Validation report form for renewal of crediting period of component project activities

(Version 03.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION			
Title and UNFCCC reference number of the programme of activities (PoA)	Title: SKG Sangha Biodigester PoA UNFCCC ref. no: 9507		
Version number of the validation report	03Aa		
Completion date of the validation report	04/10/2021		
Version numbers of PoA-DD to which this report applies	Version 5.6 of 06/01/2020		
Title and UNFCCC reference number of each CPA for renewal	CPA Ref. no.	**Title**	
	9507-P2-0001-CP2	SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1	
Sectoral scopes for each CPA	CPA Ref. no.	**Sectoral scopes (indicate mandatory and conditional sectoral scopes)**	
	9507-P2-0001-CP2	Mandatory sectoral scopes: 1 (Energy industries (renewable - /non-renewable sources) and 15 (Agriculture) Conditional sectoral scopes: Not Applicable	
Applied methodologies and standardized baselines for each CPA	CPA Ref. no.	**Applied methodologies and standardized baselines**	
	9507-P2-0001-CP2	AMS-I.C. ver. 21 - Thermal energy production with or without electricity AMS-III.R. ver. 3 - Methane recovery in agricultural activities at household/small farm level AMS-I.E. ver. 10 - Switch from Non-Renewable Biomass for Thermal Applications by the User	
Number and duration of the next crediting period (CP)	CPA Ref. no.	**No. of CP**	**Duration of the CP**
	9507-P2-0001-CP2	**1**	**2nd crediting period 28/02/2021 to 27/02/2028**
Coordinating/managing entity (CME)	M/s SKG Sangha		
Host Parties	India		
Estimated amount of annual average greenhouse gas (GHG) emission reductions or GHG removals by sinks in the next crediting period (tCO_2e), per CPA	CPA Ref. no.	**Annual emission reductions or removals (tCO_2e)**	
	9507-P2-0001-CP2	58,202	

Name and UNFCCC reference number of the DOE	RINA Services S.p.A. (RINA) UNFCCC reference number: E-0037
Name, position and signature of the approver of the validation report	**Laura Severino** (Authorized officer signing for the DOE) Head of Sustainability Compliance & New Scheme Development Coordination Unit

SECTION A. Executive summary

Purpose and general description of CPA:

The component project activity (PoA) involves installation of 9590 biogas plants; one for each household in India. The biogas plant size ranges from 2m^3 to 15m^3 with maximum gas production capacity of 6m^3 per day depending upon the size of family and number of cattles owned by the respective family. The technology used to build biogas digesters is dependent on the demand, climatic conditions and available area at the CPA level. In the absence of CPA, the energy demand for cooking and heating at user point was met by using firewood and kerosene as fuel. Also the cattle dung which is used as feedstock in bio-digester is left to decay anearobiaclly leading to methane emissions. Therefore, each digester replaces fire wood and/ kerosene which otherwise would have been used for household thermal application (cooking/heating) and avoid anearobic decay of cattle dung. The Project Implementing Partners (PIP) is M/s SKG Sangha who is also the coordinating/managing entity (CME) of the corresponding PoA reference no. 9507.

Validation process:

Validation was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.
The validation consisted of the following three phases:

- Document review;
- Follow-up actions;
- The resolution of outstanding issues and the issuance of the final validation report.

Conclusion:

Foundation myclimate - The Climate Protection Partnership has commissioned RINA to carry out the validation (renewal of crediting period) of the CPA “SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1” in India, with regard to the relevant requirements for CDM activities.

This report summarizes the findings from the validation of the updated CPA-DD, performed on the basis of UNFCCC criteria for CDM, as well as criteria given by the CDM Validation and Verification Standard for PoA, CDM Project Cycle Procedure for PoA and CDM Project Standard for PoA and included an assessment of:

(a) The impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant guidance from the Board with regard to renewal of the crediting period at the time of requesting renewal of crediting period.

(b) The correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period.

In conclusion, it is RINA’s opinion that the CPA meets all the relevant requirements for the renewal of the crediting period.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	TYP	Last	First name	Affiliation	Involvement in

			name		(e.g. name of central or other office of DOE or outsourced entity)	Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader & Validator	IR	Kudtarkar	Shruti	RINA India	√	X	√	√
3.	Technical Expert (TA 1.1)	IR	Amalorpavanathan	Cyril Augustus A.	RINA India	√	X	√	√
2.	Technical Expert (TA 15.1)	EI	Maso	Daria	Central Office	√	X	√	√

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TA 1.1)	IR	Carvalho	Thaís	RINA Brazil
2.	Technical reviewer (TA 15.1)	IR	Cefariello	Roberto	RINA Italy
3.	Approver	IR	Severino	Laura	RINA HO

SECTION C. Means of validation

C.1. Desk/document review

The CPA-DD version 4.4 of 15/12/2020 and version 4.5 of 10/02/2021, in particular, eligibility criteria for inclusion of CPA, the baseline, estimated GHG emission reductions, the monitoring plan and the crediting period were assessed as part of the validation. Appendix 3 lists the documentation that was reviewed during the validation.

C.2. On-site inspection

Duration of on-site inspection: Not Applicable				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.				
…				

Site visit has not been performed for the validation of the renewal of crediting period, in accordance with CDM validation and verification standard for programmes of activities, version 02.0, paragraph 183, as the estimated emission reductions for CPA is limited upto 60,000 tCO_2e. Representatives from CME have been interviewed, publicly available authentic sources were reviewed for cross checking information necessary for validation of the CPA. Moreoever, **FAR 04** has been raised in order to have all technical data thoroughly checked, to confirm their consistency with presented information, during next first verification of the CPA.

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Kudaravalli	Kiran Kumar	SKG Sangha	24/12/2020	Status of the project activity	Shruti Kudtarkar

					and any modifications with respect to the registered CPA-DD, lifetime of the project activity, National and local policies and changes, Monitoring plan and changes	
2.	Leon	Paul	Foundation myclimate	24/12/2020	CPA-DD preparation, Applicability to the latest methodology and relevant regulatory documents, Emission Factors and their updates, Baseline of the project and its updates	Shruti Kudtarkar

C.4. Sampling approach

Not applicable

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings (SECTION D)	No. of CL	No. of CAR	No. of FAR
CPAs to be renewed and corresponding generic CPAs	0	0	0
Compliance with CPA-DD form	0	5	1
Application and selection of methodologies and standardized baselines	5	0	0
Validity of original baseline or its update	1	0	1
Demonstration of eligibility of the CPAs	5	2	0
Estimated emission reductions or net anthropogenic removals	4	0	0
Validity of monitoring plan	3	1	1
Crediting period	0	0	0
CME and project participants	0	0	0
Post-registration changes- Refer PRC validation report			
Others (please specify)	0	0	1
Total	18	8	4

SECTION D. Validation findings

D.1. CPAs to be renewed and corresponding generic CPAs

Title and UNFCCC reference number of the CPA	Version number of the CPA-DD	Host Party	Title and reference number of the corresponding generic CPA	Version number of the PoA-DD on which the RCP is based

Title: SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1 UNFCCC Reference number: 9507-P2-0001-CP2	4.5 of 10/02/2021	India	Title: SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1 Reference number: 9507-P2-0001-CP2	Version 5.6 of 06/01/2020

D.2. Compliance with CPA-DD form

Means of validation	The updated CPA-DD version 4.4 dated 15/12/2020 and 4.5 dated 10/02/2021 (in track- change mode) is cross-checked with the latest CPA-DD template version 09 with the instructions for filling out and updated sections of this CPA-DD relating to the demonstration of eligibility for being included in the PoA, the baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan, the crediting period and other information in accordance with the generic CPA in the latest version of the registered PoA-DD version 5.6 of 06/01/2020.
Findings	**CAR 1-** CME has not included 'Number of heads per cattle species/category in an average household (N_{LT})' in B.4.2 'Data and parameters fixed ex ante' of CPA-DD version 4.4 dated 15/12/2020. **CAR 2-** CME has given wrong reference to the version of AMS-I.E. in the footnote number 5 in section B.4.3 of CPA-DD version 4.4 dated 15/12/2020. **CAR 3-** Appendix 5, 6, 7, 8, 9 & 10 of the updated CPA-DD version 4.4 dated 15/12/2020 are not matching with the CPA-DD template version 09. **CAR 4-** Reference to corresponding generic CPA of registered PoA-DD version 5.6 of 06/01/2020 for the exact reference of approved methodologies and methodological tools is not provided in section B.1 of CPA-DD. **CAR 5**- CME has mentioned wrong number of biogas plants at one place in section A.1 of updated CPA-DD. **FAR 1-** As per temporary measures pending CMP guidance at CMP 16 agreed in EB 108th meeting, CME is required to update their project or programme design documents in accordance with any requirements of the CMP guidance. Findings reported as mentioned above have been closed out after positive evaluation of responses provided by the CME.
Conclusion	RINA confirms that the updated CPA-DD is in compliance with the latest version of the CPA-DD template version 09 and the instructions therein for filling out the PoA-DD form. RINA also confirms that the CME has updated the relevant sections of the CPA-DD in accordance with the relevant requirements in the Project Standard for PoA. It is confirmed that the information transferred from included CPA-DD in the registered PoA-DD version 5.6 to the updated CPA-DD version 4.5 is materially the same.

D.3. Application and selection of methodologies and standardized baselines

Means of validation	CME has applied methodology AMS-I.C. version 21, AMS-III.R. version 3 and AMS-I.E. version 10 to the updated PoA-DD dated 31/05/2021. For AMS I.E. & AMS III.R., refer CL The PoA meets the criteria defined in the methodologies as described below: **<u>Validation of application and selection of AMS-I.C. version 21:</u>**

Paragraph	Criteria as per Para 2 'Scope, applicability, and entry into	Means of validation

	reference of AMS-I.C. version 21	**force' of AMS-I.C. version 21**	
	2	This methodology comprises renewable energy technologies that supply users i.e. residential, industrial or commercial facilities with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.	CPA involves household biogas plants run on catlle dung (energy derived from renewable biomass). The biogas generated is utilised for the purpose of cooking and heating water at the household level therefore displacing heat that otherwise would have been produced using kerosene and fire wood. There is no change in the design of the CPA technology. CPA technology was cross checked in interview with CME & PP, documentation review like biogas plant data of beneficiaries and hence meets the methodology requirement. However, CME is requested to furnish copies of agreements with beneficiaries for verification of specification (technology used, capacity of the plant) of biogas plants included in the CPA. **CL 1**.
	3	Biomass-based cogeneration and trigeneration systems are included in this category.	CPA involves household biogas plants which generate biogas. The biogas is then used for cooking and heating water at the household level. This is not a co-geneation or trigeneration system. This is confirmed in interview with CME & PP, documentation review like biogas plant data of beneficiaries. Hence, this requirement is not applicable.
	4	Emission reductions from a biomass cogeneration or trigeneration system can accrue from one of the following activities: (a) Electricity supply to a grid; (b) Electricity and/or thermal energy production for on- site consumption or for consumption by other facilities; (c) Combination of (a) and (b).	As explained above, CPA does not involve co-generation or trigeneration system. Hence, this requirement is not applicable.
	5	Project activities that seek to retrofit or modify an existing facility for renewable energy	As explained in point 1 above, CPA involves household biogas plants run on cattle waste. It

		generation are included in this category.	does not involve retrofit or modify an existing facilty for renewable energy generation. Hence, this requirement is not applicable.
	6	In the case of new facilities (Greenfield projects) and project activities involving capacity additions the relevant requirements related to determination of baseline scenario provided in the "General guidelines for SSC CDM methodologies" for Type-II and Type-III Greenfield/capacity expansion project activities also apply.	CPA is not a greenfield or capacity addition activity. It displaces existing system of kerosene and fire wood used to generate heat with cattle waste based biogas plants. Hence, this requirement is not applicable.
	7	The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45MWthermal.	Maximum capcity of biogas plant is 6m^3 which is equivalent to 2.496KWthermal and thus below the specified limit of 45MWthermal. Calculation for thermal capacity of 6m^3 was checked found to be appropriate.
	8	For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal.	Although there is increase in the total number of biogas plants from 6890 to 9590, there is no change in the capacity of each biogas system. The capcity of each biogas plant remains 2 m^3 or 3 m^3 with maximum being 6 m3. Electrical capacity of maximum of 6m^3 biogas system is 0.832 kWh or 2.496 kWthermal. The number of units proposed to be installed under this CPA are 9590 and the total installed capacity is within micro scale limit of 5MWe. Therefore each CPA will automatically apply also to the SSC limits which are less than or equal to 15MWe and 45MW thermal installed capacity. The calculation for electrical capity of maximum capacity of 6 m^3 was checked and found to be in order. Capacities of biogas plants installed under CPA are verified from the CPA beneficiary list. The same is in line with the registered PoA-DD version 5.6.
	9	The following capacity limits apply for biomass cogeneration and trigeneration units: (a) If the emission reductions of	CPA involves household biogas plants which generate biogas. The biogas is then used for cooking and heating water at

