph 19 (d) of AMS-III.AO (Version 01): project activities where a portion of the biogas is destroyed through flaring and the other portion is used for energy may consider to apply the flare efficiency to the portion of the biogas used for energy, if separate measurements are not performed; When the amount of methane that is combusted for energy and that is flared is separately monitored, a destruction efficiency of 100% can be used for the amount that is combusted for energy.	*analysers shall be subject to regular maintenance, testing and calibration to ensure accuracy;*" further details are required to confirm. Issue is still open.

c. Revised PDD addresses the concern. However, PP is further requested to clarify the purpose of monitoring this parameter in line with para 24 of AMS-I.Dv17. Accuracy class, type and calibration frequency of meter is not defined. Further clarification is requested on mode of archiving data.		A portion of the biogas is destroyed through flaring and another portion us used for energy generation. Hence: BGburnt,y = BGcombusted, y + BGflared,y (19) The project participant will monitor BGtotal, y and BGflared,y. Hence: BGcombusted, y = BGtotal, y – BGflared,y (20) Where: BGtotal, y = Total biogas recovered in year y (m3). Hence formula (18) is rewritten: MDy = (BGflared,y * wCH4,y * DCH4 * FE * GWP_CH4) + (BGcombusted, y * wCH4,y * DCH4 * GWP_CH4) (21) c. EGgross,y Purpose of EGgross,y: Indeed the parameter EGgross,y is not mentioned in para 24 of AMS-I.Dv17. The purpose of monitoring this parameter is that it enables PP to determine how much power they are using on site (the project site).	c. PJRCES has reviewed the revised PDDv03 and "ID. 16./ $EG_{gross,y}$". the parameter is not required for monitoring as per AMS-I.D and PP uses this parameter internally would serve as back up data and hence, issue is now closed.

		The metering arrangements with facilities to record export and import of energy shall be provided in accordance with the Central Electricity Authority (installation and Operation of Meters) Regulations, 2006, Commission's Intra State Open Access Regulations 2005. Tamil Nadu Electricity Distribution Code, 2004 and Tamil Nadu Grid Code, 2004 in consultation with Distribution Licensee / State transmission Utility. The periodicity of testing, checking, calibration etc., will be governed by the Regulations issued by the Central Electricity Authority / Commission31. - Mode of archiving: The data will be archived in the Computer hard disk through the PLC, which will be connected to the Computer to store the data. Also the PP will take back up CD every year once for all the data for storage backup and archiving.	
d. Source of data is still missing in the		d. EGBL,y	

PDDv02.2. Description of measurement method is not adequate. Please clarify for including cross checking procedure under measurement methods. Accuracy class, type and calibration frequency of meter is not defined. Further clarification is requested on mode of archiving data.		Source of data: PP have added that the source of the data used in the parameter box for EGBL,y and ECPJ,y is an energy meter. Inclusion of cross-referencing: Cross-referencing procedure under measurement is to ensure that PP is conservative: PP will check both energy meter and energy bill documents and will always take the lesser value. This has now been added to the PDD. The metering arrangements with facilities to record export and import of energy shall be provided in accordance with the Central Electricity Authority (installation and Operation of Meters) Regulations, 2006, Commission's Intra State Open Access Regulations 2005. Tamil Nadu Electricity Distribution Code, 2004 and Tamil Nadu Grid Code, 2004 in consultation with Distribution Licensee / State transmission Utility. The periodicity of testing, checking, calibration etc.,	d. PJRCES has reviewed the revised PDDv03, ID. 17./$EG_{BL,y}$. 1. Source of data is still not corrected. 2. QA/QC procedures are still incomplete with respect to EPA. 3. Archiving to be defined in-line with SSC CDM general guidelines. Issue is still open.

		will be governed by the Regulations issued by the Central Electricity Authority / Commission 32 . The measuring equipment used for monitoring data is recalibrated at least once in three years. - Mode of archiving: The data will be archived in the Computer hard disk through the PLC, which will be connected to the Computer to store the data. Also the PP will take back up CD every year once all the data for storage backup and archiving.	
e. Response is not complete. Please address the query completely. QA/QC procedures to be incorporated in the relevant sections of PDD.		e. ECPJ,y PP have added that the source of the data used in the parameter box for EGBL,y and ECPJ,y is an energy meter. Metering arrangements: Every month the meter readings are noted jointly between PP and TANGEDCO officials and it is agreed in the audit report. The same records will be used for billing / invoice purpose. The metering arrangements with	e. PJRCES has reviewed the revised PDDv03, ID. 17./$EC_{PJ,y}$. 1. Source of data is still not corrected. 2. QA/QC procedures are still incomplete with respect to EPA. 3. Archiving to be defined in-line with SSC CDM general guidelines. Issue is still open.

		facilities to record export and import of energy shall be provided in accordance with the Central Electricity Authority (installation and Operation of Meters) Regulations, 2006, Commission's lntra State Open Access Regulations 2005. Tamil Nadu Electricity Distribution Code, 2004 and Tamil Nadu Grid Code, 2004 in consultation with Distribution Licensee / State transmission Utility. The periodicity of testing, checking, calibration etc., will be governed by the Regulations issued by the Central Electricity Authority / Commission 33 . The measuring equipment used for monitoring data is recalibrated at least once in three years.	
f. Parameter is still not in conformance with the tool with respect to data unit, description, source of data and description of measurement methods. Also, QA/QC procedure is incomplete with respect to calibration		f. fvCH4,RG,h Description corrected as "Methane content in exhaust". And separate parameter wCH4 as methane content in the biogas.	f. PJRCES has reviewed the revised PDDv03 and ID.21./ $fv_{CH_4,RG,h}$. Justify for including this parameter in-line with the option chosen for

and check procedure. Submit supporting document for value used is PDD.		PP have added that the source of the data used in the parameter box for fvCH4,RG,h is a gas analyser. The 30 minutes interval assures a confidence/ precision level higher than the 90/10 level required (see appendix 4 regarding the required sample size). Analyser will be calibrated according to manufacturers specifications and recalibrated at least once in three years. The Operator records the readings. Based on the logged data, a monthly report is prepared by Manager-in-Charge which is forwarded to the CDM Coordinator. The data used is reviewed by conducting a inter department review meeting once in 6 months. Once the data is compiled and checked, it will be handed over to the Verifier for verification. The measuring equipment used for monitoring data are calibrated as per manufacturers specifications and recalibrated at least once in three years.	monitoring of flare efficiency. Issue is still open.

		The data will be archived until two years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	
g. Source of data to be specified. Submit supporting document for value used in PDD. QA/QC procedure is incomplete with respect to calibration frequency and cross check procedure.		g. FVRG,h - Source of data: PP has added in the PDD that the source of data is a thermal mass flow meter. - Supporting document: as supporting document for ex ante value used in PDD for FVRG,h, PP refer to to the CER-tab in SD_16, made available to DOE. QA/QC procedure: the measuring equipment (Gas analyser) is designed as per ANSI/API RP 555-2001 manufacturing standard specifications. The measuring equipment used for monitoring data are calibrated as per manufacturers specifications and is recalibrated at least once in three years.	g. PJRCES has reviewed revised PDDv03 and ID. 23./$FV_{RG,h}$. Source of data, QA/QC procedures and calibration frequency has been verified and found acceptable. Measurement methods description is still not complete in-line with the tool. Issue is still open.

h. PP has reproduced the text from the tool as is in the description of measurement methods. PP is requested to clarify the procedure to be followed as a part of project activity. Provide the value of data applied for calculating emissions reductions with supporting documents. Again QA/QC procedure PP is requested to clarify conditions under which the thermocouple will be replaced. Further, clarification is requested on mode of archiving. Description under Data/parameter column is not consistent with other parameters in the PDD.		h. T_{flare} The measuring equipment (Gas analyser) is designed as per ANSI/API RP 555-2001 manufacturing standard specifications. The measuring equipment used for monitoring data are calibrated as per manufacturers specifications and is recalibrated at least once in three years. The Thermocouple will be replaced as per the calibration report every year conducted by the PP as per recommendation of the manufacturer. The replacement is dependent on the usage and maintanance of the instrument. The data will be archived in the Computer hard disk through the PLC, which will be connected to the Computer to store the data. Also the PP will take back up CD every year once all the data for storage backup and archiving. Description under Data/parameter	h. PJRCES has reviewed the revised PDDv03 and ID. 28./ T_{flare} and found that source of data has been made in-line with requirements of the Tool. Also, calibration frequency has been defined in-line with the tool and hence, issue is now closed.

		column has been made consistent with other parameters in the PDD.	
3rd Assessment b. 1. PJRCES has reviewed the revised PDDv03 section B.7.2. PP has included calculation of MDy based on monitoring parameter (ID. 22/w_{CH_4}) and parameter (ID. 14/$\eta_{flare,h}$). 2. However, PJRCES did not find any monitoring parameter for density of methane at temp. & pressure of biogas D_{CH_4}.		Third Response: CAR#12 b 1. Gas volume reading will be normalized so that density calculations at normal conditions can be used. PP refer to SD_69 Flow_meter_spec_sheet. On line 10 in SD_69 it is mentioned that the flow is measured in Normvolume (i.e. Nm3). 2. New response in DVR is as follows: PP has changed the text for ID Parameter 24 and 25 since PP are not using one meter and two automatic valves, but two flow meters. Therefore, in the PDD (ref. PDD section B.7.1), PP have revised as follows: ID 24, Description of measurement methods and procedures to be applied: The quantity of biogas generated is measured using a calibrated flow meter. The flow meter values are	Refer 3rd Assessment. Assessment of DVRv3.0 responses b. Assessment 1. PJRCES has reviewed the revised PDDv04 and found that the explanation is missing for relevant parameter. Issue is still open. 2. PJRCES has reviewed the revised PDDv04 and found that PP has clarified that PP will use seprate flow meters and included necessary description as mentioned in the response. Alos, the accuracy class of 0.1% is confirmed through review of technical specifications provided by manufacturer and hence, issue is now closed.

		logged in the system. The accuracy class of the flow meter for is +0.1% of full scale. ID 25, Description of measurement methods and procedures to be applied: The quantity of biogas flared is measured using a calibrated flow meter. The flow meter values are logged in the system. The accuracy class of the flow meter for is +0.1% of full scale. Regarding this accuracy, PP refer to SD_69 Flow meter spec sheet (especially line C8) made available to DOE.	
3. For Para 19(c): PP has simply reproduced the text as is from methodology. Please clarify how the same fulfils the requirements of methodology.		3. PP's response to § 19.c now reads "The methods and instruments used for metering, recording and processing are described in the relevant parameter boxes for BGtotal,y, BGcombusted,y, wCH4, DCH4 and FE and below in formula 21. The monitored parameters are	3. Revised PDDv04 have been reviewed and PJRCES confirms that the PP has revised the description in-line with the justification. Also, PJRCES has reviewed the SD_70 and hence,

		BGtotal,y (ID.24), BGflared,y (ID.25) and Tflare (ID.28). [TABLE] Since BGflared, BGtotal and Tflare are monitored continuously, confidence level is 100% (no statistical sampling; entire population is measured), hence the results for one year of measurements are within the confidence level." Also, PP have made available to the DOE SD_70, which contains a line diagram of the project plant which indicates the locations where parameters will be monitored.	issue is now closed.
4. As per equation 19 & 20 under section B.7.2, PDDv03 please clarify are $BG_{burnt,y}$ & $BG_{total,y}$ same? 5. Parameters (ID. 24/$BG_{total,y}$) & (ID. 25/ $BG_{burnt,y}$), accuracy class of meters is not defined.		4. Yes, BGburnt,y & BGtotal,y are the same. 5. ID.25 is not BGburnt but BGflared. PP install two separate gas flow meters for engine combustion and gas flare system also. The accuracy of the both flow meters are +0.1% of full scale. SD_69 Flow meter spec sheet (line C8) made available to DOE. Also PP refer to SD_71 spec sheet for	4. Explanation was verified with the PDDv04 and hence, issue is now closed. 5. PJRCES has reviewed the SD_69 and SD_71 for confirming the accuracy class for separate meters and found to be in order. This issue is now closed.

6. (ID. 25/ $BG_{burnt,y}$) – calibration frequency is not defined in-line with SSC CDM General guidelines. 7. PP has mentioned that (f) "*Flow meters, sampling devices and gas analysers shall be subject to regular maintenance, testing and calibration to ensure accuracy;*" further details are required to confirm. Issue is still open.		Gas Analyser now made available to DOE. 6. ID.25 is not BGburnt, but BGflared. In the parameter boxes for both BGtotal,y and BGflared, PP have now added a reference that calibration frequency is as per §17 (c) of the General guidelines to SSC CDM methodologies (version 17). c. In section B.7.2 of the PDD, PP have now indicated the following for paragraph 19 (f) of AMS-III.AO (Version 01): *Each individual digester included in the project boundary will be inspected on site for each verification.* Also, in section B.7.1 of the PDD, PP have added to the QA/QC procedures of the parameter boxes of ID.22/w_{CH4}; ID.23/$FV_{RG,h}$, ID.24/$BG_{total,y}$ and ID.25/$BG_{flared,y}$ that calibration, maintenance and testing will also be done as per ISO 9001:2008. In this regard, PP refer to SD_72a, which contains the ISO	6. Revised PDDv04 refers to General guidelines for calibration frequency and hence, issue is now closed. 7. Section B.7.2 of revised PDDv04 includes the justification in-line with the response provided. Also, the section B.7.1 of revised PDDv04 provides the QA/QC procedure for the parameters refered in the response and found the same to be in order. This issue si now closed.

