GS-VER VALIDATION REPORT

INSTALLATION OF BIOGAS PLANTS BY INSEDA MEMBERS & PARTNERS IN INDIA

REPORT NO. 2010-0465

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GS-VER GS-VER VALIDATION REPORT

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Recommended for approval	Approved by	Organisational unit:
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Client:	Client ref.:
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Summary:

Project Name: Installation of Biogas Plants by INSEDA Members & Partners
Country: India
Methodology: Indicative programme, baseline and monitoring methodology for Small Scale Biodigester Voluntary Gold Standard
Version: 1
GHG reducing Measure/Technology: Biogas use in rural house holds mainly for cooking and heating.
ER estimate: 24 170 tCO_2e per year (average)
Size

☐ Large Scale ☒ Small Scale

Validation Phases:

☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues

Validation Status

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

In summary, it is DNV's opinion that the project activity "Installation of Biogas Plants by INSEDA Members & Partners" in India, as described in the PDD, version 02 of 23 May 2011, meets all relevant Gold Standard requirements for GS-VER projects. DNV thus requests the registration of the project as a Gold Standard VER project activity in the Gold Standard Registry.

Report No.:	Subject Group:
2010-0465	Environment

Report title:
Installation of Biogas Plants by INSEDA Members & Partners in India

Work carried out by:
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Work verified by:
Wu Lin

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Abbreviations

AKKPS	Aadivasi khadi Avom krishi Pariskchan Sansthan
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
DNV	Det Norske Veritas
DOE	Designated Operational Entity
EIA	Environmental Impact Assessment
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GS	Gold Standard
GS-TAC	Gold Standard Technical Advisory Committee
GS-VER	Gold Standard -Verified Emission Reduction
GWP	Global Warming Potential
IIT	Indian Institute of Technology
INR	Indian National Rupees
INSEDA	Integrated Sustainable Energy and Ecological Development Association
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of approval
LPG	Liquified Petroleum Gas
MP	Madhya Pradesh
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PP	Project participant
SDA	Sustainable Development Agency
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change
VER	Voluntary Emission Reduction
VERPA	Verified Emission Reductions Purchase Agreement

1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the project activity "Installation of Biogas Plants by INSEDA Members & Partners" in India. The validation was performed on the basis of Gold Standard criteria for voluntary offset project activities and 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 DNV with sufficient evidence to determine the fulfilment of stated criteria.

The project correctly applies the Gold Standards baseline and monitoring methodology "Indicative programme, baseline and monitoring methodology for Small Scale Biodigester".

The project activity involves bundling of household biodigesters installed in various districts forming a part of the states of Kerala and Madhya Pradesh in India. As a result, the project results in reductions of methane 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 24 170 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.

The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is DNV's opinion that the project participants are able to implement the monitoring plan.

In summary, it is DNV's opinion that the project activity "Installation of Biogas Plants by INSEDA Members & Partners" in India, as described in the PDD, version 02 dated 23 May 2011, meets all relevant requirements for Gold Standard oluntary offset project activities and correctly applies the Gold Standard baseline and monitoring methodology "Indicative programme, baseline and monitoring methodology for Small Scale Biodigester". DNV thus requests the registration of the project as a GS-VER project activity.

New Delhi and Oslo, 27 June 2011

Nitin Kapoor
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Michael Lehmann
Director of Services and Technologies
DNV Climate Change Services AS

2 INTRODUCTION

Integrated Sustainable Energy and Ecological Development Association (INSEDA) has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the project activity Installation of Biogas Plants by INSEDA Members & Partners in India (hereafter called "the project"). This report summarises the findings of the validation of the project, performed on the basis of GS-VER criteria for the GS-VER project activities, as well as criteria given to provide for consistent project operations, monitoring and reporting.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant Gold Standard criteria for voluntary offset project activities, as well as criteria given to provide for consistent project operations, monitoring and reporting are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all Gold Standard voluntary offset project activities (GS VER) and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of GS VERs.

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the Gold Standard criteria stated for voluntary offsets projects and the approved baseline and monitoring methodology. The validation was based on the recommendations in the UNFCCC Validation and Verification Manual.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk review of the project design documentation

The following tables list the documentation that was reviewed during the validation.

3.1.1 Documentation provided by the project participants

/1/ INSEDA: *PDD for project activity "Installation of* Biogas Plants by INSEDA Members & Partners*" in India*, Version 01 dated 14 April 2010 and version 02 dated 23 May 2011

/2/ INSEDA: ER sheets, version 1 dated 14 April 2010, and version 2 dated 23 May 2011.

/3/ Undertaking dated nil by Secretary General com Chief executive of INSEDA (PP) to confirm that INSEDA has no registered CDM/VER project activity.

/4/ Undertaking given by 4265 plant owners (all) of Madhya Pradesh and Kerala to confirm that biodigesters are not included in any other voluntary programme or CDM activity.

List with unique identification of all 4265 plant owners.

Agreement between local NGOs and INSEDA conforming transfer of Voluntary Carbon Credit rights.

/5/ Web link: http://en.wikipedia.org/wiki/Kerala, to confirm the climatic zone for the state of Kerala which is equatorial tropic climate

/6/ Web link: http://en.wikipedia.org/wiki/Madhya_Pradesh, to confirm the climatic zone for the state of Madhya Pradesh which is sub tropical climate

/7/ Survey's conducted to know the type and quantity of firewood used in the absence of the project activity and confirm the average monthly income of households included in the project activity

1. "Department of Bio-energy, Agricultural Engineering College & Research Institute, Tamil Nadu Agricultural University" dated 27 April 2010 for the state of Kerala.

2. "Environment and Energy Management Group, Bhopal for the state of Madhya Pradesh dated 10 June 2010.

Mail dated 6 April 2010 from Gold Standard confirming that "methodology is applicable and survey to be completed as soon as possible if not conducted as yet".

/8/ Web link: http://www.indiaenvironmentportal.org.in/files/527_final.pdf , to confirm the energy source for cooking in Indian Households

/9/ Web link: http://wgbis.ces.iisc.ernet.in/energy/paper/scope%20for%20solor%20energy%20device

s/solar%20devices.htm, shows the usage of kerosene required ranges from 0.05 (hilly) to 0.34 (coastal) kg/person/day

/10/ Web link: http://www.mp.gov.in/mpfood/Pra-Prativeden-2006-07_add.pdf, to confirm that the cost of kerosene in M.P. ranges between INR 8.86 – 9.97/litre

Documents of Kerala Government to confirm the cost of kerosene is INR 9.5/litre in Kerala (not dated)

Purchase receipt of Kerosene stove dated 13 Aug 2006 shows cost is Rs.480

/11/ ODA declaration in GS prescribed form dated 9 Nov 2009 by PP confirming no usage of any Official development assistance

Mail from Gold Standard dated 16 September 2010, to confirm that financial plan is not required along with ODA

/12/ Web link: http://www.iei-asia.org/IEIBLR-LPG-IndianhomesReport.pdf (page#17), shows 11.3 kg of LPG gas is required for cooking in one month for an average Indian family.

Purchase receipt dated 5 November 2009 of Indane (one of the biggest gas supplier) to confirm the cost of a gas cylinder as INR 325.

Web link: http://www.iocl.com/Products/LiquefiedPetroleumGasFAQ.aspx-, to confirm the cost of a LPG Stove at INR 1 250.

/13/ Commissioning certificate dated 4 July 2006 by AKKPS for the first bio digester confirming the date of commissioning as 1 June 2006, which is after 1 January 2006.

/14/ Web link: http://www.ecology.kee.hu/pdf/0604_015027.pdf, dated 13 November 2006 shows the lower penetration of biogas plants in India (confirming that only 3.44 Million have been installed against a potential of 12 Million)

/15/ Ration card copies provided by the Government to confirm the monthly income is approximately INR 500 of the local persons in the state of Kerala and INR 850 in Madhya Pradesh where biodigesters are installed (not dated). These were verified during the site visit.

/16/ Audit report of the NGO AKKPS (Aadivasi khadi Avom krishi Pariskchan Sansthan), M.P. 2006 confirming the estimated cost of bio digesters at ($2m^3$- INR 9 650, $3m^3$-INR 11 600, $4m^3$-INR 13 850 and $6m^3$-INR 16 500)

/17/ Evaluation Study on National Project on Biogas Development, May 2002; (page#9 and 12) stating that “only 7% households in the sample villages were found to be using biogas, often as a supplementary source of fuel” and very less funds available for training and research and development.

“Renewable Energy Resources for Climate Change Mitigation” which confirms an achievement of approximately 28% only of the targeted potential of Biogas plants confirming lower dissemination in the host country

/18/ Letter dated 24 September 2010 from Dr. Virendra Kumar Vijay, IIT stating the lifetime of biodigesters as 10-15 years.

/19/ Web link:

http://www.mospi.gov.in/nsso_4aug2008/web/nsso/sdrd/findings%5C61R_1.0.pdf, (Energy Sources of Indian Households for Cooking) confirming that lower monthly per capita expenditure classes used more firewood & chips

/20/ Letter from Dr. Virendra Kumar Vijay, Biogas development & Training centre, IIT Delhi stating physical methane leakage from the project type biodigesters ie Deenbandhu biodigestors is not more than 5% (not dated).
Confirmation by GS via e-mail dated 21 September 2010 that the letter can be used for the purpose of calculation of project emissions for the project activity if required.

/21/ Web link: http://envfor.nic.in/legis/eia/so1533.pdf, to confirm that the project activity does not require a prior environmental clearance.

/22/ Stakeholder meeting advertisement in Kerala, published in Sunday Express (English) as well as in Malyalam Manorma (in Malyalam-vernacular language) on 11 October 2009
Stakeholder meeting advertisement in Madhya Pradesh advertisement was published in Dainik Bhaskar on 8 October 2009.

/23/ Details of the blind sustainable exercise conducted post distribution of the non technical summary during the main stakeholder consultation dated 12 October 2009 and 11 October 2010 for the state of MP and 14 October 2009 and 19 October 2010 for the state of Kerala.

/24/
- Resolution of AKKPS dated 26 December 2005 confirming the consideration of carbon revenue for the project activity.
- Board resolution from Gramudyog Mandal dated 27 December 2005 stating Gramudyog Mandal along with AKKPS will install biogas plants in the state of Madya Pradesh and will consider carbon credits as well.
- Board Constitution document of Gramudyog Mandal dated 21 April 2004 confirming the members of the board to the Resgistrar of Companies. This is used to confirm that there are common members to the board of AKKPS and Gramudyog Mandal
- Resolution dated 2 February 2006 of Sustainable Development Agency (SDA) stating installation of biogas plants in the state of Kerala and consideration of carbon credits for the project activity.
- Board Resolution of INSEDA dated 28 September 2007 stating that Carbon credits have been considered for the project activity. The Board note also confirms that INSEDA will henceforth be the managing entity for the project activity.

Discussion with GTZ, consultants and their subsequent appointment on 1 January 2008 for writing the PDD and other associated work.

/25/ Verified Emission Reductions Purchase Agreement (VERPA) between First Climate & INSEDA on 2 May 2008.

/26/ Mail copies confirming the submission of PDD and passport to GS for pre feasibility assessment on 16 February 2009.

/27/ GS passport submitted to GS and the pre feasibility assessment report by GS as confirmed from the email by GS dated 8 September 2009

/28/ Appointment of DOE as confirmed from the signed validation contract dated 10 March 2010

/29/ Mail from Gold Standard dated 23 September 2010, confirming that documents related to stakeholder feedback round can be made publically available for one week subject to a live meeting conducted for feedback round

/30/ Minutes of meeting of main as well as feedback consultation rounds with stakeholders on 12 October 2009 and 11 October 2010 for the state of MP.

/31/ Minutes of meeting of main as well as feedback consultation rounds with stakeholders on 14 October 2009 and 19 October 2010 for the state of Kerala.

/32/ Copies of invitation e-mail sent to GS, GS supporter NGOs, local NGOs and DNA of India inviting them for the main stakeholder consultation as well as the feedback consultation round

/33/ NSS Report No 527: Household Consumer Expenditure in India, 2006-07, page # 28, dependence on firewood and wood chips for cooking is high in Kerala, followed by Chhattisgarh and Madhya Pradesh (MP)

/34/ Forest Survey of India report, Kerala 2009 & Forest Survey of India report, M.P. for confirming the total geographical Area (Kerala & MP) and Forest land (Kerala & MP).

/35/ Forestry For Sustainable Biomass Production And Carbon Sequestration In India Ravindranath et al. 2001 for confirming (1) Sustainable rate of fuel wood extraction from Kerala & MP (2) Sustainable extraction rate from plantations.

/36/ Community Forest Management and Joint Forest Management; An Ecological, Economic and Institutional Assessment in Western Ghats, India- Sudha dated 1987- confirming the mean annual increment 2.84%

/37/ Department of Economics & Statistics report 2009, Kerala for confirming total plantation area including misc tree crops and groves used in the calculation of NRB

/38/ Census of India 2001 (http://www.censusindia.gov.in/Tables_Published/Basic_Data_Sheet.aspx) for confirming the population of Kerala and MP

Census of India-2001 (Kerala& MP)-Housing profile for confirming the percentage of households reliant on biomass for cooking.

/39/ The Management, Operation and Training Manual of INSEDA outlining procedures for maintenance, details of the bio digesters, monitoring requirements and the roles and responsibilities, version 1 dated 31 July 2007

3.1.2 Methodologies, tools and other guidance by Gold Standard

/40/	CDM : Validation & Verification Manual, version 1.2
/41/	Latest version (2.1) of the Gold Standard toolkit confirming that project applying for retroactive registration by uploading the required documentation and paying the pre-feasibility assessment fee before 1 August 2009 will still be able to use Version 2.0 of the GS toolkit
/42/	The Gold Standard: Indicative programme, baseline, and monitoring methodology for Small Scale Biodigester Voluntary Gold Standard, version 1
/43/	CDM Executive Board: Tool for the demonstration and assessment of additionality version 5.2 UNFCCC Link to confirm India as a Listed Non-Annex I Party http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php CDM Executive Board: EB 49, Annex 22 - Revision to "Guidelines for the demonstration and assessment of prior consideration of the CDM' (version 03)
/44/	General guidelines for sampling and surveys for SSC CDM project activities Web link: http://cdm.unfccc.int/Panels/ssc_wg/meetings/020/ssc_020_an14.pdf
/45/	IPCC Guidelines 2006 for National Greenhouse Gas Inventories

3.2 Follow-up interviews with project stakeholders

During the period 6 to 7 May 2010 (Kerala) and 27 to 28 May 2010 (Madhya Pradesh), Nitin Kapoor and Krishnan Namboodri of DNV conducted site visits and visited a few households where the project bio digesters have been installed. The households were selected at random from the complete list where the bio digesters have been installed. During the site visit, DNV also interacted with the project developer (INSEDA) and local stakeholders, to discuss on topics as stated below. DNV further had face to face interviews with GS on 6 May 2011 to confirm the appropriateness of the prior consideration for the project activity as well as on the calculation of project emissions.

	Date	Name	Organization	Topic
/46/	6, 7 May 2010 in Kerala	Mr. Raymond Myles	INSEDA	Carbon revenue consideration; Project starting date; Stakeholder consideration process; System and procedures for data recording.
		1. V.P.Thomas 2. T.E.Muhaammad 3. K.P.George 4. Sr.Theyyamma Matha nethrakanthi siddha vaidyasramam 5. John Verkey 6. T.S.Jayan 7. Sergy Mathew 8. Madusudanan Nair 9. Reji Mathew	Stakeholders from Kerala	Pre-project scenario; Quantity of firewood used in the pre project scenario; Source of firewood and time used in gathering the firewood; Income as verified from the ration cards with the households visited; Any issues with the operations of bio digesters Confirmation on the transfer of rights of carbon revenue to the local NGOs. Benefits accruing to them from the NGOs; Capacity of bio digesters.
	27, 28 May 2010 at Madhya Pardesh (MP)	10. Lal Singh 11.Likhan lal 12. Sher Singh/Lakshman 13.Esvant/Kalka 14. Harakchand	Stakeholders from Madhya Pradesh	Confirmation that INSEDA and their members NGOs are carrying out the routine maintenance of bio digesters

	15. Garjan Singh		
6 May 2011	1. Abhishek Goyal 2. Ayushi Jain	Gold Standard Foundation-New Delhi	Confirmation on the appropriateness of the prior consideration; Project emissions

3.3 Resolution of outstanding issues

The objective of this phase of the validation is to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the 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 GS-VER 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.

The validation protocol consists of four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the project activity "Installation of Biogas Plants by INSEDA Members & Partners" is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

(b) The GS-VER requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable GS-VER requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the GS-VER requirements for registration.

Validation Protocol Table 1: Mandatory Requirements for Gold Standard VER 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 either acceptable based on evidence provided (**OK**) or a **corrective action request (CAR)** if a requirement is not met.*

Validation Protocol Table 2: Requirement Checklist				
Checklist question	***Reference***	***Means of verification (MoV)***	***Assessment by DNV***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the PDD	*Gives reference to documents where the answer to the checklist question or item is found.*	*Means of verification (MoV) are **document review (DR)**, **interview (I)** or any other follow-up actions (e.g., on site visit and telephone or email interviews) and **cross-checking (CC)** with available information relating to projects or technologies similar to the proposed project activity under validation.*	*The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.*	*OK is used if the information and evidence provided is adequate to demonstrate compliance with GS-VER requirements. A c**orrective action request (CAR)** is raised when project participants have made mistakes, the GS-VER requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A **clarification request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable GS-VER requirements have been met. A **forward action request (FAR)** during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/ or clarification requests	***Ref. to checklist question in table 2***	***Response by project participants***	***Validation conclusion***
*The **CARs** and/ or **CLs** raised in Table 2 are repeated here.*	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants to address the CARs and/or CLs.*	*The validation team's assessment and final conclusions of the CARs and/or CLs.*

Validation Protocol Table 4: Forward Action Requests		
Forward action request	***Ref. to checklist question in table 2***	***Response by project participants***
The FARs raised in Table 2 are repeated here.	*Reference to the checklist question number in Table 2 where the FAR is explained.*	*Response by project participants on how forward action request will be addressed prior to first verification.*

Figure 1: Validation protocol tables

3.4 Internal quality control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for GS-VER validation and verification.

3.5 Validation team

				Type of involvement					
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Sectoral competence (Sectoral scopes 3 & 13)
CDM validator / Technical team leader	Kapoor	Nitin	India	✓	✓	✓	✓		✓
GHG auditor	Namboodri	Krishnan	India	✓	✓				✓
Technical reviewer	Lin	Wu	China					✓	

The curricula vitae of each individual validation team member are detailed in Appendix B to this report.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. 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.