		the project activity are on account of thermal and electrical energy production, the total installed thermal and electrical energy generation capacity of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating the capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the installed capacity of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant); (b) If the emission reductions of the project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment shall not exceed 45 MW thermal; (c) If the emission reductions of the project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment shall not exceed 15 MW.	the household level. This is not a co-geneation or trigeneration system. This was verified in interview with CME and PP and documentation. Hence, this requirement is not applicable.
	10	The capacity limits specified in paragraphs 7 to 9 above apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project shall comply with capacity limits specified in the paragraphs 7 to 9, and shall be physically distinct2 from the existing units.	The project does not involve any retrofit or addition of renewable energy unit to existing renewal energy units. However, the maximum capacity within each CPA is restricted to 5MWe. This was checked during interview with CME and PP and the same is in line with the registered PoA-DD version 5.6.
	11	If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation.	CME has not proposed to use any solid biomass fuel. The same was confirmed with CME and PP and is in line with the registered PoA-DD. Hence, this requirement is not applicable.
	12	Where the project participant is not the producer of the processed	CME has not proposed to use any solid biomass fuel. The

		solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions.	same was confirmed with CME and PP and is in line with the registered PoA-DD version 5.6. Hence, this requirement is not applicable.
	13	If electricity and/or thermal energy produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.	CPA includes household biogas units and biogas generated from each of this biogas plant is used for cooking and water heating purpose at the same household. There is no transfer of heat to third party. The same was confirmed with CME and PP and is in line with the registered PoA-DD version 5.6. Hence, this requirement is not applicable.
	14	If the project activity recovers and utilizes biogas for producing electricity and/or thermal energy and applies this methodology on a standalone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions as per relevant procedures in the tool “Emissions from solid waste disposal sites” and/or “Project emissions from flaring”. In the event that the biomass fuel (solid/liquid/gas) is sourced from an existing CDM project, then the emissions associated with the production of the fuel shall be accounted with that project.	Since biogas is recovered and used for producing heat which in turn used for cooking and water heating, CPA uses AMS-III.R. version 3 and methodological tool “Project and leakage emissions from anaerobic digesters”, version 2 for Type III component of the project in combination with AMS-I.E. version 10 along with applied methodological tool “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”, version 3 and “Calculation of the fraction of non-renewable biomass”, version 2.
	15	If project equipment contains refrigerants, then the refrigerant used in the project case shall have no ozone depleting potential (ODP).	As CPA involves household biogas plants, this requirement is not applicable.
	16	Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources, provided: (a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or	CME has not proposed to use charcoal for energy generation. The same was confirmed with CME and PP and is in line with the registered PoA-DD version 5.6. Hence, this requirement is not applicable.

	(b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology "AMS-III.K: Avoidance of methane release from charcoal production by shifting from traditional open-ended methods to mechanized charcoaling process". Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be demonstrated that the parameters from these are comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.	
17	In cases where the project activity utilizes biomass, sourced from dedicated plantations, applicability conditions prescribed in the tool "Project emissions from cultivation of biomass" shall apply.	CPA involves use of biogas to generate heat. There is no use of biomass sourced from plantation as confirmed in interview with CME & PP and hence this requirement is found to be not applicable.

Validation of application and selection of AMS-I.E. version 10:

Paragraph reference of AMS-I.E. version 10	Criteria as per Para 2 'Scope, applicability of AMS-I.E. version 10	Means of validation
2	This methodology comprises of activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include, but are not limited to biogas stoves, bio-ethanol stoves, solar cookers, passive solar homes.	As confirmed with CME & PP and supporting documents like beneficiary database with details of biogas plant, it is noted that CPA involves biogas based renewal energy technology displacing the previous use of fire wood and kerosene. Hence, this requirement is found to be fulfilled. However, refer **CL 1.**
3	Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports	Refer **CL 2** for this requirement.

		or statistics.	
	4	The methodology is applicable for technologies displacing use of non-renewable biomass by renewable energy.	As explained in point 2 above, CPA consists of biogas based technology displacing use of kerosene and fire wood. Hence, this requirement is applicable.
	5	Project participants or coordinating and managing entities shall describe in the PDD/PoA-DD how the double counting of emission reductions has been addressed (e.g. between end users, distributors and producers of stoves).	CME has signed agreements with beneficiaries as mentioned in the CPA-DD to have unique identification number for each biogas plant. However, it is required to submit the agreement copies for verification. Refer **CL 1.** Further, a cross check at UNFCCC and GS database to be done to check if the CPA is already registered as a CDM or GS project. Therefore, procedures are in place to avoid double counting.
	6	For project activities introducing bio- ethanol cookstoves, project participants or coordinating and managing entities shall demonstrate that the bioethanol cookstoves are designed, constructed and operated to the requirements (e.g. with regard to safety) of a relevant national or local standard or comparable literature. Latest guidelines issued by a relevant national authority or an international organisation may also be used.	As confirmed from CME & PP and supporting project documents, project activity does not involve bio-ethanol cook stoves and hence, this requirement is not applicable.
	7	The CDM-PDD or CDM-PoA- DD/CPA-DD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others also claim credit for emission reductions	All beneficieries of a CPA will have to sign an agreement with the CME stating all required information about the carbon money and about the rights of carbon savings to be handed over to the CME. However, PP is requested to furnish copies of agreements

	from the project devices.	with beneficiaries for verification of capacities of biogas plants included in the CPA. Refer **CL1.**

Validation of application and sselection of AMS-III.R. version 03:

Paragraph reference of AMS-III.R. version 3	Criteria as per 'technology/measure, of AMS-III.R. version 3	Means of validation
1	This project category comprises recovery and destruction of methane from manure and wastes from agricultural activities that would be decaying anaerobically emitting methane to the atmosphere in the absence of the project activity. Methane emissions are prevented by: (a) Installing methane recovery and combustion system to an existing source of methane emissions, or (b) Changing the management practice of a biogenic waste or raw material in order to achieve the controlled anaerobic digestion equipped with methane recovery and combustion system.	As explained in applicability of AMS-I.C. & I.E, CPA involves utilization of cattle manure in digester to recover biogas and use the same for cooking purposes replacing existing firewood/kerosene based cooking system. In the absence of the project, cattle dung is left to decay anaerobically in pits which lead to methane emissions. This is confirmed from the baseline survey conducted in first crediting period. Therefore, the condition is met. However, CME is requested to submit copy of baseline survey in format reported in Appendix 7 of the CPA-DD. Refer **CL3**.
2	The category is limited to measures at individual households or small farms (e.g. installation of a domestic biogas digester). Methane recovery systems that achieve an annual emission reduction of less than or equal to five tonnes of CO_2e per system are included in this category. Systems with annual emission reduction higher than five tonnes of CO2e are eligible under AMS-III.D "Methane recovery in animal manure	The project activity is implemented in individual households. CME is requested to justify how emission reductions from individual systems are limited to less than or equal to 5 tonnes of CO_2e per year for additional 2700 units. Refer **CL 4.**

		management systems'.	
	3	This project category is only applicable in combination with AMS-I.C "Thermal energy production with or without electricity" and/or AMS-I.I "Biogas/biomass thermal applications for households/small users" and/or AMS-I.E "Switch from non-renewable biomass for thermal applications by the user".	AMS-I.C and AMS-I.E are also applied along with this methodology. Hence, condition is justified.
	4	The project activity shall satisfy the following conditions: (a) The sludge must be handled aerobically. In case of soil application of the final sludge the proper conditions and procedures that ensure that there are no methane emissions must be ensured. (b) Measures shall be used (e.g. combusted or burnt in a biogas burner for cooking needs) to ensure that all the methane collected by the recovery system is destroyed.	The sludge from the biodigesters will be used as a fertiliser by spreading thinly and directly on the ground. CME jas proposed to provide training on the proper handling of sludge to beneficiaries and requested to submit copies of training records. Refer **CL 5.** The methane that builds up in the biodigester is destroyed on a daily basis by burning it in cookers for meeting household cooking needs and in some cases water heating needs. Therefore, the condition is met.
		Aggregated annual emission reductions of all systems included shall be less than or equal to 60 kt CO_2 equivalent.	The annual emission reductions of all systems is 58,202 tCO_2e and hence, this condition is met.
Findings	**CL 1-** CME is requested to furnish copies of agreements with beneficiaries for verification of details (like technology, capacity, unique identification number, geographical location) of biogas plants included in the CPA. **CL 2-** CME is requested to furnish supporting evidence to demonstrate compliance with AMS-I.E, version 10 requirement that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics. **CL 3-** CME is requested to submit copies of baseline survey conducted as per format reported in Appendix 7 of the CPA-DD for verification. **CL 4-** CME is requested to justify how emission reductions from individual systems are limited to less than or equal to 5 tonnes of CO_2e per year as per AMS-III.R. version 3 for additional 2700 units.		

	CL 5- CME is requested to provide records of training provided to beneficiaries for proper application of sludge in order to demonstrate applicability of condition no. 4 of AMS-III.R, version 3. Findings reported as mentioned above have been closed out after positive evaluation of responses provided by the CME.
Conclusion	RINA hereby confirms that the selected baseline and monitoring methodologies have been previously approved by the CDM Executive Board, and is applicable to the CPA, which complies with all the applicability conditions therein and the selected version is valid at the time of submission of the CPA for renewal of crediting period. It is also confirmed that the methodology is correctly applied by comparing it with the actual text of the applicable version of the methodology and there is no deviation from the selected methodology.

D.4. Validity of original baseline or its update

Means of validation

Requirements contained in paragraph 288 to 291 of CDM project standard for programme of activities, version 02 have been checked to check how CME has demonstrated validity of the original baseline. As per paragraph 288, CME is not required to reassess the baseline scenario, instead is required to assess modalities to calculate GHG emission reductions that would have resulted from the baseline scenario. Further, as per paragraph 289, CME is required to assess impact of national and/or sectoral policies and circumstances existing at the time of request for renewal of CPA period on modalities to estimate baseline emissions for second crediting period.

In the context of these requirements, CME is requested to clarify requirements of 288 to 291 in section B.3 of the updated CPA-DD. Refer **CL 6**.

In accordance of paragraph 382 (a) of validation and verification standard for programmes of activities, version 02.0, RINA ssessed the impact of new relevant and national and/or sectoral policies and circumstances on the PoA as below:

The programme involves installation of household biogas digesters. In the host country (India), the Ministry of new and renewable energy promotes biogas plants in rural and semi urban areas by setting up of small size biogas plants of $1m^3$ to $25m^3$ capacity with financial assistance. However, installation of biogas plants is not mandatory by any law or any programme of the Government in India. Therefore, the national and/or sectoral policies and circumstances does not adversely impact the validity of original projected baseline for the PoA.

The data and parameters determined ex-ante and not monitored during the PoA period is provided and justification is given below:

Data/parameter	Value	Assessment
Emission factor for the substitution non-renewable woody biomass by similar consumers $_{projected_fossilfuel}$);	64.4 tCO_2/TJ	This value is sourced from AMS-I.E. version 10 and is same as per the registered PoA-DD version 5.6 and found to be valid.
Global warming potential for methane (GWP_{CH4}); tCO_2 / tCH_4	25 tCO_2 / tCH_4	The value is updated as per Decisions under UNFCCC and the Kyoto Protocol for second commitment period (from 1 January 2013) and is found to be valid. However, as per temporary measures

			pending CMP guidance at CMP 16 agreed in EB 108th meeting, CME is required to apply any global warming potential values that may be adopted by the CMP for that period in their monitoring reports for any emission reductions achieved on or after 1 January 2021. Refer **FAR 2**.
Findings	**CL 6-** CME is requested to clarify how it has demonstrated validity of the original baseline in accordance with the requirements of 288 to 291 of CDM project standard for programme of activities, version 02 in section B.3 of the updated CPA-DD for better clarity. **FAR 2-** As per temporary measures pending CMP guidance at CMP 16 agreed in EB 108th meeting, CME is required to apply any global warming potential values that may be adopted by the CMP for that period in their monitoring reports for any emission reductions achieved on or after 1 January 2021 and updating of CPA-DD in accordance with any requirements of CMP16 guidance. Findings reported as mentioned above have been closed out after positive evaluation of responses provided by the CME.		
Conclusion	RINA concludes that the validty of original baseline is justified in the updated PoA-DD as per paragraph 288 to 291 of CDM project standard for programme of activities, version 02.		