		9001:2008 standard and SD72b, which highlights clause 7.6 of ISO 9001:2008. Both SD72a and SD_72b have now been made available to the DOE.	
d. PJRCES has reviewed the revised PDDv03, ID. 17./$EG_{BL,y}$. 1. Source of data is still not corrected.		d. 1. Please refer to the parameter box of ID.18./EGBL,y in the PDD, which now reads as follows: TANGEDCO (Tamil Nadu Generation and Distribution Corporation) report based on this which PP will raise the invoice to TANGEDCO along with duly signed report.	d. Assessment 1. Revised PDD clarifies the source of data and hence, issue is now closed.
2. QA/QC procedures are still incomplete with respect to EPA.		2. Please refer to the QA/QC procedures of the parameter box of ID.18./EGBL,y, which now reads as follows: If primary energy meter fails to read then TANGEDCO will refer the secondary energy meter. If both energy meters fails then source of data will be used from the previous last 3 months reports mutually agreed by PP &	2. Revised PDDv04, PP has provided the QA/QC procedures in-line with the responses. The same was cross verified with the PPA and found to be acceptable and hence, issue is now closed

		TANGEDCO. Based on the logged data, a report is prepared by Manager-in-Charge and is forwarded to CDM Coordinator through email on monthly basis. The data used is reviewed by conducting an inter department review meeting once in 6 months. The Coordinator CDM will discuss the data (received from respective departments) with the operators of the concerned departments. Once the data is compiled and checked, it will be handed over to Verifier for verification. The metering arrangements with facilities to record export and import of energy shall be provided in accordance with the Central Electricity Authority (installation and Operation of Meters) Regulations, 2006, Commission's Intra State Open Access Regulations 2005. Tamil Nadu Electricity Distribution Code, 2004 and Tamil Nadu Grid Code, 2004 in consultation with Distribution Licensee / State transmission Utility. The periodicity	

		of testing, checking, calibration etc., will be governed by the Regulations issued by the Central Electricity Authority / Commission 34 The energy meters healthiness will be checked by TANGEDCO at regular intervals will be decided by TANGEDCO on time to time basis. The measuring equipment used for monitoring data is recalibrated at least once in three years as per § 17.c of the general guidelines to SSC CDM methodologies (version 17).	
3. Archiving to be defined in-line with SSC CDM general guidelines. Issue is still open.		3. PP have now specified in the parameter box for EGBL,y that the data will be archived until two years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later as per § 17.a of the general guidelines to SSC CDM methodologies (version 17).	3. Revised PDDv04 have been cross verified and it was found that the archiving is now made in-line with General guidelines to SSC CDM methodologies (version17) and hence, issue is now closed.
e. PJRCES has reviewed the revised PDDv03, ID. 17./$EG_{PJ,y}$. 1. Source of data is still not corrected.		e. 1. Please refer to the parameter box of ID.19./ECPJ,y in the PDD, which now reads as follows:	e. Assessment 1. Revised PDD clarifies the source

		TANGEDCO (Tamil Nadu Generation and Distribution Corporation) report based on this which PP will raise the invoice to TANGEDCO along with duly signed report.	of data and hence, issue is now closed.
2. QA/QC procedures are still incomplete with respect to EPA.		2. Please refer to the QA/QC procedures of the parameter box of ID.19./ECPJ,y, which now reads as follows: If primary energy meter fails to read then TANGEDCO will refer the secondary energy meter. If both energy meters fails then source of data will be used from the previous last 3 months reports mutually agreed by PP & TANGEDCO. The metering arrangements with facilities to record export and import of energy shall be provided in accordance with the Central Electricity Authority (installation and Operation of Meters) Regulations, 2006, Commission's Intra State Open Access Regulations 2005. Tamil Nadu Electricity Distribution Code,	2. Revise PDDv04, PP has provided the QA/QC procedures in-line with the responses. The same was cross verified with the PPA and found to be acceptable and hence, issue is now closed.

		2004 and Tamil Nadu Grid Code, 2004 in consultation with Distribution Licensee / State transmission Utility. The periodicity of testing, checking, calibration etc., will be governed by the Regulations issued by the Central Electricity Authority / Commission 35 The energy meters healthiness will be checked by TANGEDCO at regular intervals will be decided by TANGEDCO on time to time basis. The measuring equipment used for monitoring data is recalibrated at least once in three years as per § 17.c of the general guidelines to SSC CDM methodologies (version 17).	
3. Archiving to be defined in-line with SSC CDM general guidelines. Issue is still open.		3. PP have now specified in the parameter box for ECPJ,y that the data will be archived until two years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later as per § 17.a of the general guidelines to SSC CDM methodologies (version 17).	3. Revised PDDv04 have been cross verified and it was found that the archiving is now made in-line with General guidelines to SSC CDM methodologies (version17) and hence, issue is now closed.
f. PJRCES has reviewed the revised		f. ID.21./ fvCH4,RG,h has been moved to § B.6.2 and renumbered ID.15. as	

PDDv03 and ID.21./ $fv_{CH_4,RG,h}$. Justify for including this parameter in-line with the option chosen for monitoring of flare efficiency. Issue is still open. g. PJRCES has reviewed revised PDDv03 and ID. 23./$FV_{RG,h}$. Source of data, QA/QC procedures and calibration frequency has been verified and found acceptable. Measurement methods description is still not complete in-line with the tool. Issue is still open.		it is only used for ex-ante estimation of the methane content in the residual gas since PP opts to use option (a) page 3 of the "Tool to determine project emissions from flaring gases containing methane" (version 01), fvCH4,RG,h is only required in step 5 to calculate the ex-ante value of TMFG,h since under step 6 PP opts to use default values and enclosed flare. This justification has been added to the justification box of parameter ID.15 fvCH4,RG,h. g. PP added: "PP will ensure that the same basis (dry or wet) is considered for this measurement." to the Measurement methods box of the parameter FVRG,h and has added to the comment box: "In § III of the "Tool to determine project emissions from flaring gases containing methane" (version 01) in the parameter box for FVRG,h under "Measurement procedures" the following sentence is included ("[…] and the measurement of volumetric fraction of all components in the residual gas (fvi,h) when the residual	f. Explanation is accepted. Revised PDDv04 have been cross verified and found that ID.15 $fv_{CH_4,RG,h}$ is determined ex-ante. Issue is now closed. g. Explanation is accepted. In-line with the option chosen by PP and clarification that the same basis is ensured for measurement and hence, issue is now closed.

		gas temperature exceeds 60 oC.]. Since PP opts to use option (a) page 3 of the "Tool to determine project emissions from flaring gases containing methane" (version 01), this part of the sentence is not relevant and has hence been left out."	
4th Assessment a. 1. PJRCES has reviewed the revised PDDv04 and found that the explanation is missing for relevant parameter.		b. 1. corrected under 'Any Comments' of paramater box ID.14. the reference to formula 15 (was mistakenly refering to formula 5). corrected under 'Any Comments' of parameter box ID.5. the referecen to formulas 6 and 14 (were mistakenly refering to formulas 5 and 6) respectively and added reference to formula 18. (calculation of MDy). Added under 'Any Comments of parameter box ID.22 the text: "Value is used in formula 18."	CAR#12 – refer 4th Assessment. Assessment of DVRv04 responses b. 1. Revised PDD addresses the concern and hence, issue is now closed. CAR#12 is now closed.
CAR#12.1 **Additional Issues identified.**	/CAR#12/		Assessment of DVRv02 responses

a. $EC_{PJ,y}$ – Source of data is not defined. Accuracy class, type and calibration frequency of meter is not defined. Further clarification is requested on mode of archiving data.		a. $EC_{PJ,y}$ This is measured with help of an energy meter; audited energy bill documents are used as cross reference. The metering arrangements with facilities to record export and import of energy shall be provided in accordance with the Central Electricity Authority (installation and Operation of Meters) Regulations, 2006, Commission's lntra State Open Access Regulations 2005. Tamil Nadu Electricity Distribution Code, 2004 and Tamil Nadu Grid Code, 2004 in consultation with Distribution Licensee / State transmission Utility. The periodicity of testing, checking, calibration etc. will be governed by the Regulations issued by the Central Electricity Authority / Commission [36] The measuring equipment used for monitoring data is recalibrated at least once in three years. The data will be archived until two	a. This issue is covered in CAR#12(e) and will be closed there only. This point is now closed.

[36] Biomass Energy Purchase Agreement. Document made available to DOE.

		years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	
b. **$BG_{total,y}$** : PP has indicated that no value has been used for emissions reduction calculation. Since, the biogas is utilized for energy generation and the same is being calculated for deriving the emissions reductions. PP is requested to justify for not providing the value.		b. **$BG_{total,y}$** $BG_{total,y}$: PP have taken the value of 7,984,808 from SD_16 CDM financial analysis, on the tab-sheet 'Energy & Material Balance' and added it to the parameter box in the PDD, where PP have now also stated the following regarding sources: "Sourced from SD_16 CDM financial analysis, on the tab-sheet 'Energy & Mass Balance'; SD_16 made available to DOE". Project participants will monitor which will provide the actual value".	b. PJRCES has reviewed revised PDDv03 and (ID.24./ $BG_{total,y}$) and found that necessary corrections have been made and hence, issue is now closed.
c. **$BG_{flared,y}$**: PP has indicated that no value required for emission reduction calculation. Please justify.		c. **$BG_{flared,y}$** PP refer to SD_16, to the tab-sheet 'CER', under the heading "Project Emissions due to Flare". Value: 10% of the total biogas generated. The PDD has been revised accordingly.	c. PJRCES has reviewed revised PDDv03 and (ID.25./ $BG_{flared,y}$) and found that necessary corrections have been made and hence, issue is now closed.
d. Further PP is requested to clarify how PP will arrive at the quantity of		d. PP refer to their response to CAR#07(e).	d. In-line with assessment of CAR#07(e) issue is now closed.

biogas from poultry litter against which emission reductions are claimed. Please clarify the parameters used for monitoring the biogas generated from poultry litter only. e. **FC_{Diesel}**: PP is requested to provide the value of the data.		e. **FC_{Diesel}**: Value of FCDiesel is zero. This will be monitored ex-post. Monthly stock balance shall be used for calculating quantity of diesel consumed during operation of tillers and DG set at the site.	e. Explanation is accepted and hence, issue is now closed. CAR#12.1 is now closed.
CAR#13 a. The starting date of the crediting period in not in-line with the latest guidelines available i.e. Para 25 Annex12, EB59.	/C.2/ /PDD/C.2.2.1/	a. Corrected.	Assessment of DVRv01.1 responses. a. No correction found in the revised PDDv02.2. Issue is open. Refer 2nd Assessment.
2nd Assessment a. No correction found in the revised PDDv02.2. Issue is open.		Second response: a. Starting date is 22 July 2011. This is the date of the Purchase Order made available to DOE as supporting SD_35a.	Assessment of DVRv02 responses a. No corrections are made in revised PDDv03. Issue is still open. Although not relevant to original query the response is not consistent with section C.1.1 of revised PDDv03. Refer 3rd Assessment.
3rd Assessment a. No corrections are made in revised PDDv03. Although not relevant to		Third Response: a. PP has chosen this date, because they anticipate that crediting will start on	Assessment of DVRv3.0 response f. PP has considered 01/01/2013 as starting date of the crediting period

original query the response is not consistent with section C.1.1 of revised PDDv03. Issue is still open.		this date. As per discussion with PJR on 26/04/2012, it was noted that as there is no specific definition for start of crediting period in CDM rules and regulations, PP can maintain the provided date and PJR will close this issue.	and hence, explanation is accepted and hence, issue is now closed. CAR#13 is now closed.
CAR#14 a. PP needs to use AMS-III.AOv1.0 and apply the correct equations and parameters for determination of baseline emissions. b. PP needs to include parameters in-line with §12 and the guidance referred therein. c. PP needs to use §§ 13 – 20 of AMS-III.AO V1 and guidance referred therein to calculate project emissions and correct the parameters in the subsequent sections of PDD. d. PP needs to demonstrate conformance to Para 29 and 30 of AMS-III.H latest ver16.	/B.4.1/ /B.4.2/	a. Done b. Done. c. Done. d. PP refers to response to Applicability Criteria 10 of AMS-III.AO in table 4 of the PPD that now states "In the proposed project activity, all biogas captured shall be combusted/ flared and used for 'electrical energy	Assessment of DVRv01.1 responses. a. PP has used correct equations as per AMS-II.AOv1.0 and hence, issue is now closed. b. The issues are covered in CAR#12 and 12.1. c. PP has revised the PDD and used the equations in-line with the AMS-III.AOv1.0. PP is requested to respond to CAR#12.1 & 14.1. d. Response is incomplete with respect to the query. PP is requested to respond in-line with the conditions specified in Para 29 and 30 of AMS-III.H latest ver16. Issue is still open.