The final validation findings relate to the project design as documented and described in the PDD, version 02 dated 23 May 2011.

4.1 Project design

The project activity involves setting of bio digesters in households spread over various districts in the states of Kerala and Madhya Pradesh (MP) which form a part of India. The coordinates of all the districts included in the project activity have been detailed in section A.4.1.3, Table 2 in the PDD /1/.

The project activity has involved the installation of fixed-dome digesters which consist of one lower segment (digester) and a hemisphere over it which functions as a gas holder. The "feed" is fed into the digester via the inlet pipe and undergoes digestion in the digestion chamber. Anaerobic digestion takes place in the biodigesters in which microorganisms break down biodegradable material (primarily cow dung) in the absence of oxygen. This process produces methane (CH_4) rich biogas, which serves as a substitute fuel for non-renewable biomass for cooking applications. The project activity has been implemented and involved installation and operation of such biodigesters with capacities of 1 m^3, 2 m^3, 3 m^3, 4 m^3 and 6 m^3 which has been confirmed during the site visit /46/. Thus the implementation of the project activity eliminates the usage of non renewable biomass which was being used in the baseline. This is also the pre project scenario as confirmed from the survey reports /7/ and site visit interviews with the various project stakeholders /46/. The project description is complete and accurate.

Project activity is not a de bundled component of large project activity as this is the first GS VER project activity by the project participant has not registered any other VER project activity before this project. This has been verified from the undertaking by PP /3/ that there is no other similar project activity by PP.

The project starting date is 1 June 2006 as confirmed from the commissioning date of the first bio digester /13/.

The lifetime of the project activity is stated to be 15 years and was verified based on the letter from Indian Institute of Technology (IIT) /18/. The project proponent has chosen a fixed crediting period of 10 years with 2 years of retroactive crediting from the date of registration which is acceptable as per GS rules. The start date of crediting period has been mentioned as 1 September 2009 which is appropriate.

DNV considers the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant forms and guidance for completing the PDD.

4.1.1 Project eligibility criteria

DNV has evaluated the seven criterions to confirm that the project is eligible:

(a) Scale of Project Activity: DNV has been able to confirm that it is a small scale VER project as the project is a renewable energy project with a thermal capacity of 39.43 MW_{th} as

confirmed from the Excel sheet /2/. This is equivalent to 13.14 MW_{el} and hence less than the threshold value of 15 MW.

(b) Host Country or state: India is the host country and is eligible as confirmed from the website provided in GS Toolkit, version 2 /41/. India is listed as a Non-Annex I Party on the UNFCCC website /43/.

(c) Type of Project: The project activity is a renewable energy supply category generating heat from non fossil fuel energy sources as it involves generation of biogas using animal waste.

(d) Greenhouse Gases: The greenhouse gas is Carbon Dioxide which is eligible as per the GS toolkit, version 2, Table 1.3 /41/.

(e) Official Development Assistance (ODA): The validation has not revealed anything that could confirm any ODA flow into the project. The PP in addition has provided an ODA declaration confirming non usage of any ODA /11/.

(f) Project Timeframe:

1. Previous announcement check: DNV has been able to confirm from the board note /24/ that the project requires revenue from carbon credits.
2. Retroactive Registration: The project activity was operational at the time of first submission to GS and hence has undergone pre feasibility. DNV has verified the pre feasibility assessment by GS /27/.
3. Retroactive Crediting: The project activity applies for GS-VERs under retroactive registration and the VERs shall be claimed for a period not exceeding 2 years prior to GS registration. This has been clearly mentioned in the PDD /1/.
4. Parallel Submission: The project is being submitted only to GS-VER stream. An undertaking that all 4265 biodigesters included in the project activity are not included in any other voluntary programme or CDM activity /4/.

(g) Other Certification Schemes: The project is not claiming any other certificates under any other certification schemes. An undertaking that all 4265 biodigesters included in the project activity are not included in any other voluntary programme or CDM activity /4/.

4.1.2 Project Type Eligibility Screen

The project activity involves setting of bio digesters in households spread over various districts in the states of Kerala and Madhya Pradesh (MP). According to the Gold Standard Toolkit (version 2) /41/, the proposed project falls into category A.1. - Renewable Energy Supply project activity, involves generation of energy services (heat) from non fossil and non-depletable resources.

This project adopts ecologically sound bio digesters and generates emission reductions due to avoidance of non renewable biomass. Hence, the project is eligible under the Gold Standard.

4.1.3 Host country eligibility check

India as host country has no quantitative reduction target under the Kyoto Protocol. India is also identified as a Non Annex I country as confirmed from the UNFCCC website /43/.

4.2 Application of selected baseline and monitoring methodology

The project correctly applies Gold Standard Methodology "Indicative programme, baseline, and monitoring methodology for Small Scale Biodigester" /42/ as explained below:

** This methodology is applicable to the project involving the implementation of biodigesters in households within the project's boundaries.*

It has been confirmed while undertaking the site visit /46/ that the project activity involves biodigesters in the households bound within the states of Madhya Pradesh and Kerala in India.

** The project activity is implemented by a project coordinator who acts as the project participant. The individual households will not act as project participants.*

INSEDA is the project coordinator and acts as the project participant. The individual households are not the project participants as confirmed during the site visit through interviews with the households /46/. It was further confirmed that individual households have signed agreements with the respective state NGOs who in turn have signed an agreement with INSEDA that is acting as a bundling agency /4/.

** The biodigesters program promotes the wide-scale use of biogas as substitute for wood, agricultural residues, animal dung and fossil fuels that are presently used for the cooking, space heating and lighting needs of most rural households.*

The project activity since involves the installation of bio digesters in 4 265 rural households and thus promotes the wide scale use of biogas as a substitute fuel for cooking in the rural households. It has been confirmed from the surveys carried out by the project proponent /7/ and on-site interviews /46/ that firewood was primarily utilized for domestic needs before the implementation of the project.

** The methodology applies to project with biodigesters with a maximum total biodigester volume of 20 m^3.*

The project activity involves biodigesters with a maximum volume of 6 m^3 as confirmed from the list of bio digesters /4/ that form part of this project activity.

** The biodigesters in the programme are not included in another CDM or voluntary market project, (i.e. no double counting takes place).*

DNV has verified the agreement of the farmers with the respective state NGOs transferring their rights for Carbon Credits to state NGOs /4/ (agreements with all individual farmers). Similarly, the state NGOs have transferred the rights of Carbon Credits to INSEDA /4/ which is the project proponent and the bundling agency for the project. INSEDA has given an undertaking that this project activity will not be included in any other CDM or voluntary market project to avoid double counting /3/. DNV also confirmed that there is no such project that is under validation with the UNFCCC by cross checking the title on the UNFCCC website (http://cdm.unfccc.int/Projects/Validation/index.html).

** If more than one climate zone is included in the project, the project should make a distinction per climate zone.*

It has been confirmed that Kerala has equatorial tropic climate also known as tropical rainforest climate while Madhya Pradesh has sub tropical climate /5/. Since there are two

climatic zones involved in the project activity, the emission reduction calculations as well as monitoring shall be done separately for each of the two states independently.

DNV thus concludes that the GS-VER methodology is applicable to the project activity.

4.3 Baseline determination

The procedure for selection of baseline scenario stipulated by the methodology /42/ requires the PP to select one of the following options:

1. The situation before the implementation of the bio digesters (i.e. pre-project situation).

2. The situation where fossil fuels are used to meet energy service needs (even if they are not currently being used).

The pre-project scenario is use of firewood to meet the heat requirement, this has been confirmed through site interviews /46/ and the survey conducted by the PP on the type and quantity of usage of firewood /7/. The PP has thus appropriately chosen option 1 "the situation before the implementation of the bio digesters (i.e. pre-project situation)" as the baseline scenario.

Further it has been clarified by GS in their e-mail dated 6 April 2010 /7/ that the PP needs to complete the survey as soon as possible and hence the condition of "survey should be held before the implementation of the biodigester or within 3 months after the implementation of the biodigester" has been relaxed with respect to timelines while carrying out the validation.

The approved baseline methodology has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed GS project activity.

All the assumption and data used by the project participants are listed in the PDD and/or supporting documents. All documentation relevant for establishing the baseline scenario are correctly quoted and interpreted in the PDD /1/. 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 /1/.

Project boundary

As per the methodology the project boundary is the physical, geographical site of the renewable energy generation equipments and hence appropriately, the project boundary encompasses the sum of all the 4 265 physical geographical sites of all individual biogas plants (digester system, pipe leading to the stove and the stove itself). The project boundary also includes the animal waste handling and storage. However the baseline emissions from this source have been excluded which is conservative.

The system boundaries have been presented in tabular format as below:

	GHGs involved	*Description*
Baseline emissions	*CO_2*	*Thermal energy need*
Project emissions	*CH_4*	*Emissions from physical leakage and incomplete combustion of biogas*

Leakage	*N/A*	*This is not required as per methodology*

The identified boundary and selected sources and gases are justified for the project activity. 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 reductions, which are not addressed by the GS methodology /42/.

4.4 Additionality

The methodology /42/ requires the additionality be demonstrated using the latest version of the "Tool for the demonstration and assessment of additionality" /43/ and in line with the requirements.

4.4.1 Evidence for prior consideration and continuous actions to secure carbon revenue for the project activity

The start date of the project activity has been mentioned as 1 June 2006 which has been confirmed from the date of commissioning of the first bio digester /13/.

DNV has verified the board resolution dated 26 December 2005 of AKKPS and 27 December 2005 of Gramudyog Mandal confirming the requirement of carbon revenue for project implementation in the state of Madhya Pradesh and other states in India /24/. It has also been verified that AKKPS and Gramudyog Mandal worked on the common areas and have board members common to both the organisations /24/. DNV also confirmed from the board resolution dated 2 February 2006 of SDA confirming the need of carbon revenues for the installation and maintenance of the bio digesters in the state of Kerala /24/. Post this there is a board resolution of INSEDA dated 28 September 2007 confirming that carbon credits were essential and would be considered for the project activity, which has been verified /24/. The PP has after this initiated discussions with consultants for the development of the PDD for which e-mail confirmations dated 1 January 2008 have been verified /24/. The PP also entered into a discussion on the possibility of a VERPA, confirmed from e-mails dated 22 February 2008 which was subsequently signed on 2 May 2008 /25/. Subsequent to this the passport and PDD were submitted to GS for a pre feasibility assessment on 16 February 2009 /26/ and hence DNV is able to confirm that there was no previous public announcement of the project without GS. The feedback on the pre feasibility assessment was received on 8 September 2009 as confirmed from the e-mail /27/. This was followed by stakeholder meetings in Madhya Pradesh and Kerala on 12 and 14 October 2009 respectively as confirmed from the minutes /30//31/. The DOE was subsequently appointed on 10 March 2010 as confirmed from the agreement between the PP and DOE /28/.

Hence, it is ascertained that continued action to secure carbon revenue was taken parallel to the implementation of projects since a gap of more than 2 years between the documented evidence to secure carbon credits for the project activity does not exist. This is in line with the latest guidelines given in CDM-EB 49, Annex 22 /43/ which says that *"where there is less than 2 years of a gap between the documented evidence (contracts with consultants for CDM/PDD/methodology services, Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), evidence of agreements or negotiations*

with a DOE for validation services, submission of a new methodology to the CDM Executive Board, publication in newspaper, interviews with DNA, earlier correspondence on the project with the DNA or the UNFCCC secretariat), the DOE shall conclude that continuing and real actions were taken to secure CDM status for the project activity".

4.4.2 Identification of alternatives to the project activity consistent with current laws and regulations

The following credible alternatives have been defined:

A. Use of firewood as fuel for cooking applications

B. Use of Kerosene oil for cooking applications

C. Use of Liquid Petroleum Gas (LPG) for cooking applications

D. Implementation of project activity i.e., use of bio digesters without any carbon revenue benefits

Alternative A is a plausible alternative and is also the pre project scenario. It has been confirmed that in rural India 75% of the households continue to depend on firewood and chips for cooking /33/. It has further been confirmed through surveys /7/ that this does not involve any additional investment for cooking and has no running costs as firewood is cheap and easily available.

Alternative B is not a realistic alternative as this results in an minimum additional expenditure of INR 468 per month based on a daily consumption of 0.78 liters for a family of four (4) /9//10/. This is very high considering the average monthly income is only INR 500 in-case of Kerala /7/ and INR 850 for Madhya Pradesh /7/ and hence not a realistic alternative. Their monthly incomes were also confirmed while conducting the site visit /46/ and scrutiny of the ration card documents /15/.

Alternative C is not a realistic as it results in an additional operating cost of INR 258.62 per month (11.3 kg's consumption by a family of four /12/ comparing the energy level of kerosene and LPG). This is very high considering the average monthly income is only INR 500 in-case of Kerala and INR 850 for Madhya Pradesh /7/.

Alternative D is also not feasible with out carbon credit revenues since it has higher investment and maintenance costs with no running costs. This has been detailed in the next section.

Hence the identified realistic scenarios are Alternative A and D.

Both the alternatives are consistent with the existing laws and regulations of the host country India.

4.4.3 Barrier analysis

As per the methodology /42/, the project participant has chosen investment barrier which is "the programme cannot be implemented as the initial investment in the bio digesters is too high for individual households". Besides that, the project activity faces other barriers which have also been discussed in this section.

It has been confirmed that the initial capital cost required for the family type biodigesters at least is INR 9 650 for 2 m^3 Deenbandhu model and increases to INR 16 500 for a 6 m^3

capacity. This has been confirmed from the audit report of Aadivasi khadi Avom krishi Pariskchan Sansthan (AKKPS) for the year 2006 /16/. The cost of a 2 m^3 has been considered as the number of these digesters is maximum while there are only a few 1 m^3 digesters that are installed as a part of this project activity

The initial capital cost for a kerosene stove is INR 480 confirmed from purchase receipt of kerosene stove /12/ and that for a LPG stove is INR 1 250 from Indian Oil Corporation Limited (IOCL) official website /12/.

There is no cost associated with the use of firewood which is the baseline scenario.

It has been verified from the ration cards during the site visit /46/ and survey results provided by the PP /7/ that the average monthly income for households in Madhya Pradesh and Kerala is INR 850 and INR 500 respectively.

Thus it can be concluded that:

1. Investment cost of bio digesters is much higher as compared to other alternatives
2. The investment cost is approximately 160% of the annual income of targeted household in Kerala and almost same as annual income of targeted households in the state of Madhya Pradesh.

This is considering the investment cost of only a 2 m^3 bio digester of INR 9 650. The cost of bio digesters forming a part of the project activity range from INR 9 650 to INR 16 500 as confirmed from the audit report /16/.

Further the project activity also faces technological barriers as it has been confirmed from the study /14/ that only 45% of the biodigesters in India are operational and 60% of these plants turned non functional due to various structural problems and other issues like choking of inlet/outlet, corrosion/leakage in pipeline, scum formation in digester slurry and water accumulation in gas pipe /14/. Thus maintenance of the bio digesters requires trained man power as compared to no maintenance required for wood stoves. Hence sufficient knowledge is not available locally about the technology to enable autonomous uptake. The project participant shall provide training and maintenance for all the biodigesters covered under the project activity. It was also confirmed during the site visit interviews /46/ that the local people depended on members of INSEDA for the upkeep of the bio digesters

Further DNV has verified an independent study “Renewable Energy Resources for Climate Change Mitigation” /14/ which confirms an achievement of approximately 28% only of the targeted potential of Biogas plants confirming lower dissemination in the host country.

Based on the guidance provided in the methodology /42/, sufficient evidences to show that the project faces investment and technological barriers have been provided and verified by DNV.

The alternative A, pre project scenario of using firewood as fuel for cooking applications does not involve any investment, operational or technological barriers or any of the barriers mentioned above and hence does not face any barrier.

4.4.4 Common practice analysis

It has been confirmed that out of a total potential of 12 million biodigestors, only 28% which is 3.44 million have been installed in the country /14/. Further it has been confirmed only 45% of the plants are working fully /17/. It has also been mentioned in the evaluation study on

National Project on Biogas Development that only 7% of the households in the sample villages were found to be actually using biogas that too often as a supplementary source of fuel /17/. Moreover, rural households belonging to the lower MPCE (Monthly Per Capita Expenditure) classes used more firewood and chips /19/. Hence it can be ascertained that it is not a common practice to use bio digesters.

In summary, it is sufficiently demonstrated that the project is not a likely a baseline scenario and that emission reductions occurring from this are additional.

4.5 Monitoring

The project applies the approved monitoring methodology "Indicative programme, baseline and monitoring methodology for Small Scale Biodigester Voluntary Gold Standard" /42/. The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

The details of the monitoring parameters are detailed in section B.7.1 of the PDD /1/.

The project monitoring plan is in compliance with the monitoring methodology.

It is DNV's opinion, that the project participants are able to implement the monitoring plan.

4.5.1 Parameters determined ex-ante

Following parameters have been determined ex ante:

1. Total amount of biomass substituted (B_y): Total amount of biomass substituted in Kerala is 7 831.8 tonnes per annum and that for Madhya Pradesh is 7 610.9 tonnes per annum of firewood consumption. This figure is based on surveys conducted in the states of Kerala and Madhya Pradesh /7/.
2. Fraction on non renewable biomass (fNRB,y) calculated as per guidance in the methodology /42/ is 91% for Kerala and 86% for Madhya Pradesh /2/.
3. Net Calorific value of NRB (NCV_i) is 0.0156 TJ/Ton based on IPCC 2006 /45/.
4. Emission factor of non renewable biomass ($EF_{CO2,y}$) taken as 112 tCO_2/TJ as per default value of IPCC 2006 /45/.Methane conversion factor (MCF) for the animal waste handling system in the baseline situation by climate zone k is 100% based on IPCC 2006 /45/.
5. Efficiency of biodigester ($\eta_{biogastove}$) taken as 98% based on GS approved methodology /42/.
6. Daily volatile solid excreted for livestock category (VS_T) for Dairy cows for Indian subcontinent taken as 2.6 kg dry matter/ animal/ day based on IPCC 2006 /45/.
7. Maximum methane producing capacity for manure produced by livestock category (Bo) for Dairy cows for Indian subcontinent taken as 0.13 m^3CH4 /kg of VS excreted based on IPCC 2006 /45/.