D.5. Demonstration of eligibility of the CPAs

Means of validation	The CME employs clear and unambiguous criteria for the inclusion of the CPA. The eligibility criteria's have been stated are in line with the applicability of the applied methodologies. Following has been included as eligibility criteria for for CPA- 1.Geographical boundary – The CPAs has to be implemented within geographical boundary of India. 2. Double counting – CPA shall not been implemented as a single CDM project activity or included in in another PoA. Unique reference number to be allocated to each bio-digester. 3.Technology – Each CPA involve biodigesters within the range of 2-15 m^3 with a capacity of upto 6 m^3 gas production per day at household level in rural areas. 4.Baseline Scenario – Beneficieries uses traditional cookstoves where firewood used is from non-renewable sources and animal waste management is based on anaerobic fermentation. 5.Inclusion – The start of the CPA occurs after the start date of the validation of the PoA. The start date will be defined as the date on which the CPA is included in the PoA, whichever comes earlier. 6.Compliance with applied methodology –The CPA shall meet all applicability criteria of applied methodology i.e AMS I.E, Version 10, AMS-I.C version 21 and AMS-III.R version 3. However, refer **CL 1.** 7.Additionality- CPA shall meet auto-additional criteria as defined in "Guidelines on the demonstration of additionality of small-scale project activities" version 09 which is:1. Each unit is no larger than the 5% of the small scale CDM thresholds. 2. Each of the independent subsystem in the project activity is smaller than or equal to 1500 kW electrical installed capacity 3. End user of the subsystem, biogas plant is a household.

	8.Local stakeholder consultation:- The CPA has carried out a local stakeholder consultation. 9.Diversion of ODA – CPA implementation should not result in ODA diversion. 10.Debundling check: The CPA is not a debundled component of a large-scale project activity in accordance with the approved version of the Methodological tool "Assessment of debundling for small-scale project activities, version 04". 11.Carbon credit ownership – All households within the CPA transfer their right of CER ownership to the CME, SKG Sangha. 12.Target group- All beneficiaries are rural households without grid connection. 13.CPA complies with the sampling plan as set out in Section C.1. 14. The CPA is a voluntary action and not required by law. 15. To be included in the PoA, Project Implementing Partner (PIPs) must sign an agreement with the CME under which they acknowledge that they have signed up to the PoA and are aware of all its duties and tasks within the programme and project level including its eligibility criteria.
Findings	**CL 7-** CME is requested to submit declaration confirming that the project is not registered or in the process of being registered as a stand-alone CDM project outside of the PoA to demonstrate compliance with eligibility criteria of double counting. **CL 8-** CME is requested to submit declaration confirming that households that have been using traditional cook stoves are only eligible under the CPA if they fulfill the conditions is needed to assess fulfilment of eligibility criteria of baseline scenario. **CL 9-** Please provide calculations justifying 0.4158 KWe installed capacity and emission reductions of 9.07 tCO_2 e/year of each independent biogas unit to check eligibility criteria of additionality. **CL 10**- Please provide local stakeholder consultation report to demonstrate compliance with the eligibility criteria of LSC. **CL 11-** Please provide declaration regarding no diversion of ODA funds to the project activity to demonstrate compliance with the eligibility criteria of ODA. **CAR 6-** CME is required to report in CPA-DD impact of increase in the biogas unit from 6890 to 9590 on the additionality of the project activity in line with the requirement contained in Paragraph 242 of CDM project standard for programme of activities version 02. Also, it is requested to amend the foot note 10 in the same section. **CAR 7-** CME is requested to demonstrate eligibility criteria for CPA- 'debundling check' as per the tool "Assessment of debundling for small-scale project activities, version 04" referred in registered PoA-DD version 5.6. Findings reported as mentioned above have been closed out after positive evaluation of responses provided by the CME.
Conclusion	RINA confirms that the subject CPA meets the eligibility criteria defined in the the registered PoA-DD version 5.6 including conditions that the CPAs meet the requirement pertaining to the demonstration of additionality.

D.6. Estimated emission reductions or net anthropogenic removals

Means of validation	Baseline emissions, Project emissions and Leakage emissions calculation included in the updated CPA-DD version 4.4. dated 15/12/2020 and ER emission calculation sheet dated 15/12/2020 was crossed checked with the applied methodologies namely AMS-I.C.version 21, AMS-III.R. version 3 and AMS-I.E. version 10, applicable methodological tools and registered POA-DD version 5.6 dated 06/01/2020. **Validation of Baseline emission calculations is explained below:**

Baseline emissions comprise of emissions from following sources:

1. Baseline emissions from burning of kerosene for household cooking needs (**$BE_{y,kerosene}$**)
2. Baseline emission from non-renewable biomass i.e. fire wood (**BE_{y,NRB_B}**)
3. Baseline emissions from cattle manure left to decay anearobically (**$BE_{y,manure}$**)

Calculation of baseline emissions from burning of kerosene for household cooking needs (**$BE_{y,kerosene}$**) for one operating unit (emissions obtained using this formula are multiplied by total number of operating units in a year):-

$BE_{kerosene} = FC_{kerosene} * N * \rho_{kerosene} * NCV_{kerosene} * EF_{CO2,\ kerosene} * 10^{-9}$ (1)

$BE_{y,kerosene}$ Baseline emissions from burning of kerosene for household cooking needs (t CO_2e/year)
$FC_{kerosene}$ Annual amount of kerosene used for cooking in an average household (l/year)
N Number of devices (biodigesters)
$\rho_{kerosene}$ Kerosene density (kg/l)
$NCV_{kerosene}$ Net calorific value of kerosene (TJ/Gg)
$EF_{CO2,\ kerosene}$ Emissions factor of kerosene (kg CO_2/TJ)

The fixed parameters are:

Parameter	Value	Unit	Data source assessment
$\rho_{kerosene}$	0.817	kg/l	http://www.simetric.co.uk/si_liquids.htm
$NCV_{kerosene}$	43.8	TJ/Gg	IPCC 2006 Default value, T.1.2 volume
$EF_{CO2,\ kerosene}$	71,900	kg CO2/TJ	IPCC Chapter 1 T.4

$BE_{kerosene}$ = 18.00 l * 1 * 0.817 kg/l * 43.8 TJ/Gg * 71,900 kgCO_2/TJ * 10^{-9} = 0.032 t CO_2

Calculation of baseline emission from non-renewable biomass i.e. fire wood (**BE_{y,NRB_B}**) for one operating unit (emissions obtained using this formula are multiplied by total number of operating units):-

$$BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil_fuel}$$

BEy = By X $f_{NRB,y}$ X $NCV_{biomass}$ X $EF_{projected_fossil\ fuel}$

BE_y Baseline emission from non-renewable biomass during the year *y* in tCO_2e

B_y Quantity of woody biomass that is substituted or displaced in tonnes

$f_{NRB,y}$ Fraction of woody biomass used in the absence of the project activity in year *y* that can be established as non-renewable biomass using survey methods

$NCV_{biomass}$ Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)

$EF_{projected_fossil_fuel}$ Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 64.4 tCO_2/TJ

Following data/ parameters are used:

Parameter	Value	Data source assessment

	B_y	5.52 tonnes	This value is obtained from baseline survey conducted once during first crediting period which will be carried out again in the first monitoring period of second crediting period. The source of data is same as per registered PoA-DD and found to be appropriate. However, CME is requested to furnish copies of baseline survey forms from which this data is sourced for verification. **CL 3.**
	$f_{NRB,y}$	0.8866	This value is obtained through calculation of NRB and then the fraction of NRB for which forest reports of Karnataka State for the year 2011 & 2019 released by MoEF, Census report 2011 for India are used. The calculation was checked to ensure correctness of input data from these sources and various formulas used in to derive values like mean annual increment of woody biomass growth per hectare in sub-category i of forest areas ($MAI_{forest,i}$) and in sub-category i of other wooded land areas ($MAI_{other,i}$) , renewable biomass in the project area (RB), total annual consumption of wood in the absence of project activity in project area (H) for Bidar, Gulbarga, Yadgir and combinely for all three districts. The calculations are similar to the registered PoA-DD and found to be appropriate.
	$NCV_{biomass}$	0.015 TJ/tonne	This value is sourced from data/parameter table 8 of AMS-I.E. verision 11 and found to be appropriate.
	$EF_{projected_fossil\ fuel}$	64,400 Kg CO_2/TJ	This value is sourced from table 2 of AMS-I.E. verision 11 and found to

		be appropriate.

$BE_{y,NRB\ B}$ = 5.52t * 0.8866 * 0.015 TJ/t * 64,400 kg CO_2/TJ * 10^{-3} = 4.72 t CO_2

Calculation of baseline emissions from cattle manure left to decay anearobically (**$BE_{y,manure}$**) for one operating unit (emissions obtained using this formula are multiplied by total number of operating units in a year):-

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

$BE_{y,\ manure}$ Baseline emissions in year *y* (tCO_2e)

GWP_{CH4} Global Warming Potential (GWP) of CH_4

D_{CH4} CH_4 density (0.00067 t/m^3 at room temperature (20 ºC) and 1 atm pressure)

LT Index for all types of livestock

j Index for animal manure management system

MCF_j Annual methane conversion factor (MCF) for the baseline animal manure management system *j*

$B_{0,LT}$ Maximum methane producing potential of the volatile solid generated for animal type *LT* (m^3 CH_4/kg dm)

$N_{LT,y}$ Annual average number of animals of type *LT* in year *y* (numbers)

$VS_{LT,y}$ Volatile solids for livestock *LT* entering the animal manure management system in year *y* (on a dry matter weight basis, kg dm/animal/year)

$MS\%_{Bl,j}$ Fraction of manure handled in baseline animal manure management system *j*

UF_b Model correction factor to account for model uncertainties (0.94)

The maximum methane-producing capacity of the manure (B_o) varies by species

$BE_{manure} = \sum_{(T)} (EF_T*N_T)*UF_b*GWP_CH_4/1000$

$EF_{(T)} = VS_{(T)}*365*B_{o(T)}*0.67kg/m^3*f_{collected}*(MCF_{liquid}/100*MS_{liquid} + MCF_{liquid\ with\ crust}/100*MS_{liquid\ with\ crust} + MCF_{solid}/100*MS_{solid} + MCF_{dry}/100*MS_{dry}$

Following parameters are used:

Parameter	**Value**	**Data source assessment**
GWP_{CH4}	25 kg CO_2 / kg CH_4	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories which is as per decisions for second commitment period and fixed for the second crediting period. However, as per Guidelines for National Greenhouse Gas Inventories which is as per decisions for second commitment period and fixed for the second crediting period. However, as per

			temporary measures pending CMP guidance at CMP 16 as agreed in EB 108th meeting, **FAR 2** is raised.
	MCF_{liquid}	78%	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories table T. 10A-4 to 10A-6 and found to be appropriate.
	$MCF_{liquid\ with\ crust}$	48%	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories table T. 10A-4 to 10A-6 and found to be appropriate.
	MCF_{solid}	5%	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories table T. 10A-4 to 10A-6 and found to be appropriate.
	MS_{liquid}	0.25	This value is sourced from baseline survey conducted once during first crediting period which will be carried out again in the first monitoring period of second crediting period. The source of data is same as per registered PoA-DD and found to be appropriate.
	$MS_{liquid\ with\ crust}$	0.18	This value is sourced from baseline survey conducted once during first crediting period which will be carried out again in the first monitoring period of second crediting period. The source of data is same as per registered PoA-DD and found to be appropriate.
	MS_{solid}	0.24	This value is sourced from baseline survey conducted once during first crediting period which will be carried out again in the first monitoring period of second crediting period. The source of data is same as per registered PoA-DD and found to be appropriate.

	For dairy cow:-		
	N_{LT}	2.13	This value is sourced from baseline survey conducted once during first crediting period which will be carried out again in the first monitoring period of second crediting period. The source of data is same as per registered PoA-DD and found to be appropriate. Refer **CL 3**.
	$VS_{(LT)}$	3.8 kg dry matter/(head*day)	This value is sourced from 'Biogas Technology by B.T. Nijaguna (see reference 5 in Annex 5), Table 2.12'. CME is requested to provide copy of this reference for verification. **CL 12.**
	$B_{o(LT)}$	0.15 m^3 CH_4/kg VS	CME is requested to provide source of this data in the CPA-DD and furnish copy of the same for verification. **CL 13.**
	For buffalo:		
	N_{LT}	1.40	This value is sourced from baseline survey conducted once during first crediting period which will be carried out again in the first monitoring period of second crediting period. The source of data is same as per registered PoA-DD and found to be appropriate. Refer **CL 3** above.
	$VS_{(LT)}$	3.1 kg dry matter/(head*day)	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories table T. 10A-4 to 10A-6 and found to be appropriate.
	$B_{o(LT)}$	0.1 m^3 CH_4/kg VS	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories table T. 10A-4 to 10A-6 and found to be appropriate.
	Other cattle:-		
	N_{LT}	1.57	This value is sourced from baseline survey conducted once during first crediting period which will be carried out again in the first monitoring period of

		second crediting period. The source of data is same as per registered PoA-DD and found to be appropriate. Refer **CL 3** above.
$VS_{(LT)}$	1.4 kg dry matter/(head*day)	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories table T. 10A-4 to 10A-6 and found to be appropriate.
$B_{o(LT)}$	0.1 m^3 CH_4/kg VS	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories table T. 10A-4 to 10A-6 and found to be appropriate.