[37] SD_03, Detailed Project Report made available to DOE.

		generation directly' (paragraph 3 (a) of AMS-III.H Methane recovery in wastewater treatment (Version 16). Paragraph 4 of the same methodology states: "If the recovered biogas is used for project activities covered under paragraph 3 (a), that component of the project activity can use a corresponding methodology under Type I. Hence PP follows AMS-I.D Grid connected renewable electricity generation - version 17"	
e. In-line with latest version 2.2.1 of the tool to calculate emission factor for an electricity system PP is requested to revise the calculation of combined margin emission factor. Please justify the conservativeness of the revised combined margin.		e. See CAR#08.l, m & n.	e. In-line with the justification provided issue is now closed.
f. PP needs to revise PDD and make Project emissions due to incremental transport distances in-line with §14 of AMS-III.AO Ver1.		f. Changes have been made accordingly.	f. Revised PDDv02.2 addresses the concerns and hence, issue is now closed.
g. PP needs to correct the definition of $EG_{gross,y}$ as defined in the equation 10 in the PDD and make it in-line with AMS-I.D latest ver17.		g. See formula's 14 through 17. PP uses eggross for own generation. Egbl is used in tools. Introduced by pp in formula 10 (formula 16 of pdd version 2.0).	g. Response is not clear. Please clarify "own generation" Issue is open.

h. Please clarify – does auxiliary consumption include the power generation from the project activity and import from grid? Further please clarify how the same is being monitored?		h. Is included. See equations in B.7.2.	h. Response is not clear nor providing any directions. PP is requested to provide complete response here and then refer to the amendments made in the PDD. Issue is open. Refer 2nd Assessment.
2nd Assessment d. Response is incomplete with respect to the query. PP is requested to respond in-line with the conditions specified in Para 29 and 30 of AMS-III.H latest ver16. Issue is still open.		Second response: d. PP refer to their response to CAR#05.1(f) where it is stated that the justification for condition 8 of AMS-III.AOv01 has been amended and now reads as follows: "PP has defined the condition of zero-liquid discharge in the DPR as has been consented by Pollution Control Board which copy has been handed over to the DOE PJRCDM[37]. Therefore, the paragraphs 29 and 30 of AMS-III.Hv16 are not applicable to the project activity.	Assessment of DVRv02 responses d. In-line with assessment of CAR#05(f) the explanation is accepted and hence, issue is now closed.
g. Response is not clear. Please clarify "own generation" Issue is open.		g. EG Gross is the total electricity generated by the engines at the generator terminal of the project activity. "Own generation" refers to the electricity generated by the	g. Explanation is accepted and issue is now closed.

		project activity itself.	CAR#14 is now closed.
CAR#14.1 a. Provide justification for using default and/or IPCC values for $EF_{CO2,diesel,y}$, NCV_{Diesel}, ρ_{diesel} and $EF_{CO2,transport}$.	/CAR#14/	a. Justification for using default and/or IPCC values for: **- $EF_{CO2,diesel,y}$** PP have added to the parameter box in the PDD, a justification for using IPCC default values by refering to methodological tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01). **NCV_{Diesel}** As Project Participants do not have invoices from suppliers, they have opted for IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories. **- ρ_{diesel}** Appendix B (page 26) of the CO2 Baseline Database for the Indian Power Sector User Guide. http://www.cea.nic.in/reports/plannin	Assessment of DVRv02 responses a. PJRCES has reviewed the revised PDDv03. **ID. 10./$EF_{CO2,diesel,y}$**: Explanation is accepted and hence point is now closed. **ID. 11./NCV_{Diesel}**: Explanation is accepted and hence point is now closed. **ID. 12./ ρ_{diesel}**: Explanation is accepted. However, use of CEA database version 07 is addressed at CAR#08(b). Issue is now closed.

		g/cdm_co2/user_guide_ver7.pdf The Central Electricity Authority is the statutory organisation under Ministry of Power who collects and records data concerning the generation, transmission, trading, distribution and utilization of electricity. **- $EF_{CO2,transport}$** PP have stated in the parameter box in the PDD that Transport is sub-contracted; value determined as per contracts obtained from logistics company and that they have provided to DOE supporting document of Substrate Transport Quotation.	**ID. 13./ $EF_{CO2,transport}$**: PJRCES did not receive any supporting documents. Issue is still open.
b. $\eta_{flare,h}$ – PP is requested to submit manufacturers specifications. Further, please clarify what are the parameters that would be checked. Also, further clarify how it will be monitored that parameters are out of range.		b. **$\eta_{flare,h}$** Manufacturer's specifications: The thermocouples are manufactured as per ANSI standard specifications. Thermocouples are replaced or calibrated every year as per the manufacturer recommendations. Under the proposed project activity an enclosed flare will be installed. For enclosed flares the Tool to	b. **ID. 14./ $\eta_{flare,h}$ = FE_y**: PJRCES has verified the revised PDDv03 and found that PP has provided necessary information in-line with the Tool and hence, explanation is accepted and issue is now closed.

		determine project emissions from flaring gases containing methane (Version 01) stipulates two options: (a) to use default values of the flare efficiency; or (b) continuous monitoring of the methane destruction efficiency of the flare (flare efficiency). For determination of the flare efficiency option (a) – use of default values – has been chosen for the proposed project activity. In case of enclosed flares and use of default values the following flare efficiency values shall be applied: 0% if the temperature in the exhaust gas of the flare (T_{flare}) is below 500 °C for more than 20 minutes during the hour h; 50%, if the temperature in the exhaust gas of the flare (T_{flare}) is above 500 °C for more than 40 minutes during the hour h, but the manufacturer's specifications on proper operation of the flare are not met at any point in time during the	

		hour h; 90%, if the temperature in the exhaust gas of the flare (T_{flare}) is above 500 °C for more than 40 minutes during the hour h and the manufacturer's specifications on proper operation of the flare are met continuously during the hour h. Based on continuous measured T_{flare}, η_{flare} is determined based upon above default values. The above has also been added to the parameter box for η_{flare} in the PDD.	
c. PP is requested to justify for not monitoring the truck capacity, no. of trips and average distance travelled.		c. Since the logistics contract would be outsourced to agencies, it would be very difficult to measure what types of trucks they use, which truck is loading our feedstock, as the agency may use the same truck in the en-route to carry some other materials also. Since the control of truck movement / type of truck used are not with the PP, it is very difficult to monitor the truck parameters.	c. In-line with assessment of CAR#05(g) explanation is accepted and hence, issue is now closed.

<table>
<tr>
<td>d. Please clarify how the Transmission and distribution losses are accounted for in calculation of net energy delivered to grid. Also, please justify for using default value of 20%. Please justify for not monitoring the parameter as required by Tool.</td>
<td></td>
<td>PP also kindly refer to their Second Response to CAR#05(g) and to SD_64 Sampling Plan IOTM Pudhuchatram_v1 and SD_64a Sampling plan statistical calculations IOTM Pudhuchatram v1.
d. It is difficult to obtain data on pure transmission and distribution losses, because the TDL data available in India is mixed with commercial losses. Therefore, as per the methodological “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (Version 01), PP have opted for the following:
<table>
<tr><td rowspan="2">$TDL_{j,y}$</td><td>Grid</td><td>20 %</td><td>As per tool,2nd bullet option (a) of parameter box $TDL_{j,y}$</td></tr>
<tr><td>Gen set</td><td>3%</td><td>As per tool,3rd bullet option (b) of parameter box $TDL_{j,y}$</td></tr>
</table>
The PDD has been revised accordingly.</td>
<td>d. PJRCES has reviewed the revised PDDv03 and found that PP has made necessary corrections in-line with the Tool and hence, issue is now closed.</td>
</tr>
<tr>
<td>3rd Assessment:</td>
<td></td>
<td>Third Response:
PP would like to note to PJR that PP understood that CAR#14 was still open with the noted issue.</td>
<td>Refer 3rd Assessment.
Assessment of DVRv3.0 responses</td>
</tr>
</table>

a. **ID. 13./ $EF_{CO2,transport}$**: PJRCES did not receive any supporting documents. Issue is still open.		a. Regarding **ID. 13./ $EF_{CO2,transport}$**, PP have now added to comments section of parameter box: = (NCV Diesel x ρDiesel x EFCO2,diesel,y)/ Fdiesel,avg / liter x 1/1000 hence since: NCV Diesel = ID.11 ρDiesel = ID.12 EFCO2,diesel,y = ID.10 Fdiesel,avg = 8 liter/km, as per SD_28. The result = (43.3*0.83*74.8)/8/1000 = 0.336 Please refer to SD_28 for source on Fdiesel,avg; the average liters per kilometer.	a. PJRCES has reviewed the revised PDDv04 and also, reviewed the SD_28 and found the same to be acceptable and hence, issue is now closed. CAR#14.1 is now closed.
CL#01 a. PP is requested to substantiate that the PA will lead to generation of direct and indirect employment and that the private entity has directly employed local rural population.	/A.1.1/ /PDD/A.2/A.4.2/A.4.3 /EB34/Annex9/ /EPA/ /TIDE Report/	a. It is planned that the Puduchatram biogas plant will employ approx. 28 people directly or by contract (see SD 29, page 3) for the operation of the plant. Most of these employees or contractors will be employed from within Namkkal Taluk to ensure stable long-term employer / employee relationship. Further, Greenpower International will be employed to	Assessment of DVRv01.1 responses. a. PJRCES has reviewed the SD_29, Page#03 and also conducted interviews during the site visit and confirms that the project activity will lead to generation of direct or indirect employment opportunities within Namakkal district and hence, issues is now closed.

		provide on-site operating personnel for the O&M of the gas engines. The term-sheet (Source: IRR ANNEX 3) defines three shifts per day with at least one person per shift (i.e. at least three further full time personnel). In addition to the personnel directly needed at the plant site, numerous people will find employment for indirect services at or for the biogas plant, such as the provision of logistics services delivering and picking up feedstock and fertilizer respectively. Further indirect employment will be required for the marketing and sales of the approximately twenty-two thousand tonnes of organic fertilizer (e.g. four-hundred-forty thousand 50 kg bags).	
b. Please clarify what is the capacity of the project activity. The EPA states that the capacity of the project is 2MW.		b. See response to CAR#01 f.	b. PP is requested to respond to assessment of DVRv1.1 response in CAR#01(f).
c. Also, please clarify will the project activity use biomass for power generation?		c. Done see A.2.	c. Revised PDDv02.2 addresses the concerns and hence, issue is now closed.
d. Please clarify what is the feed mixture?		d. Done.	d. Response not clear. Please explicitly state what has been done. Issue is

e. Please clarify what is the capacity of the biomethanation plant i.e. how much feed mixture can be handled per day? f. What is the expected bio-solids generation? g. What is the expected quantity of liquid effluent discharge?		e. See SD_20 technical note on capacity. f. Please refer to SD_14 Mass balance which states Fertilizer 22,706 t/d g. Please refer to SD_14 Mass balance which states 0.	open. e. PP is requested to provide response here only and make necessary amendments in the PDD wherever required. Issue is open. f. SD_14 is not conclusive enough to close the issue. Issue is open. g. SD_14 is not conclusive enough to close the issue. Issue is open. Refer 2nd Assessment.
2nd Assessment b. PP is requested to respond to assessment of DVRv1.1 response in CAR#01(f). d. Response not clear. Please explicitly state what has been done. Issue is open. e. PP is requested to provide response here only and make necessary amendments in the PDD wherever required. Issue is open. f. SD_14 is not conclusive enough to close the issue. Issue is open. g. SD_14 is not conclusive enough to		Second response: b. b. PP refer SD_17, SD_18, SD_19 containing communication on capacity increase to capacity of 2.4MW. d. PP refers to SD_14 Mass balance made available to DOE. A reference to the same has been added to PDD section A.4.2. e. PP has corrected the value of Qres waste to 21,723 t/y and refers to SD_14 mass balance as source document. f. PP refers to SD_14 mass balance made available to DOE. g. PP refers to stamped SD_14 mass	Assessment of DVRv02 responses b. In-line with assessment of CAR#01(f) issue is now closed. d. Revised PDDv03, section A.4.2 have been verified and found that PP has applied necessary corrections and hence, issue is now closed. e. This issue is covered in CAR#01(l) and will be closed there only. This point is now closed. f. This issue is covered in CAR#01(l) and will be closed there only. This point is now closed. g. In-line with assessment of

close the issue. Issue is open.		balance made available to DOE.	CAR#01(m) issue is now closed. CL#01 is now closed.
CL#02 a. Please clarify what is the background of the PP. Does PP have any prior experience in such type of projects? b. Please clarify what will happen to the electricity generated. c. Please clarify further where this project activity will be installed. Include the exact location details of the facility. d. PP is requested to clarify whether there are any anaerobic digesters operational prior to the start of project activity.	/A.1.2/ /PDD/A.2/A.4.1.4/	a. Text has been added to section A.2 on the background of PP and on PP's prior experience in Germany (Mabagas) with Biogas plant in Lünen as is also referenced in the Detailed Project Report made available to DOE. b. Done: section A.2 now states that electricity will be sold to the distribution licensee as per the Biomass Energy Purchase Agreement. c. Location details as provided in section A.4.1.4 elaborated by adding location details from Biomass Energy Purchase Agreement. d. Done: section A.2 now explicitly states that the proposed project activity is Greenfield.	Assessment of DVRv01.1 responses. a. PP is further requested clarify does PP have any prior experience in handling CDM projects of similar type and scale? Issue is open. b. In-line with the justification provided and revised PDDv02.2 issue is now closed. c. In-line with the justification provided and revised PDDv02.2 issue is now closed. d. In-line with the justification provided, site visit conducted and revised PDDv02.2 issue is now closed. Refer 2nd Assessment.
2nd Assessment a. PP is further requested clarify does PP have any prior experience in handling CDM projects of similar type and scale? Issue is open.		Second response: a. PP refer to their Second Response to CAR#01(b).	Assessment of DVRv02 responses a. In-line with assessment of CAR#01(b) issue is now closed. CL#02 is now closed.