4.5.2 Parameters monitored ex-post

The following parameters as required by the methodology shall be monitored

1. Project Area (ID 1/$Area_i$) shall be monitored based on official websites and the forest survey reports.

2. Number of households in the baseline sample group (ID2/n_{bl}) shall be determined and monitored by the PP considering 95% confidence level and 5% margin of error.
3. Number of households in the project sample group (ID3/n_{pi}) shall be determined and monitored by the PP considering 95% confidence level and 5% margin of error.
4. Total number of households participating in the program in year y (ID5/$n_{hh,y}$) shall be monitored by the PP and included in the database.
5. Amount of fuel consumption in the baseline (ID6/$F_{i,bl1}$) shall be monitored based on the survey conducted by the PP.
6. Amount of fuel consumption in the project (ID8/$F_{i,ypj}$) shall be monitored through survey conducted by the PP.
7. Annual biomass increment on the project area (ID9/I) shall be monitored by the PP based on field surveys.
8. Annual biomass harvest on the project area (ID10/H) shall be monitored by the PP based on field surveys.
9. Fraction of livestock category manure treated in the animal waste management system (ID 11/ MS), in climate region k shall be monitored by the PP based on field surveys.
10. Physical Leakage (ID 12/ PLy) to be monitored by PP on a sampling basis through surveys
11. Number of life stock of category K (ID 13/ LC) to be monitored through surveys
12. Global Warming Potential (GWP) of methane (ID 16/ GWP_{CH4}) to be monitored annually based on most recent IPCC guidelines.

4.5.3 Monitoring of sustainable development parameters

According to the requirement of Gold Standard, the choice of indicators is based on the issues contributing critically to the sustainable development.

Initial stakeholder consultations were conducted after getting pre-feasibility results in both the states of Madhya Pradesh and Kerala on 12 October 2009 and 14 October 2009 respectively. This was done to intimate the local community about the project activity and the benefits on its implementation and to get their feedback about the proposed project. INSEDA representatives explained about their project activity its benefits and the resultant emission reductions. As per the requirements of GS, a blind sustainable exercise /23/ was conducted after circulating a non-technical summary to the stakeholders. The impact on the sustainable development indicators was also discussed during the stakeholder consultation and the blind exercise undertaken.

The stakeholders were invited through an advertisement in the local newspaper of the Seoni district and Kerala as well as personal invitations were sent to the local people /22/. GS along with all the local and international Gold Standard NGO supporters, DNA of India were invited through mails along with local NGOs, Panchayat members and local residents /32/.

In line with the GS version 2.0, the following safeguarding principles were assessed as a part of Do No Harm Assesment:

- The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project is not complicity in Human Rights abuses: the project is dedicated to reducing deforestation and lethal acute respiratory infections and enhancing the livelihoods of rural poor. The project endeavours to empower rural people through these measures. There is no mitigation measure which is required.
- The project does not involve and is not complicit in involuntary resettlement: this principle is not relevant for the project since it is implemented inside the households of local people;
- The project does not involve and is not complicity in the alteration, damage or removal of any critical cultural heritage: this principle is not relevant for the project since it is implemented inside the households of local people;
- The project respects the employees' freedom of association and their right to collective bargaining and is not complicit in restrictions of these freedoms and rights: the project does not involve any employment of people which can be classified as labour. The project involves appointment of technicians for bio digesters and employees to handle data along with service records. Therefore, no mitigation measures are needed;
- The project does not involve and is not complicit in any form of forced or compulsory labour: the project does not involve any employment of people which can be classified as labour. The project involves appointment of technicians for bio digesters and employees to handle data along with service records. Therefore, no mitigation measures are needed;
- The project does not employ and is not complicit in any form of child labour: the project does not involve any employment of people which can be classified as labour. The project involves appointment of technicians for bio digesters and employees to handle data along with service records. Therefore, no mitigation measures are needed;
- The project does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis: the project employs both male and female. Female will keep record of monitoring of the biogas plants and Male will contribute towards field activity, the project represents a low risk on this since there is no discrimination involved in the project. Therefore, no mitigation measures are needed;
- The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments: the project does not involve and is not complicit in exposing employees to unsafe or unhealthy environment. Therefore, no mitigation measures are needed;
- The project takes a precautionary approach in regard to environmental challenges and is not complicity in practices contrary to the precautionary principle. This principle can be defined as: "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.": although this principle is relevant for the project, the project represents a low risk on this since project activity

involves installation of the anaerobic biodiesters for generating thermal energy used for household purposes and trained persons will maintain the systems. Therefore, no mitigation measures are needed;

- The project does not involve and is not complicity in significant conversion or degradation of critical natural habitats, including those that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value or (d) recognized as protected by traditional local communities: this principle is not relevant for the project since it is implemented inside the households of local people;
- The project does not involve and is not complicit in corruption: The project does not involve and is not complicit in corruption. Therefore, no mitigation measures are needed;
- Any relevant critical issue for my project: Household biogas plants will be installed in the households: although this principle is relevant for the project, the project represents a low risk on this since project activity involves a large amount of small, distributed heating, cooking or electricity generation devices. However trained persons will maintain the systems. Therefore, no mitigation measures are needed;

As a conclusion, no mitigation measures were needed for the "do not harm" assessment principles. DNV considers the "do not harm" assessment results reasonable and adequate.

The indicators described under Sustainable Development Matrix of the GS Toolkit, version 2, Annexure I /41/ have been evaluated correctly in the GS passport /27/. It is confirmed that there are no negative impacts on any of the 12 indicators listed under Sustainable Development Matrix of the GS Toolkit, version 2, Annexure I /41/. The following three indicators have a positive impact and shall be monitored as mentioned in the GS passport /27/ and PDD /1/.

The indicators that shall be monitored are

1. Air Quality by monitoring the functionality of bio digester at least once in a month
2. Livelihood of poor by monitoring the reduction in usage of firewood on an annual basis through a survey.
3. Access to clean and affordable energy by monitoring the functionality of bio digesters at least once a month.

4.5.4 Management system and quality assurance

The management, operation and training manual /39/ covers the completely operational structure and mechanism including responsibilities and authorities for project management, procedures for monitoring, reporting, QA/QC procedures, and training, which were verified to be appropriate.

The local NGOs involved in the project activity shall be responsible for collection and compilation of the monitoring data including the surveys required as a part of the monitoring plan /1/. INSEDA shall ensure that the data monitored has been accurately recorded, properly

archived, and that QA/QC procedure for the entire monitoring process has been implemented in line with the GS-VER requirements.

All the relevant documents will be kept for at least two years after the end of the crediting period. It has been confirmed during the site visit /46/ that adequate procedures are in place for subsequent verification of emission reductions.

The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

4.6 Estimation of GHG emissions

Baseline Emissions:

The PP has chosen option 1 which is the pre-project situation as the baseline scenario, hence in line with Table 1 of the methodology has used the questionnaires among households. It has been confirmed that no fossil fuel was used in the pre project scenario and hence there are no baseline emissions due to fossil fuel consumption and the adjusted baseline emissions for the share of non renewable biomass (NRB) have been determined.

The PP has further determined the total quantity of biomass used through questionnaires among households in a sample of the total population (option b) of the methodology /42/. The third party survey concluded on 10 June 2010 in M.P and 27 April 2010 in Kerala to quantify the NRB (fire wood) used by the families in the project area /7/.

It has been clarified by GS vide their e-mail dated 6 April 2010 /7/ that the PP needs to complete the survey as soon as possible and hence the condition of "survey should be held before the implementation of the bio digester or within 3 months after the implementation of the bio digester" has been relaxed with respect to timelines while carrying out the validation.

The baseline emissions are given by

$$BE_{th,h,option1} = \Sigma\left(\left(F_{i,bl,h}\right) \cdot NCV_i \cdot EF_{CO2i}\right)$$

$BE_{th,h,\ option1}$ is the baseline emissions used to meet the thermal energy need of one household

$F_{i,bl,h}$ is the total amount of fuel i in the baseline situation (mass or volume) of one household

NCV_i is the net calorific value (energy content) per mass or volume unit of a fuel i

$EF_{CO2,i}$ is the CO_2 emission factor per unit of energy of the fuel.

The sample survey has been conducted in the project area and data obtained for all the installed capacities of the biodigesters.

The following approach has been used for estimating the baseline emissions for a 1 m^3 capacity biodigester

1. The total quantity of fuel (fire wood) used has been determined as 4 870 kg/month for 39 biodigesters
2. The average quantity thus works out to be 124.87 kg/month/plant
3. Since this is for the state of Kerala, where NRB has been calculated as 91%, the average non renewable biomass is 91% times 124.87 which is 113.85 kg/month/plant equivalent to 1.37 Tonnes. The NRB has been calculated correctly following the

guidance of Annex 1 of the methodology /42/ and verified to be correct /2/. The calculation is based on independent reports and publicly available data /34//35//36//37//38/.

4. Using the IPCC default values /46/ for NCV of firewood at 0.0156 TJ/Tonnes and EF for firewood at 112 tCO_2/TJ, the yearly baseline emissions work out to be 2.3 tCO_2e.

Similarly the yearly emission reductions per household have been determined for all the capacities separately for the state of Kerala and Madhya Pradesh as detailed in the excel file /2/.

The mean of each State (Kerala and Madhya Pradesh) is then calculated as the yearly emission reductions for each type ($1m^3$, $2m^3$, $3m^3$, $4m^3$ and $6m^3$) multiplied by the number of respective household samples divided by the total number of household samples taken during the survey for that particular state. This works out to be 6.62 and 5.245 tCO_2 for Kerala and Madhya Pradesh, respectively /7/.

The standard deviation has then been calculated for the state of Kerala and Madhya Pradesh as required by the methodology /42/ as 0.458 and 0.222, respectively.

Equation 5 of the methodology /42/ has been further used correctly to determine the baseline emissions in the pre project situation.

The calculations have been detailed in the excel files /2/ and verified to be correct.

The baseline emissions have been calculated as 14 096 tCO_2 and 11 096 tCO_2 for the states of Kerala and Madhya Pradesh respectively.

Project Emissions:

As per the methodology /42/ project emissions from household fuel consumptions after installation of biodigesters and emissions from biodigesters which include physical leakage of biodigester and incomplete combustion of biogas have to be considered.

The project emissions due to fuels used to meet the thermal energy need per household has been considered and the quantity of fuel consumed in the households shall be monitored. For the purpose of ex ante estimations the emission due to this is taken as nil which is appropriate as it has been confirmed through site visit interviews /46/ that no fossil fuel was being used.

The project emissions from the bio digesters have been calculated as 1 022 tCO_2 as detailed in the Excel worksheet /2/. The PP has assumed 2 cows per household for the calculation of project emissions. However, the type and number of livestock per household needs to be established through a survey before undertaking the first verification. This has been raised as FAR 1.

The physical leakage has been considered as 5%. This has been verified from letter by Dr. Virendra Kumar Vijay, Biogas development & Training centre, IIT Delhi stating physical methane leakage from the project type biodigesters ie Deenbandhu biodigestors is not more than 5% /20/ and the same has been accepted by GS. Further the combustion efficiency of biodigestor has been taken as 98% from the methodology /42/. Default and conservative values have been taken from IPCC 2006 tables /45/ for the estimation of project emissions and have been detailed in the Excel worksheet clearly /2/.

The calculation of project emissions is detailed in the Excel files /2/.

The total project emissions have been calculated as 1 022 tCO_2 which are considered to be as conservatively estimated.

This is appropriate and in line with the methodology /42/.

Leakage:

No significance sources of leakage are identified. This is appropriate and in line with the methodology /42/.

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average *ex-ante* estimation of emission reduction conservatively calculated to be 24 170 tCO_2e per year for the fixed crediting period of 10 years /2/.

All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD /1/ and the excel files /2/. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

4.7 Environmental impacts

Social and environmental impacts of the project have been sufficiently addressed. A detailed environmental impact assessment is not necessary. This was verified from the Environment Impact Assessment Notification S.O. 1533 dated 14 September 2006 issued by the Ministry of Environment and Forests /21/.

A Do No Harm assessment as well as a SD Matrix has been carried and detailed in the GS passport /27/.

4.8 Public Consultation Procedures

4.8.1 Initial and main stakeholder consultation

Since the project activity has been implemented the stakeholder consultation at the design stage of the project activity has not been carried out. However, a local stakeholder meeting has been conducted on 12 October 2009 at Madhya Pradesh and on 14 October 2009 at Kerala after publishing stakeholders' meeting advertisements in the local newspaper.

In Kerala, advertisement was published in Sunday express (English) as well as in Malyalam Manorma (in Malyalam) on 11 October 2009 /22/. In Madhya Pradesh advertisement was published in Dainik Bhaskar on 8 October 2009 /22/. In addition, official e-mail invitations were sent by PP to GS, GS supporter NGOs, local NGOs and DNA on 4 and 5 October 2009 /32/ which have been verified by DNV. The copies of newspaper and personal invitation have been verified along with the attendance sheet and minutes of meeting /30//31/. DNV confirms that adequate media have been used and that every stakeholder had the possibility to get informed about the project activity.

In the filled questionnaires and main stakeholder meeting /30//31/ there were no negative comments on the proposed project. A blind development exercise was conducted to make the stakeholders aware of the environmental and social impacts of the project activity. All the participants gave a positive assessment on the environmental, social and sustainable impacts of the proposed project and supported the project implementation.

No negative comments were received from any of the stakeholders during the stakeholder meeting as confirmed from the minutes of the meeting /30//31/. Hence, the stakeholder consultation of the representatives can be considered to be sufficient and adequate and in line with the GS requirements.

4.8.2 Stakeholder feedback round

The stakeholder feedback round has been conducted on 11 October 2010 in MP /30/ and on 19 October 2010 in the state of Kerala /31/ after webhosting the revised project documents for a period of one week starting 23 September 2010 on the website of the INSEDA (*http://www.inseda.org/*) and communicating to all the relevant stakeholders invited for the main stakeholder consultation. The e-mail copies sent to GS, DNA of India as well as the GS supported NGOs which includes the local NGOs, and have been verified to confirm the same /32/. All the stakeholders who attended were apprised about the project status. There were no negative comments received during the feedback round /30//31/.

The procedure is considered appropriate by DNV as GS via its mail /29/ confirmed that a stakeholder feedback round can be conducted after webhosting the revised project documents for a period of one week.

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APPENDIX A

GS VALIDATION PROTOCOL

Table 1 Screens for Voluntary Offset Project Activities

Requirement	Reference	Conclusion
Project Type Eligibility Screen	GS Toolkit	
1. Project type check		OK
2. Host country eligibility check		OK
3. Project Size Check		OK
Additionality Screen	GS Toolkit	
4. Previous public announcement check	GS Toolkit	OK
5. Conservative approach screen of the baseline scenario	GS Toolkit	OK
6. Additionality Tool	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	~~**CAR3**~~ OK
Sustainable Development Screen	GS Toolkit	
7. Sustainable development assessment	GS Toolkit	OK
8. Environmental Impact Assessment	GS Toolkit	OK
9. Public consultation procedures	GS Toolkit	~~**CL 15**~~ OK
About forecast emission reductions		
10. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
Other		
11. The baseline and monitoring methodology shall be previously approved by the GS-VER Executive Board.		OK
12. A baseline shall be established on a project-specific basis, in a transparent manner		OK

Requirement	Reference	Conclusion
and taking into account relevant national and/or sectoral policies and circumstances.		
13. The baseline methodology shall exclude to earn VERs for decreases in activity levels outside the project activity or due to force majeure.		OK
14. The project design document shall be in conformance with the GS-VER-PDD format.		OK

Table 2 Requirements checklist

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A General description of project activity						
A.1	**Title of the project activity**					
A.1.1	Does section A.1 of the PDD include a clearly identifiable project title, version number of the PDD and date of the PDD?	/1/	DR	☒ Clearly identifiable title of the project activity ☒ Version number of the PDD is included ☒ Date of the PDD is included.		OK
A.1.2	Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/	DR	☒ Yes *If no, list where the PDD is not in accordance:*		OK
A.2	**Description of the project activity**					
A.2.1	How was the design of the project assessed?	/1/	DR	*What type is the project?* ☐ Project in existing facility or utilizing existing equipment(s) ☐ Large scale project ☐ bundled small scale projects, each with emission reductions not exceeding 15 000 tCO_2e per year ☐ individual small scale project activity with emission reductions not exceeding 15 000 tCO_2e per year ☒ Greenfield project *How was the design of the project assessed?* ☒ Physical site inspection ☐ Reviewing available designs and feasibility studies		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				A physical site inspection was undertaken on 6, 7 May 2010 for the state of Kerala and 27, 28 May 2010 for the state of Madya Pradesh.		
A.2.2	If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR	The biodigesters under the project were commissioned between January 2006 and December 2008. All the bio igestors that were visited during the site visit were confirmed to be commissioned after January 2006.		OK
A.2.3	If physical site visits were performed based on sampling (only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO_2e per year), justify the sampling through a statistical analysis:	/1/	DR	Not applicable		OK
A.2.4	Is the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed GS VER project activity?	/1/	DR	The project activity is installation of anaerobic bio digesters in 4345 rural house holds of Kerala and Madhya Paradesh States to replace non – renewable biomass for domestic cooking. (a)The number of digesters included in the project activity need to be confirmed by PP along with the names, identification no, capacity as well as the date of installation of the bio digestors. It was confirmed during site visit that some of the bio digesters were being used for commercial operations like hospitals and canteens. The PP is requested to revisit the complete list and consider only those which are applicable to households only as per the requirements of the methodology.	~~CL 1~~	OK
A.2.5	Does the project activity involve alteration of existing	/1/	DR	No		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?					
A.2.6	Does the project design engineering reflect current good practices?	/1/	DR	Yes. Fixed dome type bio digesters of capacities ranging from 1 to 20 m^3 are used		OK
A.2.7	Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?	/1/	DR	No technology transfer from Annex 1 country is involved as this technology is available in India, which can be confirmed by DNV.		OK
A.2.8	Does the project qualify as a small scale CDM project activity as defined in paragraph 6(c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	As per GS toolkit, version 2, the PP needs to provide the detailed calculations for confirming that it falls under small scale category.	~~CL 2~~	OK
A.2.9	Is the small scale project activity a debundled component of a larger project activity?	/1/	DR	The PP is requested to provide and undertaking confirming that the project activity is not a debundled component of a larger project activity.	~~CL 3~~	OK
A.3	**Participation requirements**					
A.3.1	Do all participating Parties fulfil the participation requirements as follows:	/1/	DR	Integrated Sustainable Energy and Ecological Development Association (INSEDA) from India and First Climate AG from Germany are the project participants.		OK
		(host)		County X	Country Y	
	a) Party has ratified the Kyoto Protocol	☒ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
	b) Party has designated a Designated National Authority	☒ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
	c) The assigned amount has been determined	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
A.3.2	Do the letters of approval meet the following requirements?		DR	There is no such requirement for a voluntary project.		OK
		(host)		County X	Country Y	
	a) LoA confirms that Party has ratified the Kyoto Protocol	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
	b) LoA confirms that participation is voluntary	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No	
	c) The LoA confirms that the project contributes to the sustainable development of the host country?	☐ Yes ☐ No		NA	NA	