Therefore:

$EF_{dairy\ cow}$= 3.8 kg VS/(head*day) * 365 * 0.15 m^3 CH_4/kgVS * 0.67 kg/m^3 * (78/100 * 0.25 + 48/100 * 0.18 + 5/100 * 0.24+ 2/100*0.07) = 40.96kgCH_4/year

$EF_{buffalo}$ = 3.1 kg VS/(head*day) * 365 * 0.1 m^3 CH_4/kgVS * 0.67 kg/m^3 * (78/100 * 0.25 + 48/100 * 0.18 + 5/100 * 0.24+ 2/100*0.07))=22.27 kgCH_4/year

$EF_{othercattle}$ = 1.4 kg VS/(head*day) * 365 * 0.1 m^3 CH_4/kgVS * 0.67 kg/m^3 (78/100 * 0.25 + 48/100 * 0.18 + 5/100 * 0.24+ 2/100*0.07) = 10.06 kgCH_4/year

$BE_{y,manure}$ for a 3m^3 unit = (40.96 kgCH_4/year*2.13+ 22.27kgCH_4/year*1.40+ 10.06kgCH_4/year*1.57)* 0.94*25 kgCO_2/kgCH_4 / 1000 = 3.15 tCO_2e

$BE_{y,manure}$ for a 2m^3 unit = 3.15 tCO2e * 2/3 = 2.10 tCO_2e

22% of the units are 3m^3 and 78% are 2m^3 units, therefore $BE_{y,manure}$ for one average unit is:

$BE_{y,manure}$ =3.15 tCO_2e * 0.22 + 2.10 tCO_2e * 0.78 = 2.33 t CO_2e

Validation of project emissions calculation is explained below:

Project emissions considered by CME are basically from:

1. Project emissions from physical leakage of biogas digester (**PE_{CH4y}**) calculated as per AMS-III.D. para 21, option b as suggested in para 7 of AMS-III.R. version 3 and methodological tool "Project and leakage emissions from anaerobic digesters", version 2.
2. Project emissions from fuelwood consumption during non-operation of biogas units (**$PE_{y,NRB}$**)
3. Project emissions through consumption of kerosene due to use of traditional stove in case of nonoperation of bio-digester (**$PE_{kerosene}$**)

<u>Calculation of project emissions from physical leakage of biogas digester (**PE_{CH4y}**):</u>

$PE_{CH4y} = Q_{CH4,y} * EF_{CH4,default} * GWP_{CH4}$

Where, PE_{CH4y} = Project emissions of methane from the anaerobic digester in year y

$Q_{CH4,y}$ = Quantity of methane produced in the anaerobic digester in year y

$EF_{CH4,default}$ = Default emission factor for the fraction of CH4 produced that leaks from the anaerobic digester.

Q_{CH4} is to be calculated as below:

$Q_{CH4} = Q_{biogas,y} * f_{CH4,default} * \rho_{CH4}$

Where,
$Q_{biogas,y}$ = Amount of biogas collected at the digester outlet in year y (Nm^3 biogas)

$f_{CH4,default}$ = Default value for the fraction of methane in biogas (m^3 CH_4/m^3 biogas)

ρ_{CH4} = Density of methane

Data used for this calculation is explained in the table below:

Parameter	**Value**	**Assessment of data source**
Average size of the unit	2.21 m^3/day	This is an average of 2m^3 and 3m^3 of biogas plants which are 22% and 78% respectively. Checked this ratio from list of biogas plants submitted for validation and found to be appropriate.
$f_{CH4,default}$	0.6 m^3 CH_4/m^3	This is taken from methodological tool "Project and leakage emissions from anaerobic digesters", version 2 and found to be acceptable.
ρ_{CH4}	0.00067 tCH_4/m^3 CH_4	This is taken from section 6.3 of methodological tool "Project and leakage emissions from anaerobic digesters", version 2 and found to be acceptable.
$EF_{CH4,default}$	0.1 t CH_4 leaked / t CH_4 produced	This is taken from section 6.3 of methodological tool "Project and leakage emissions from anaerobic digesters", version 2 and found to be acceptable.
GWP_{CH4}	25 CO_2e / t CH_4	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas

		Inventories which is as per decisions for second commitment period and fixed for the second crediting period. However, as per Guidelines for National Greenhouse Gas Inventories which is as per decisions for second commitment period and fixed for the second crediting period. However, as per temporary measures pending CMP guidance at CMP 16 as agreed in EB 108th meeting, **FAR 2** is raised.
Number of days in year	365	This is as per calender year and found to be in order.

Therefore,
PE_{biogas} = (2.21* 365days* 60% * 0.67 * 25* 0.05)/1000 = 0.81 tCO_2/unit and found to be in order.

<u>Calculation of project emissions from fuelwood consumption during non-operation of biogas units (**$PE_{y,NRB}$**):</u>

$PE_{y,NRB} = B_{biomassproject,y} * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$

$B_{biomassproject,y}$ = Quantity of woody biomass that is used in project activity in tonnes

$f_{NRB,y}$ = Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods

$NCV_{biomass}$ = Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)

$EF_{projected_fossilfuel}$ = Emission factor for the substitution of non-renewable woody biomass by similar consumers.

Data used for this calculation is explained in the table below:

Parameter	**Value**	**Assessment of data source**
$NCV_{biomass}$	0.015 TJ/tonnes	This is as per Paragraph 39 of AMS-I.E.version 10 and found to be appropriate.
$EF_{projected_fossilfuel}$	64,400 kg CO_2/TJ	This is taken from Paragraph 26, table 2 for South Asia region from AMS-I.E.version 10 and found to be appropriate.

<u>Calculation of Project emissions through consumption of kerosene due to use of traditional stove in case of nonoperation of bio-digester (**$PE_{kerosene}$**):</u>

Any form of kerosene consumption due to use of traditional stove will be monitored by yearly surveys and any use found in these surveys will be applied for all the project households. Following equation will be used:

$PE_{kerosene} = F_{kerosene, project} * N * \rho_{kerosene} * NCV_{kerosene} * EF_{kerosene} * 10^{-9}$

Where,

$F_{kerosene, project}$ is the quantity of kerosene that is substituted or replaced in an average household.
$\rho_{kerosene}$ is the density of kerosene.

$NCV_{kerosene}$ = Net calorific value of kerosene

$EF_{kerosene}$ is the emission factor for kerosene

Data used for this calculation is explained below:

Parameter	**Value**	**Assessment of data source**
$\rho_{kerosene}$	0.817 TJ/Gg	This is sourced from http://www.simetric.co.uk/si_liquids.htm and found to be appropriate.
$NCV_{kerosene}$	43.8 TJ/Gg	This is sourced from IPCC 2006 Default value, T.1.2 Volume and found to be appropriate.
$EF_{kerosene}$	71,900 Kg CO_2/TJ	This is sourced from IPCC Chapter 1 T.4 and found to be appropriate.
$F_{kerosene, project}$	0 litres	Monitoring survey carried out annually by district level team as per monitoring plan and found to be in order. CME is requested to submit copy of latest monitoring survey on which this value is based on and to clarify this in the CPA-DD. Refer **CL 14**.

LeakageEmissions:

Leakage relating to non-renewable biomass according to AMS-I.E., version 10 Paragraph 31 is assessed from ex-post surveys of users and areas from where biomass is sourced. Under this para, following leakage source is considered and found to be not applicable by CME:

<u>a)Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities:</u>

It is checked from UNFCCC/GS websites that there is neither registered nor under registration project with UNFCCC or the GS which saves NRB in the present project area.
Further, CME has ensured that if there will be any wood saving CDM or PoA activity going to be implemented in the future in Gulbarga, Yadir or Bidar district,

	then CME will consider the wood saving of that project and add this wood saving to the available wood while calculating the NRB. Overall, this the justification to exclude this source of leakage emissions and provision made to include the same is found to be in line with requirement contained in Para 39 of AMS-I.E., version 10 and hence, appropriate. <u>b) Increase in the use of non-renewable woody biomass outside the project boundary:</u> Non-project households will be surveyed in the monitoring to know whether their wood usage has been increased compared to the baseline. If at all the survey shows a significant increase of "$B_{biomass\ non\text{-}project}$" in comparison to "Total $B_{biomass,y}$" due to the project activity, then the difference between "Total $B_{biomass,y}$" and "$B_{biomass\ non\text{-}project}$" will be considered for leakage calculation. In case it is shown that the fuelwood consumption of non-project households increased due to non- project related issues, such as i.e. reduction in fuelwood price, leakage will not be considered. Leakage due to increased use of fuelwood in non-project households will be calculated as follows: $LE_y = (B_{biomass,non\text{-}project,y} - \text{Total } B_{biomass,y}) * f_{NRB,y} * NCV_{biomass} * EF_{projected_fossilfuel}$ Where, LE_y = Project emissions due to leakage during the year y in tCO_2e $B_{biomass\ ,nonproject,y}$ = Quantity of woody biomass that is used during project activity in non-project household in tonnes Total $B_{biomass,y}$ = Quantity of woody biomass that is used in baseline in tonnes $f_{NRB\ y}$ = Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods $NCV_{biomass}$ = Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne) $EF_{projected_fossilfuel}$ = Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 64.4 tCO_2/TJ This leakage emissions is calculated as zero since monitoring survey report shows that there is no increase in fire wood consumption in non-project households compared to baseline study which can be attributed to availability of fire wood due to the project activity and hence found to be appropriate.
Findings	Refer **CL 3, FAR 2** **CL 12**- Please provide copy of Biogas Technology by B.T. Nijaguna (see reference 5 in Annex 5), table 2.12 to substantiate VS_{LT}. **CL 13**- CME is requested to provide source of $B_{o(LT)}$ in the CPA-DD and furnish evidence for the same for verification. **CL 14-** CME is requested to provide monitoring survey carried out in January 2020. **CL 15**- CME is requested to explain the basis of 95% confidence level used to derive values based on the baseline survey results for baseline emissions. Findings reported as mentioned above have been closed out after positive evaluation of responses provided by the CME.
Conclusion	RINA confirms the equations and parameters including the data and parameters fixed ex ante that are used in the equations to calculate GHG emission reductions

	applied in the updated CPA in accordance with the modalities in the corresponding generic CPA. The methodologies and applicable tools have been pplied correctly to calculate baseline, project and leakage GHG emissions as well as GHG emission reductions in accordance with the modalities in the corresponding generic CPA. Further, the ex ante estimates of baseline, project and leakage GHG emissions as well as GHG emission reductions can be replicated are in accordance with the modalities in the corresponding generic CPA.

D.7. Validity of monitoring plan

Means of validation

Monitoring plan included in the updated CPA-DD version 4.4. dated 15/12/2020 was crossed checked with the applied methodologies namely AMS-I.C.version 21, AMS-III.R. version 3 and AMS-I.E. version 10, applicable methodological tools and registered monitoring plan included in the POA-DD version 5.6 dated 06/01/2020. For data and parameters used for determining the original baseline, that were determined ex ante and not monitored during the crediting period and which are no longer valid, it was confirmed that the CME updated such data and parameters in accordance with the "Methodological tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

CME has proposed to add 2700 household biogas plants in the already registered plants of 6890 together with the request of renewal of crediting period. This change in the number of biogas plants was considered in order to assess compliance, level of accuracy and completenemess of monitoring with requirements contained in the registered monitoring plan and applied methodologies and related regulatory documents which is explained separately in the validation report for PRC.