CL#03 a. PP is requested to submit Letter of Approval from Host Party and Annex-I party. b. A clarification is requested on the relation of Private entities identified in the PDD.	/A.2/ /PDD/[A.3/]	a. In progress; DVR is required. b. Done in A.2.	Assessment of DVRv01.1 responses. a. Issue will be closed upon submission of documents. b. In-line with the justification provided and revised PDDv02.2 issue is now closed. Refer 2nd Assessment.
2nd Assessment a. Issue will be closed upon submission of documents.		Second response: a. Documents are pending.	Assessment of DVRv02 responses a. Issue will be closed upon submission of documents. Refer 3rd Assessment.
3rd Assessment a. Issue will be closed upon submission of documents.		Third response a.	Assessment of DVRv3.0 response a. No response is provided. No Documents are submitted. Issue is still open. Refer 4th Assessment.
4th Assessment a. No response is provided. No Documents are submitted. Issue is still open.		a. Update: LoA expected in fortnight.	Assessment of DVRv04 responses. a. Validation team has reviewed the LoA dated 14 September 2012 issued by DNA of host Party and was able to confirm exact title of the project activity, name of PP, project activity's contribution to sustainable development of host Party, ratification status of Kyoto protocol, voluntary participation and LoA is

			unconditional with respect to any version of the PDD and hence, issue is now closed. CL#03 is now closed.
CL#04 a. PP is requested to include the chronology events related to CDM project activity.	/B.3.2/ /PDD/[B.5/]	a. Done – see table w/ timeline in § B.5.	Assessment of DVRv01.1 responses. a. PP is requested to include the details on events on change in capacity of project activity as well. Also, provide reference for Initial Global stake holder consultation. Also, clarify and provide the supporting documents for the same. Issue is still open. Refer 2nd Assessment.
2nd Assessment a. PP is requested to include the details on events on change in capacity of project activity as well. Also, provide reference for Initial Global stake holder consultation. Also, clarify and provide the supporting documents for the same. Issue is still open.		Second response: a. PP have now added to the table in the PDD the web link to the Global Stakeholder Consultation and added a mention of email correspondence with DOE. PP has already provided the other supporting documents: Change in capacity: SD_17; SD18; SD_19 and LSC: SD_12 Minutes of the stakeholder consultation.	Assessment of DVRv02 responses a. Revised PDDv03 section B.5 has been verified by PJRCES. It was found that PP has included necessary details and submitted supporting documents and hence, issue is now closed. CL#04 is now closed.
CL#05 a. Please clarify following – The EPA	/B.3.5/ /PDD/[C.1.2/]	a. Updated to 20 years.	Assessment of DVRv01.1 responses a. Revised PDD has been verified.

submitted is valid for 20 years, whereas the PDD states operational life time of the project activity as 15 years.	/Financial Analysis/		Further, reference in the footnote to point 18 refers to the project life time considered while arriving at a tariff rate, PP is requested to justify for the lifetime as requested in point "a" above. PP to substantiate the project life time with evidence Issue is open.
b. PP is requested to justify for not applying the salvage value in-line with Para 4, Annex5, EB62.		b. Please refer to page 14 of Comprehensive Tariff Order for Biomass based power plants", TNERC 2009 (footnote to point 18 in table 7. Assumptions to calculate equity IRR)	b. Page No.14 of the Order states the rate of depreciation for wind energy generators and the same rate is applicable for biomass plants; 85% of the capital cost to be considered as cost of plant & machinery and there are no guidelines regarding salvage value; issue is open.
c. PP is requested to clarify how the total revenue of 27,050,392/- per year is arrived at?		c. Total revenue in PDD was misprinted. Total should be 127 million instead of 27. Clarification in excel provided to DOE (sheet Cost&Revenue)	c. Revised financials and PDD have been verified and found that the CER revenues stated in the spreadsheet and in the PDD are internally inconsistent; Issue is open.
d. In the PDD PP has considered the sensitivity on fertilizer revenue including feedstock cost. This is not in-line with the spreadsheet submitted.		d. Values are (re-)aligned.	d. Revised PDDv02.2 addresses the concerns and hence, issue is now closed.
e. PP needs to include the sensitivity on feedstock cost separately.		e. Sensitivity included.	e. Revised PDDv02.2 addresses the concerns and hence, issue is now

f. PP is requested to include the scenarios under which the IRR crosses the benchmark and justify the probability of occurrence of these scenarios.		f. Scenarios added, justification & probability provided.	closed. f. **Capital Expenditure**: PP to provide invoice and payments made to IOT Infrastructure and Energy Services Ltd to support the claim that capital expenditure cannot be lowered by 18.50%. Issue is open. **Biomass Plant O & M**: PP has provided copy of Agreement on General terms and conditions of O & M contract; PP to provide copy of actual O & M contract. Issue is open. **Substrate cost**: PP to provide supporting document for the claim that substrate costs are conservative. Issue is open. **Fertilizer Revenue**: It is difficult to trace how PP has arrived at values of fertilizer revenues. PP is requested to justify the market change in the fertilizer revenue independent of Substrate cost. Also, comment on cell D4 of "Energy & Material Balance" is not consistent with source column. Issue is open. Furthermore, **input values considered for various feedstocks** are not consistent with the source

			mentioned in the spreadsheet. Also, the conservativeness of the values considered is not justified. Issue is open. **Electricity Revenue**: Since, the value is fixed by TNERC and any increase in tariff rate is unlikely and hence, issue is now closed. Refer 2nd Assessment.
2nd Assessment a. Revised PDD has been verified. Further, reference in the footnote to point 18 refers to the project life time considered while arriving at a tariff rate, PP is requested to justify for the lifetime as requested in point "a" above. PP to substantiate the project life time with evidence Issue is open. b. Page No.14 of the Order states the rate of depreciation for wind energy generators and the same rate is applicable for biomass plants; 85% of the capital cost to be considered as cost of plant & machinery and there are no guidelines regarding salvage value; issue is open. c. Revised financials and PDD have		Second response: a. In the PDD PP have changed the lifetime to 15 years. EPA is a standard format of TNERC, which is normally signed for a period of 20 years. The technical life of the plant is 15 years. b. PP has considered 95% depreciation value of the property over a period of 15 years as straight-line method and 5% Salvage value. c. PP has made both consistent.	Assessment of DVRv02 responses a. PJRCES did not receive the supporting for technical life time of the project. Issue is still open. b. The revised financials have been verified and PP has depreciated 95% of cost of fixed asset after considering rebate of one time subsidy; however CL#05(g) on input cost of fixed asset is open; this issue is also open. c. Revised financials and PDD have

been verified and found that the CER revenues stated in the spreadsheet and in the PDD are internally inconsistent; Issue is open.			been verified and found that the CER revenues stated in the spreadsheet and in the PDD are still inconsistent. Issue is still open.
f. **Capital Expenditure**: PP to provide invoice and payments made to IOT Infrastructure and Energy Services Ltd to support the claim that capital expenditure cannot be lowered by 18.50%. Issue is open.		f. **Capital Expenditure**: Invoices from IOT Infrastructure and Energy Services Ltd to support the claim that capital expenditure cannot be lowered by 18.50% is provided to DOE.	f. **Capital Expenditure**: PJRCES has verified the SD_58 provided by Itemized cost submitted and verified the original document and confirm that the project cost cannot be lowered by 18.50% and 22% (as indicated in the current SD_16). Issue is now closed.
Biomass Plant O&M: PP has provided copy of Agreement on General terms and conditions of O & M contract; PP to provide copy of actual O & M contract. Issue is open.		**Biomass Plant O & M**: PP have now made available to the DOE copy of O & M contract as per SD_42.	**Biomass Plant O&M**: PP has provided copy of Agreement on General terms and conditions of O & M contract as per attachment SD_42; PP to provide copy of actual O&M contract. Issue is still open.
Fertilizer Revenue: It is difficult to trace how PP has arrived at values of fertilizer revenues. PP is requested to justify the market change in the fertilizer revenue independent of Substrate cost. Also, comment on cell D4 of "Energy & Material Balance" is not consistent with source column. Issue is open.		**Fertilizer Revenue**: Fertilizers are agricultural products and are governed by the Goverment of India. Although there are no norms / regulations for Organic compost, the prices do not vary. The farmers do not buy if the prices are increased.	**Fertilizer Revenue**: PJRCES has cross verified SD_31 for the justification of the fertilizer revenue and hence, issue is now closed.
Furthermore, **input values**		**Input values considered for various**	**Input values considered for various**

considered for various feedstocks are not consistent with the source mentioned in the spreadsheet. Also, the conservativeness of the values considered is not justified. Issue is open.		**feedstocks** In SD_16, the input values considered for feedstocks are now consistent with the source mentioned in the spreadsheet. **Conservativeness of values considered** PP refer to SD_02, Tide Technocrats Private Limited, Bangalore, Assessment report of feedstock availability and market for Biomethanation Solids, April 2011 and acknowledge copy of Tide Report in SD_31, both made available to the DOE.	**feed-stocks**: Cow dung cost has been made in-line with source. Issue is now closed. **Conservativeness of values considered**: PJRCES has reviewed the SD_31 for prices considered and hence, issue is now closed. Refer 3rd Assessment.
3rd Assessment a. PJRCES did not receive the supporting for technical life time of the project. Issue is still open.		Third Response: a. PP have revised the technical lifetime to 20 (twenty) years in line with the TNERC source available prior to investment decision, please refer to footnote 64 Page 14 of Comprehensive Tariff Order for Biomass based power plants", TNERC 2009: http://tnerc.tn.nic.in/orders/Tariff%20Order%202009/Bio%20Mass%20Order%2027.04.4009.pdf (accessed November 3 2011)	Assessment of DVRv03 responses a. The reference have been verified and the technical lifetime is in line with TNERC Tariff Order for Biomass based power plants; however the financials are estimated for 15 years which is not the lifetime of the project; issue is open.

		In their financial model (SD_16) PP take into account depreciation over 15 (fifteen) years.	
b. The revised financials have been verified and PP has depreciated 95% of cost of fixed asset after considering rebate of one time subsidy; however CL#05(g) on input cost of fixed asset is open; this issue is also open.		b. See response CL#05(g)	b. The revised financials have been verified and cost of fixed asset is in line with the reference provided. The revised financials have been estimated for 15 years and depreciation as per books is estimated for 20 years and 95% of the cost is not depreciated; issue is open.
c. Revised financials and PDD have been verified and found that the CER revenues stated in the spreadsheet and in the PDD are still inconsistent. Issue is still open.		c. PP have now corrected CER revenue in PDD in line with SD_16.	c. The revised financials and PDD have been verified and CER revenues are still inconsistent; issue is open.
f. **Biomass Plant O&M**: PP has provided copy of Agreement on General terms and conditions of O & M contract as per attachment SD_42; PP to provide copy of actual O&M contract. Issue is still open.		f. As discussed with PJR the actual O&M contract will be signed only when the plant reaches commissioning stage. So, there is no actual O&M contract signed at this stage of the project construction. Therefore PJR had noted to PP that it would close this issue.	f. **Biomass Plant O&M**: Since, there is no O&M contract in existence, and PP has sourced the values from the DPR and hence, this issue is now closed.
New Issue: g. Justify for the capital expenditure cost – the value considered in the SD_16 is not matching the Source		g. Response: Value adjusted to 284,000,000; which is in line with source.	g. The revised financials have been verified and cost of fixed asset is in line with the reference provided; issue

mentioned therein.			is now closed. CL#05-Refer 4th Assessment.
4th Assessment a. The reference have been verified and the technical lifetime is in line with TNERC Tariff Order for Biomass based power plants; however the financials are estimated for 15 years which is not the lifetime of the project; b. The revised financials have been		a. Lifetime of project has been taken as 20 year, economic assessment has been performed over a period of 15 years. As per § 3 of GUIDELINES ON THE ASSESSMENT OF INVESTMENT ANALYSIS (Version 05), EB62 annex 05 "(…) Both project IRR and equity IRR calculations shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime), or - if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period. In general a minimum period of 10 years and a maximum of 20 years will be appropriate. (…)". PP has taken a fair value of the assets at the end of the assessment period (cell R23 of tab P&L + Balance Sheet in SD_16) and hence complies with §3 of the guidelines. b. PP has added assumption 21 in Table	Assessment of DVRv04 responses a. The revised financials have been reviewed and PP has presented the profitability statement for 15 years and considered the fair value of asset as at the end of 15th year as salvage value in cash flow statement; since, the same is in line with prar03 of Investment guidance and hence, issue is now closed. b. PP has added the assumption

estimated for 15 years and depreciation as per books is estimated for 20 years and 95% of the cost is not depreciated; c. The revised financials and PDD have been verified and CER revenues are still inconsistent;		8 section B.5. with the following explanation: "Fair value of the project activity assets used in the last year in the financial model = (Investment (assumption 1 – ass. 2 = 29.7 cr) – Capital Assistance (ass. 16 = 3.6 cr) – Depreciation (15 years (=last year of the fin. model) x ((ass. 1 – ass. 2) / ass. 19) = 1.178 cr))." hence PP takes into account a fair value at the end of the assessment period. c. CER price has been taken out (as per CL#15.d.)	regarding fair value of the asset as at end of 15 years in the PDD and considered the same as salvage value in the cash flow statement; issue is now closed. c. The revised financials and PDD has been verified and PP has now deleted all references to CER revenues; issue is now closed. CL#05 is now closed.
CL#06 a. Provide copy of purchase order for cross-checking. Also provide copy of invoices and payment evidences for the project cost. b. Substantiate for considering number of years for book depreciation as 13 years.	/B.3.5/ /Spreadsheet/	a. Were provided to technical expert, Mr. Jain, during site visit. b. CHANGED over lifetime of the asset; non-linear according to Indian law. See footnote to point 19 in table 7. Assumptions to calculate equity IRR (also in IRR annexes 6 & 11)	Assessment of DVRv01.1 responses a. Documents were checked during site visit and PP is requested to submit the copy of the same. Issue is open. b. Annexure-11 states rate of depreciation for the first 10 years is 7% and then from the 11th year at 2% and PP has depreciated equally over the life of the asset; Issue is open.