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	d) The LoA refers to the precise project activity title in the PDD			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
	e) The LoA is unconditional with respect to (a) to (d) above			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
	f) The LoA is issued by the respective Party's DNA			☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No		
	g) The LoA was received directly by the DNA or the PP			☐ DNA ☐ PP ☐ DNA ☐ PP ☐ DNA ☐ PP		
	h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic					
A.3.3	Have all private/public project participants been authorized by an involved Party?	/1/	DR	Not applicable since the project activity is a GS-VER projects.		OK
A.4	**Technical description of the project activity**					
A.4.1	Is the project's location clearly defined?	/1/	DR	The project is located in 12 districts of Kerala state, between $10^0$00' N to $76^0$25' E, on the south-western part of India and 5 districts of Madhya Pradesh state, between 23^0 30'N to 80^0 00' E, in north western part of India		OK
A.5	**Public funding of the project activity**					
A.5.1	In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided 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?	/1/	DR	The ODA declaration in GS prescribed form need to be provided. In addition the PP needs to provide the financial plan approved by a chartered accountant.	~~CAR 1~~	OK
B	**Application of a baseline and monitoring methodology**					
B.1	**Methodology applied**					
B.1.1	Does the project apply an approved methodology and the correct version thereof?	/1/	DR	The project applies *Indicative programme, baseline, and monitoring methodology for Small Scale Bio digester* by Voluntary Gold Standard.	~~CL 15~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			The PP along with the methodology is using GS Toolkit, version 2 while version 2.1 is available. The PP needs to justify the use of older version of toolkit for the project activity.		
B.2 Applicability of methodology (and tools)					
B.2.1 How was it validated that project complies with the following applicability criteria: This methodology is applicable to programmes of activities involving the implementation of biodigesters in households within the project's boundaries. The project activity is implemented by a project coordinator who acts as the project participant. The individual households will not act as project participants. The consumption of biogas from the biodigesters replaces the consumption of fossil fuel and/or biomass.	/1/	DR	The project activity, involves installation of bio digesters in rural areas, of Kerala and Madhya Pradesh to supply thermal energy for household cooking purposes, thus replacing non-renewable biomass. INSEDA (project participant) will act as bundling agency which will bundle all the household biogas plants. Individual households have signed an agreement with the respective state NGOs (ASAD in Kerala and AKKPS and GM in MP) and will not act as project participant. (a) PP needs to provide copies of the agreement between NGOs with PP and NGOs with households.	~~CL 3~~	OK
B.2.2 How was it validated that project complies with the following applicability criteria: The biodigester programme promotes the wide-scale use of biogas as substitute for wood,agricultural residues, animal dung and fossil fuels that are presently used for the cooking, space heating and lighting needs of most rural households.	/1/	DR	The biogas generated from the bio digesters will be used for domestic application and will replace non-renewable biomass which would have been utilized in the absence of the project activity. b) Details of baseline survey need to be provided to establish the fuel used in pre-project activity.	~~CL 3~~	OK
B.2.3 How was it validated that project complies with the following applicability criteria: The methodology applies to project with biodigesters with a maximum total biodigester volume of 20 m3.	/1/	DR	Size of the biodigesters installed under the project are 1 m^3, 2 m^3, 3 m^3, 4 m^3, 6 m^3, 8 m^3, 10 m^3,12 m^3, 15 m^3 and 20 m^3. The complete list of participants and respective bio digester capacity need to be provided.	~~CL 1~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			Refer A.2.4 above		
B.2.4 How was it validated that project complies with the following applicability criteria: The biodigesters in the programme are not included in another CDM or voluntary market project,(i.e. no double counting takes place).	/1/	DR	The biodigesters installed in the project activity are not included in another CDM or voluntary market project, as per the undertaking by farmers. (c) Copies of undertakings by farmers to the effect that the bio digesters are not included in another CDM or voluntary market project need to be given.	~~CL 3~~	OK
B.2.5 How was it validated that project complies with the following applicability criteria: If more than one climate zone is included in the project, the project should make a distinction per climate zone.			Kerala has equatorial tropic climate also known as tropical rainforest climate while Madhya Pradesh has sub tropical climate. Appropriately the PP has considered the calculations of emission reductions and monitoring separately depending on the climatic zone.		OK
B.2.6 Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/	DR	The baseline selected is "the situation before implementation of the bio digestors ie the pre project situation". This is appropriate		OK
B.3 Project boundary					
B.3.1 What are the project's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR	The project boundary includes the physical geographical sites of all the 4 345 individual biogas plants with associated digester system, the gas stove and pipe leading to the stove, included in the project activity		OK
B.3.2 Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/	DR	In the baseline CO_2 emissions from thermal energy source is considered. Emissions from the handling of animal waste in households in the baseline situation are not included.		OK
B.3.3 Does the project involve other emissions sources not	/1/	DR/I	No.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?					
B.4	**Baseline scenario determination**					
B.4.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/	DR	The baseline alternatives considered are (i) firewood as fuel for cooking applications (ii) kerosene as fuel for cooking applications (iii) liquid petroleum gas (LPG) as fuel for cooking applications.		
B.4.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/	DR	Alternatives (ii) and (iii) are eliminated as these involves higher fuel cost compared to fuel wood which is partly available as free and rest bought from local market. Also for the house hold with monthly income of INR 500, use of kerosene or LPG, even though subsidised is found unaffordable. The PP needs to provide a copy of documents in support of monthly fuel cost, fuel requirement and monthly income to justify the exclusion of the alternatives.	~~CL 4~~	OK
B.4.3	What is the baseline scenario?	/1/	DR	The baseline scenario is *the situation before implementation of the biodigesters (i.e. pre-project situation*) which is *continuation of firewood for cooking applications.*		OK
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	Yes		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Refer B.4.2 above	~~CL 4~~	OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Refer B.4.2 above	~~CL 4~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Refer B.4.2 above.	~~CL 4~~	OK
B.4.8	Is the baseline determination adequately documented in the PDD? • All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well 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. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity	/1/	DR	Refer B.4.2 above.	~~CL 4~~	OK
B.5	**Additionality determination.**					
B.5.1	What approach/tool does the project use to assess additionality? Is this in line with the methodology?	/1/	DR	Additionality is demonstrated using the "Tool for the demonstration and assessment of additionality", EB 39, version 5.2 and available in UNFCCC web site.		OK
B.5.2	Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	Yes.		OK
B.5.3	Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Refer below.		OK
B.5.4	What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/	DR	Barrier analysis is used to demonstrate additionality.		OK
	Prior consideration of CDM					
B.5.5	What is the evidence for serious consideration of CDM prior	/1/	DR	The PP needs to demonstrate and clearly describe	~~CAR 2~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	to the time of decision to proceed with the project activity?			in the PDD the requirements related to retroactive registration. The project was first submitted to Gold Standard on 16 February 2009 and covers only bio digesters installed till December 2008, the PP needs to go through a pre feasibility assessment. The pre feasibility assessment needs to be provided.		
B.5.6	If the starting date is after 2 August 2008 and before the global stakeholder consultation, has the DNA and UNFCCC confirmed that the project participants have informed in writing of the project's intention to seek CDM status?	/1/	DR	The PP also needs to provide documents related to pre-announcement check, ODA declaration form, DNA notification, mechanisms in place to prevent risk of double counting (projects related to other schemes), clarify on the districts not forming a part of the project boundary and give a detailed project description. In addition the PP needs to respond to all the comments received from GS as a part of prefeasibility assessment.	~~CAR 4~~	OK
	Continuous efforts to secure CDM status (only to be completed if starting date is before 2 August 2008)					
B.5.7	What initiatives where taken by the project participants from the starting date of the project activity to the start of validation in parallel with the physical implementation of the project activity?	/1/	DR	Refer B.5.5.	~~CAR 2~~	OK
B.5.8	When did the construction of the project activity start?	/1/	DR	The first bio digestor was installed on 1 June 2006. The PP needs to provide the detailed list of bio digestors with commissioning dates and the location	~~CL 1~~	OK
B.5.9	When was the project commissioned?	/1/	DR	The bio digesters were commissioned between 1		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				June 2006 and 28 December 2008.		
B.5.10	Does the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure CDM status?	/1/	DR	Refer B.3.5.	~~CAR 2~~	OK
Investment analysis						
B.5.11	Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PDD?	/1/	DR	No, revenue generation from the project or its alternatives.		OK
B.5.12	Do any of the alternatives to the project activity involve investment? Is this reflected in the PDD?	/1/	DR	Yes.		OK
B.5.13	Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/	DR	NA.		OK
B.5.14	Is the benchmark/discount rate the latest available at the time of decision?	/1/	DR	NA.		OK
B.5.15	What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/	DR	NA.		OK
B.5.16	Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value?	/1/	DR	NA.		OK
B.5.17	Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/	DR	NA.		OK
B.5.18	Is the time period of the investment analysis and operating time of the project realistic? Has salvage value been taken into account? Is working capital returned in the last year of operation?	/1/	DR	NA.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.19	When a feasibility study report or similar approved by the government is used as the basis for the investment analysis: Can it be confirmed that the values used in the PDD are fully consistent with the FSR and is the period of time between finalization of the FSR and the investment decision adequate?	/1/	DR	NA.		OK
B.5.20	How was the amount of output (e.g. sales of electricity) assessed? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM version 1 paragraph 95.	/1/	DR	☐ The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval ☐ The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company) ☐ Other approach. *Provide details on how the load factor was validated::* Not applicable since there is no sale of biogas generated.		OK
B.5.21	How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM version 1 paragraph 95.	/1/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants *Provide details on how the output price was validated:* NA.		OK
B.5.22	How were the investment costs assessed? Were the data available and valid at the time of decision? Remember to	/1/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices)		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM version 1 paragraph 95.			☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants *Provide details on how the investment costs were validated:* (a) PP need to provide support document for investment cost for all the identified alternatives in the PDD.	~~CAR 3~~	
B.5.23	How were the O&M costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM version 1 paragraph 95.	/1/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants *Provide details on how the O&M costs were validated:* (b)PP needs to provide supporting documents for fuel costs and the quantum of usage for all alternatives considered while evaluating financial barrier.	~~CAR 3~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.24	Describe the assessment of the other input parameters. Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM version 1 paragraph 95.	/1/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants *Provide details on how other input parameters were validated:* (c) It was confirmed while carrying out the site visit from the ration cards issued by the government authority that most of the people were having a monthly income of up to INR 1 000 only. The PP also needs to provide evidence in support of limited monthly incomes for all the districts of both the Indian States that are covered under the project activity and thus their inability to meet the energy costs of other alternatives described in the PDD.	~~CAR 3~~	OK
B.5.25	Was the financial calculation spreadsheet verified and found to be correct?	/1/	DR	(d) The PP needs to provide the financial comparison calculation	~~CAR 3~~	OK
B.5.26	Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?	/1/	DR	As the PP has demonstrated additionality using investment barrier, this is not required.		OK
B.5.27	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/	DR	NA		OK
B.5.28	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/	DR	NA		OK
Barrier analysis						