Validation of data and parameters fixed ex ante during the second crediting period is explained below:

Data/Parameter	Value in the updated CPA-DD	Validation assessment
$FC_{kerosene}$ (Quantity of kerosene that is substituted or replaced in average household per year)	18 litres/year	This value is obtained from the baseline survey conducted for the first crediting period. The baseline survey results are provided in the ER calculation sheet. However, CME is requested to submit baseline survey results in the format of Appendix 8 to substantiate the value considered for ER calculation. **CL 3.** **FAR 3**- CME has made a provision that this value will be re-assessed during the first monitoring period of the second crediting period by conducting a new survey immediately after the expiration of first crediting period. This is to be checked during first verification of the second There is no change in the monitoring plan from

			the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	$\rho_{kerosene}$ (Density of kerosene)	0.817 kg/litre	This value is obtained from publicaly available database i.e. http://www.simetric.co.uk/si_liquids.htm which was same for first crediting period and found to be acceptable. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	$NCV_{kerosene}$ (Net calorific value of kerosene)	43.8 TJ/Gg	This value is obtained from table 1.2 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1 which was same for first crediting period and found to be acceptable. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	$EF_{CO2,\ kerosene}$ (Emission factor from burning of Kerosene in households)	71,900 $kgCO_2/TJ$	This value is obtained from table 2.5 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1 which was same for first crediting period and found to be acceptable. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	$B_{biomass}$ (Quantity of biomass that is substituted or replaced in an average household)	5.52 tonnes	This value is obtained for the baseline survey conducted for the first crediting period. The baseline survey results are provided in the ER calculation sheet. However, CME is requested to submit baseline survey results in the format of Appendix 8 to substantiate the value considered for ER

			calculation. Refer **CL 3.** **FAR 3**- CME has made a provision that this value will be re-assessed during the first monitoring period of the second crediting period by conducting a new survey immediately after the expiration of first crediting period. This is to be checked during first verification of the second crediting period. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	Total $B_{biomass}$ (Total quantity of biomass that is used in an average household)	6.65 tonnes	This value is obtained for the baseline survey conducted for the first crediting period. The baseline survey results are provided in the ER calculation sheet. However, CME is requested to submit baseline survey results in the format of Appendix 8 to substantiate the value considered for ER calculation. Refer **CL 3.** **FAR 3**- CME has made a provision that this value will be re-assessed during the first monitoring period of the second crediting period by conducting a new survey immediately after the expiration of first crediting period. This is to be checked during first verification of the second crediting period. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	$NCV_{biomass}$ (Net calorific value of the non-renewable biomass that is substituted)	0.015 TJ/Tonne	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas

			Inventories which was same for first crediting period and found to be acceptable. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	EF $_{projected_fossilfuel}$ (Emission factor for the substitution of non-renewable woody biomass by similar consumers)	64.4 tCO_2/TJ	This value is obtained from table of AMS-I.E. version 10 for South Asia region and found to be acceptable. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	f_{NRB} (Fraction of biomass used in the absence of project activity that can be established as non-renewable biomass using survey methods)	88.66 %	This value is calculated using approach given Tool 'Calculation of the fraction of non-renewable biomass', version 02 as recommended in AMS-I.E. version 10. CME has taken an ex ante approach and fixed this value once for the second crediting using most recently available information in the public domain on total fuelwood consumption (http://fsi.nic.in/forest-report-2019, page 77) and supply (http://fsi.nic.in/forest-report-2011, page 161) data for CPA districts i.e. Bidar, Gulbarga and Yadgir. NRB is calculated as difference between total annual consumption of wood in the absence of the project activity (H) and quantity of renewable biomass in the project area (RB) i.e. respective districts. Fraction of NRB is calculated by dividing NRB value by sum of NRB and RB. India State of Forest Report 2011 and 2019, Census of India Report 2011 was verified to check values used in calculation of H, RB, NRB and f_{NRB} separately for each of

			the three districts which are mainly geographical area, forest cover, tree outside the forest cover (TOF), total population, population using fuel wood, demand/fuelwood use per capita and found to be suitable. The approach taken is in line with the methodological tool 30. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020.
	GWP_{CH4} (Global warming potential for methane)	25 t CO_2 / t CH_4	This value is obtained from 2006 IPCC Guidelines for National Greenhouse Gas Inventories which is as per decisions for second commitment period and fixed for the second crediting period. However, as per temporary measures pending CMP guidance at CMP 16 as agreed in EB 108th meeting, following FAR is raised. **FAR 2**- CME is required to apply any global warming potential values that may be adopted by the CMP for that period in their monitoring reports for any emission reductions achieved on or after 1 January 2021 and update their project or programme design documents in accordance with any requirements of the CMP guidance. **CAR 8**- In line with the temporary measures pending guidance on CMP 16 as agreed in EB 108th meeting, CME is requested to submit "Risk acknowledgement and acceptance form" (CDM-RAA-FORM) duly completed and signed by the focal point of the PoA.
	$VS_{(LT)}$ (Daily volatile solid	3.8 for dairy cow, 3.1 for	These values are

	excreted for livestock category T)	buffalo, 1.4 for other cattle kg (kilograms) dry matter / (head * day)	obtained from tables 10A-4 to 10A-6 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 4, Chapter 10) for buffalo and other cattles since nationally published values are not available for India. Biogas Technology by B.T. Nijaguna, table 2.12 is used for the value of dairy cow. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020. However, PP is requested to provide copy of Biogas Technology by B.T. Nijaguna for verification. **CL 12.**
	$B_{o(LT)}$ **(**Maximum methane producing capacity for manure produced by livestock category T)	0.13 for dairy cattle, 0.1 for buffalo and other cattle m^3 CH_4/kg VS	These values are obtained from tables 10A-4 to 10A-6 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 4, Chapter 10) for buffalo and other cattles since nationally published values are not available for India. Biogas Technology by B.T. Nijaguna, table 2.12 is used for the value of dairy cow. There is no change in the monitoring plan from the latest version of registered POA-DD i.e. version 5.6 dated 06/01/2020. However, refer **CL 12** above.
	MCF_{manure} **(**MCF_{liquid}**,** $MCF_{liquid\ with\ crust}$**,** MCF_{solid}**)** **(**Methane correction factor for cattle manure for each manure management system S by climate region k)	78 for liquid/slurry manure management system (MCF_{liquid}), 48 for liquid/slurry manure management system with natural crust cover ($MCF_{liquid\ with\ crust}$), 5 for solid storage manure management system (MCF_{solid}) and 2 for dry storage manure management system (MCF_{dry})	These values are obtained from Table 10.17 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Chapter 10 and were same for the first crediting period. It is referred to average annual temperature of 27^0C corresponding to warm climate. Hence

			found to be acceptable.
	$MS\%_{manure}$ (MS_{liquid}, $MS_{liquid\ with\ crust}$, MS_{solid} and MS_{dry}) (Fraction of livestock category T's manure handled using manure management system S in climate region k (fraction of livestock manure handled using liquid/slurry manure management system, fraction of livestock manure handled using liquid/slurry with natural crust cover, fraction of livestock manure handled using solid storage manure management system and ,fraction of livestock manure handled using dry storage manure management system))	0.25 for liquid/slurry manure management system (MS_{liquid}), 0.18 for liquid/slurry with crust cover manure management system ($MS_{liquid\ with\ crust}$), 0.24 for solid storage manure management system (MS_{solid}) and 0.07 for dry storage manure management system (MS_{dry})	These values are obtained from the baseline survey conducted for the first crediting period. The baseline survey results are provided in the ER calculation sheet. However, CME is requested to submit baseline survey results in the format of Appendix 8 to substantiate the value considered for ER calculation. Refer **CL 3** above. CME has made a provision that these values will be re-assessed during the first monitoring period of the second crediting period by conducting a new survey immediately after the expiration of first crediting period. This is to be checked during first verification of the second crediting period. Refer **FAR 3** above**.**
	N_{LT} (Number of heads per cattle species/category in an average household)		This parameter is missing in the updated CPA-DD in section B.2.4 Data and parameters fixed ex ante. Refer **CAR 1.**
	<u>Data and parameters to be monitored ex post during second crediting period is explained below:</u>		
	$N_{operating}$ (Number of systems (biogas units) operating)	9590	A record is maintained by the area supervisor of number of biogas unit beneficiaries in his area for which the supervisor updates functioning status of biogas plant and gas burners and non-functioning days of biogas plant in a monthly record. This data is monitored in yearly suvey with 90/10 confidence/precision levels. Sampling approach is explained by the CME in CPA-DD. Meets the requirement contained in AMS-I.E.

			version 10. There is an increase in the number of biogas plants from 6890 to 9590. CME is requested to provide records relating to beneficiary names, UID, village/district & agreement with PIP for the additional 2700 units. Refer **CL 1.** CME is requested to submit copies of area wise biogas plant beneficiary records and monthly record maintained by area supervisor. Refer **CL 16.** There is no change in the monitoring plan from registered PoA-DD.
	$FC_{kerosene}$ (Amount of kerosene consumed by household after installation of biogas unit)	0 litres	The value is obtained from monitoring suvey done by district level CME annually which was recently being carried out in Jan 2020. This data is monitored in yearly suvey with 90/10 confidence/precision levels. Sampling approach is explained by the CME in CPA-DD. Meets the requirement contained in AMS-I.E. version 10. CME is requested to submit copy of this survey report. Refer **CL 14.** There is no change in the monitoring plan from registered PoA-DD.
	$B_{biomass, project}$ (Consumption of fuel wood in households participating in the project activities)	3.71 tonnes	The value is obtained from suvey done by CME team annually on district level which was recently being carried out in Jan 2020. CME is requested to submit copy of this survey report. Refer **CL 14.** There is no change in the monitoring plan from

			registered PoA-DD.
	$B_{biomass,non-project}$ (Total quantity of biomass that is used in an average household not participating in the project activities)	4.76 tonnes	CME is requested to explain basis of sampling only 100 households to monitor this value and how it meets the confidence/precision level of 90/10 as specified in AMS-I.E. version 10. Refer **CL 17.**
	N_{LT} (Annual average animal population in a household (number of heads of dairy cow, buffalo and other cattle)	2.133 for dairy cows, 1.396 for buffalos, 1.567 for other cattle	These values are obtained from baseline survey once at the beginning of crediting period at 90/10 confidence/precision level as per AMS-III.R., version 03. The cross checking of these values will be done by CME team by conducting radom checks on district level annually. The current values are based on the survey carried out for the first crediting period which is on-going. For the second crediting period, CME will conduct a new baseline survey in order to estimate this value for 1st montiroing period which will be carried out immediately after the end of current crediting period. This is to be verified during first verification. Refer **FAR 3.**
	H_{stove} (Annual hours of operation of an average system (hours of burner functioning)	3.99 hours	This parameter is not used for emission reduction calculation purpose, rather only used to keep track of whether the biodigester produced enough biogas to substitute previous use of firewood and kerosene. The value is recorded by beneficiaries in a sheet provided by area supervisors by way of recording daily cooking hours (start and end time). CME team cross checks this during their visits to households. The method is considered to be appropriate. CME is requested to furnish copy of

			monitoring survey conducted last in January 2020 to estimate this value. Refer **CL 14.**
	$B_{manure,generated}$ (Average amount of animal manure generated per household per year)	18.56 tonnes	The value is obtained from annual monitoring survey which was conducted recently in January 2020. The value is further crossed checked by CME team on district level by performing random checks every year. The confidence/precision level of 90/10 is as per AMS-III.R. version 03. The monitoring plan is same as per registered PoA-DD and found to be appropriate. Refer **CL 14** above.
	$B_{manure,fed}$ (Average amount of animal manure manure fed into a biogas digester per year)	17.60 tonnes	The value is obtained from survey of a representative (at least 5%) sample of beneficiaries. Surveys will be carried out once per year by the Taluk level monitoring team. The value is further crossed checked by CME team on district level by performing random checks every year. It is not clear how CME meets the confidence/precision level of 90/10 as per AMS-III.R. version 03 by conducting survey of 5% representative sample. **CL 18**. The monitoring plan is same as per registered PoA-DD and found to be appropriate. Refer **CL 14** above for submitting January 2020 montioring survey results.
	$H_{manure,collected}$ (Average hours of animals kept in shed/confinement)	16.25 hours/day	The value is obtained from annual monitoring survey conducted by district level team at 90/10 confidence/precision

			level as per AMS-III.R. version 03. The latest survey was done in January 2020. The value is cross checked by CME team on district level by conducting radom checks and by calculating amount of generated manure by multiplying heads of different types of cattle by typical amount of manure generated by these cattle types. There is no change in the monitoring plan from registered PoA-DD. Refer **CL 14** above for submitting January 2020 montioring survey results.
	Application of sludge (Proper application of the sludge from the biogas unit)	6.07 tonnes/year	The value is obtained from annual monitoring survey conducted by district level team at 90/10 confidence/precision level as per AMS-III.R. version 03. The latest survey was done in January 2020. The value is cross checked by CME team on district level by conducting radom checks. Further, CME proposes to provide training on use of slude either for vermicompost or manuare for agriculture purpose to beneficiaries. The monitoring plan is same as per registered PoA-DD and found to be in order.
Findings	Refer **CAR 1, CL 12, CL 14.** **CAR 8-** In line with the temporary measures pending guidance on CMP 16 as agreed in EB 108th meeting, CME is requested to submit “Risk acknowledgement and acceptance form" (CDM-RAA-FORM) duly completed and signed by the focal point of the PoA. **CL 16**- Please provide monthly records of biogas plants maintained by area supervisors. **CL 17**- CME is requested to explain basis of sampling only 100 households to monitor $\mathbf{B}_{\mathbf{biomass,non\text{-}project}}$ and how it meets the confidence/precision level of 90/10 as specified in AMS-I.E. version 10.		

	CL 18- It is not clear how CME meets the confidence/precision level of 90/10 as per AMS-III.R. version 03 by conducting survey of 5% representative sample for 'Average amount of animal manure manure fed into a biogas digester per year ($B_{manure,fed}$)'. **FAR 3**- CME has proposed that the values for N_{LT}, $MS\%_{manure}$ (MS_{liquid}, $MS_{liquid\ with\ crust}$, MS_{solid} and MS_{dry}, Total $B_{biomass}$, $B_{biomass}$ and $FC_{kerosene}$ will be re-assessed during the first monitoring period of the second crediting period by conducting a new survey immediately after the expiration of first crediting period. This is to be confirmed during first verification of the second crediting period. Findings reported as mentioned above have been closed out after positive evaluation of responses provided by the CME.
Conclusion	RINA confirms that the monitoring plan included in the updated CPA-DD version 4.5 is valid as per the applied methodologies and conforms with the registered PoA-DD latest version 5.6.