c. Substantiate the basis for considering inflation rate (percent) for O & M cost in the analysis. Also provide copy of O & M agreement.		c. As per 'General Terms & Conditions for O&M contract" signed 29 June 2011 between GreenPower int. & IOT Mabagas; page 2 tenth bullit DISCUSS discrepency between O&M contract & PDD (5%);	c. The revised financials have been verified and PP has considered as per the 'General Terms & Conditions for O & M contract'; however PP to provide copy of actual signed O & M agreement, Please further clarify how the referred document was available at the time of investment decision. Issue is open.
d. Energy purchase agreement does not specify tariff rate; however PP has considered tariff at the rate of Rs.4.92 per Kwh with an inflation of 2.9%. Substantiate with evidence for the tariff considered in the analysis.		d. See footnote to point 6 in table 7. Assumptions to calculate equity IRR	d. PP has revised the value of tariff rate. Provided references do not give the value of tariff rate referred in PDDv02.2. Issue is open.
e. M/s. Tide Technocrats, consultant report. Provide a complete copy of this consultants report.		e. Provided as documents SD_02, SD_02a and SD_02b	e. PP has still not provided the acknowledged copy of the referred report. Issue is open.
f. Provide evidence for the sources stated for calculation of CER revenues in the analysis. Also substantiate the basis for considering -10% as inflation parameter.		f. The -10% (minus) inflation refers to "Reduction of CER based on CER sharing order by CERC" Please refer to IRR annex 6 page 18	f. Revised financials have been verified along with the explanation provided as per Tariff Order for Biomass 2009; PP has considered CER revenues for 9.5 years, Issue is open.
g. Provide reference for MAT and Corporate tax rates considered in the analysis.		g. See footnotes to point 10 and 11 in table 7. Assumptions to calculate equity IRR.	g. References stated in the revised assumptions have been verified; PP to provide evidence for considering surcharge on MAT rates, Issue is

h. Provide evidence for date of commissioning of the project.		h. Please refer to SD_26 Revised Schedule for 2MW BIO-GAS POWER PLANT FOR IOTM 16.08.2011.	open. h. Reference provided has been verified and PP has considered revenues as per the expected commissioning date in the profitability statement, issue is closed. Refer 2nd Assessment.
2nd Assessment a. Documents were checked during site visit and PP is requested to submit the copy of the same. Issue is open. b. Annexure-11 states rate of depreciation for the first 10 years is 7% and then from the 11th year at 2% and PP has depreciated equally over the life of the asset; c. The revised financials have been verified and PP has considered as per the 'General Terms & Conditions for O & M contract'; however PP to provide copy of actual signed O & M agreement, Please further clarify how the referred document was available at the time of investment decision. Issue is open. d. PP has revised the value of tariff rate.		Second response: a. PP refers to SD_48 containing two EPC invoices made available to the DOE. b. Depreciation is calculated now for 15 years life time under straight line method. c. Copy of actual signed O & M terms with GPIL was provided to DOE. PP refers to SD_42 IOTM GPIL O&M Terms and SD_46 made available to the DOE. The proposal of GPIL was inclusive of O&M terms only. The offer has been made available to the DOE. d. PP refer to SD_03 DPR, chapter on	Assessment of DVRv02 responses a. PP has provided only two invoices totalling to Rs.2.51 crores. Issue is now closed. b. The revised financials have been verified and PP has calculated depreciation as per books for 15 years life time and hence, issue is now closed. c. Attachment SD_46 is an e-mail copy regarding offer for O&M agreement. PP to provide copy of O&M contract. Issue is still open. d. PJRCES has reviewed the DPR and

Provided references do not give the value of tariff rate referred in PDDv02.2. Issue is open. e. PP has still not provided the acknowledged copy of the referred report. Issue is open. f. Revised financials have been verified along with the explanation provided as per Tariff Order for Biomass 2009; PP has considered CER revenues for 9.5 years, Issue is open. g. References stated in the revised assumptions have been verified; PP to provide evidence for considering surcharge on MAT rates, Issue is open.		TNERC tariff, where is clearly explained the applicable tariff rate for the project and the escalation. This is based on the TNERC Biomass Tariff order dated 27.04.2009. e. PP refer to their response to CAR#04.1. f. PP has revised and has now considered CER revenues for 10 years. g. PP have now made available to DOE supporting document SD_50 MAT as evidence for considering surcharge on MAT rates. Please note that MAT percentage is considered as per Indian Direct Taxes ready reckoner for 2011-12. Under this MAT is considered as per Domestic Company having more than 1 Crore as profit, where in Surcharge is applicable on MAT. Profit more than 1 Crore is proved in the financial calculations. DOE may kindly refer the same. Supporting document is SD-50	verified the calculation based on TNERC tariff order dated 27.04.2009. the same is consistent with Annexure IX of TNERC order and hence, issue is now closed. e. CAR#04.1 is with respect to TNAU report and CAR is with respect to TIDE report. Issue is still open. f. The revised financials have been verified and PP has now considered CER revenues for 10 years; issue is closed. g. The supporting document provided has been verified and issue is now closed.

3rd Assessment c. Attachment SD_46 is an e-mail copy regarding offer for O&M agreement. PP to provide copy of O&M contract. Issue is still open. e. CAR#04.1 is with respect to TNAU report and CAR is with respect to TIDE report. Issue is still open.		MAT.pdf. Third Response: c. PP refers to their Third Response to CL#05(f) above. e. PP has now provided DOE the full acknowledged and stamped Tide Report including its annexes as SD_02.	Refer 3rd assessment. Assessment of DVRv3.0 responses c. In-line with assessment of CL#05(f), this point is now closed. e. PJRCES has reviewed the SD_02 submitted with DVR3.0 responses and found to be OK. Issue is now closed. CL#06 is now closed.
CL#07 a. PP needs to explain in the PDD, how the Benchmark analysis and equity IRR as financial indicator and return on equity as Benchmark are appropriate in line with the "Guidance on the assessment of investment analysis". b. PP to demonstrate investment barrier adequately in the PDD.	/PDD/B.5	a. See revised section B.5. b. See response to CAR#11.c and d.	Assessment of DVRv01.1 a. Revised PDDv02.2 has been verified and issue is closed. b. Revised PDDv02.2 has been verified and issue is closed. CL#07 is now closed.
CL#08 a. PP is requested to provide the documents related to "*Flow chart for CDM Data monitoring & recording*" for one cycle;	/B.5/ /PDD/B.7.1/ B.7.2/	a. Provided.	Assessment of DVRv01.1 responses a. PP has provided the flow chart and hence, issue is now closed.

b. PP is requested to provide the formula to calculate emission from fossil fuel consumption and describe in detail. c. PP is requested to justify for not accounting the project emissions due to storage. Submit the reports justifying the claim that dry matter content of the manure when removed from barns is greater than 20%. d. Calibration frequency to be defined consistently throughout PDD. Refer §17, Annex21, EB61 e. Please clarify how the flow meter used for measuring the flow of biogas generated will be calibrated? f. Data archiving is not defined. PP is requested to respond in-line with "General Guidelines to SSC CDM Methodologies" latest ver17.		b. Added in B.6.1. c. See response to CAR #4.i. d. Done. e. Clarification provided in PDD Section B.7.2 f. Added to the PDD in section B.7.2. "As per §17 of the General Guidelines to SSC CDM methodologies (Version 17): Monitoring: while monitoring the emission reductions from the small-scale project activity, project participants shall: (a) Electronically archive all data collected as part of monitoring for a period of two years from the end of the crediting period; All data will be	b. Revised PDDv02.2 addresses the concern and hence, issue is now closed. c. PP is requested to respond to CAR#04.1. this point is now closed. d. Response is not clear. Issue is open. e. PP has provided the description on the same. However, PP is requested to define the frequency. Issue is open. f. In-line with the justification provided and revised PDDv02.2 issue is now closed.

		archived until two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.	
g. Indicate the option chosen for flare efficiency.		g. PP has included the stepwise procedure to determine the FE (resulting in option a).	g. PP is requested to respond to assessment of CAR#09(j).
h. Provide the basis and justification of poultry litter processed, plant load factor and auxiliary consumption.		h. On justification of poultry litter see CAR #01.g regarding plant load factor is based on O&M contract – see CAR #09.n.	h. PP is requested to provide response to the poultry litter processed here only. Note that query is not related to type. For plant load factor please respond to assessment of CAR#09(n). Issue is open. Refer 2nd Assessment.
2nd Assessment d. Response is not clear.		Second response: d. PP has now consistently defined calibration frequency in the PDD.	Assessment of DVRv02 responses. d. Revised PDDv03 addresses the concerns and hence, issue is now closed.
e. PP has provided the description on the same. However, PP is requested to define the frequency.		e. PP has now defined the frequency: the measuring equipment used for monitoring data are calibrated as per manufacturers' specifications and recalibrated at least once in three years.	e. Revised PDDv03 addresses the concerns and hence, issue is now closed.
g. PP is requested to respond to assessment of CAR#09(j).		g. PP refers to their response to CAR#09(j).	g. Revised PDDv03 clarifies the option chosen is in-line with the tool and hence, issue is now closed.

h. PP is requested to provide response to the poultry litter processed here only. Note that query is not related to type. For plant load factor please respond to assessment of CAR#09(n). Issue is open.		h. Regarding poultry litter, PP refers to SD_14 Mass balance. Regarding plant load factor, PP refers to their response to CAR#09(n).	h. In-line with assessment of CAR#01(g), this point is now closed. PLF issue is covered in CAR#09(n) and will be closed there only. Hence, this point is now closed. CL#08 is now closed.
CL#09 a. Please provide the number of personnel employed and their training requirements based on the technology employed in the project.	/PDD/[B.7.2/]	a. see CL#01a	Assessment of DVRv01.1 responses a. In-line with the assessment of response to CL#01(a) issue is now closed. CL#09 is now closed.
CL#10 a. Provide reference documents for the composition of poultry litter, relevant test reports/results	/AMS III.D/[V17/] /PDD/[B.7.1/]	a. Reference documentation provided: reference made to Tamil Nadu Agricultural University report (SD_04).	Assessment of DVRv01.1 responses a. PP is requested to respond to CAR#04.1. Refer 2nd Assessment.
2nd Assessment a. PP is requested to respond to CAR#04.1.		Second response: a. PP refer to their response to CAR#04.1.	Assessment of DVRv02 responses a. In-line with assessment of CAR#04.1 issue is now closed. CL#10 is now closed.
CL#11 a. PP is requested to demonstrate that the start date is in-line with EB41, §67 and the guidance referred therein.		a. Done see § B.5 and C.1.1.	Assessment of DVRv01.1 responses a. PP has considered LoI date as the start date. Please clarify how the same is in-line with the guidelines. Also, please submit the LoI dated 23/02/2011 and purchase/work orders related to project activity.

			Refer 2nd Assessment.
2nd Assessment a. PP has considered LoI date as the start date. Please clarify how the same is in-line with the guidelines. Also, please submit the LoI dated 23/02/2011 and purchase/work orders related to project activity.		Second response: a. The starting date is indicated as 22 July 2011, which is the date of the first significant Purchase Order, as has now been made available to DOE via SD_35a.	Assessment of DVRv02 responses. a. Explanation is accepted. However, no corrections have been made in the PDD. Issue is still open. Refer 3rd Assessment.
3rd Assessment a. Explanation is accepted. However, no corrections have been made in the PDD. Issue is still open.		Third Response: a. PP have now starting date corrected in § C.1.1 to 22/07/2011.	Assessment of DVRv3.0 responses. a. Revised PDDv04, section C.1.1., provides start date as 22 july 2011, which is the date for placement of purchase order. Since, the same is in-line with latest guidance available at EB66, Annex63 and hence, issue is now closed. CL#11 is now closed.
CL#12 a. PP needs to include the description on leakage in-line with AMS-III.AO. The methodology refers to general guidance on leakage in biomass project activities (attachment C to Appendix B).	/B.4.3.2/	a. DONE in Table 4 AMS-III.AO § 1d.	Assessment of DVRv01.1 responses a. PP is requested to respond to CAR#05.1(a). Refer 2nd Assessment.
2nd Assessment a. PP is requested to respond to CAR#05.1(a).		Second response: a. PP refer to their response to CAR#05.1(a).	Assessment of DVRv02 responses a. In-line with assessment of CAR#05.1(a) issue is now closed.

			CL#12 is now closed.
CL#13 a. PP is requested to submit the invitation letters to local villagers, direct stakeholders and government officials and acceptance of invitation letters.	/D.1/	a. Letters are provided in the annex of stakeholder meeting report (SD_12 Minutes of local stakeholder consultation);	Assessment of DVRv01.1 responses a. It is difficult to conclude the date on which advertisement was published. Submit copy of invitation letter passed on to panchayat notice board. Submit the attendance sheet. Refer 2nd Assessment.
2nd Assessment a. It is difficult to conclude the date on which advertisement was published. Submit copy of invitation letter passed on to panchayat notice board. Submit the attendance sheet.		Second response: a. PP has now provided the attendance list duly stamped and dated as per SD_49 made available to DOE.	Assessment of DVR responses a. Scan copy of the attendance sheet is now received. However, PP has not submitted the copy of invitation letter. Issue is still open. Refer 3rd Assessment.
3rd Assessment a. Scan copy of the attendance sheet is now received. However, PP has not submitted the copy of invitation letter. Issue is still open.		Third Response: a. In discussion with PJR, PP noted very clearly that the stakeholder meeting minutes itself contain the sample of invitation letters in its Annexure 1. PJR please refer the stakeholder minutes SD_12. PP request PJR to close this issue.	Assessment of DVRv03 responses a. SD_12 have been reviewed. It contained the invitation letters sample and hence, issue is now closed. CL#13 is now closed.
CL#14 a. As discussed in the PDD, PP needs to submit the necessary environmental clearances for the project activity.	/E.1/	a. Added reference to D.1 stating EIA not required.	Assessment of DVRv01.1 responses a. PP is requested to provide the supporting document or link for the same. Refer 2nd Assessment.

2nd Assessment a. PP is requested to provide the supporting document or link for the same.		Second response: a. PP has already provided the web link to the regulatory document in the PDD and reproduces it here: http://moef.nic.in/legis/eia/so1533.pdf The document behind this link shows that biogas projects are not required to do EIA. Ad as stated in the PDD, Moreover, the project activity has obtained approval from the Tamil Nadu Pollution Control Board for setting up of the project.	Assessment of DVRv02 responses a. PJRCES has reviewed the link and found that biogas projects are not required to conduct EIA and hence, issue is now closed. CL#14 is now closed.
CL#15 a. Provide loan application document for term loan from financial institutions along with the feasibility study report submitted to banks. b. The repayment tenure is 8 years including moratorium period of 2 years; however PP has considered the duration as 7 years and referred to loan sanction letter. c. The discount factor considered is 15% and the reference stated is	/B.3.5/ /Spreadsheet/	a. See IRR ANNEX 10 formal sanction of credit facilities.pdf b. See IRR ANNEX 10 formal sanction of credit facilities.pdf. c. Proof provided in B.3.5 and disclosed to DOE.	Assessment of DVRv01.1 responses a. PP is requested to submit loan application documents. Response is not complete. Furthermore, sanction letter does not contain reference to any loan application. Issue is open. b. PP has referred to formal sanction of credit facilities. sanction letter is dated 15/10/2011 whereas, starting date considered is 23/02/2011, Please clarify how the sanction letter was available at the time of investment decision date. Issue is open. c. Response is not clear. PP is requested to respond to CAR#11(f).