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.29	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/	DR	Investment barrier has been chosen by the PP.		OK
B.5.30	How were the investment barriers assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	Refer B.5.23 to B.5.25 above.	~~CAR 3~~	OK
B.5.31	How does CDM alleviate the investment barriers?	/1/	DR	(e)The PP needs to discuss in the PDD how carbon revenue alleviates the investment barrier	~~CAR 3~~	OK
B.5.32	Is the project activity prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	(f)The PP needs to discuss in the PDD whether and how at least one of the possible alternatives to the project is feasible under similar circumstances.	~~CAR 3~~	OK
B.5.33	How were the technological barriers assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR	Technological barrier is argued on account of the following problems associated with anaerobic biodigesters for thermal application 1. Operational Problems 2. Chocking of the inlet/outlet 3. Corrosion/Leakage in the gas outlet pipes 4. Scum Formation in the digester slurry 5. Water Accumulation Considering that the local people have no prior experience to operate and maintain the anaerobic biodigesters this involves a huge risk in the successful operation of the anaerobic digesters. Hence training is an integral part of the successful operation of the anaerobic bio digesters. The issues were also confirmed through interviews with the villagers (a)However, the PP needs to demonstrate that these technological barriers/issues are substantiated by a source independent of the	~~CL 4~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				project participants.		
B.5.34	How does CDM alleviate the technological barriers?	/1/	DR	(b)The PP needs to discuss in the PDD how revenue fron carbon credit alleviates the technological barrier which have been listed above.	~~CL 4~~	OK
B.5.35	Is the project activity prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	(c)PP to discuss in the PDD whether the alternatives to the projects is prevented by the technological barrier	~~CL 4~~	OK
B.5.36	How were the barriers due to prevailing practise assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	In Kerala and Madhya Pradesh, around 84% and 75.9% firewood is used for cooking purpose respectively as per Census 2001. Firewood is available free from the nearby forest/own land or bought from the nearby area. Being cost effective, firewood remains the most common cooking fuel in the rural areas. (a) PP to support the prevailing practices by data /documents and provide copies of the same and also the references 17 to 19 of the PDD.	~~CL 5~~	OK
B.5.37	How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	(b) PP to discuss in the PDD how carbon revenue alleviates the barrier due to prevailing practise.	~~CL 5~~	OK
B.5.38	Is the project activity prevented by the barriers due to prevailing practise and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	(c) PP to discuss in the PDD whether the alternatives to the projects are prevented by prevailing practise.	~~CL 5~~	OK
B.5.39	How were the other barriers assessed to be real? Are the other barriers substantiated by a source independent of the project participants?	/1/	DR	(a) Discussion under institutional barrier need to be supported with data from independent source.	~~CL 6~~	OK
B.5.40	How does CDM alleviate the other barriers?	/1/	DR	(b) PP to discuss in the PDD how revenue from carbon credit alleviates the technological barrier	~~CL 6~~	OK
B.5.41	Is the project activity prevented by the other barriers and at least one of the possible alternatives to the project activity is	/1/	DR	(c) PP to discuss in the PDD whether the alternatives to the projects is prevented by the	~~CL 6~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	feasible under the same circumstances?			Institutional barrier		
	Common practice analysis					
B.5.42	What is the geographical scope of the common practice analysis? Is this justified?	/1/	DR	The geographical scope considered for common practise has been taken as India. It has been mentioned that in India 7% using bio digesters partly and is supported by data. Bio digestors being used all across the country , the scope is justified (a) The PP however needs to justify a higher achievement of 4.12 Million as against a stated potential of 12 Million. (b) The common practise in states like Kerala and MP are not sufficiently discussed and supported by publically available data. This also needs to be discussed.	~~CL 7~~	OK
B.5.43	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR	This is not warranted as the bio digestors used in households are of a specific size and the technology used is indigenous.		OK
B.5.44	What is the data source(s) used for the common practice analysis?	/1/	DR	Refer B.5.42 above.	~~CL 7~~	OK
B.5.45	How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	In India nearly 7% are using bio digesters partly. Refer B.5.42 above.	~~CL 7~~	OK
B.5.46	How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR	(c) The essential distinctions between the project and similar activities occurring in Kerala,& MP states or in the geographical scope chosen needs to be established with the help of supporting data and information.	~~CL 7~~	OK
B.5.47	What is the conclusion of the common practice analysis?	/1/	DR	Refer B.5.43 & B.46.above	~~CL 7~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	Conclusion					
B.5.48	What is the conclusion with regard to the additionality of the project activity?	/1/	DR	The barrier analysis should also include the possible barriers along with related evidences given in Page (4) of the GS methodology.	~~CL 8~~	OK
B.6	**Calculations of GHG emission reductions**					
	Data and parameters that are available at validation and that are not monitored					
B.6.1	How was the parameter *total amount of biomass substituted* (**By**) available at validation verified?	/1/	DR	Value used is 16 229.11 tonnes per year based on survey in both states. a) The reference documents for inputs for the calculation of biomass availability & requirement need to be provided. The details of the survey including details like the party carrying the survey, the date, the summary and results (derived) need to be provided and in line with the methodology requirements of being carried out before the implementation of the biodigester or within 3 months after the implementation of the bio digestor.	~~CL 9~~	OK
B.6.2	How was the parameter *Fraction of Non Renewable Biomass* (***f*NRB, y**) available at validation verified?	/1/	DR	The values calculated based on sample survey are 97% for Kerala & 89% for Madhya Pradesh. (b) The copy of baseline sample survey reports in MP & Kerala along with the detailed calculation sheets for deriving the NRB needs to be provided. The assumptions and references used need to be clearly mentioned.	~~CL 9~~	OK
B.6.3	How was the parameter *Net Calorific Value of non-*	/1/	DR	Value used is 0.0156 TJ/Tonne, as per 2006		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	renewable biomass(NCVi) available at validation verified?			IPCC Guidelines for National Greenhouse Gas Inventories, Table 1.2.		
B.6.4	How was the insert parameter *Emission factor of non-renewable biomass* **($EF_{CO2,i}$)**available at validation verified?			Value used is 112 tCO_2/TJ, as per 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Table 1.4.		OK
	Baseline emissions					
B.6.5	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes ,the calculations are in accordance *with the applied voluntary GS methodology - Baseline Option 1: baseline emission from thermal energy demand in the pre-project situation"* The baseline emissions from thermal energy demand will be based on the determination baseline emissions from fuel consumption and adjusting the baseline emissions for the share of non-renewable biomass. Non renewable biomass use is determined through surveys conducted in both the states in sample group of districts, where anaerobic bio digesters are installed. Environment and Energy Management Group, Bhopal conducted survey of fire wood use in 3 districts of MP and the Department of Bio-energy, Agricultural Engineering College & Research Institute, Tamilnadu Agricultural University Bhopal conducted survey of fire wood use in 3 districts of Kerala. As per the calculations based on these surveys the percentage of Non renewable biomass use in Kerala is 97% and in Madhya Pradesh it is 89%. (c) The PP needs to provide the detailed calculation sheets for calculation of baseline		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				emissions indicating all assumptions and support documents for the same.	~~CL 9~~	
B.6.6	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Refer B.6.2 & B.6.5	~~CL 9~~	OK
B.6.7	Are uncertainties in the baseline emission estimates properly addressed	/1/	DR	As above	~~CL 9~~	OK
	Project emissions					
B.6.8	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Project emissions from fuels used to meet the thermal energy need per household h in year y($PE_{th,h,y}$) is considered. However, since methane emissions associated with feed is not considered in the project activity, Project emission due to physical leakage and incomplete combustion of biogas from the biodigester ($PE_{biodigester,h,y)}$ is ignored in the project emission calculations. The exclusion of project emission due to physical leakage and incomplete combustion of biogas from the biodigester need to be reviewed	~~CL 10~~	OK
B.6.9	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	The exclusion of project emission due to physical leakage and incomplete combustion of biogas from the biodigester need to be reviewed	~~CL 10~~	OK
B.6.10	Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Refer B.6.9 above.	~~CL 10~~	OK
	Leakage					
B.6.11	Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	No significant leakage identified in the methodology.		OK
B.6.12	Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	NA		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.6.13 Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	NA		OK
Emission Reductions					
B.6.14 Algorithms and/or formulae used to determine emission reductions: • All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.	/1/	DR/I	The emission reduction should be reviewed to make it in conformance with requirements under clause 7 Emission reductions of the methodology with regard to implementation plan, selection & size of sample group, baseline questionnaire.& calculation of emission reductions	~~CL 9~~ ~~CL 10~~	OK
B.7 Monitoring plan					
Data and parameters monitored					
B.7.1 Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR	A sampling plan will be evolved to analyze the sample of anaerobic biodigesters installed in rural areas of Kerala and Madhya Pradesh on a yearly basis during the entire crediting period. The PP needs to confirm that the monitoring plan is sufficient for emission reduction determination in conformance with requirements under clause 7 on Emission reduction of the methodology with regard to implementation plan, selection & size of sample group, baseline questionnaire and calculation of emission reductions etc.	~~CAR 5~~	OK
B.7.2 Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	The monitoring plan consider monitoring of following parameters-	~~CL 11~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				• Project area(ID 1 / Area) • Number of households in project sample group (ID 3 / n_{pj}) • Total number of households participating in the programme in year y (ID 5 / $n_{hh.y}$ **)** • Amount of non-renewable biomass consumption in the baseline(ID 6 / $F_{i,bl1}$**)** • Annual biomass increment on the project area I (ID 9 / I) • Annual biomass harvest on the project area i(ID 10 / H) (a)The PP needs to also monitor in addition to all stated parameters in the PDD ,the fossil fuel consumption (if any) for calculation of project emissions.		
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	NA		OK
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR	NA		OK
B.7.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	NA		OK
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	NA		OK
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	NA		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	Ability of project participants to implement monitoring plan					
B.7.8	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/	DR	The monitoring will be done by the local NGO present in the villages and the NGO members will be trained by INSEDA to maintain the biogas plants. Sample of bio digesters will be selected in both Kerala and Madhya Pradesh at 90% confidence level and 10 % margin of error. The selected bio digesters will be continuously monitored by the NGO members and the compiled reports will be sent to INSEDA office once in two months (or annually). (b)The PP needs to align this in line with the requirements of the methodology with respect to the determination of sample size group as detailed in Step 3 of emission reductions. (c) In addition, the reporting frequency of monitoring details by NGOs to INSEDA needs to be clarified.	~~CL 12~~	OK
B.7.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?			(d) PP to indicate the procedure for data handling	~~CL 11~~	OK
B.7.10	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/	DR	(e) Procedure to ensure quality assurance in sampling survey as per the methodology need to be indicated	~~CL 11~~	OK
B.7.11	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	Yes, all monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of carbon revenue for this project activity,		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				whichever occurs later.		
	Monitoring of sustainable development indicators/ environmental impacts					
B.7.12	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	No.		OK
B.7.13	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Yes, this has been done as per the GS requirement. The monitoring plan is mentioned clearly in GS passport and PDD.		OK
B.7.14	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR	Yes.		OK
	C Duration of the project activity / crediting period					
C.1.1	**Start date of project activity**					
C.1.2	How has the starting date of the project activity been determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/1/	DR	The indicated starting date of project activity is 1 June 2006 which is considered OK as it has been confirmed that Gold Standard Rules and Procedure dated 17 December 2007 the earliest start date for retroactive crediting is 1 January 2006. This has been taken as the earliest part considered as a part of this bundled project was commissioned on 1 June 2006.		OK
C.1.3	Is the stated expected operational lifetime of the project activity reasonable?	/1/	DR	The operational lifetime stated is 15 years. The PP needs to justify the operational lifetime of the project.	~~CL-12~~	OK
C.1.4	Is the start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/1/	DR	The PP has chosen 10 years fixed crediting period starting from 1 June 2006.	~~CL-13~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Since for Gold Standard VERs under the retroactive project cycle, it is potentially eligible for receiving credits for realized emission reductions prior to Gold Standard registration for a maximum period of two years only the PP needs to be correct this based on the expected time of registration.		
D Environmental Impacts						
D.1.1	Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? Does the approval contain any conditions that need monitoring?	/1/	DR	No, this is not required as confirmed from EIA notification of MoEF, Government of India, 2006 where this activity does not fall under the projects that require an EIA.		OK
D.1.2	Does the project comply with environmental legislation in the host country?	/1/	DR	Yes		OK
D.1.3	Will the project create any adverse environmental effects?	/1/	DR	No, rather it is expected to create beneficial environment impact.		OK
D.1.4	Have identified environmental impacts been addressed in the project design?	/1/	DR	NA		OK
D.1.5	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	NA		OK
D.1.6	Are transboundary environmental impacts considered in the analysis?			NA		OK
E Stakeholder Comments						
E.1.1	Have relevant stakeholders been consulted?	/1/	DR	Yes, the stakeholder were consulted in a meetings conducted in both the states Madhya Pradesh and Kerala on 12 October 2009 and 14 October 2009		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				respectively to intimate the local community about the project activity and the benefits on its implementation and to get their feedback about the proposed project.		
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	The stakeholders were invited through an advertisement in the local news paper and also by personal invitations to the local people. (a)The PP needs to provide the copies of newspaper and personal invitation.	~~CL-14~~	OK
E.1.3	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	No, this is not mandated by host country regulations.		OK
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	(b)The PP needs to provide the stake holder consultation report.	~~CL-14~~	OK
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	Refer E.1.4 above.	~~CL-14~~	OK

Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 1 The ODA declaration in GS prescribed form need to be provided. In addition the PP needs to provide the financial plan approved by a chartered accountant.	A.5.1	ODA declaration in GS prescribed form dated 9 Nov 2009 by Mr. Raymond Myles, Secretary General-cum-chief executive, INSEDA (hereafter referred as "PP") confirming no usage of any Official development assistance has been submitted to DoE and same is given as a reference #1 along with the DVR. As per confirmation from GS official Neha Rao, Regional Manager - India and Central Asia, financial plan is not required.	ODA declaration in GS prescribed form dated 9 Nov 2009 by PP confirming no usage of any Official development assistance has been verified /11/. A confirmation mail dated 16 September 2010 from GS official stating that financial plan is not required has been verified /11/. CAR is closed.
CAR 2 The PP needs to demonstrate and clearly describe in the PDD the requirements related to retroactive registration. The project was first submitted to Gold Standard on 16 February 2009 and covers only biodigestors installed till December 2008, the PP needs to go through a pre feasibility assessment. The pre feasibility assessment needs to be provided	B.5.5, B.5.7, B.5.10	In the project activity bio digesters installed between June 2006 and Dec 2008 are considered. Hence, project activity falls under retroactive category. As per Gold Standard toolkit version 02, Sec 2.5, retroactive projects are required to have pre feasibility assessment from GS registry. A draft PDD and passport as a requirement of pre feasibility on 16 February 2009 and received pre feasibility assessment from Neha Rao, GS on 8 September 2009 were submitted. It is evident from the pre feasibility assessment that project is eligible under GS VER. The pre feasibility assessment has been submitted and same is given as reference #2 along with DVR.	A pre feasibility assessment required for the project dated 8 September 2009 done by Gold Standard has been verified. It has been verified from the pre-feasibility assessment that the project falls under retroactive category as per the GS requirements /26//27/.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
In addition the PP needs to demonstrate prior consideration and continuous action to secure carbon revenues as per Demonstration and assessment of prior consideration of CDM, version 3 (EB 49, annex 22).		Serious consideration of carbon credits is explained in revised PDD through chronology of events with supported documents.	• The board resolution dated 28 September 2007 confirming that Carbon Credits are essential and will be considered for the project activity has been verified /24/. • The PP has after this initiated discussions with consultants for the development of PDD; e-mail confirmations dated 1 January 2008 have been verified /24/. • The PP also entered into a discussion on the possibility of a VERPA, confirmed from emails dated 22 February 2008 which was subsequently signed on 2 May 2008 /25/. • Subsequent to this the passport and PDD were submitted to GS for a pre feasibility assessment on 16 February 2009 /26/. And feedback on the pre feasibility assessment was received on 8 September 2009 as confirmed from the e-mail /27/. • This was followed by stakeholder meetings in Madhya Pradesh and Kerala on 12 and 14 October 2009 respectively as confirmed from the minutes /30//31/. • The DOE was subsequently

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr><td></td><td></td><td></td><td>appointed on 10 March 2010 as confirmed from the agreement between the PP and DNV /28/.
Hence, it is ascertained that continued action to secure Carbon revenue was taken parallel to the implementation of project.
Same in form of chronology has been added in the revised PDD dated 23 May 2011 and has been verified.

CAR is closed.</td></tr>
<tr><td>CAR 3
a)PP need to provide support document for investment cost for all the identified alternatives in the PDD</td><td>B.5.22-5.25; B.30-5.32</td><td>a) All the identified alternatives are given in table below:
<table><tr><th>S.No</th><th>Identified alternative</th><th>Cost</th><th>Reference</th></tr><tr><td>1</td><td>LPG stove</td><td>Rs, 1250</td><td>As per IOCL report</td></tr><tr><td>2</td><td>Kerosene Stove</td><td>Rs. 480</td><td>Purchase receipt from Kamal furniture dated 13 August 06</td></tr><tr><td>3</td><td>Wood stove</td><td>0</td><td>Wood stove is made up of three bricks which are easily available at homes.</td></tr></table>All the references stated above has been submitted</td><td>• Cost of LPG stove taken as INR 1 250 has been verified from IOCL report /12/.
• Cost of Kerosene stove taken as INR 480 has been verified from Purchase receipt dated 13 Aug 2006 /10/.
• It has been verified from the site visit /46/ as it involves putting up a few bricks which are readily available. Hence wood stove does not involve any capital cost.</td></tr>
</table>

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr>
<td>b) PP need to provide supporting documents for fuel costs and the quantum of usage for all alternatives considered while evaluating financial barrier.</td>
<td></td>
<td>to DoE and also submitted as Ref 3 along with DVR.

b) Fuel cost and quantum of usage of all the identified alternatives are given in table below:
<table>
<tr><th>S.No</th><th>Identified alternative</th><th>Cost(Rs/ month) & quantum</th><th>Reference (a) Fuel cost b) fuel requirement</th></tr>
<tr><td>1</td><td>LPG stove</td><td>258.62 & 11.3 kg/month</td><td>a) Purchase receipt from Jyothi Gas dated 5 November 09.
b) As per Report on the use of LPG as a domestic cooking fuel option in India by Antonette D’Sa and K.V.Narasimha Murthy, June 2004,p#17</td></tr>
<tr><td>2</td><td>Kerosene Stove</td><td>220& 0.78l/day</td><td>a) Value is calculated based on Kerosene cost in Kerala & in M.P.
In Kerala, cost is INR 9.5/litre(as per Kerala govt report)
In M.P., it is 8.86 – 9.97/l (M.P.govt).As per govt rule only two litres of kerosene is provided to one family per month at subsidized rate.
Therefore, 220INR/month is required to suffice the need of kerosene.</td></tr>
</table>
</td>
<td>Fuel cost and consumption has been verified from following sources:
• Purchase receipt from Jyothi Gas dated 5 November 09 for LPG cost /10/. Kerosene consumption of 11.3 kg/month has been verified from “Report on the use of LPG as a domestic cooking fuel option in India”; Antonette D’ Sa and K.V. Narasimha Murthy dated June 2004 published by International Energy Initiative /12/.
• Cost of kerosene has been verified from Kerala government and M.P government reports giving the average cost of kerosene in both the states /10/. Kerosene consumption has been verified from study -Scope for Solar Energy Devices in Karnataka State, India by T.V. Ramachandra, 1996 /10/.
• It has been verified from site visits /46/ that firewood does not involve any cost since it is easily available in the project areas.</td>
</tr>
</table>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
(c)It was confirmed while carrying out the site visit from the ration cards issued by the government authority that most of the people were having a monthly income of upto INR 1 000 only.		<table><tr><td></td><td></td><td></td><td>**b)** The monthly consumption of kerosene is as per study -Scope for Solar Energy Devices in Karnataka State, India by T.V. Ramachandra,1996 As per the report Kerosene consumption for cooking, in kg/person/ day, ranges from 0.05 (hilly) to 0.34 (coast). However in Kerala few regions are hilly and most of them are coastally. In M.P. none of the areas are hilly or coastal therefore average is taken of hilly and coastal. Considering average family has 4 person daily requirement is 0.78l/month.</td></tr><tr><td>3</td><td>Wood stove</td><td>0</td><td>As per survey report in both the states, Firewood is easily available and collected from nearby areas free of cost</td></tr></table> All the references stated above has been submitted to DoE and also submitted as Ref 4 along with DVR. c) Survey was conducted in Kerala by Department of Bio-energy, Agricultural Engineering College & Research Institute, Tamilnadu Agricultural University in September 2009 and in Madhya	The monthly income is INR 500 of households in Kerala and INR 850 of households in M.P. This has been verified from survey reports dated

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr>
<td>The PP also needs to provide evidence in support of limited monthly incomes for all the districts of both the Indian States that are covered under the project activity and thus their inability to meet the energy costs of other alternatives described in the PDD.

d) The PP needs to provide the financial comparison calculation</td>
<td></td>
<td>Pradesh by Environment and Energy Management Group, Bhopal in September 2009 to know the monthly income of the households participated in project activity.
As per survey results the average income in Kerala is 500 INR and in Madhya Pradesh is 850 INR

d) Financial comparison table is given below:

<table>
<tr><th>Alternative</th><th>Cost (Rs/month)</th><th>Reference</th></tr>
<tr><td>Firewood</td><td>0</td><td>As per survey report in both the states, Firewood is easily available and collected from nearby areas free of cost</td></tr>
<tr><td>Kerosene</td><td>220</td><td>Calculated</td></tr>
<tr><td>LPG</td><td>258.62</td><td>Purchase receipt from Jyothi Gas dated 5 Nov 09</td></tr>
</table>
All the above alternatives are compared with the cost of biogas plants of different capacities.
Comparing the cost of all alternative with biogas plant, it can be concluded that installation biogas plants is most expensive and as per survey results the average income in Kerala is 500 INR and in Madhya Pradesh is 850 INR. Therefore, it can be concluded that the cost of family type biogas plant is comparatively higher than the available alternatives and the same is not affordable to the</td>
<td>September 2009 for both the states /7/ and also cross checking with ration cards of the households visited while carrying out the site visit /15/.