D.8. Crediting period

Means of validation	Crediting period for CPA is 7 years renewable. This is the second crediting period and its start date is 28/02/2021, which is day immediately after the expiration of current crediting period i.e. 28/02/2014 to 27/02/2021.
Findings	No findings
Conclusion	RINA confirms that the second crediting period for the CPA commences on the day after the expiration of the current crediting period from 28/02/2021 which is as per paragraph 391 of VVS for PoA version 02.

D.9. CME and project participants

Means of validation	Cross checking the CME and project participants name from the list of project participants and CME of the PoA from the view page at UNFCCC website and latest MoC statement. RINA also reviewed the letter of approval (Ref. No.:4/10/2012-CCC dated 27/06/2012) issued from the DNA of India authorizing SKG Sangha as CME and letter of approval from DNA of Switzerland (dated 29/06/2012) authorizing Foundation myclimate-the climate protection partnership as project participant. The latest MoC dated 25/01/2019 confirm the name of the project participant.
Findings	No findings
Conclusion	RINA confirms that the CME and project participants of the CPA is listed in the updated CPA-DD and this information is consistent with the information provided in the latest MoC and hence meets paragraph 384 of VVS PoA version 02.

D.10. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[1]	N		
Corrections	N		
Changes to the start date of the crediting period of component project activity	N		
Inclusion of monitoring plan	N		
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from applied methodologies, standardized baselines, or other methodological regulatory documents	N		
Changes to the project design	Y	0	16/02/2021

[1] Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

Changes specific to afforestation and reforestation activities	NA		
Others (please specify)	NA		

SECTION E. Internal quality control

The draft final validation report before being submitted to request for registration is subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent RINA instructions. The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

SECTION F. Validation opinion

RINA has undertaken the validation for renewal of the second crediting period for the registered PoA, "SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1 (9507-P2-0001-CP2). The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism, CDM Validation and Verification Standard for Programme of Activities (VVS-PoA) version 02 and host country criteria.

The CPA involves implementation of biogas applications at individual households in in Gulbarga, Yadgir and Bidar district of Karnataka state in India. The different sizes of the digesters included in the CPA are between $2m^3$ to $3m^3$ gas generation per day. Each digester replaces fire-wood which otherwise would have been used for household thermal application (cooking/heating). Thereby, the CPA reduces GHG emissions from firing of fire-wood at household level and avoidance of methane emissions from open manuare disposal.

To arrive at the final validation conclusions and opinion, RINA carried out review of project documents, assessment of compliance with and application of the approved baseline and monitoring methodologies as well as the approved methodological tools and interview with CME. Validation team confirms that project information remains materially same as in the registered PoA-DD.

The validation team is of the opinion that the PoA correctly applies the small scale methodology AMS-I.E Version 10, AMS-I.C version 21 and AMS-III.R version 3 and conforms to all the relevant UNFCCC requirements for the CDM as well as the host country's national requirements and that the monitoring arrangements described in the monitoring plan are feasible within the project design. Therefore, RINA requests the renewal of crediting period of "SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1 (9507-P2-0001-CP2) to the CDM Executive Board.

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH_4	Methane
CL	Clarification Request
CME	Coordinating and managing entity
CMP	Conference of the parties serving as meeting of the parties to the Kyoto Protocol
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CPA	Component project activity
CRT	Coordination and Technical Control Staff
DD	Design Document
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EF	Emission Factor
EI	External Resource
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
Gg	Giga Joule
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IR	Internal Resource
kW	Kilo Watt
LoA	Letter of Approval
MoC	Modalities of Communication
MoV	Means of Verification
MR	Monitoring Report
NA	Not Applicable
NCV	Net Calorific Value
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PoA	Program of Activities
PP(s)	Project Participant(s)
PRC	Post Registration Changes
Ref.	Document Reference
RINA	RINA Services Spa
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
TJ	Terra Joule
tCO_2e	Tonnes of Carbon Dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms: **Shruti Kudtarkar**

è qualificato come[1]:
is qualified as: **CDM -TEC, -VAL, -VER, -TL**

per le seguenti aree tecniche:
for the following technical areas: **1.2, 13.1, 13.2**

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.2	Renewables	1
13.1	Solid Waste and wastewater	13
13.2	Manure	13

in accordo alle istruzioni della Unità Certification Innovation and Sustainability.
in accordance with the instructions of the Certification Innovation and Sustainability Unit.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	03/12/2012	-
5	10/11/2015	New revision of IS-QPT-GHG-20
6	15/11/2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"

Il Resp. CEINS
Head of CEINS

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms: **Amalorpavanathan Cyril AUGUSTUS AROKIASAMY**

è qualificato come[1]:
is qualified as: CDM-TEC, CDM-VAL, CDM-VER, CDM-TL, ITRP, REG-EXP[2]

per le seguenti aree tecniche:
for the following technical areas: 1.1, 1.2, 3.1, 4.1, 5.1, 13.1

AREE TECNICHE *TECHNICAL AREAS*	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.1	Thermal energy generation	1
1.2	Renewables	1
3.1	Energy Demand	3
4.1	Cement and lime production	4
5.1	Chemical industry	5
13.1	Solid Waste and wastewater	13

In accordo alle istruzioni della Unità Certification Innovation and Sustainability.
In accordance with the Instructions of the Certification Innovation and Sustainability Unit.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	30/06/2010	-
13	31/03/2017	Updated qualification as ITRP
14	20/09/2018	Update qualification as REG-EXP
15	15/11/2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"
16	15/09/2020	Update

Il Resp. CEINS
Head of CEINS

[1] Legend:
VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS : Verified Carbon Standard
GS: Gold Standard
SCS: SocialCarbon Standard
JI: Joint Implementation

[2] Ghana, Azerbaijan, China, Sri Lanka, Bangladesh, Nepal, Thailand, Indonesia, Singapore, Malaysia, Cambodia, Vietnam, Philippines, UAE and Iraq, Brazil, Japan.

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

GHG_QUAL_CERT_EN_07_18 Page 1 of 1

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: / *We declare that Mr/Mrs/Ms:* **Daria MASO**

è qualificato come[1]: / *is qualified as:* **TEC**

per le seguenti aree tecniche: / for the following technical areas: **14.1, 15.1**

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
14.1	Afforestation and reforestation	14
15.1	Agriculture	15

in accordo alle istruzioni dell'unità Certificazione, Innovazione e Sostenibilità.
in accordance with the instructions of the Certification, Innovation & Sustainability Unit.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	29/09/2017	First Issue
1	22/01/2020	Update qualification in TA 15.1

Il Resp. CEINS
Head of CEINS

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS4GG: Gold Standard For Global Goals
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS4GG Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

GHG_QUAL_CERT_EN(07-2018) Page 1 of 1

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: / *We declare that Mr/Mrs/Ms:* — Thais DE LIMA CARVALHO

è qualificato come[1]: / *is qualified as:* — CDM -TEC, -VAL, -VER, -TL ITRP, REG-EXP[2]

per le seguenti aree tecniche: / for the following technical areas: — 1.1, 1.2, 2.1, 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.1	Thermal energy generation	1
1.2	Renewables	1
2.1	Electricity distribution	2
13.1	Solid waste and wastewater	13

in accordo alle istruzioni della Unità Certification Innovation and Sustainability.
in accordance with the instructions of the Certification Innovation and Sustainability Unit

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	19-08-2009	-
13	31-03-2017	Added qualification as ITRP
14	20-07-2018	Added qualification as REG-EXP
15	15/11/2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"

Il Resp. CEINS
Head of CEINS

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
FIN-EXP:	Financial Expert	JI: Joint Implementation
DET:	Determiner	

[2] Argentina, Mexico, Panama, Colombia, Dominican Republic, Honduras, Ecuador, Chile, Cape Verde

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GHG_QUAL_CERT_EN_07_18 — Page 1 of 1

Security level: RINA/CL/SENSITIVE

RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: / *We declare that Mr/Mrs/Ms:* — Roberto CEFARIELLO

è qualificato come[1]: / *is qualified as:* — CDM-TEC

per le seguenti aree tecniche: / for the following technical areas: — 5.1, 15.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
5.1	Chemical industry	5
15.1	Agriculture	15

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	14-10-2020	First issue

Il Resp. CEINS
Head of CEINS

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: SocialCarbon Standard
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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Foundation myclimate – The Climate Protection Partnership…	Updated CPA-DD titled 'SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1'	Version 4.4 dated 15/12/2020, Version 4.5 of 10/02/2021	CME
2	Foundation myclimate – The Climate Protection Partnership	Registered PoA-DD titled 'SKG Sangha Biodigester PoA'	Version 5.6 dated 06/01/2020	CME
3	Foundation myclimate – The Climate Protection Partnership…	CER calculation.xls	Version 0 dated 15/12/2020	CME
4	UNFCCC	Small-scale methodology AMS-I.E 'Switch from non-renewable biomass for thermal applications by the user'	Version 10	Others
5	UNFCCC	Small-scale methodology AMS-I.C 'Thermal energy production with or without electricity'	Version 21	Others
6	UNFCCC	Small-scale methodology AMS-III.R 'Methane recovery in agricultural activities at household/small farm level'	Version 03	Others
7	UNFCCC	Guidelines on the demonstration of additionality of small- scale project activities	Version 09	Others
8	UNFCCC	Guideline: Sampling and surveys for CDM project activities and programmes of activities	Version 09	Others
9	UNFCCC	Guideline: General guidelines for SSC CDM methodologies	Version 23	Others
10	UNFCCC	Methodological tool: Assessment of debundling for small-scale project activities	Version 04	Others
11	UNFCCC	Methodological tool: Calculation of the fraction of non-renewable biomass	Version 03	Others
12	UNFCCC	Methodological tool: Project and leakage emissions from anaerobic digesters	Version 02	Others
13	UNFCCC	Standard: CDM validation and verification standard for programmes of activities	Version 02	Others
14	UNFCCC	Standard: CDM project standard for programmes of activities	Version 02	Others
15	UNFCCC	Procedure: CDM project cycle procedure for programmes of activities	Version 02	Others

16	UNFCCC	Meeting report: CDM Executive Board 108th meeting	Version 01	Others
18	UNFCCC	UNFCCC viewpage: In English accessed on 25/01/2021 PoA 9507 titled 'SKG Sangha Biodigester PoA' https://cdm.unfccc.int/PoARenewal/ren_db/poaren546963387/view	Version 5.6 dated 06/01/2020	Others
19	UNFCCC	UNFCCC viewpage: In English accessed on 25/01/2021 CPA 9507-P1-0001-CP1 titled' SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1' https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/J9KD8PWLMZXABI6H3Y2U471F0NQ5ST/viewCPAs	Version 4.3 dated 21/12/2012	Others
20	RINA	Validation report for the renewal request for crediting period of PoA titled 'SKG Sangha Biodigester PoA' in India	Version 2.0Aa	Others
21	IPCC	IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1	-	Others
22	IPCC	Tables 10A-4 to 10A-6 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 4, Chapter 10)	-	Others
23	Ministry of new and renewable energy, Government of India	New national biogas and organic manure programme https://mnre.gov.in/bio-energy/schemes, accessed on 25/01/2021	-	Others
24	SI metric	Density of Kerosene, https://www.simetric.co.uk/si_liquids.htm accessed on 25/01/2021	-	Others
25	Forest Survey of India, Ministry of Environment, Forest and Climate Change	State of Forest Report for year 2011 (https://fsi.nic.in/forest-report-2011?pgID=forest-report-2011) and 2019 (https://fsi.nic.in/forest-report-2019?pgID=forest-report-2019), accessed on 25/01/2021	-	Others
26	Office of the Registrar General & Census Commissioner, India, Ministry of Home Affairs, Government of India	Census Report of India of 2011, https://censusindia.gov.in/2011-common/censusdata2011.html , accessed on 25/01/2021		Others
27	SKG Sangha	Declaration regarding CPA	Dated 09/02/2021	Others
28	Foundation myclimate – The Climate Protection Partnership	Risk acknowldgement and acceptance form	Version 01 dated 11/02/2021	Others
29	SKG Sangha	Monitoring survey reports	Dated Jan 2020	Others
30	SKG Sangha	Baseline survey carried out during first crediting period	Dated 2012	Others
31	TUV NORD	Validation report for registration of	Report no. 53603111-	Others

		CPA titled 'SKG Sangha Biodigester PoA Gulbarga Biodigester Project CPA1'	12/082- CPA 1 dated 31/12/2012	
32	SKG Sangha	Agreements between SKG Sangha and beneficiaries	Signed in first crediting period	Others

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	1	**Section no.**	D.3	**Date:** 25/01/2021
Description of CL				
CME is requested to furnish copies of agreements with beneficiaries for verification of details of biogas plants included in the CPA.				
CME response				**Date:** 10/02/2021
Samples of the agreements between SKG Sangha and the beneficiaries based on the template 'Appendix 10. Model End User Agreement between the CME and the beneficiaries regarding the ownership of carbon credits' approved since the first crediting period will be sent to the DOE.				
Documentation provided by CME				
Sample agreements between SKG Sangha and beneficiaries				
DOE assessment				**Date:** 16/02/2021
Checked agreements signed by SKG Sangha with biogas digester beneficiaries and found to be in accordance with the template included in Appendix 10 of the CPA-DD. The agreements include specific details like beneficiary name, address, date etc. and found to be in order. Hence, CL 1 is closed.				