IOTM Board Protocol. The discount factor is estimated by MABA, Germany, PP to substantiate the basis for concluding on this discount factor. PP to also substantiate whether this factor 15% has been used earlier in any of the investment decision making of the company.			
d. The exchange rate for one Euro is considered as Rs.60 in INR and PP has referred the same from BoD investment request. Provide evidence for the same.		d. Exchange rate as per 3 November 2011 http://www.xe.com/currencycharts/?from=EUR&to=INR?	d. Response is not in-line with the query. PP has now considered exchange rate at Rs.67; however the PP has considered 10 Euros at 82.5% of index price as CER sale price. As per page number 11 of the ERPA the CER rate is 7 Euros at 82.5% of index price. Issue is open.
e. PP has provided a letter from M/s. Karur Vysya Bank. This letter is not loan sanction letter as it is stated in the letter as "however, the final sanction and terms are subject to approval of the Board, which please note". Provide copy actual loan sanction letter.		e. See IRR ANNEX 10 formal sanction of credit facilities.pdf.	e. PJRCES has received the document and hence, issue is now closed.
f. Substantiate the amount of closing balance considered as bank loan in the P & L + Balance sheet spreadsheet (Equal Loan repayment		f. Closing balance = 0. See IRR ANNEX 10 formal sanction of credit facilities.pdf for bank loan conditions.	f. The revised financials have been verified and issue is closed.

has been considered for each year from year 2013 onwards). Also substantiate for adding an amount of Rs.722574. g. The rate of interest on term loan considered is 11% which is the actual rate as per offer letter from M/s. Karur Vysya Bank. Justify.		in cell D38 Rs. 722574 deleted. g. See IRR ANNEX 10 formal sanction of credit facilities.pdf.	g. Response is not clear. Please justify the letter from Krura Vysya Bank is dated 28/03/2011. How the same was available at the time of investment decision date. Issue is open. Refer 2nd Assessment.
2nd Assessment a. PP is requested to submit loan application documents. Response is not complete. Furthermore, sanction letter does not contain reference to any loan application. b. PP has referred to formal sanction of credit facilities. sanction letter is		Second response: a. PP had contacted several financial institutions verbally and in emails. In this regard, PP refer to supporting documents SD_51, SD_52, SD_53, SD_54, SD_55 containing some of the initial correspondences PP had with financial institutions and indicative termsheets received. With KVB, there was only physical submission of loan application, (project documents), an email confirmation from KV Bank is attached for reference as per SD_53. Also please refer to SD_56 providing bank loan comparative term details. b. Please refer to SD_56 containing the revised financial calculations based on	Assessment of DVRv02 responses a. PP has provided extracts of e-mails exchanged with various banks. PP to address issue regarding sanction letter from KVB does not contain any reference to loan application letter. Issue is still open. b. SD_56 is comparative statement for cost of borrowing loans from banks.

dated 15/10/2011 whereas, starting date considered is 23/02/2011, Please clarify how the sanction letter was available at the time of investment decision date.		10 years of repayment. This is as per the loan agreement signed with KV Bank for the term loan. This is reflected in the formal sanction letter submitted. (The financial calculations use the Loan term (which is now 10 years) and Interest rate. These two elements are provided in the comparison contained in SD_56).	Even in the revised financials PP has considered loan parameters as per formal sanction of credit facilities from Karur Vysya Bank which was not available at the investment decision date. Issue is still open.
d. Response is not in-line with the query. PP has now considered exchange rate at Rs.67; however the PP has considered 10 Euros at 82.5% of index price as CER sale price. As per page number 11 of the ERPA the CER rate is 7 Euros at 82.5% of index price.		d. The in-principle approval for the investment for Namakkal project was provided by the Board in the board meeting 28th January 2011. PP refer to Board minutes contained in SD_59 made available to DOE. **Exchange rate** The INR to Euro exhange rate on 28/1/2011 was 63 INR = 1 Euro. PP refer to SD_21 (which shows this exchange rate), made available to DOE. **Carbon price** The ERPA considers a floor price ("minimum" as per definition of "unit price" in ERPA and PP has made an estimation of an average of Euro 10.00 (ten Euro) on the basis of market trend. This is the expectation	d. **Exchange Rate:** PP has now considered exchange rate available at the investment decision date and hence, issue is now closed. **Carbon Price**: PJRCES has reviewed SD_65. In the revised SD_16, PP has considered price rate of 7 Euros. Issue is still open.

		of the entrepreneur. For documentation of the carbon price at the time of investment decision, PP refer to SD_65, which is Point Carbon publication "CDM & JI Monitor" dated 19 January 2011 and which was the most recent publication of the CDM&JI Monitor available at the investment date of 28 January 2011. The bid-price for CERs as indicated in SD_65 is €10.30 Euro. To be conservative, PP have rounded this down to €10.00 Euro in their analysis.	
g. Response is not clear. Please justify the letter from Krura Vysya Bank is dated 28/03/2011. How the same was available at the time of investment decision date.		g. The Interest rate of the project is considered as 11% during the investment decision period on the basis of base interest from State Bank of India (which is indicative of all banks) + 1% as applicable market rate. This is based on the fact that IOT as a corporate group is executing many of its projects at base rate + 1%.	g. PP to provide justification for considering rate of interest on loan as per actual loan sanction letter which was not available at the investment decision date. Issue is still open. Refer 3rd Assessment.
3rd Assessment a. PP has provided extracts of e-mails exchanged with various banks. PP to address issue regarding sanction letter from KVB does not contain any		Third Response: a. Please refer to the supporting documentation of the email correspondence from KVB, where in page 2 they are clearly mentioning	Assessment of DVRv03 responses a. PJRCES has reviewed the Page 2 of email correspondence from KVB states the receipt of application. Issue, is now closed.

reference to loan application letter.		the receipt of the application. Also PP has very clearly stated in the earlier response that there was no formal application form, it was a physical submission of project documents like DPR, Financial statements etc. PP request PJR to close this issue.	
b. SD_56 is comparative statement for cost of borrowing loans from banks. Even in the revised financials PP has considered loan parameters as per formal sanction of credit facilities from Karur Vysya Bank which was not available at the investment decision date.		b. PP had already stated to PJR that PP have considered 11% based on the corporate company`s experience and relationship with SBI, and the same terms were negotiated and accepted by KVB during formal sanction of the project. Later due to the RBI changes, interest rate was increased to 11.5%. This has been discussed already with PJR in Bangalore. PP request PJR to close this issue.	b. In-line with the discussions held in Bangalore, PP is requested to submit the documentary evidence which was available at the time of investment decision date in January 2011. Issue is still open.
d. **Carbon Price**: PJRCES has reviewed SD_65. In the revised SD_16, PP has considered price rate of 7 Euros.		d. As explained to PJR, PP have removed the CER calculation from the PDD as this is not required by the UNFCCC.	d. The CER sale price and revenues are still stated in the revised PDDv04 and SD_16; issue is open.
g. PP to provide justification for considering rate of interest on loan as per actual loan sanction letter which was not available at the investment decision date.		g. PP had already stated to PJR that PP have considered 11% based on the corporate company`s experience and relationship with SBI, and the same terms were negotiated and accepted by KVB during formal sanction of	g. This issue is covered in point (b) above and will be closed there only. This point is now closed.

		the project. Later due to the RBI changes, interest rate was increased to 11.5%. This has been discussed already with PJR in Bangalore. PP request PJR to close this issue.	CL#15 - Refer 4th Assessment.
4th Assessment b. In-line with the discussions held in Bangalore, PP is requested to submit the documentary evidence which was available at the time of investment decision date in January 2011.		b. Reference is made to IRR ANNEX 11 Order_256-2010_RE_Tariff_FY_11-12 (see also http://www.cercind.gov.in/2010/November/Signed_Order_256-2010_RE_Tariff_FY_11-12.pdf) for 10 year loan repayment period; document was available at time of investment decision.	Assessment of DVRv04 responses b. The reference provided has been verified and accepted; issue is now closed.
d. The CER sale price and revenues are still stated in the revised PDDv04 and SD_16;		d. All references to CER revenue & sales price taken out of PDD and SD 16 (assumptions 9 and 10; other assumptions renumbered).	d. The revised financials and PDD has been verified and PP has now deleted all references to CER revenues; issue is now closed. CL#15 is now closed.
CL#16 a. PP has stated one time subsidy on this project to be Rs. 25,000,000/- substantiate the treatment of this cost in the financial analysis.	/B.3.5/ /Spreadsheet/	a. Capital Assistance Scheme offered by MNES (application planned but not yet filed - consideration in the model is a conservative assumption). The capital assistance scheme is used to reduce bank loan requirements -	Assessment of DVRv01.1 responses a. PP has considered Rs.34,200,000/- as one time subsidy in the revised financials. Please substantiate the same. Issue is open.

		basically an interest free loan. Refer to rows 40 – 44 in P&L + Balance Sheet in SD_16 CDM Financial Analysis	
b. Substantiate for considering financial depreciation rate at 40% and also provide reference for the same.		b. Changed to 20 in line with Indian Tax. (IRR Annex 6 and IRR annex 11).	b. CL #06 (b) with regard to depreciation as per books is open; hence this issue is also open.
c. Cost of land is also depreciated as per financial depreciation calculated in Indian tax spreadsheet.		c. Corrected in the Indian tax spreadsheet	c. Revised financials have been verified and cost of land is not depreciated; issue is closed.
d. Provide reference for the parameters considered in energy and material balance spreadsheet.		d. References provided	d. Separate CL to be raised.
e. Substantiate the basis for declaration of dividend.		e. The dividend allocation is based on two principles: 1. The maximal (possible) dividend of a year is limited to the retained earnings at the beginning of the same year. If the retained earnings are negative, dividends are not considered. 2. The maximal dividend payment is limited by the available cash position prior to dividend payments. If the cash position is zero or lower, dividends will not be paid, also if the requirements for No 1 are fulfilled. Scheduled bank loan instalments and	e. Response is not clear. PP has explained the scenarios for dividend declaration; Please clarify how the same are applicable in case of the project activity. Further, substantiate the justification. Issue is open.

		shareholder loan repayments have priority over dividend payments.	
f. Provide reference for rate of dividend distribution tax 17% considered in the analysis.		f. Source provided in SD_16 CDM Financial Analysis	f. The revised financials have been verified and PP has not provided reference for the same; however PP has also not considered dividend distribution tax also; Issue is open.
g. PP has considered 70% of the total project cost to be financed by way of term loan and 30% as equity. PP to justify for calculating equity IRR when the project is financed by both debt and equity.		g. IRR ANNEX 10 formal sanction of credit facilities.pdf.	g. Response is not in-line with the query. Issue is open.
h. Substantiate for not considering benefits of tax shield in the initial year of losses in estimating equity IRR.		h. Substantiated in SD_16 CDM Financial Analysis.	h. The revised financials have been verified and found that profitability statement is prepared for 20 years and taxation for 15 years and tax shield is not considered; also, justify for revising the financials to 20 years in-line with para 3, Annex5, EB62. Issue is open. Refer 2nd Assessment.
2nd assessment a. PP has considered Rs.34,200,000/- as one time subsidy in the revised financials. Please substantiate the same. Issue is open.		Second response: a. PP has considered 32,400,000/- as capital subsidy. This is calculated as per the policy of MNRE detailed in the DPR pages 45 to 50. This is	Assessment of DVRv02 responses a. SD_63 – MNRE letter dated 20-Mar-2012 states the subsidy amount of 3,23,80,000/-. DPR pages 45 to 50 states the subsidy amount of Rs.

		estimated at the rate of 1.5 Cr/MW for 2.4 MW net of admin and legal expenses.	1.0+0.5= 1.5 Cr/MW. Revised SD_16 to be made consistent with SD available at the investment decision time. Issue is still open.
b. CL #06 (b) with regard to depreciation as per books is open; hence this issue is also open.		b. PP refers to their Second Response to CL#6(b). The depreciation calculation method has now been changed in the financial model to reflect the Indian company act section 205 which provides 95% depreciation and 5% salvage value after 15 years. A straight line method has been applied. PP refer to the latest version of SD_16 Financial Analysis made available to DOE.	b. The revised financials have been verified and PP has calculated depreciation as per books for 15 years life time; issue is now closed.
e. Response is not clear. PP has explained the scenarios for dividend declaration; Please clarify how the same are applicable in case of the project activity. Further, substantiate the justification. Issue is open.		e. Dividend is declared because for the first two years the shareholders are paying loans to provide working capital requirement, since the project is not generating enough cash.	e. The revised financials have been verified and found that shareholders are paid interest at the rate of 11.50% per annum which is conservative considering the shareholders would expect more rate as compared to bank rate and hence, acceptable. PP to substantiate on payment of dividend for the first year when the EAT is negative. Issue is still open.
f. The revised financials have been verified and PP has not provided reference for the same; however PP		f. Dividend distribution tax is not considered in the latest version of the financial analysis.	f. DOE has raised the CL as to why dividend distribution tax is not accounted for in the financials. Issue

has also not considered dividend distribution tax also; Issue is open. g. Response is not in-line with the query. Issue is open.		g. The equity IRR calculation has been chosen because the internal rate of return is the financial valuation measure used by investors to calculate and assess the financial attractiveness / viability of capital-intensive projects or investments. Further, as investors the shareholders IOT and Mabagas are interested to learn on the attractiveness of their equity and not the debt. See also CAR 11 (f) As per paragraph 10 of EB 62, Annex 5 Guidelines on the assessment of investment analysis (version 05): in the calculation of equity IRR only the portion of investment costs which is financed by equity should be considered as the net cash outflow, the portion of the investment costs which is financed by debt should not be considered a cash outflow. The purpose of the equity IRR calculation is to determine the final return on the initial equity investment. In such	is still open. g. The explanation is accepted; however CAR#11(f) is open and will be discussed there only. This point is now closed.