Financial comparison has been provided in the revised PDD dated 23 May 2011 /1/ and has been verified.</td>
</tr>
</table>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
(e)The PP needs to discuss in the PDD how carbon revenue alleviates the investment barrier.		target population. Same is explained in the revised PDD in Sec B.5 e) Beside initial investment to make plant functional proper operation and maintenance is required. As per Evaluation study on National Project on Biogas Development by Programme Evaluation Organisation Planning Commission Government of India, May 2002, the main reasons for plants becoming non-functional are structural and operational problems, non-availability of cattle/dung, easy availability of other convenient fuels, chocking of inlet/outlet, corrosion/leakage in pipeline, scum formation in digester slurry and water accumulation in gas pipe. Considering low income of the farmers as stated above regular operation & maintenance of plant is difficult. Therefore, carbon revenue will act as support and catalyst for sustained operation of the plant and increasing penetration of the technology in the rural India. INSEDA will conduct various training programmes for masons, local technical staff in state NGOs and will be engaged in setting up of service centre at state level to provide free of cost service to the end users of biogas plant throughout the crediting period. Role of carbon revenue in alleviating investment barrier is also explained in Sec B.5 of the revised PDD.	In accordance with methodology /42/, the PP has correctly chosen Investment barrier which is "the programme cannot be implemented as the initial investment in the bio digesters is too high for individual households". It has been confirmed that the initial capital cost required for the family type bio digesters at the least is INR 9 650 for $2m^3$ Deenbandhu model and goes upto INR 16 500 for a $6m^3$ capacity. This has been confirmed from the audit report of Aadivasi khadi Avom krishi Pariskchan Sansthan (AKKPS) for the year 2006 /16/. The initial capital cost for a kerosene stove is INR 480 confirmed from purchase receipt of kerosene stove /10/ and that for a LPG stove is INR 1 250 from Indian Oil Corporation Limited (IOCL) official website /12/. It has further been verified from the ration cards /15/ verified while carrying out the site visit and survey results provided by the PP that the

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
(f)The PP needs to discuss in the PDD whether and how at least one of the possible alternatives to the project is feasible under similar circumstances.		f) Continuation of the usage of firewood is the only alternative which doesn't face any barrier. In addition firewood stove doesn't involve any Operation and maintenance cost. Same is explained in detailed in PDD under Section B.5	average monthly income for households in Madhya Pradesh and Kerala is INR 850 and INR 500 respectively /7/. Thus it can be concluded that the 1. Investment Cost of bio digesters is much higher as compared to other alternatives 2. The investment cost is approximately 160% of the annual income of targeted household in Kerala and almost same as annual income of targeted households in the state of Madhya Pradesh. This is considering the investment cost of only a $2m^3$ bio digester (INR 9 650). The cost of bio digesters range from INR 9 650 to INR 16 500 /16/. It has been further confirmed that the usage of wood stove does not involve any investment. The CAR is closed.
CAR 4 The PP also needs to provide documents related to pre-announcement check, ODA declaration form, DNA notification, mechanisms in place to prevent	B.5.6	As per the undertaking given by Mr. Raymond Myles, Secretary General-cum-chief executive, INSEDA neither INSEDA nor its member organizations have announced the project activity	ODA declaration in GS prescribed form dated 9 Nov 2009 by PP confirming no usage of any Official development assistance has been

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
risk of double counting (projects related to other schemes), clarify on the districts not forming a part of the project boundary and give a detailed project description.		officially without considering carbon revenue. Board resolution dated 28 September 2007 between INSEDA, AKKPS and SDA was first official declaration to consider carbon revenue for project development. Board resolution is given as ref #5 along with DVR. ODA declaration in GS prescribed form dated 9 Nov. 2009 by Mr. Raymond Myles, Secretary General-cum-chief executive, INSEDA (hereafter referred as "PP") confirming no usage of any Official development assistance has been submitted Official e-mail Invitation was sent on 04 October 2009 to CDM Authority, Designated National Authority, Ministry of Environment and Forest by Mr. Raymond Myles, Secretary General-cum-Chief Executive-INSEDA for stakeholder meetings in Kerala and M.P. and same is given as Ref #6 along with DVR. Undertaking has been submitted by all the 4265 biogas plant owners confirming the plant is not included in any other CDM/VER activity. Same has been given as ref#7 along with DVR. Districts involved in project activity in states of Kerala & Madhya Pradesh have been corrected in the revised PDD.	verified /11/. Board Resolution stating that Carbon credits will be considered for the project activity dated 28 September 2007 has been verified /24/. Official e-mail invitation dated 4 October 2009 to Ministry of Environment and Forests by PP inviting for stakeholder meeting has been verified /32/. Undertaking given by Project Participant to confirm that INSEDA has no registered CDM/VER project activity has been verified /3/. The revised PDD now has districts forming a part of Kerala and MP.
In addition the PP needs to respond to all the comments received from GS as a part of prefeasibility assessment.		All the comments received from GS in prefeasibility assessment have been addressed in the PDD as well as explained in separate table at the end of DVR.	Revised PDD dated 23 May 2011 and passport is in accordance with GS comments in pre feasibility

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			assessment has been verified. CAR is closed.
CAR 5 The PP needs to confirm that the monitoring plan is sufficient for emission reduction determination in conformance with requirements under clause 7 on Emission reduction of the methodology with regard to implementation plan, selection & size of sample group, baseline questionnaire and calculation of emission reductions etc.		As per GS methodology, point 7, the project implementation and determination of emission reductions involves the following steps: Step 1: Determination of the project area(s) i Step 2:Establishment of a project activity implementation plan Step 3: Determination of the size of the project sample group Step 4: Selection of the households to be included in the project sample group Step 5: Establishment of a project database Step 6: Perform baseline questionnaire Step 7: Perform project questionnaire Step 8: Calculation of the mean and standard deviation of project and baseline emissions Step 9: Calculation of emission reductions All these steps are included in revised PDD for calculation of emissions reductions	All the steps for emission reduction determination as per the requirements under clause 7 of GS methodology have been verified to be included in revised PDD dated 23 May 2011. CAR is closed.
CL 1 (a)The number of digesters included in the project activity need to be confirmed by PP along with the names, identification no, capacity as well as the date of installation of the bio digesters. It was confirmed during site visit that some of the biodigesters were being used for commercial operations like hospitals and canteens. The PP is requested to revisit the complete list and consider only those which are applicable to	A.2.4, B.2.1,B.5.8	Project activity includes plants installed in between June 2006-Dec 2008. Detailed list of 4 265 plants is available with Plant owner's name, address, capacity and biogas plant ID. Same is given as Ref#8 along with DVR. Formerly plants were 4 369 with plant size varying from $1m^3$ to $20m^3$ but after removal of all the plants established in commercial institutions revised list has 4265 plants. In addition all the plants having capacity more than $6m^3$ have been removed even if it was utilized for domestic	Detailed list of 4 265 plants included in the project activity has been verified /4/. It has been verified that only plants installed in households are included in project activity now as per the methodology. Further all higher capacity plants have been removed from the revised list.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
households only as per the requirements of the methodology.		purpose.	The clarification is closed.
CL 2 As per GS tool kit, version 2, the PP needs to provide the detailed calculations for confirming that it falls under small scale category.	A.2.8	As per detailed calculation in the Emission reduction sheet project activity falls under small scale category as thermal energy production is 39.43 MW_{th} which is less than 45 MW_{th}. Therefore it can be concluded that project activity falls under small scale.	Detailed calculation sheet has been verified to ascertain that project falls under small scale activity. The clarification is closed.
CL 3 The PP is requested to provide and undertaking confirming that the project activity is not a debundled component of a larger project activity. b) Details of baseline survey need to be provided to establish the fuel used in pre-project activity. (c) Copies of undertakings by farmers to the effect that the bio digesters are not included in another CDM or voluntary market project need to be given.	A.2.9, B.2.1,B2.2, B.2.4	An Undertaking has been given by Mr. Raymond Myles (PP) confirming that the project activity is not a debundled component of a larger project activity. Same is given as Ref # 9 with DVR b) In Kerala survey by Department of Bio-energy, Agricultural Engineering College & Research Institute, Tamilnadu Agricultural University in September 2009 and in Madhya Pradesh survey was conducted by Environment and Energy Management Group, Bhopal in September 2009 As per survey, firewood was used before implementation of bio gas plants by the villagers to suffice their thermal energy needs. Survey report of both the states has been submitted and given as Ref# 10 with the DVR c) Undertakings were taken from 4 265 plant owners in Kerala and M.P. whereby plant owners have declared that 4 265 bio digesters included in the project activity are not included in another CDM or voluntary market project. Same is	Undertaking given by PP confirming that project is not a debundled component of a larger project activity has been verified /3/. Survey report dated September 2009 for Kerala and M.P confirming use of firewood in baseline scenario has been verified /7/. Undertaking from all plant owners that bio-digesters are not included in any other project activity has been verified /4/.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		given as Ref# 11 along with the DVR.	The clarification is closed.
CL 4 (a) The PP needs to demonstrate that the technological barriers/issues are substantiated by a source independent of the project participants (b)The PP needs to discuss in the PDD how revenue from carbon credit alleviates the	B.5.33-B.5.35	As per Evaluation study on National Project on Biogas Development by Programme Evaluation Organisation Planning Commission Government of India, May 2002, the main reasons for plants becoming non-functional are structural and operational problems, chocking of inlet/outlet, corrosion/leakage in pipeline, and scum formation in digester slurry with water accumulation in gas pipe. Therefore, to maintain and operate the plant successfully training is an integral part. Since local people have no prior experience to operate and maintain the anaerobic biodigesters this involves a huge risk in the successful operation of the plant. Considering low income of the farmers' regular operation and maintenance of plant is difficult. Therefore, carbon revenue will act as support and catalyst for sustained operation of the plant and increasing penetration of the technology in the rural India. INSEDA and its partner agencies will take care of training programmes for masons, local technical staff in state NGOs and will be engaged in setting up of service centre at state level to provide free of cost service to the end users of biogas plant throughout the crediting period. Biogas plant owners will also get additional sharing from the sale of carbon credits.	DNV has verified an independent study "Renewable Energy Resources for Climate Change Mitigation" which confirms an achievement of approximately 28% only of the targeted potential of Biogas plants confirming lower dissemination in the host country /17/. Further the project activity also faces technological barriers as it has been confirmed from the study that only 45% are operational and 60% of the plants turned non functional due to various structural problems and other issues like choking of inlet/outlet, corrosion/leakage in pipeline, scum formation in digester slurry and water accumulation in gas pipe. Thus maintenance of the bio digesters requires trained man power as compared to no maintenance required for wood stove's /17/. The pre project scenario of using firewood as fuel for cooking applications does not involve any investment or operational barriers and hence does not face any barrier.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
technological barrier which have been listed above. (c) PP to discuss in the PDD whether the alternatives to the projects is prevented by the technological barrier		Technological barrier has been revised in the PDD under sec B.5. No other alternative to the project is prevented by the technological barrier except project operation.	Technology barrier in PDD has been revised and same has been verified from revised PDD dated 23 May 2011. It has also been verified that project activity faces technological barriers and no other alternative faces the technological barriers. The clarification is closed.
CL 5 (a) The PP is requested to support the prevailing practices by data /documents and provide copies of the same and also the references 17 to 19 of the PDD. (b) The PP is requested to discuss in the PDD how carbon revenue alleviates the barrier due to prevailing practise. (c) The PP is requested to discuss in the PDD whether the alternatives to the projects is prevented by prevailing practise	B.5.36-B.538	Barriers due to prevailing practices have been removed from the revised PDD as main barriers explained the version 2 of the PDD is Investment and Technological barriers.	Barriers due to prevailing practices have been removed and same has been verified from revised PDD. This is acceptable and is in line with methodology. The clarification is closed.
CL 6 (a) Discussion under institutional barrier need to be supported with data from independent source (b) The PP is requested to discuss in the PDD how revenue from carbon credit alleviates the technological barrier (c) The PP is requested to discuss in the PDD whether the alternatives to the projects is prevented by the Institutional barrier.	B.5.39-B.41	Institutional barrier has been removed from the revised PDD as main barriers explained the version 2 of the PDD is Investment and Technological barriers.	Institutional barrier has been removed and same has been verified from revised PDD. This is acceptable and is in line with methodology. The clarification is closed.
CL 7	B.5.42-	(a) & (b) As per Evaluation Study on National	It has been confirmed that out of a

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
(a)The PP needs to justify a higher achievement of 4.12 Million as against a stated potential of 12 Million biodigesters. (b)The common practise in states like Kerala and MP are not sufficiently discussed and supported by publically available data. This also needs to be discussed. c)The essential distinctions between the project and similar activities occurring in Kerala,& MP states or in the geographical scope chosen needs to be established with the help of supporting data and information	B.5.47	Project on Biogas Development, by Programme Evaluation Organisation Planning Commission Government of India, May 2002, India has got potential of 12 million biogas plants but the total number of family size biogas plants installed is 3.44 million, though only half of these are in use or 7% are operational. This indicates that penetration of such type of projects is very less and also because of operation and maintenance cost associated with the biodigesters almost 50% of the plants are not working. Same has been elaborated in details in the revised PDD. (c) The distinctions specific to the similar activity in MP & Kerala can be assumed to the exclusivity of the installed bio-digesters in the project locations and there non participation in other projects / programs. The same is proved by submission of exclusivity agreements between the farmers and respective state NGOs.	total potential of 12 Million bio digesters, only 28% which is 3.44 Million has been achieved from Evaluation Study on National Project on Biogas Development, by Programme Evaluation Organisation Planning Commission Government of India dated May 2002. It has also been mentioned in the study that only 7% of the households in the sample villages were found to be actually using bio gas that too often as a supplementary source of fuel /17/. Hence it can be ascertained that it is not a common practice to use bio digesters. It has been verified from the exclusivity agreements between farmers and respective state NGOs that installed biodigesters covered under the project activity are not included in any other programme /4/. The clarification is closed.
CL 8 The barrier analysis should include the possible barriers along with related evidences given in Page (4) of the GS methodology. The barrier analysis should also include the possible barriers along with related evidences given in Page (4) of	B.5.48	The barrier analysis is demonstrated in the PDD with the help of following illustrations: a) High initial investment in biodigesters as compared to monthly income of farmers. b) Problems in maintenance of biodigesters c) Lack of end user training	The barrier analysis is now in line with GS methodology requirements. This has been verified from revised PDD dated 23 May 2011 and considered appropriate.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
the GS methodology		d) As per the Planning commission report, household biogas based systems; continuous operation in India shows low penetration. All these parameters are in line with the methodology respect to additionality assessment.	The clarification is closed.
CL 9 a) The reference documents for inputs for the calculation of biomass availability and requirement need to be provided. The details of the survey including the party carrying the survey, the date, the summary and results (derived) need to be provided and in line with the methodology requirements of being carried out before the implementation of the biodigester or within 3 months after the implementation of the bio digestor. b) The copy of baseline sample survey reports in MP & Kerala along with the detailed calculation sheets for deriving the NRB needs to be provided. The assumptions and references used need to be clearly mentioned.	B.6.1, B.6.2, B.6.5-6.7	a)All reference documents related to Non renewable biomass calculation has been submitted to DoE as ref#12 As per Gold standard methodology point 4.1.1- "The surveys should be held before the implementation of the biodigester or within 3 months after the implementation of the biodigester". Since, project activity is retroactive therefore survey couldn't be done at the time of implementation of biogas plant. PP asked GS personnel for the clarification and received official email confirmation regarding the applicability of the methodology from Neha Rao, Regional manager-India and Central Asia, Gold standard dated 6 April 2010 stating PP can use same methodology and survey should be done at earliest. Confirmation email from GS is given as Ref#13 b) Survey reports of Kerala and Madhya Pradesh with detailed calculation sheet is given as Ref# 14 with the DVR.	All reference documents for calculating NRB have been verified and have been considered correctly /34//35//36//37/. It has been clarified by GS vide their e-mail dated 6 April 2010 /7/ that the PP needs to complete the survey as soon as possible and hence the condition of "survey should be held before the implementation of the bio digestor or within 3 months after the implementation of the bio digestor" has been relaxed with respect to timelines while carrying out the validation. Baseline survey reports have been verified /7/.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
(c)The PP needs to provide the detailed calculation sheets for calculation of baseline emissions indicating all assumptions and support documents for the same.		c) Detailed emissions reduction sheet has been submitted as Ref # 15 to the DoE	Detailed calculations have been provided in excel sheet and same has been verified /2/. The clarification is closed.
CL 10 The exclusion of project emission due to physical leakage and incomplete combustion of biogas from the biodigester needs to be reviewed.	B.6.8-B.6.10	Project Emissions from Biodigsters ($PE_{biodigester,h,y}$) have been calculated as given in ER sheet. During monitoring period amount of fossil fuel usage will be monitored and accordingly project emissions will be adjusted. For ex-ante estimations, project emissions due to fossil fuel usage are taken as nil. Hence, total project emissions are 1 022 tCO_2/annum.	As per the methodology project emissions from household fuel consumptions after installation of bio digesters and emissions from bio digesters which include physical leakage of bio digester and incomplete combustion of biogas have to be considered. The project emissions due to fuels used to meet the thermal energy need per household has been considered and the quantity of fuel consumed in the households shall be monitored. For the purpose of ex ante estimations the emission due to this is taken as nil which is appropriate as it has been confirmed through site visit interviews that no fossil fuel was being used. The project emissions from the bio digesters have now been considered. The project emissions have been correctly calculated as 1 022 tCO_2/annum

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			The clarification is closed.
CL 11 (a)The PP needs to monitor in addition to all stated parameters in the PDD, the fossil fuel consumption (if any) for calculation of project emissions.	B.7.2-B.7.8-B.7.10	(a) Amount of fossil fuel consumption after installation of biodigester will be considered as project emissions and same will be verified as per third party survey results during monitoring. Same has been included in the revised PDD.	The revised PDD incorporates the monitoring plan for fossil fuel consumption through third party survey. Same has been verified from the revised PDD.
(b)The PP needs to align the sample size in line with the requirements of the methodology with respect to the determination of sample size group as detailed in Step 3 of emission reductions.		b) Sample size will be calculated considering 95% confidence level as stated in Step 3 of point 7 emission reductions of the methodology. As per 95% confidence level 100 samples will be monitored in Kerala and 86 samples will be monitored in M.P.	A total of 100 samples will be monitored in Kerala and 86 in M.P at 95% confidence level. This is in line with the methodology.
(c) In addition, the reporting frequency of monitoring details by NGOs to INSEDA needs to be clarified		c) State NGOs will monitor the sample of households. Sample size will be determined as per methodology considering 95% confidence and 20% margin error. 100 will be monitored in Kerala and 86 will be in M.P therefore total 186 plants will be monitored. State NGOs will monitor these 186 plants and submit the report to INSEDA once in 6 months. Same has been revised in the PDD under monitoring section.	The reporting frequency has been added in revised PDD dated 23 May 2011 and same has been verified to be appropriate.
(d) The PP is requested to indicate the procedure for data handling		d) Service record will be prepared by state NGOs to monitor the operation of bio-digesters. This data will be maintained by the State NGOs and NGOs will submit the data to INSEDA	Procedure for data handling has been added in revised PDD and is also mentioned in the operating manual. The same has been verified to be appropriate.
(e)Procedure to ensure quality assurance in sampling survey as per the methodology need to		e) Survey will be carried out every year in both the states by third party in the sample population. Sampled household will be interviewed through	The local NGOs involved in the project activity shall be responsible