CL ID	2	**Section no.**	D.3	**Date:** 25/01/2021
Description of CL				
CME is requested to furnish supporting evidence to demonstrate compliance with AMS-I.E, version 10 requirement that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.				
CME response				**Date:** 10/02/2021
The analysis of this criteria has been done and included in the previous version of the PDD v4.3 of this CPA (approved for 1st crediting period). The same is included in appendix 7 section 1.2 NRB assessment (the sources and links have been updated).				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
Checked the NRB assessment provided in the updated CPA-DD and found that the explaination provided in order to demonstrate the compliance with the requirement of AMS-I.E, version 10 is justified. Hence, CL 2 is closed.				

CL ID	3	**Section no.**	D.3	**Date:** 25/01/2021
Description of CL				
CME is requested to submit copies of baseline survey conducted as per format reported in Appendix 7 of the CPA-DD for verification.				
CME response				**Date:** 10/02/2021
Scanned copies of baseline survey conducted as part of the 1st crediting period have been submitted to the DOE.				
Documentation provided by CME				
Sample questionnaires used for conducting baseline survey				
DOE assessment				**Date:** 16/02/2021
Verified the baseline survey record submitted by the CME. The survey was conducted during first crediting period and will be carried out again at the start of second crediting period. The survey data was found to be in order. Hence, CL 3 is closed.				

CL ID	4	**Section no.**	D.3	**Date:** 25/01/2021
Description of CL				
CME is requested to justify how emission reductions from individual systems are limited to less than or equal to 5 tonnes of CO_2e per year as per AMS-III.R. version 3 for additional 2700 units.				
CME response				**Date:** 10/02/2021
As included in section I.1 for AMS-III.R of the PoA-DD 'Biogas digesters will be installed in individual households in rural areas. Only methane recovery systems that reduce less than 5 tonnes CO2 per year will be included in the project activity. Therefore, this applicability condition is also met' and based on calculation of ER/unit included at the end of section A.8 of the CPA-DD only the methane recovery share for 2m^3 and 3m^3 unit have between 2.10 and 3.15 as baseline emissions per unit (tCO_2) as baseline emission and the project emission (which was estimated for leakage factor) is between 0.77-1.10 (tCO_2) which results in emission reductions between 1.37 to 2.05 per unit (tCO_2) only for methane recovery share which comply the requirement of 5 tonnes of CO2e per year per unit. This assumption can be validated also in last verification reports of the 1st crediting period which the value ER per unit is less than 5 for methane recovery. The 2700 additional units will be delivered to the same type of biogas users of the 1st crediting period, but as written in the PoA-DD only methane recovery systems that reduce less than 5 tonnes CO_2 per year will be included in the project activity.				
Documentation provided by CME				
CER calculation sheet version 0 dated 15/12/2020				
DOE assessment				**Date:** 16/02/2021
The explaination provided above for the emission reduction calculations provided for 2 m^3 and 3m^3 biogas units in the CER has been found to be correct. Hence, CL 4 is closed.				

CL ID	5	**Section no.**	D.3	**Date:** 25/01/2021
Description of CL				
CME is requested to provide records of training provided to beneficiaries for proper application of sludge in order to demonstrate applicability of condition no. 4 of AMS-III.R, version 3.				
CME response				**Date:** 10/02/2021
Samples of training provided to beneficiaries for proper application of sludge have been submitted to the DOE.				
Documentation provided by CME				
Training records				
DOE assessment				**Date:** 16/02/2021
The training records submitted by CME include training provided to beneficiaries, regional supervisors etc. on different topics including application of sludge and found to be appropriate. Hence, CL 5 is closed.				

CL ID	6	**Section no.**	D.4	**Date:** 25/01/2021
Description of CL				
CME is requested to clarify how it has demonstrated validity of the original baseline in accordance with the requirements of 288 to 291 of CDM project standard for programme of activities, version 02 in section B.3 of the updated CPA-DD for better clarity.				
CME response				**Date:** 10/02/2021

The same has been evaluated at PoA level, see page 24 of the PoA-DD, now is included in section B.3 of the updated CPA-DD.

For Renewal of programme of activities period based on Standard CDM project standard for programmes of activities v02.0 para. 287 the coordinating/managing entity shall describe how to demonstrate the validity of the original baseline or how to update it for each of the corresponding CPAs in accordance with the provisions in paragraphs 288−291 below.

288. To demonstrate the validity of the original baseline or its update, the coordinating/managing entity is not required to re-assess the baseline scenario. Instead, the coordinating/managing entity shall assess the modalities to calculate GHG emission reductions or net anthropogenic GHG removals that would have resulted from that scenario.

-> The modalities to calculate GHG emission reductions have been assessed in section I.6.3. of the PoA-DD according the latest versions of the methodologies and tools applied and calculated in the section B.4.3 in this document.

289. The coordinating/managing entity shall assess and incorporate the impact of national and/or sectoral policies and circumstances existing at the time of requesting renewal of the PoA period on the modalities to estimate baseline GHG emissions for the subsequent crediting period of each corresponding CPA, without reassessing the baseline scenario.

-> There current national and/or sectoral policies have not been changed. The government of India is promoting biogas plants with subsidies through the Ministry of New and Renewable Energy[2]. The installation of biogas plants is a thrust programme under 20 point programme of Government of India. Yet, the installation of biogas plants is not mandatory by any law or any programme of the Government in India.

290. The requirements contained in paragraph 289 above are not applicable to a registered CDM PoA applying the valid version of an applicable approved standardized baseline that standardizes baseline scenario in accordance with paragraph 286 above.

-> No applicable as the PoA and this CPA have not been applied an approved standardized baseline.

291. If data and parameters used for determining the original baseline, that were determined ex ante and not monitored during the PoA period, are no longer valid, the coordinating/managing entity shall update such data and parameters in accordance with the "Methodological tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

-> The data and parameters determined ex-ante and not monitored during the PoA period (see section I.6.2 of the PoA-DD) and for this CPA (see section B.4.2. below) for determining the original baseline are still valid, as the latest versions methodologies do not change these data and parameters. Therefore no updated based on Methodological tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period is needed. Only the values of the next parameters: $FC_{kerosene}$, $B_{biomass}$, Total $B_{biomass}$, $N_{(LT)}$ and $MS\%_{manure}$ will be updated based on the results of new baseline surveys which will be performed as part of the 1st monitoring of the second crediting period and will be fixed during the entire second crediting period.

Documentation provided by CME	
CPA-DD version 4.5	
DOE assessment	**Date:** 16/02/2021
The validation team confirmed that the validity of the original baseline has been reassessed by the CME. MNRE web site was checked to confirm there are none national or sectoral policies with regard to implementation of household biogas digesters. Thus, the sectoral conditions remain unchanged as compared to the validation of CPA. The modalies of baseline calculation are same as per the original CPA-DD. Also, there is no data and parameters which were fixed ex-ante that are not valid any longer. Therefore, response provided by the CME was found to be appropriate. Hence, CL 7 is closed.	

CL ID	7	**Section no.**	D.5	**Date:** 25/01/2021
Description of CL				

[2] https://mnre.gov.in/biogas

CME is requested to submit declaration confirming that the project is not registered or in the process of being registered as a stand-alone CDM project outside of the PoA to demonstrate compliance with eligibility criteria of double counting.	
CME response	**Date:** 10/02/2021
A declaration form signed by SKG Sangha is submitted to the DOE.	
Documentation provided by CME	
Declaration form dated 09/02/2021	
DOE assessment	**Date:** 16/02/2021
Declaration provided by SKG Sangha dated 09/02/2021 was checked for the confirmation that the CPA will meet all the eligibility criteria including the one which requires that the project is not registered or in the process of being registered as a stand alone CDM project outside the scope of PoA. Therefore, the response is satisfactory. Hence, CL 8 is closed.	

CL ID	8	**Section no.**	D.5	**Date:** 25/01/2021
Description of CL				
CME is requested to submit declaration confirming that households that have been using traditional cook stoves are only eligible under the CPA if they fulfill the conditions is needed to assess fulfilment of eligibility criteria of baseline scenario.				
CME response				**Date:** 10/02/2021
A declaration form signed by SKG Sangha is submitted to the DOE.				
Documentation provided by CME				
Declaration form dated 09/02/2021				
DOE assessment				**Date:** 16/02/2021
Declaration provided by SKG Sangha dated 09/02/2021 was checked for the confirmation that the CPA will meet all the eligibility criteria including the one which requires only those households as eligibile for inclusion which were using traditional cook stoves. Therefore, the response is satisfactory. Hence, CL 8 is closed.				

CL ID	9	**Section no.**	D.5	**Date:** 25/01/2021
Description of CL				
Please provide calculations justifying 0.4158 KWe installed capacity and emission reductions of 9.07 tCO_2 e/year of each independent biogas unit to check eligibility criteria of additionality.				
CME response				**Date:** 10/02/2021
A footnote has been added (#12) in CPA-DD to explain the value 0.4158 KWe which was calculate for the maximum size of a biogas unit in this CPA 3m^3 following the calculation included in PoA-DD footnote #3. Biogas plant with a capacity of 3 cubic meter biogas per day will generate 3 cubic meters of biogas per day. Methane content in the biogas is about 60% and will have the thermal energy capacity of 21.6 MJ per cubic meter (BT Nijaguna book mentioned in the PoA-DD). One megajoule is equivalent of 0.28 Kwh (http://www.kylesconverter.com/energy,-work,-and-heat/megajoules-to-kilowatt--hours). 64.8 MJ is equal to 18.144 KWh. As the biogas is generated in a day (24 hours) the installed capacity of a 3 cubic meter unit is equal to 0.756 Kwh. The thermal efficiency of the biogas stove is 55% (BT Nijaguna book) and hence the net installed capacity of the 3 cubic meter gas generation per day unit is equal to 0.4158 KWh.				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
Checked the calculation explaination provided in the CPA-DD footnote no. 12. The formulae and value used for calculating installed electrical capacity and total emission reductions per unit are found to be appropriate. Hence, CL 9 is closed.				

CL ID	10	**Section no.**	D.5	**Date:** 25/01/2021
Description of CL				
Please provide local stakeholder consultation report to demonstrate compliance with the eligibility criteria of LSC.				
CME response				**Date:** 10/02/2021
The local stakeholder consultation report has been submitted to the DOE.				
Documentation provided by CME				
LSC report of meeting held on 15/09/2011				
DOE assessment				**Date:** 16/02/2021

Checked the local stakeholder consultation report of meeting held on 15/09/2011 which contains notice of meeting, invitation sent and summary of consultation meeting and found to be in order. Hence, CL 10 is closed.

CL ID	11	**Section no.**	D.5	**Date:** 25/01/2021
Description of CL				
Please provide declaration regarding no diversion of ODA funds to the project activity to demonstrate compliance with the eligibility criteria of ODA.				
CME response				**Date:** 10/02/2021
A declaration form signed by SKG Sangha is submitted to the DOE.				
Documentation provided by CME				
Declaration form dated 09/02/2021				
DOE assessment				**Date:** 16/02/2021
Declaration provided by SKG Sangha dated 09/02/2021 was checked for the confirmation that the CPA will meet all the eligibility criteria including the one which requires that the CPA does not receive ODA funds. Therefore, the response is satisfactory. Hence, CL 8 is closed.				

CL ID	12	**Section no.**	D.6	**Date:** 25/01/2021
Description of CL				
Please provide copy of Biogas Technology by B.T. Nijaguna (see reference 5 in Annex 5), table 2.12 to substantiate VS_{LT}.				
CME response				**Date:** 10/02/2021
Please check the next link https://books.google.com.pe/books?hl=es&lr=&id=QfLDbf3qbcEC&oi=fnd&pg=PA43&dq=Biogas+Technology+by+B.T.+Nijaguna&ots=r_XWarSxa5&sig=BfcN77nffT4MHeuT_pojyEhAukU&redir_esc=y#v=onepage&q=Biogas%20Technology%20by%20B.T.%20Nijaguna&f=false *Page 29 table 2.12 for the value 3.8 for dairy cow (VS_{LT}).*				
Documentation provided by CME				
The weblink above				
DOE assessment				**Date:** 16/02/2021
Checked the web link for Biogas Technology by B.T. Nijaguna and page 29 table 2.12 in the book. Was found to be appropriate. Hence, CL 12 is closed.				

CL ID	13	**Section no.**	D.6	**Date:** 25/01/2021
Description of CL				
CME is requested to provide source of $B_{o(LT)}$ in the CPA-DD and furnish evidence for the same for verification.				
CME response				**Date:** 10/02/2021
The document Biogas Technology by B.T. Nijaguna is provided as evidence.				
Documentation provided by CME				
https://books.google.com.pe/books?hl=es&lr=&id=QfLDbf3qbcEC&oi=fnd&pg=PA43&dq=Biogas+Technology+by+B.T.+Nijaguna&ots=r_XWarSxa5&sig=BfcN77nffT4MHeuT_pojyEhAukU&redir_esc=y#v=onepage&q=Biogas%20Technology%20by%20B.T.%20Nijaguna&f=false				
DOE assessment				**Date:** 16/02/2021
Checked the web link for Biogas Technology by B.T. Nijaguna for the reference of $B_{o(LT)}$. Was found to be appropriate. Hence, CL 13 is closed.				