		calculations cost of servicing debt (interest and principle payments) are considered as costs. Therefore to consider all investment costs to be a cash outflow would double count the cost of debt to the equity investor. The above has also been referenced in section B.5 of the PDD.	
h. The revised financials have been verified and found that profitability statement is prepared for 20 years and taxation for 15 years and tax shield is not considered; also, justify for revising the financials to 20 years in-line with para 3, Annex5, EB62.		h. The financial model has now been changed to reflect a 15-year period as requested by DOE PJR. PP has now submitted the certificate of incorporation of IOT Mabagas Ltd in April 2010, and the Memorandum of Association in which the business purpose is declared clearly. Please refer to SD_62.	h. This point is now covered in the CL#05 (a) and (b) and will be closed there only. This point is now closed. Refer 3rd Assessment.
3rd Assessment a. SD_63 – MNRE letter dated 20-Mar-2012 states the subsidy amount of 3,23,80,000/-. DPR pages 45 to 50 states the subsidy amount of Rs. 1.0+0.5= 1.5 Cr/MW. Revised SD_16 to be made consistent with SD available at the investment decision		Third Response: a. Reference has been changed to page 46 of SD_03 Detailed Project Report of 2.0 MW biogas to power generation project at Puduchatram which states 15,000 INR per kW installed. As PP schedules to install 2.4 MW subsidy is expected to be	Assessment of DVRv03 responses a. Page 46 of SD_03 was reviewed by PJRCES and found that PP has corrected the subsidy in the assumptions work book and PDDv04. Issue is now closed.

time. Issue is still open. e. The revised financials have been verified and found that shareholders are paid interest at the rate of 11.50% per annum which is conservative considering the shareholders would expect more rate as compared to bank rate and hence, acceptable. However, PP to substantiate on payment of dividend for the first year when the EAT is negative. Issue is still open.		15,000 INR/kW x 2400 kW = 36,000,000 INR; SD 16 and PDD made consistent with SD_03, which was available at time of investment decision. e. As per discussion with PJR on 26/4/2012, it was noted that the issue can be closed, because – as supporting document SD_16 shows – PP do not take into account dividend in year one.	e. SD_16 is now cross checked and it was found that the PP do not take into account dividend in year one and hence, issue is now closed. CL#16 is now closed.
CL#16.1 a. Substantiate for considering loan from Shareholders in addition to term loan from financial institutions. The same is not stated in the assumption spreadsheet. PP to also provide separate interest calculations for Shareholders loan.	/CL#05, 06, 15, 16/ /Spreadsheet/	a. A shareholder loan (accumulated of approximately INR 30 million is necessary in the model to avoid negative cash flow. The first year is loss-making which requires a shareholder loan to avoid insolvency. The second year requires an additional shareholder loan since loan repayment commences. As of the third year repayment of shareholder loan begins.	Assessment of DVRv02 responses a. The revised financials have been verified and shareholders loan is INR 25.5 million and substantiate as to why the means of financing in the form of equity is not stated in the assumptions spreadsheet. Issue is still open.

		In row 16 of the P&L + Balance Sheet tab of SD_16 the separate interest calculations for shareholders loan is provided.	
b. Cost of land as per land sale considered in the investment analysis is not consistent with sale deed. Also, clarify how the same document was available at the time of investment decision.		b. The land cost is part of two deeds. Sale deed value + Land development agreement value + agency commission which is 1% of the total value. PP have submitted the sale deed to DOE. Also PP have provided land development Agreement SD_41 for DOE reference.	b. The land development agreement and land sale deed is dated 22 September 2010 for Rs.1.05 crores and Rs. 25 lakhs totalling to Rs.1.30 crores. PP to provide evidence for agency commission. Issue is open.
c. PP has considered variable cost as per Tariff Order dated 27 April 2009 and fixed cost as per Tariff Order dated 12 April 2011. Please justify.		c. The applicable tariff policy of TNERC under which the EPA is signed is taken as basis for calculating the fixed cost and variable cost of power for the project. The table for power tariff applicable as per the TNERC Tariff order dated 27th April 2009 is provided in the DPR. The EPA signed on 9th Feb 2011 also refers to the same tariff order. Both the DPR and the EPA have been made available to the DOE.	c. The EPA is signed for 2 MW dated 9 February 2011. The source for tariff considered as per DPR is TNERC Order dated 27 April 2009. However PP has provided different source for tariff value in the PDD and spreadsheet calculations. Issue is open. Refer 3rd Assessment.

3rd Assessment a. The revised financials have been verified and shareholders loan is INR 25.5 million and substantiate as to why the means of financing in the form of equity is not stated in the assumptions spreadsheet. b. The land development agreement and land sale deed is dated 22 September 2010 for Rs.1.05 crores and Rs. 25 lakhs totalling to Rs.1.30 crores. PP to provide evidence for agency commission. c. The EPA is signed for 2 MW dated 9 February 2011. The source for tariff considered as per DPR is TNERC Order dated 27 April 2009. However PP has provided different source for tariff value in the PDD and spreadsheet calculations.		Third Response: a. PP has now added the means of financing in the form of equity to the assumptions spread sheet of SD_16, made available to the DOE. b. The issue refers to evidence of agency commission of "1% of total value" mentioned in the explanation provided for 2nd response. By way of conservative assumption PP have now taken 1% out. Now reads 13,000,000. c. PP has now aligned sources in revised SD_16 and PDD made available to DOE.	Assessment of DVRv03 responses a. The revised financials have been verified and PP has now included the Shareholders equity in the assumptions spreadsheet; issue is now closed. b. The revised financials have been verified and PP has considered Rs. 1.30 crores as cost of land and development; issue is now closed. c. The source for tariff considered is now made consistent in PDD and spreadsheet calculations; issue is now closed. CL#16.1 is now closed.
CL#17 As received during the International global stakeholder consultation PP is requested to respond to following comments. a. On what basis internal benchmark is	/GSC/	a. see CL#16.g.	Assessment of DVRv01.1 responses a. PP is requested to respond in-line

used for this project? b. When the project is financed by both equity and debt and debt accounts for 70% of the project cost, on what basis equity IRR is correct financial indicator? It does not comply with Additionality Tool. c. The O&M cost works out to 20% of investment. PP is requested to support the same with documentary evidence. d. Provide a breakup of the project cost and support the same with documentary evidence. e. Auxiliary consumption is very high.		b. Equity IRR is calculated over equity cash flow only. As per guidance 10 of the guidelines on the assessment of investment analysis version 05 EB 62 annex 5. c. Evidence provided: IRR annex 1 turnkey costs, IRR annex 3 O&M contract and IRR Annex 5a, IRR Annex 5b and IRR Annex 6. d. Document on break-up of project costs has been shown during site visit. See also evidence provided: IRR annex 1 turnkey costs, IRR annex 3 O&M contract and IRR Annex 5a, IRR Annex 5b and IRR Annex 6 e. See CL#08 i. and See SD_20 technical note on capacity	with assessment of response CL#16(g). b. Response does not answer the query. PP is requested to respond in-line with the query. Issue is open. c. IRR Annex5a & 5b are not conclusive due to location of project activity. Clarify how the IRR Annex 3 term sheet was available at the time of investment decision. 20% O&M costs are not consistent with IRR annex 6. Issue is open. d. PP is requested to explicitly provide the breakup of costs and provide the supporting documents. Issue is open. e. Response is not clear. Issue is open. Refer 2nd Assessment.
2nd Assessment a. PP is requested to respond in-line with assessment of response		Second response: a. PP opted to only use benchmark based on parameters that are standard	Assessment of DVRv02 responses a. Explanation provided in the response to CL#16(g) is accepted and hence,

CL#16(g). b. Response does not answer the query. PP is requested to respond in-line with the query. Issue is open. c. IRR Annex5a & 5b are not conclusive due to location of project activity. Clarify how the IRR Annex 3 term sheet was available at the time of investment decision. 20% O&M costs are not consistent with IRR annex 6. Issue is open.		in the market as per paragraph 15 of EB 62 Annex 5, Guidelines on the assessment of investment analysis (Version 05). b. PP refer to: - their Second Response to CL#17(a); - their Second Response to CL#16(g); - the latest version of SD_16 Financial Analysis made available to DOE. c. The annual Operation & Maintenance cost for the 2x1200 kW gas engines (inclusive of all spare parts for the engine units and turbo charger, as well as lube oil) to be paid by IOTM to Greenpower Int. Ltd. is approximately 0.76 Crore per annum in year 1 (see financial model in SD_16), which is equivalent to 2% of total investment cost of 31.1 Crore (i.e. 0.76/31.1). The remaining O&M cost for the biogas plant and remaining infrastructure and assets is with 1.7 Crore per annum which is approximately 5.5% of the total investment (i.e. 1.7/31.1). The combined O&M is thus 7.5% annually of the total investment	this issue is now closed. b. In-line with the assessment of CL#16(g) issue is now closed. c. PJRCES has verified the SD_16, SD_42 and SD_58 and hence, explanation is accepted. However, issue related to SD_42 is covered in CL#05(f) and will be closed there only. This point is now closed.

		made, and therefore not 20% as claimed by some global stakeholder. O&M contract signed between GPIL and IOT Mabagas has been provided to DOE as SD_42. Also, PP has now provided O&M contract emails in SD_46.	
d. PP is requested to explicitly provide the breakup of costs and provide the supporting documents. Issue is open. e. Response is not clear. Issue is open.		d. PP refer to SD_58 containing the itemized cost of the project plant, made available to DOE. PP also refers to their response to CL#17 (c). e. The auxiliary consumption of the biogas plant in Puduchatram is not "very high". It is important to understand the process design and the technologies applied to understand the cumulative electricity consumption of the plant. The supporting document "IRR Annex 17 Load List" details every power consuming technology at the Puduchatram biogas plant and details the annual power consumption (based on name plate capacity and daily operating hours). The annual consumption is approximately 2.6	d. PJRCES has reviewed the SD_58 and found the same to be acceptable. Issue is now closed. e. PJRCES has reviewed the "IRR Annex 17 Load List" and further interviewed the project participants on the same. The explanation provided was found to be acceptable due to the number & type of equipments to be installed. Issue is now closed.

		GWh which is equivalent to 14% (based on 18.6 GWh of gross power production). Please refer to latest version of "IRR Annex 17 Load List" made available to DOE. What can be seen from the load list is a great number of agitators (which are required for mixing a sludge with a high solid component; ie. chicken litter) and strong pumps (equally needed for feedstock with a high dry matter content). On top of that the screw presses which are novel in Indian biogas plants add to further internal power demand. The power demand provided here is adequately assessed for the process design proposed in order to safely and sustainably operate the biogas plant.	CL#17 is now closed.
CL#18 As received during the International global stakeholder consultation PP is requested to respond to following comments. a. What is the exact project cost? The project cost is covering what? Each value should be supported with proof.	/GSC/	a. DOE has been provided with the all costs & business case. Details are confidential (and competitive	Assessment of DVRv01.1 responses a. DOE has received the necessary information and in-line with the documents submitted issue is now

b. How is the base line defined in this project? Is Base line hypothetically defined with no proper evidences and proper justification? c. PP is requested to submit the bank approved copy of DPR and/or FR. d. Is there any past record of PP to invest or not to invest at returns expected in this project? e. PP is requested to submit invoices raised by equipment supplier.		sensitive information). b. See baseline section and DOE visit report, Anna report and Tide report. c. DOE has received documentation. d. Past records have been provided to the DOE (a.o. one investment in EU and one investment in India). e. Provided to the DOE.	closed. b. PP is requested to clarify for referring to Anna report. Issue is open. c. PJRCES has not received the DPR and/or FR approved by bank or any national authority. Issue is open. d. Past records have been checked by PJRCES and found acceptable and hence, issue is now closed. e. PJRCES has not received the invoices raised by equipment supplier. Issue is open. Refer 2nd Assessment.
2nd Assessment b. PP is requested to clarify for referring to Anna report. c. PJRCES has not received the DPR and/or FR approved by bank or any national authority. e. PJRCES has not received the invoices raised by equipment supplier.		Second response: b. PP made a mistake and meant to refer to the SD_04, TNAU report and SD_02 SD_03 Tide Report and Detailed Project Report. c. The DPR has been consented by Pollution Control Board and copy has been handed over to the DOE PJRCDM. e. There is no bank-approved copy of the DPR. Based on the submission from PP to the bank, the bank issued a sanction letter. The same has been	Assessment of DVRv02 responses b. Explanation is accepted also PJRCES has reviewed the revised SD_04 and hence, issue is now closed. c. PJRCES has reviewed the same and hence, issue is now closed. e. Response is not relevant to query. Issue is still open.