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
be indicated		questionnaires having information like amount and type of fuel used for each household, biodigester working condition, improvement in the life standard etc. Survey report and questionnaires will be provided to DOE at the time of verification.	for collection and compilation of the monitoring data including the surveys required as a part of the monitoring plan. INSEDA shall ensure that the data monitored has been accurately recorded, properly archived, and that QA/QC procedure for the entire monitoring process has been implemented in line with the GS-VER requirements. All the relevant documents will be kept for at least two years after the end of the crediting period. It has been confirmed during the site visit that adequate procedures are in place for subsequent verification of emission reductions. The clarification is closed.
CL 12 The operational lifetime stated is 15 years. The PP needs to justify the operational lifetime of the project.	C.1.3	As per letter from IIT, lifetime of Deenbandhu plants is 10-15 years. Thus a lifetime of 15 years has been taken conservatively.	Letter from IIT dated 24 September 2010 /18/ stating lifetime of the deenbandhu plants as 10-15 years has been verified. PP has taken lifetime as 15 years which is conservative and appropriate. The clarification is closed.
CL 13 Since for Gold Standard VERs under the retroactive project cycle, it is potentially eligible for receiving credits for realised emission	C.1.4	The project is expected to be registered by end of 31 August 2011, therefore crediting period of the project activity starts from 1 September 2009. The same has been revised in the PDD.	The deemed date of registration is reasonable looking at the current status of validation. The CL is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
reductions prior to Gold Standard registration for a maximum period of two years only the PP needs to be correct this based on the expected time of registration.			
CL 14 (a)The PP needs to provide the copies of newspaper and personal invitation (b)The PP needs to provide the stakeholder consultation report.	E.1.2, E.1.4	Stakeholders' meeting advertisements were given in the local newspaper of Kerala and M.P in local language. In Kerala, advertisement was Published in Sunday express(English) as well as in Malyalam Manorma (in Malyalam) on 11 October 2009 In Madhya Pradesh advertisement was Published in Dainik Bhaskar on 8 October 2009 In addition, official e-mail invitations were sent by PP to GS, GS supporter NGOs and DNA on 4 and 5 October 2009. Copies of newspaper and personal invitation have been submitted as ref#16 along with Local stakeholder consultation report.	The minutes for the stakeholder meetings /30//31/ held has been verified and appropriate. The summary of the comments has been provided and the comments have been addressed. The copies of the notices and invitation letters has been verified and found to be OK. The clarification is closed.
CL 15 The PP along with the methodology is using GS Tool kit, version 2 while version 2.1 is available. The PP needs to justify the use of older version of tool kit for the project activity.	B.1.1	PP has submitted pre feasibility assessment report with fees to GS foundation in February 2009. As per GS tool kit version 2.1 (page# 15) apply for retroactive registration by uploading the required documentation and paying the pre-feasibility assessment fee before 1 August 2009 will still be able to use Version 2.0.	GS toolkit version 2.1 mentions that retroactive projects which have submitted pre feasibility assessment report before 1 August 2009 can still use toolkit version 2.0. Use of older version is thus acceptable and in line with GS requirements. The clarification is closed.
GS Review results and conclusions based on the prefeasibility assessment on the retroactive registration request:			
ODA		ODA declaration in GS prescribed form dated 9 November 2009 by Mr. Raymond Myles, Secretary	ODA declaration in GS prescribed form dated 9 November 2009 /11/

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		General-cum-chief executive, INSEDA (hereafter referred as "PP") confirming no usage of any Official development assistance has been submitted to DoE and same is given as a reference #1 along with the DVR	by PP confirming no usage of any Official development assistance has been verified. The clarification is closed.
Please provide a pre-announcement statement in section C.3 of the GS Passport attesting that no such previous announcement has been made about the project going forward without mention of carbon revenues		As per the undertaking given by Mr. Raymond Myles, Secretary General-cum-chief executive, INSEDA neither INSEDA nor its member organizations have announced the project activity officially without considering carbon revenue. Board resolution dated 28 September 2007 between INSEDA, AKKPS and SDA was first official declaration to consider carbon revenue for project development. Same has been mentioned in section C.3 of the GS Passport	An undertaking given by INSEDA that neither INSEDA nor its member organizations have announced the project activity officially without considering carbon revenue has been verified. The board resolution dated 28 September 2007 confirming that Carbon Credits are essential and will be considered for the project activity has also been verified /24/. The clarification is closed.
DNA notification		Official e-mail Invitation was sent on 4 October 2009 to CDM Authority, Designated National Authority, Ministry of Environment and Forest by Mr. Raymond Myles, Secretary General-cum-Chief Executive-INSEDA for stakeholder meetings in Kerala and M.P	Official e-mail invitation sent on 4 October 2009 to Ministry of Environment and Forests (DNA) PP for stakeholder meetings in Kerala and M.P has been verified /32/. The clarification is closed.
Please describe the mechanisms to be put in place to prevent any risk of double-counting due to other similar project activities that could potentially claim the same emission reductions		Undertaking has been submitted by all the 4265 biogas plant owners confirming the plant is not included in any other CDM/VER activity. Same has been submitted along with DVR.	An undertaking submitted by all 4 265 bio digesters owners confirming that plant is not and will not be part of any other CDM/VER activity has been verified /4/.

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr><td></td><td></td><td></td><td>The clarification is closed.</td></tr>
<tr><td>Some of the districts mentioned under the head Kerala in the table on p8 of the PDD come under a different state i.e. Karnataka. For e.g. Dharwar, Mysore districts are in Karnataka state and not Kerala. Please clarify.</td><td></td><td>Project activity includes following districts in Kerala & Madhya Pradesh:
<table><tr><th>Districts in Kerala</th><th>Districts in Madhya Pradesh</th></tr><tr><td>Alappuzha</td><td>Balaghat</td></tr><tr><td>Ernakulum</td><td>Betul</td></tr><tr><td>Idukki</td><td>Chhindwara</td></tr><tr><td>Kannur</td><td>Seoni</td></tr><tr><td>Kasargodu</td><td>Narsinhpur</td></tr><tr><td>Kottayam</td><td></td></tr><tr><td>Kozhikod</td><td></td></tr><tr><td>Malapuram</td><td></td></tr><tr><td>Palakkadu</td><td></td></tr><tr><td>Pathanamthitta</td><td></td></tr><tr><td>Thrissur</td><td></td></tr><tr><td>Wayanad</td><td></td></tr></table>
As per Madhya Pradesh govt website it can be confirmed that these districts form part of M.P. Similarly all the districts given above in Kerala district section form a part of Kerala,
Mistakenly few districts of Karnataka were given in the PDD at the time of pre feasibility assessment which is now been removed.</td><td>The typographical mistake has been corrected and project area is now correctly mentioned in the two states.

The clarification is closed.</td></tr>
<tr><td>Please give a more detailed description of the project in Section A of the PDD, including the number of bio-digesters included in the project activity along with an approximate breakdown of their sizes. This information on the breakdown should also be included in the emission reduction</td><td></td><td>The project activity is located in rural areas of the states of Kerala and Madhya Pradesh. The consumption of non renewable biomass firewood for household purposes in the rural areas is the main cause of deforestation in the surrounding areas of Kerala and Madhya Pradesh. The project</td><td>A detailed description of project along with the breakdown of sizes has been added in Section A of revised PDD and same has been verified.</td></tr>
</table>

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr><td>calculations.</td><td></td><td>includes bundling of 4265 households in various districts of Kerala and Madhya Pradesh installed between June 2006 and December 2008.
The size of the biodigesters varies, depending on the number of people and number of cattles available per household. A detailed breakdown of the plants with the respective installed capacity is given below in Table 1.

Table 1. Breakdown of the plants with the respective installed capacity

<table>
<tr><th>Sr. No</th><th>Capacity (m^3)</th><th>Number of plants</th></tr>
<tr><td>1</td><td>1</td><td>154</td></tr>
<tr><td>2</td><td>2</td><td>1829</td></tr>
<tr><td>3</td><td>3</td><td>1842</td></tr>
<tr><td>4</td><td>4</td><td>338</td></tr>
<tr><td>5</td><td>6</td><td>102</td></tr>
<tr><td colspan="2">Total:</td><td>4265</td></tr>
</table>
Same has been revised in the section A of the PDD</td><td>The clarification is closed.</td></tr>
<tr><td>Please discuss in detail in the PDD how early consideration of carbon revenues has been decisive in the decision for the project to go ahead and evidences shall be provided to support this claim</td><td></td><td>Chronology of events has now been updated in revised PDD and same is given in the table below:
<table>
<tr><th>S.No</th><th>Event</th><th>Date</th><th>Reference</th></tr>
<tr><td>1</td><td>Board Resolution</td><td>28th Sep,2007</td><td>Copy of Board resolution</td></tr>
<tr><td>2</td><td>Discussion with gtz consultant for writing the PDD</td><td>1st Jan, 2008</td><td>Email copy</td></tr>
<tr><td>3</td><td>Verified Emission reductions Purchase Agreement (VERPA)</td><td>22nd Feb, 2008</td><td>Email copy</td></tr>
</table></td><td>The chronology of events has been updated and has been verified from revised PDD dated 23 May 2011. It can be confirmed from the chronology that carbon revenues were seriously considered in decision to go ahead for project.

The clarification is closed.</td></tr>
</table>

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>discussion with First Climate(FC)</td><td></td><td></td></tr>
<tr><td>4</td><td>VERPA signing between FC and INSEDA</td><td>2nd May,2008</td><td>VERPA copy</td></tr>
<tr><td>5</td><td>Submission of PDD and passport to GS for pre feasibility assessment</td><td>16th Feb,2009</td><td>Pre feasibility report</td></tr>
<tr><td>6</td><td>Feedback from GS on pre feasibility assessment</td><td>08th Sep,2009</td><td>Pre feasibility report</td></tr>
<tr><td>7</td><td>Stakeholder meeting in Madhya Pradesh</td><td>12th Oct,2009</td><td>Local stakeholder consultation report</td></tr>
<tr><td>8</td><td>Stakeholder meeting in Kerala</td><td>14th Oct,2009</td><td>Local stakeholder consultation report</td></tr>
<tr><td>9</td><td>DoE Appointment</td><td>10th Mar,2010</td><td>Signed Validation Contract</td></tr>
</table>
All the documents given in table above have been submitted to DoE and same has been submitted along with the DVR.
</td><td></td></tr>
<tr><td>In general, the additionality discussion is not in line with the requirements of the Addtionality Tool, version 5.2. More detail is needed and supporting documentary evidence is required for the main barrier(s). Barriers that are not supported with documents shall be removed.</td><td></td><td>Sec. B.5 has been revised in the PDD. All the alternatives and cost are justified with the supporting documents.</td><td>The additionality has been appropriately justified and has been verified from the revised PDD dated 23 May 2011. All the evidences to show that project is additional have been verified.

The clarification is closed.</td></tr>
</table>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
Identification of alternatives. Please provide sources/references for the following: • Price of biomass for the existing stoves (Rs. 1/Kg to Rs. 3/Kg), and figures for the amount of biomass used per household • Price of kerosene in the project area (Rs. 10 to Rs. 12/litre with ration and in open markets for around Rs. 25 to Rs. 30/litre), and figures for the amount of kerosene that would be used per household • Price of LPG in the region at Rs. 350 per cylinder, which is about half of daily wage of an agriculture labourer, and figures for the amount of LPG that would be used per household • Daily wage of an agriculture labourer in the region Furthermore, please clarify in more detail why firewood is the likely baseline scenario for the households included in the project activity.		The alternatives have been identified in accordance with GS methodology. The price and quantity of fuel have already been justified as part of CAR3 above. Daily wages of labour in region has also been justified as part of CAR3. The baseline has been identified as use of fuelwood (firewood) in accordance with methodology as "the situation before implementation of the biodigesters (pre project situation).	The comment has been addressed as part of CAR 3. The procedure for selection of baseline scenario stipulated by the methodology, paragraph 2 requires the PP to select one of the following options 1. The situation before the implementation of the bio digesters (i.e. pre-project situation). 2. The situation where fossil fuels are used to meet energy service needs (even if they are not currently being used). The pre-project scenario is use of firewood to meet the heat requirement, this has been confirmed through site interviews and the survey conducted by the PP on the quantum of usage of firewood. The PP has thus appropriately chosen option 1; "the situation before the implementation of the bio digesters (i.e. pre-project situation)" as the baseline scenario.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			The clarification is closed.
Please, in accordance with the GS conservativeness principle, discuss in the PDD whether the baseline identified is indeed the most conservative among the equally convincing baseline options		The baseline has been identified as use of fuelwood (firewood) in accordance with methodology as "the situation before implementation of the biodigesters (pre project situation).	The procedure for selection of baseline scenario stipulated by the methodology, paragraph 2 requires the PP to select one of the following options 1. The situation before the implementation of the bio digesters (i.e. pre-project situation). 2. The situation where fossil fuels are used to meet energy service needs (even if they are not currently being used). The pre-project scenario is use of firewood to meet the heat requirement, this has been confirmed through site interviews and the survey conducted by the PP on the quantum of usage of firewood. The PP has thus appropriately chosen option 1; "the situation before the implementation of the bio digesters (i.e. pre-project situation)" as the baseline scenario. The clarification is closed.
Please clarify in the PDD whether Sub-step 3a on p16 is an 'investment barrier'. The proposed project activity is said to have high additional cost. Please provide documentary evidence for the		LPG and Kerosene are the two alternatives for the baseline fuel. Cost and requirement of each fuel is given separately in tables below along with their references.	The project faces investment barrier and is viable with carbon revenues being available to the project. It has been verified from the revised PDD

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr><td>highlighting the cost of bio-digesters. In addition, please clarify how the carbon revenues provide the necessary additional revenues to the project to make it a viable business model.</td><td></td><td>For fuel cost:
<table>
<tr><th>S.No</th><th>Alternative</th><th>Cost(Rs)</th><th>Reference</th></tr>
<tr><td>1</td><td>LPG</td><td>258/11 .3kg</td><td>Purchase receipt of Indane gas</td></tr>
<tr><td>2</td><td>Kerosene(Kerala)</td><td>9.5/l</td><td>http://www.kerala.gov.in/dept_civilsupplies/details.htm</td></tr>
<tr><td>3</td><td>Kerosene(M. P.)</td><td>8.86 – 9.97/l</td><td>http://www.mp.gov.in/mpfood/Pra-Prativeden-2006-07_add.pdf</td></tr>
</table>
For Fuel requirement:
<table>
<tr><th>S.No</th><th>Alternative</th><th>Requirement</th><th>Reference</th></tr>
<tr><td>1</td><td>LPG</td><td>14.2kg/ month</td><td>http://www.iei-asia.org/IEIBLR-LPG-IndianhomesReport.pdf</td></tr>
<tr><td>2</td><td>Kerosene</td><td>23.4 l/month</td><td>http://wgbis.ces.iisc.ernet.in/energy/paper/scope%20for%20solor%20energy%20devices/solar%20devices.htm</td></tr>
</table>
In Kerala survey by Department of Bio-energy, Agricultural Engineering College & Research Institute, Tamilnadu Agricultural University was started in June, 2009 till March 2010 and in Madhya Pradesh survey was conducted by Environment and Energy Management Group, Bhopal from Sep 2009 to June 2010.
As per survey results the average monthly income</td><td>been justified through CAR 3 above.

The clarification is closed.</td></tr>
</table>

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr><td></td><td></td><td>in Kerala is 500 INR and in Madhya Pradesh is 850 INR.

All the above alternatives are compared with the cost of biogas plants of different capacities.

<table>
<tr><th>Size (m^3)</th><th>Estimated cost of bio digester</th><th>Reference</th></tr>
<tr><td>2</td><td>Rs. 9,650</td><td>As per Audit report of AKKPS,2006</td></tr>
<tr><td>3</td><td>Rs. 11,600</td><td>As per Audit report of AKKPS,2006</td></tr>
<tr><td>4</td><td>Rs. 13,850</td><td>As per Audit report of AKKPS,2006</td></tr>
<tr><td>6</td><td>Rs. 16,500</td><td>As per Audit report of AKKPS,2006</td></tr>
</table>

Comparing the cost of all alternative with biogas plant, it can be concluded that installation biogas plants is most expensive and as per survey results the average income in Kerala is 500 INR and in Madhya Pradesh is 850 INR. Therefore, it can be concluded that the cost of family type biogas plant is comparatively higher than the available alternatives and the same is not affordable to the target population.
Same is explained in the revised PDD in Sec B.5</td><td></td></tr>
<tr><td>Please provide more discussion on the technology barrier, including an analysis on the various bio-digester technologies present in the market and a comparative analysis on their cost and performance to show that the technology proposed</td><td></td><td>In the baseline, households are handling normal “chulahs” or wood stove chulahs in which no maintenance is required. However for the subject project activity, trained persons are required for the proper operation and maintenance of the anaerobic</td><td>The technological barriers have been discussed and closed in CL 4.

Kindly refer to CL 4 for this</td></tr>
</table>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
in this project activity requires additional revenues to overcome the barriers.		biodigesters. As per Evaluation study on National Project on Biogas Development by Programme Evaluation Organisation Planning Commission Government of India, May 2002, the main reasons for plants becoming non-functional are structural and operational problems, non-availability of cattle/dung, easy availability of other convenient fuels, chocking of inlet/outlet, corrosion/leakage in pipeline, scum formation in digester slurry and water accumulation in gas pipe. Some of the problems can be rectified by the beneficiaries themselves, provided they are trained properly about preventive maintenance. Considering all above points it can be concluded that training is an integral part of the successful operation of the anaerobic biodigesters. Since local people have no prior experience to operate and maintain the anaerobic biodigesters this involves a huge risk in the successful operation of the plant. Carbon revenue will act as support and catalyst for sustained operation of the plant and increasing penetration of the technology in the rural India. INSEDA will conduct various training programmes for masons, local technical staff in state NGOs and will be engaged in setting up of service centre at state level to provide free of cost service to the end users of biogas plant throughout the crediting period. Biogas plant owners will also get additional sharing from the sale of carbon credits. Same has been mentioned in the revised PDD of 23 May 2011	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
As per the Addtionality Tool Step 4, please provide a common practice analysis in line with the requirements of the Tool. Please remove Step 5 from the PDD accordingly.		Common practice analysis has been revised in the PDD and Step 5 has been removed.	Revised PDD with common practice incorporated and Step 5 removed has been verified. The clarification is closed.
As required by the applied methodology, please provide the survey results to demonstrate the following: • that NRB has been used since 31st December 1989 • the average annual consumption of biomass per appliance (tonnes/year) • fraction of NRB In general, please provide more information in the PDD on the differentiation between Non-renewable and Renewable biomass in the baseline scenario as required by paragraph 7, p2 of the approved methodology AMS I.E, Version 01. Specifically, the fraction of NRB ($f_{NRB,y}$) needs further discussion.		GS methodology- Indicative programme, baseline, and monitoring methodology for Small Scale Biodigester Voluntary Gold Standard is being used in place of AMS I E ver 01 Survey was conducted in Kerala by Department of Bio-energy, Agricultural Engineering College & Research Institute, Tamilnadu Agricultural University and in Madhya Pradesh by Environment and Energy Management Group, Bhopal and it is evident from the survey that: 1. NRB has been used since 31 December 1989 2. the average annual consumption of biomass per appliance in Kerala is 3.7 tonnes/year and in M.P. is 3.6 tonnes/year 3. As per detailed calculation non renewable percentage in Kerala is 91% and in M.P. it is 86%.	It has been verified from the survey results /7/ that: 1. NRB has been used since 31 December 1989 and before that 2. The average annual consumption of biomass per appliance in Kerala is 3.7 tonnes/year and in M.P. is 3.6 tonnes/year 3. Non renewable biomass percentage in Kerala is 91% and in M.P. it is 86%. The calculation of the NRB has been detailed in the excel file /2/ and all references have been mentioned. This is in line with requirements of GS methodology. The clarification is closed.
As per AMS I.E. version 01, it is required to use a "proxy" fossil fuel instead of the emission factor for firewood, which is not allowed under this methodology. Hence, please either use the most likely fossil fuel to be used by similar consumers (and demonstrate this accordingly) or,		GS methodology- Indicative programme, baseline, and monitoring methodology for Small Scale Biodigester Voluntary Gold Standard is being used in place of AMS-I.E ver 01. GS methodology allows the usage of firewood emission factor i.e. 112tCO_2/TJ for the calculation	GS methodology for biogas projects is being used by the PP instead of AMS-I.E, version 01. PDD and calculations have been revised to reflect the change in methodology.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
alternatively, revise the PDD by using the GS-VER methodology for biogas projects, which does not have the same requirement.		of emission reductions.	PP has now correctly used a emission factor of 112 tCO_2/TJ for the calculation of emission reductions. The clarification is closed.
ER calculations. Please upload the ER calculations as an Excel spreadsheet along with the final set of documents.		The ER calculations in excel sheet have been submitted for validation	The ER excel sheet /2/ has been submitted and has been verified
Please revise the PDD to include a detailed discussion on the 5 potential sources of leakage identified in the applied methodology.		The methodology has been revised from AMS-I.E ver 01 to GS methodology- Indicative programme, baseline, and monitoring methodology for Small Scale Biodigester Voluntary Gold Standard. Hence, discussion on 5 potential sources of leakage is not required. As per GS methodology point 6 page #13- No significant sources of leakage are identified.	Methodology has been correctly revised from AMS-I.E, version 01 to GS VER methodology for biogas projects. As per GS VER methodology, no significant sources of leakage are identified. Thus there are no leakage emissions from the project. The clarification is closed.
The level of risk involved for the Safeguarding Principles (SP) must be easily reproducible by the DOE and reviewers. Please therefore support the justification paragraph with reference sources (for reference sources which are not easily accessible, please attach them to the Passport as an annex). Also, justify on what basis the other safeguarding principles have not been considered and are excluded from the assessment.		Detailed Do no harm assessment has been provided in the passport with proper justification of each Safeguarding principle and risk level.	A detailed Do no harm assessment has been provided in the passport and same has been verified to be correct. The clarification is closed.
Please justify why certain sustainable development indicators have been mentioned as		Based on consolidated sustainable development matrix neutral sustainable indicators are:	The installation of biodigesters is not expected to have any influence

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
not applicable to the project activity. How it has been ensured that there are no effects of the project activity on those indicators? Please ensure that an appropriate reference source is cited in order to justify all scores, even neutral scores.		• Water quality and quantity • Other pollutants • Balance of payments and investment • Technology transfer and technological self-reliance In household biogas plant, cow dung is mixed with water and feed into the bio digester. Gas produced from the biodigester is utilized for cooking purpose and slurry which comes out of the plant is used as organic manure. Therefore, it can be considered that project activity doesn't affect water quality and quantity and doesn't emit any other pollutant in the atmosphere. It is evident from the financial plan that INSEDA (PP) and its member state NGOs will invest to install biogas plant and this will be reimbursed in small instalments acc to the monthly income of the biogas plant owners without any interest. In addition biogas plant owners will get free operation and maintenance cost throughout the crediting period along with this there will be sharing in carbon revenue. There is no balance payment therefore it is considered as neutral. There is no technology transfer in the project activity. Biodigesters have been built by local technician working with state NGOs. Therefore all these points have been considered as neutral.	on the water quality nor result in any other pollutant. The project technology being indigenous does not involve any technology transfer nor any balance of payments or any investment from outside. Hence these are considered to be neutral. The clarification is thus closed.
Please provide any information on previous stakeholder consultation meetings conducted and upload this information to the GS registry.		As per point VIII.b.4 of GS requirement version 02, *"Project Proponents submitting a project activity for retroactive registration shall NOT conduct a Local Stakeholder Consultation but instead must apply for a Pre-feasibility*	There was no stakeholder consultation meeting organized previously since it is a retroactive project. This is in line with GS requirements, version 02.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		Assessment". Since project activity is retroactive so no previous meetings were organized.	However a stakeholder consultation has been conducted in both the states The clarification is closed.
Please organize a second round of stakeholder consultation with a live meeting and ensure that GS NGO supporters (local ones and international ones1), local NGOs, local officials and local residents are invited. GS requirements call for an active invitation process via various media (e.g. emails, ad in newspaper, sms, radio, announcements in religious buildings, door-to-door visits, etc.). Please make sure there is sufficient diversity (skills, gender, ethnic, etc.) in the stakeholder representation. Please especially try to include the views of women, as this project seems to highly impact them in terms of less indoor air pollution and less collection time for firewood.		Stakeholders' meeting was conducted on 12 Oct 2009 in M.P. and in Kerala on 14 Oct 2009. Stakeholders' meeting advertisements were given in the local newspaper of Kerala and M.P in local language. In Kerala, advertisement was Published in Sunday express(English) as well as in Malyalam Manorma (in Malyalam) on 11 October 2009 In Madhya Pradesh advertisement was Published in Dainik Bhaskar on 8 October 2009 In addition, official e-mail invitations were sent by PP to GS, GS supporter NGOs and DNA on 4 and 5 October 2009. Copies of newspaper and personal invitations have been submitted	This has been done and explained in section 4.8 of this report. The clarification is closed.
The project proponent should submit a report after the second round of stakeholder consultation has occurred in order to facilitate a more efficient DOE validation. This second round of stakeholder feedback should be reported upon in section E.2 of the Passport (and Section E of the PDD should at least refer to the relevant section in the Passport). In this section, please include a summary of stakeholder comments and actions taken to resolve the issues presented in a written and interpretable manner so as to provide a paper trail that underpins a decision by the validator.		Local stakeholder consultation report has been prepared and submitted to DoE. Stakeholders' meeting was conducted on 12 October 2009 in M.P. and in Kerala on 14 October 2009. Stakeholders' meeting advertisements were given in the local newspaper of Kerala and M.P in local language. In Kerala, advertisement was Published in Sunday express(English) as well as in Malyalam Manorma (in Malyalam) on 11 October 2009	The minutes for the stakeholder meetings /30//31/ held has been verified and appropriate. The summary of the comments has been provided and the comments have been addressed. The copies of the notices and invitation letters /32/ has been verified and found to be OK. The clarification is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
Please ensure that the following points are taken into account and fully documented: • A list of all stakeholders invited for comments, including local NGOs and GS NGO Supporters (please see attached spreadsheet for complete list of GS NGO Supporters active in India). • A copy of posters/flyers, newspaper articles, e-mails or other advertisements that were used to invite participants to the meetings. • A clear list of all meeting attendees, with their signatures and clear contact details. • A copy of the non-technical summary of the project handed out at that meeting. • A summary of the resulting stakeholder comments and responses provided. • Original filled-in copies of any questionnaires (use highly recommended) that may be distributed at the second-round consultation.		In Madhya Pradesh advertisement was Published in Dainik Bhaskar on 8 October 2009 In addition, official e-mail invitations were sent by PP to GS, GS supporter NGOs and DNA on 4 and 5 October 2009. During meeting copies of Non-technical summary was submitted to the stakeholders and stakeholders were asked to filled evaluation forms and questionnaire at the end of the meeting. Hard copies of the forms have been submitted to DoE. Copies of newspaper and personal invitations have been submitted	
All non-neutral indicators must be monitored. Please keep in mind that the scoring of the indicators will depend partly on the original scored matrix, but also on the blind scoring of the matrix that is done by the stakeholders at the live meeting (please refer to Toolkit for more guidance). The final scoring will thus depend on a combination of the project proponent's scoring and the blind scoring. Once the scores are settled, it will become clear which indicators to include in the monitoring plan.		During stakeholder feedback round Blind development exercise was conducted and final consolidated Sustainable matrix was prepared. Acc to consolidated sustainable matrix all the non neutral indicators are given below: • Air quality • Livelihood of the poor • Access to affordable and clean energy services Survey will be carried out every year in both the states by third party in the sample population. Sampled household will be interviewed through questionnaires having information of all the above	The indicators described under Sustainable Development matrix of the GS Toolkit, version 2, annexure I have been evaluated correctly in the GS passport. It is confirmed that there are no negative impacts on any of the 12 indicators listed under Sustainable Development matrix of the GS Toolkit, version 2, annexure I. The following three indicators have a positive impact and shall be monitored as mentioned in the GS passport and PDD.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		SD indicators.	The indicators that shall be monitored are 1. Air quality by monitoring the functionality of bio digester at least once in a month 2. Livelihood of poor by monitoring the reduction in usage of firewood on an annual basis through a survey. 3. Access to clean and affordable energy by monitoring the functionality of biodigesters at least once a month. The clarification is closed.
The monitoring plan must also include any mitigation measures from the Do no Harm Assessment that were implemented in order to neutralize an indicator, or that were implemented in general.		As per the Do no Harm Assessment, given in the Sec.F.1 of the passport any of the safeguarding principle doesn't involves huge risk. Those indicators which involve Low risk will be dealt properly to avoid or mitigate any risk	The project activity has been implemented and it was confirmed through site visit that the risks associated with the project activity are low and the PP has the capability to implement this. Specific monitoring related to sustainable development indicators has been mentioned in the PDD as well as in the passport which is considered appropriate. This clarification is closed.
The final SD monitoring plan should be included in Section G of the GS Passport.		SD monitoring plan is included in Section G of the GS Passport.	SD monitoring plan has been added in Section G of passport which has been verified.
Based on the revised leakage discussion in the PDD, please also make sure to add any missing monitoring parameters that are required by the		The methodology has been revised from AMS I E ver 01 to GS methodology- Indicative programme, baseline, and monitoring methodology for Small	Methodology has been correctly revised from AMS-I.E, version 01 to GS VER methodology for biogas

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
applied methodology to monitor leakage.		Scale Biodigester Voluntary Gold Standard. Hence, discussion on 5 potential sources of leakage is not required. As per GS methodology point 6 page #13- No significant sources of leakage are identified.	projects. As per GS VER methodology, no significant sources of leakage are identified. Thus there are no leakage emissions from the project. The clarification is closed.
Please include more detailed information in the PDD regarding the number of units that will be checked annually to ensure that they are still operating or are replaced by an equivalent in service appliance, and how this figure is a representative sample		State NGOs will monitor the sample of households. Sample size will be determined as per methodology considering 95% confidence. 100 will be monitored in Kerala and 86 will be in M.P therefore total 186 plants will be monitored. State NGOs will monitor these 186 plants regularly and submit the report to INSEDA once in 6 months. Same has been revised in the PDD under monitoring section.	A total of 100 samples will be monitored in Kerala and 86 in M.P at 95% confidence level. This is in line with methodology. Details of sampling procedure have been added in monitoring section of revised PDD which has been verified. The clarification is closed.
Please include a monitoring parameter to confirm the displacement or substitution of the non-renewable biomass at each location. In the case of appliances switching to renewable biomass the quantity of renewable biomass used shall be monitored. Since the PDD mentions that animal or other organic wastes will be used in the project activity, renewable biomass will be used.		Survey will be carried out every year in both the states by third party in the sample population. Sampled household will be interviewed through questionnaires having information like amount and type of fuel used for each household, biodigester working condition, improvement in the life standard along with other non neutral SD indicators. Survey report and questionnaires will be provided to DoE at the time of verification.	The monitoring plan has now incorporated detailed sampling procedure for monitoring amount and type of fuel used for each household, biodigester working condition, improvement in the life standard. The same was verified from the revised PDD dated 23 May 2011. The clarification is closed.
Please provide link or source to the MoEF EIA notification dated 14 September 2006. Please also		The project activity does not fall under the purview of the Environmental Impact Assessment (EIA)	Social and environmental impacts of the project have been sufficiently

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
provide a discussion on this in section D of the PDD.		notification of the Ministry of Environment and Forest, Government of India, 2006 (http://envfor.nic.in/legis/eia/so1533.pdf). The use of biogas from residential bio digesters has positive effects on the socio-economic and health conditions of the participating households as well as on local environment. There are no additional adverse environmental impacts identified from the project activity. There is no significant impact identified due to the project activity. Furthermore, per Gold Standard norms an EIA is not required for the project activity since none of the Sustainable Development Indicator scores negative.	addressed. A detailed environmental impact assessment is not necessary. This was verified from the Environment Impact Assessment Notification S.O. 1533 dated 14 September 2006 issued by the Ministry of Environment and Forests /21/. The clarification is closed.
Please ensure that the information in the registry matches that of the PDD and Passport. For example, the registry lists an annual amount of emissions reductions at 12 000 whereas the PDD lists 34 089. Please ensure that the registry is updated accordingly.		Information in the registry will match the information given in the PDD and passport. Total number of VERs is 23 223 tonnes of CO_2e per annum. The same shall be updated in the registry post the completion of validation.	The total number of VERs is 23 223 as detailed in excel sheet and PDD. This shall be uploaded. The clarification is closed.
As per GSV2 rules, please note that project activities proceeding under the retroactive project cycle, may be eligible for retroactive crediting for realised emission reductions prior to Gold Standard registration of a maximum period of two years. Hence, please revise crediting period accordingly.		Project is expected to be registered by end of August 2011 therefore crediting period of the project activity starts from September 2009. Same has been revised in the PDD.	The project is expected to register by end of August 2011. The start date of crediting period has thus been appropriately taken as 1 September 2009 in line with GS requirements. The clarification is closed.

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
FAR 1 The PP needs to carry out the survey before the verification to establish the following two parameters for the calculation of project emissions accurately 1. The type of livestock in the states of MP and Kerala. 2. The number of livestock in the households selected for the project.		

APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Nitin Kapoor holds a Bachelor in Chemical Engineering and is also a qualified Chartered Financial Analyst (CFA) He has an overall experience of 15 years and 6 months as on date. Prior to joining DNV he had experience of 10 years and 5 months in Oil & Gas as well as manufacturing sector (food) with leading MNC's like ITC, Coca Cola and Enron Oil and Gas. During his stint in industry his responsibilities included carrying out energy audits and to identify potential areas of improvement. His experience includes analysis of specific consumptions (primarily on energy, raw materials and utilities) of processes based on historical data, carrying out material balances (heat and mass), analysis of equipment performance and identification and measurement of energy saving opportunities. He has also been responsible for the operations of the complete Crude Distillation Unit in the refinery, complete platform operations in Oil and Gas sector as well as for the utilities like steam, AHU while in Maintenance at ITC. He also has been incharge of the ETP operations in Coca Cola and ITC as well as Water and Sewage treatment plants while working offshore. He has been responsible for EMS and QMS at ITC and Coca Cola.

He has experience of 3.5 years in validation and verification of numerous CDM projects within DNV. He has received extensive training in the CDM validation and verification process. He is an appointed validator for the CDM validation and verification program of DNV and has performed validation of several CDM projects. He is also a Lead Auditor for QMS, auditor for EMS and Safety. His qualification, industrial experience and project experience in CDM demonstrate his sufficient sectoral competence in Energy Generation from renewable energy sources, energy efficiency, heat and energy demand and waste/waste water treatment. His direct work experience in Oil and Gas and food sector demonstrates his sectoral competence in these industries.

Krishnan Namboodiri, Project Manager, DNV Kochi, India. Holds graduate degree in chemical engineering and has done a short term diploma course in Management. Prior to joining DNV in 2008, has had 24 years of direct work experience in the fertilizer and chemicals industry. Work experience covers 5 years in process design & engineering for chemical industry; 7 years in technical services including environment management activities, 7 years in project management and 5 years in training & corporate planning in fertilizer & petrochemical manufacturing units. Has been actively involved in Management System Audits as per ISO 14001 for more than 8 years.
The above work experience includes-(a) experience in steam system optimization & trouble shooting , development of improvement schemes in large fertilizer & caprolactam complex (b) Design and engineering, efficiency studies and development of efficiency improvement schemes for fossil fuel fired steam & power generation plants (c) Implementation of energy saving measures in Ammonia plants , sulfuric acid plant etc (d)Monitoring, trouble shooting and development & implementation of of improvement schemes for of pollution control facilities (chemical, aerobic & anaerobic treatment systems) in Fertilizer and pertochemical complex. Development & implementation of landfill facilities for solid and hazardous wastes from fertilizer & caprolactam manufacturing complex.
He has received extensive training in the CDM validation and verification process. He is an appointed GHG auditor for the CDM validation and verification program of DNV and has performed validation & verification of several CDM projects. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in (1) Thermal energy generation from fossil fuels as well as thermal electricity from solar and (2) waste handling and disposal.

Wu Lin: holds a Master Degree in Chemical Engineering & Process, a Bachelor Degree in Chemical Engineering & Process and a Bachelor Degree in Computer Science & Technology, having an overall experience of around seven years. Prior to joining DNV, he has around four years experience in chemical industry covering design of chemical process and system, piping

design, commissioning and project management on site. His experience also covers the fields of desulfurization of flue gas in power plant industry.

He has experience of around 3 years in validation and verification of CDM/JI projects and other 3rd party validation/verification services.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in “Energy Generation from Renewable Energy Sources” and “Chemical Processes Industries”.

Felipe Antunes holds a Master’s Degree in Production Engineering (Quality) and a Post Graduate Diploma in Environmental Management and Industrial Waste Management and Treatment. Possesses an International experience of more than 10 years in the field of quality and environmental auditing, working two years as the responsible of the QMS of Rede Metrológica RS and since 1999 as a QMS and EMS auditor in DNV.

He has experience of more than 3 years in validation and verification of numerous CDM projects in DNV, both in South America & abroad. He has also been actively involved in Management System Audits such as ISO 9001, ISO 140001 and OHSAS 18001 standards in various industrial sectors for more than 10 years in DNV.

His qualification and experience in CDM demonstrate him sufficient sectoral competence in energy generation from renewable energy sources, waste handling and disposal, and animal waste management.