3rd Assessment e. Response is not relevant to query.		made available to the DOE for reference. Third Response: e. SD 48 was submitted to PJR. This is the tax invoice from IOTIES for the project on the PP. PP request PJR to close this issue.	Refer 3rd Assessment. Assessment of DVRv03 responses e. PP has submitted two invoices from IOT IES; since, the project is under implementation stage and hence, it is not feasible to verify all the invoices. The two invoices have been verified; issue is now closed. CL#18 is now closed.
CL#19 Energy & Material Balance worksheet a. Cost of chicken litter: PP has referred to different sources. Cell D4 comment, PP has referred to Anna university report. Please clarify the exact source and maintain consistency. Also, justify the conservativeness of the same for the consideration under project activity. b. Cost of Press mud: Justify applicability of IRR Annex 13 & IRR Annex 14. Cost considered is not consistent with the source. Justify the conservativeness of the cost considered. Justify the conservativeness of the gas	/Spreadsheet/	a. For the cost of Chicken litter please refer to the DPR and TIDE reports and SD_31_TIDE_CORRECTIONS_Price_value_chain made available to the DOE. PP have taken the value of the chicken litter based on these reports. b. For the cost of press mud please refer to the DPR and TIDE reports. PP has taken the value of the press mud based on these reports.	Assessment of DVRv02 responses a. PJRCES has reviewed the SD_02 and "*IRR Annex 7 Tide Technical Report*". The cost is now consistent with the source provided and hence, issue is now closed. b. In revised SD_16 the cost is still not in-line with "*IRR Annex 7 Tide Technical Report* – page 3". Issue is still open.

production considered. c. Cost of starch water: Cost considered is not consistent with the source. UNDP report and Project both are different project activities. Please justify the applicability of the UNDP report to the project activity. Justify the conservativeness of the gas production considered. d. Cost of Cow dung: Publication date of the MNES report is not clear. Cost considered is not consistent with the source. Justify the conservativeness of the cost.		c. PP have not taken any cost for sago water as it is evaluated to be available free of cost. Only transportation cost for tankers to bring sago water to site is considered in the project. d. The date of the publication is not clear that is true and it is not known to PP. The point of adding the report was to show the CH4 value of cow dung (page 9) and since the report appears to be published around 2005 (by an Indian Ministry) it is highly unlikely that the CH4 value of cow dung has changed over the elapsed time. It is true that the cost for cow dung does not appear to be consistent with the Tide report (i.e. Annex 7 page 3). This was a mistake and it has now been corrected in the financial model (ref. SD_16) and the average cost as given in the Tide report is now being used (i.e. a drop from 1000 INR/t to 700 INR/t).	c. PJRCES visited the place from where sago water is being sourced and also interviewed the service provider for transportation of the same and hence, justification is acceptable and hence, issue is now closed. d. Explanation is accepted. PJRCES visited web link "http://www.indg.in/rural-energy/technologies-under-rural-energy/energy-production/biogas-mnre%20booklet.pdf/view?set_language=en" and confirmed that no date is available. Also, PJRCES verified on the Page3 of the report which claims that information is as on 31-Mar-2005. However, the methane content in the cow dung was also verified through other link i.e. "http://www.green-trust.org/2000/biofuel/methane.htm" and was found to be in the similar range and hence, the issue is now closed. Also, PJRCES has reviewed revised

			SD_16 and found that PP has corrected the cost of cow dung and made it in-line with the source and hence, issue is now closed.
e. Cost of process water: PP is requested to substantiate the cost considered.		e. The cost of water is considered as per tanker cost of water Rs 600/ 12 m^3 tanker, this is bare minimum cost for water based on market condition.	e. In-line with assessment of CL#19(c) above, explanation is accepted and hence, issue is now closed.
f. Calorific value of biogas: Please clearly specify the source.		f. The calorific content of biogas can be expressed as LHV (Hi) and HHV (Hs). For calculating the electrical output of CHP engines the calorific value of biogas at LHV is required which for this biogas plant is 6 kWh/m^3. This is derived from the following: Pure methane (i.e. 100%) has an upper calorific value of 55.5 MJ/kg and a lower calorific value of 50 MJ/kg, which corresponds to a ratio of 0.901 (see http://en.wikipedia.org/wiki/Heat_of_combustion). Expressed in the more conventional units (i.e. kWh/m^3) 100% of methane has a calorific value (HHV) of 11.06 kWh/m^3. To convert this to biogas with 60% methane and to LHV the following formula is used. 11.06	f. PJRCES has reviewed the link "http://en.wikipedia.org/wiki/Heat_of_combustion" and also reviewed the calculation for the same and found to be acceptable and hence, issue is now closed.

		kWh/m^3 x 60% methane x 0.901 = 6 kWh/m^3 (LHV).	
g. Gas engine PLF: Please clarify how the same is in-line with Annex11, EB48.		g. CHP plant load factor: EB48 Annex 11, Guidelines for the reporting and validation of plant load factors (Version 01), section II, paragraph 3 for determining the plant load factor stipulates the plant load factor that has been used for bank financing or determined by a third-party (e.g. engineering company) to be used. IOTM has used a plant load factor of 7500h/8760h in the DPR (i.e. SD_03 page 114) and has negotiated an MOU for an O&M contract over 8000h/8760 with Green Power International (please refer to supporting document "IRR Annex 3"). PP have henceforth taken the average of the two aforementioned operating hours of 7750h which is equivalent to a PLF of 88%.	g. Issue is covered in CAR#09(n) and will be closed there only. This point is now closed.
h. Justification for assuming that gas engines may attain operation level of 95% is not adequate.		h. This has now been corrected and assumes a full name plate capacity operation of 2400 kW (el) at each operating hour, although it is PP's expert opinion that this cannot be achieved in reality (i.e. operating	h. Revised SD_16 provides corrected value and hence, issue is now closed.

i. Gas engine efficiency: PP is requested to submit copy acknowledged by Green power international (P) Ltd. j. Electricity Auxiliary consumption: PP is requested to substantiate IRR Annex 17 Load list. Also, in justification provided at cell F59 is not adequate.		conditions vs. test conditions). i. Copy of the O&M term sheet signed with GPIL has been made available to DOE as SD_42. The offer from GPIL itself was with O&M terms. PP refers to SD_46. j. The load list as per supporting document "IRR Annex 17 Load List" has now been revised according to the latest O&M protocol by PP's internal experts. The same has been made available to DOE. PP have not made any deductions to the total value provided in "IRR Annex 17 Load List", although it is the expert opinion of PP that a deduction is justified since the name plate capacities of each electrical item will not operate at full name plate capacity. Please also refer to PP's Second Response to CL#17 (e).	i. Issue related to SD_46 is covered in CL#06(e) and will be closed there only. This point is now closed. j. In-line with the assessment of CL#17(e), the explanation is accepted and hence, issue is now closed. Refer 3rd Assessment.
3rd Assessment b. In revised SD_16 the cost is still not in-line with "*IRR Annex 7 Tide Technical Report* – page 3". Issue is still open.		Third Response: f. PP refer to SD_03 DPR page 67 where in table 5 for press mud the price mentioned is INR 450, which is the result of average INR 250 purchase price (see IRR Annex 7	Assessment of DVRv3.0 response b. The cost considered by PP is consistent with SD_03 page#67 and hence, issue is now closed.

		Tide report) plus a logistics assumption of INR 200 = INR 450.	CL#19 is now closed.

APPENDIX B
VALDIATION TEAM DETAILS

Team Member	Role	Experience
Mathsy Kutty	Lead Validator and Team Leader Sector Expert – 01, 13	Mathsy. K holds a Bachelors degree in Environmental Engineering in addition to Masters in Environment & Ecology. She has a combined experience of 10 years including national and international experience in environmental field. Prior to working in the Climate change related field, she was working at for a firm on the implementation of legal compliance management systems for various industries like the thermal power plants, construction, and mining industry. At this firm, her specific responsibility was on the legal compliances in the Environment, Health and Safety requirements by the law of the land. Earlier to this company she also worked in providing consulting for the various Management System implementation, viz; ISO 9001, ISO 14001 and OHSAS. The main industry types covered include state Government transport sector, textile industries. She has also undergone the internal auditor course and the Lead Auditor course for ISO 14001. She has a strong background in climate change & Environment related issues and DOE back ground of (about 7 years) Validating and verifying projects in sectors like Renewable energy (Sectors TA 1.1 and TA 1.2 of latest accreditation standard), Energy Efficiency (Sectors TA 1.1 of latest accreditation standard), Waste handling (Sectors TA 13.1 and TA 13.2) and Manufacturing Industries (Sector SS 4 of latest accreditation standard). She has worked in more than 10 projects in the waste heat recovery in cement and steel sector including projects from South East Asia. Has reviewed and registered more than 100 projects in different capacities i.e. as CDM validator/ verifier/Project Manager/Technical Reviewer.
Chirag Gajjar	Lead Validator & Sector Expert – 01	Over 5 years of Experience in the fields of CDM/Climate Change – worked as CDM Consultant and working as GHG Auditor with PJRCES. CDM/VCS Projects - Preparation and Review of Project Information/Concept Note, CDM – Project Design Documents, (PDD), VCS 2007 – Project Description (PD) for Renewable energy projects under Scope 1, Facilitation during Validation & Verification – responding to CARs/CLs, revision in the methodology under Scope 4 (manufacturing sector), facilitating the sale of CERs, As a DOE review of projects under Scope 1 for renewable energy projects. In addition to the above, also have experience in GHG Accounting and CSR Assurance services. GHG Accounting – Estimation, Development of Empirical models as per GHG Protocol, verification of the GHG emissions of the organization as per ISO14064.

		CSR – Verification of the Key Performance of indicators related to Waste, Energy and water under Corporate Sustainability Report as per GRI G3 guidelines.
Ajay Verma	Lead Validator	Ajay Verma holds a Bachelor degree in Chemical Engineering and Postgraduate degree in Energy Management. He has a combined experience of 4.5 years. Prior to his entry into the CDM market business, he worked for 1.5 years in energy auditing wherein he was involved in energy audits for plant utilities, commercial buildings, manufacturing plants. During his tenure in industry, his technical responsibilities included involvement in base data collection, analysis and preparation of consolidated energy audit report with energy saving measures. He is a certified Energy Auditor by BEE (Bureau of Energy Efficiency) Government of India, a certified Indian Green Building Council Accredited Professional (IGBC AP) and trained as a Lead Auditor for EMS (ISO 14001). He has also trained on "Photovoltaic System Design, Operation, Maintenance and Repair of Solar PV Systems" conducted by Solar Energy Center, Ministry of New and Energy, government of India. His experience in CDM includes 2 years in CDM projects development consultancy and 1 year in validation and verification of projects in regulated as well as non-regulated market. He has handled various CDM projects in different areas like renewable energy, energy efficiency, waste heat recovery, fuel switch etc.
Shailendra Jain	Sector Expert – 13	Mr. Jain holds a Bachelors Degree in Mechanical Engineering. He has engineered and executed various green field methane recovery projects for Bhopal Gelatine Private Limited, Bhopal, M/s Haldiram, Nagpur, Indorama Synthetics Limited, Nagpur, etc. He also has developed manure based biogas power plant at many small and medium sizes dairy with herd size from 300 to 800 for captive use of electricity. He has also been instrumental in up gradation of effluent treatment facilities to augment methane recovery and utilization for Cadbury India Limited, Malanpur, Gwalior, Cadbury India Limited Buddi, Himachal Pradesh, Narmada Gelatine Limited, etc. He has also developed a 0.5 MW manure based methane recovery project which is under CDM Validation. He is also developing a PoA for methane recovery from live stock farm.
Anuradha S.	Financial Expert	Ms. Anuradha is a Commerce graduate and a Chartered Accountant. She is also an Information System Auditor (ISA). She has a work experience in:

		• Statutory Audits; Test check, random verification of transactions, preparation of financial statements, and verification of compliance of various statutory requirements. • Internal Audits: Detail verification of transactions, preparation of Bank Reconciliation Statement, Branch reconciliation. • Handling internal, statutory and tax audits of 75 entities • Income tax assessments She handled income tax assessments and finalization of financial statements of individuals, firms and corporate (around 10 corporate and over 150 entities). She was involved in preparation of project reports (financials) for borrowings from financial institutions and verification of project reports with regard to the investment feasibility. She has worked on financial expert for around 30 CDM and 70 VCS projects.
Sathis Kumar	Independent Technical Review Sector expert – 01	**Sathis Kumar** holds a Bachelor's degree in Mechanical Engineering and a Post Graduate Diploma in Energy Management. He has a total experience of around ten years after graduation. Prior to entering the CDM field he worked as Assistant Director in the Energy Management division of National Productivity Council (NPC), an autonomous organization under Ministry of Industry and Commerce, Government of India. In NPC he was actively involved in energy audit studies, preparing project reports, feasibility reports, reference manuals for various training programmes & workshops. As an Energy Auditor he was responsible for carrying out a detailed energy audit studies in buildings and industries, quantifying energy consumption and establishing base line energy information, doing energy and material balance, performing efficiency evaluation of energy & utility systems, comparing energy norms with existing energy consumption levels, etc. He is a Certified Energy Auditor by Bureau of Energy Efficiency, Government of India. He is also a Certified Measurement and Verification Professional (CMVP) by Efficiency Evaluation Organization (EVO) and has also completed the advanced Lead Auditor training for ISO 14001 approved by IEMA. He has around 4.5 years of experience in validation and verification of CDM projects. He has worked in more than fifty CDM projects (in his previous company-SGS) from both India and abroad and has experience of handling projects in different sectoral scopes like 1, 4, 11, 13 and 15. He was an approved expert in SGS for the technical areas of TA 1.1 (Thermal energy generation from fossil fuels and biomass including thermal electricity from solar, TA 1.2 (Energy generation from renewable energy Sources- Wind and Hydro), TA 2.1

		Electricity distribution, TA 2.2 Heat distribution, TA 3.1 Energy Demand. His sufficient sectoral competence in Energy Industries (renewable / non-renewable sources), Energy Distribution, Energy Demand and Energy Efficiency is sufficiently demonstrated through his educational qualification and work experience.
Dr Chakradhar	Sector Expert – 13	Dr. Chakradhar is a Ph.D (**Chem.Engg**) and has working as independent Environment management & waste treatment consultant since, August 2008. He is having a vast experience of 30 years in the fields of Environment management, waste treatment and methane recovery. He has served with various reputed organizations such as, National Environmental Engineering Research Institute, NEERI, Hyderabad Zonal Laboratory (Deputy Director), Regional Research Laboratory (RRL), Bhopal (CSIR, New Delhi.), etc. He has been former Expert Member for • Expert Committee Member, Thematic expert group on prevention, abatement and control of pollution for environmental research national river conservation and climate change/ clean technologies MoEF, New Delhi. • Member of CFO committee of AP Pollution Control Board, Hyd. • Expert Committee Member for Hazardous Waste contaminated sites monitoring, Bio Remidiation,& control-MoEF, New Delhi His sufficient sectoral competence in Bio-Technology- Methane Recovery, Hazardous waste management (Landfill sites), Industrial Waste Treatment Plant, Mathematical Modeling for air, water / wastewater and hazardous waste management is sufficiently demonstrated through his educational qualification and work experience.