CL ID	14	**Section no.**	D.6	**Date:** 25/01/2021
Description of CL				
CME is requested to provide monitoring survey carried out in January 2020.				
CME response				**Date:** 10/02/2021
Scanned copies of monitoring surveys carried out in January of 2020 as part of the 1st crediting period have been submitted to the DOE.				
Documentation provided by CME				
Monitoring survey reports of January 2020				
DOE assessment				**Date:** 16/02/2021
Checked the monitoring survey reports of January 2020 and found to be in order. Hence, CL 14 is closed.				

CL ID	15	Section no.	D.6	Date: 25/01/2021
Description of CL				
CME is requested to explain the basis of 95% confidence level used to derive values based on the baseline survey results for baseline emissions.				
CME response				**Date:** 10/02/2021
The basis used is explained in section B.5.2. Sampling plan where the sample size for each of the parameters will be determined on the 90/10 level of precision. The number of surveys conducted for baseline scenario was 769 which comply by large the minimum sample size even for 95% confidence level, based on the fourth monitoring report dated 13/05/2020 (the last with credits issued) page 18: "According to the PoA-DD and according the "Standard from Sampling and Surveys for CDM Project Activities and Programme of Activities" (EB 65, Annex 2)" the sample size shall be chosen for a 90/10 level of precision (a 90% confidence interval and 10% margin of error). To be more conservative we have chosen the 95% confidence interval and a 10% margin of error. According to the baseline survey the maximum sample size is 155" Besides the derive values based on the baseline survey results for baseline emissions was used with a 95% confidence level following a conservative approach.				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
Noted that CME has used a more conservative approach by chosing 95/10 level by way of selecting larger sample size than needed by 90/10 approach. Hence, approach taken by CME is acceptable. Hence, CL 15 is closed.				

CL ID	16	Section no.	D.7	Date: 25/01/2021
Description of CL				
Please provide monthly records of biogas plants maintained by area supervisors.				
CME response				**Date:** 10/02/2021
Scanned copies of the records of biogas plants maintained by area supervisors as part of the 1st crediting period have been submitted to the DOE.				
Documentation provided by CME				
Training records				
DOE assessment				**Date:** 16/02/2021
Checked the records of training provided to regional supervisors in the first crediting period and found to be appropriate. Hence, CL 16 is closed.				

CL ID	17	Section no.	D.7	Date: 25/01/2021
Description of CL				
CME is requested to explain basis of sampling only 100 households to monitor $B_{biomass,non-project}$ and how it meets the confidence/precision level of 90/10 as specified in AMS-I.E. version 10.				
CME response				**Date:** 10/02/2021
As explained in section B.5.2 Sampling plan point B. Data to be collected parameter $B_{biomass, non-project}$ in CPA-DD this parameter need to comply with 90/10 level of precision and in case the chosen sample size for the parameter is too small to comply this precision level it will be enlarged during the monitoring so that the 90/10 level of precision can be assured. So far in the monitoring reports with credits issued the sample size achieved precision level set in the CPA-DD, the precision level will be based on the standard error for the two parameters for the non-project households' surveys are: firewood use for and for firewood use for other reasons.				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
CME will enlarge the sample to match 90/10 level as specified in AMS-IE. Hence, the CL 17 is closed.				

CL ID	18	Section no.	D.7	Date: 25/01/2021
Description of CL				
It is not clear how CME meets the confidence/precision level of 90/10 as per AMS-III.R. version 03 by conducting survey of 5% representative sample for 'Average amount of animal manure manure fed into a biogas digester per year ($B_{manure,fed}$).				
CME response				**Date:** 10/02/2021

The information for parameter $B_{manure,fed}$ in section B.5.1. Data and parameters to be monitored in the updated CPA-DD has been corrected (the 5% has been deleted) to maintain concordance with the statements written in section B.5.2. Sampling plan where is clearly defined that the sample size for each of the parameters (included $B_{manure,fed}$) will be determined on the 90/10 level of precision following the confidence/precision level of 90/10 as per AMS-III.R. version 03.	
Documentation provided by CME	
CPA-DD version 4.5	
DOE assessment	**Date:** 16/02/2021
Checked that CME has deleted 5% representative sample for $B_{manure,fed.}$ Rather, sample size will be chosen based on 90/10 level which is correct. Hence, CL 18 is closed.	

Table 2. CAR from this validation

CAR ID	1	**Section no.**	D.2	**Date:** 25/01/2021
Description of CAR				
CME has not included 'Number of heads per cattle species/category in an average household (N_{LT})' in B.4.2 'Data and parameters fixed ex ante' of CPA-DD version 4.4 dated 15/12/2020.				
CME response				**Date:** 10/02/2021
The parameter 'Number of heads per cattle species/category in an average household (NLT)' is included in section B.4.2 'Data and parameters fixed ex ante' on updated CPA-DD.				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
Checked that the CME has included N_{LT} in B.4.2 of updated CPA-DD. Hence, CAR 1 is closed.				

CAR ID	2	**Section no.**	D.2	**Date:** 25/01/2021
Description of CAR				
CME has given wrong reference to the version of AMS-I.E. in the footnote number 5 in section B.4.3 of CPA-DD version 4.4 dated 15/12/2020.				
CME response				**Date:** 10/02/2021
The version of AMS I.E has been corrected to 10 in footnote #6 in section B.4.3 of CPA-DD.				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
Checked that CMS has corrected version number of AMS-I.E. in the footnote in B.4.3 of the DD. Hence, CAR 2 is closed.				

CAR ID	3	**Section no.**	D.2	**Date:** 25/01/2021
Description of CAR				
Appendix 5, 6, 7, 8, 9 & 10 of the updated CPA-DD version 4.4 dated 15/12/2020 are not matching with the CPA-DD template version 09.				
CME response				**Date:** 10/02/2021
The template used for CPA-DD has been corrected for Appendix 5, 6, 7, 8, 9 & 10 in the updated version of the CPA-DD.				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
Checked that CME has corrected template used for Appendix 5 to 10 of CPA-DD. Hence, CAR 3 is closed.				

CAR ID	4	**Section no.**	D.2	**Date:** 25/01/2021
Description of CAR				
Reference to corresponding generic CPA of registered PoA-DD version 5.6 of 06/01/2020 for the exact reference of approved methodologies and methodological tools is not provided in section B.1 of CPA-DD.				
CME response				**Date:** 10/02/2021

The next references have been added in section B.2 of the updated CPA-DD: ➢ *Methodological tool Calculation of the fraction of non-renewable biomass Version 02.0* *https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v2.0.pdf* ➢ *Standard CDM project standard for programmes of activities Version 02.* *https://cdm.unfccc.int/filestorage/e/x/t/extfile-20181221092036155-Reg_stan03v02.pdf/Reg_stan03v02.pdf?t=NTN8cW84bXBqfDDtOG8oS5DP5lohjirRImIf* ➢ *Methodological tool Demonstration of additionality of small-scale project activities Version 13.1* *https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-21-v13.1.pdf* ➢ *Guidelines for sampling and surveys for CDM project activities and programmes of activities Version 04.0* *https://cdm.unfccc.int/filestorage/e/x/t/extfile-20151023152925164-Meth_GC48_-ver04.0-.pdf/Meth_GC48_%28ver04.0%29?t=OEV8cW84bW5rfDB91uwqeOu5O6nkHw4972eP* ➢ *Methodological tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period* *https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf* ➢ *Guidelines on the demonstration of additionality of small-scale project activities" Version 09.0* *https://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf*

Documentation provided by CME	
CPA-DD version 4.5	
DOE assessment	**Date:** 16/02/2021
Checked the updated CPA-DD for the references mentioned in the response and found to be included. Hence, CAR 4 is closed.	

CAR ID	5	**Section no.**	D.2	**Date:** 25/01/2021
Description of CAR				
CME has mentioned wrong number of biogas plants at one place in section A.1 of updated CPA-DD.				
CME response				**Date:** 10/02/2021
The same has been corrected in paragraph 5 of section A.1 of updated CPA-DD.				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
Checked that the CME has corrected biogas plant number in A.1. Hence, CAR 5 is closed.				

CAR ID	6	**Section no.**	D.5	**Date:** 25/01/2021
Description of CAR				
CME is required to report in CPA-DD impact of increase in the biogas unit from 6890 to 9590 on the additionality of the project activity in line with the requirement contained in Paragraph 242 of CDM project standard for programme of activities version 02. Also, it is requested to amend the foot note 10 in the same section.				
CME response				**Date:** 10/02/2021

The next paragraphs have been included at the end of the section F of the updated CPA-DD. It is required to report in CPA-DD the impact of increase in the biogas unit from 6890 to 9590 on the additionality of the project activity in line with the requirement contained in Paragraph 242 of CDM project standard for programme of activities version 02. (d) The additionality of the PoA or CPA; -> The automatic additionality criteria related to the CPA could be summarized as follow: 1. Each unit is no larger than the 5% of the small scale CDM thresholds: The maximum emission reduction per independent subsystem are 6.78 tCO2 e/year which is also use for the new biogas units to be built under 2nd crediting period as the same technology will be installed. 2. Each of the independent subsystem in the project activity is smaller than or equal to 1500 kW electrical installed capacity: Each independent subsystem installed capacity is 0.4158 kW electrical (based on a plant with 3m^3 which is the maximum size) which is also considered for the new units to be built as the same technology will be installed. 3. End user of the subsystem, biogas plant is a household: End users are only households, the same is maintained for the new units to be built. The footnote #11 has been amended.
Documentation provided by CME
CPA-DD version 4.5
DOE assessment **Date:** 16/02/2021
CME has demonstrated additionality of the current CPA included in the registered PoA or any CPA inclusion based on the 3 criterias discussed above. Each criteria evaluates at the individual unit level and includes less than 5 % small scale CDM threshold, to be lesser or equal to 1500 kW electrical capacity and household level implementation. All the plants included in the CPA meet these criteria. Further, CME will ensure that the proposed addition of 2700 units will too meet the additionality critiera. Hence, CAR 6 is closed.

CAR ID	7	**Section no.**	D.5	**Date:** 25/01/2021
Description of CAR				
CME is requested to demonstrate eligibility criteria for CPA- 'debundling check' as per the tool "Assessment of debundling for small-scale project activities, version 04" referred in registered PoA-DD version 5.6.				
CME response				**Date:** 10/02/2021
The same has been already included in section A.8 of the CPA-DD.				
Documentation provided by CME				
CPA-DD version 4.5				
DOE assessment				**Date:** 16/02/2021
Checked the section of eligibility criteria and noted that CME has included the criteria- debundling check which was missed out earlier. Hence, CAR 7 is closed.				

CAR ID	8	**Section no.**	D.7	**Date:** 25/01/2021
Description of CAR				
In line with the temporary measures pending guidance on CMP 16 as agreed in EB 108th meeting, CME is requested to submit "Risk acknowledgement and acceptance form" (CDM-RAA-FORM) duly completed and signed by the focal point of the PoA.				
CME response				**Date:** 10/02/2021
The risk and acknowledgement and acceptance form signed by the focal points is submitted to the DOE.				
Documentation provided by CME				
Risk and acceptance form				
DOE assessment				**Date:** DD/MM/YYYY
Risk and acceptance form dated 11/02/2021 submitted by CME is accepted. Hence, CAR 8 is closed.				

Table 3. FAR from this validation

FAR ID	1	**Section no.**	D.2	**Date:** 25/01/2021

Description of FAR	
As per temporary measures pending CMP guidance at CMP 16 agreed in EB 108th meeting, CME is required to update their project or programme design documents in accordance with any requirements of the CMP guidance.	
CME response	**Date:** 10/02/2021
The project and programme design documents will be updated when new requirements are approved.	
Documentation provided by CME	
DOE assessment	**Date:** 16/02/2021
Accepted. FAR 1 is closed.	

FAR ID	2	**Section no.**	D.3	**Date:** 25/01/2021
Description of FAR				
As per temporary measures pending CMP guidance at CMP 16 agreed in EB 108th meeting, CME is required to apply any global warming potential values that may be adopted by the CMP for that period in their monitoring reports for any emission reductions achieved on or after 1 January 2021 and updating of CPA-DD in accordance with any requirements of the CMP16 guidance.				
CME response				**Date:** 10/02/2021
The new global warming potential values will be used in their monitoring reports for any emission reductions achieved on or after 1 January 2021 when the decision is taken and updating of CPA-DD in accordance with any requirements of the CMP16 guidance.				
Documentation provided by CME				
DOE assessment				**Date:** 16/02/2021
Accepted. FAR 2 is closed.				

FAR ID	3	**Section no.**	D.7	**Date:** 25/01/2021
Description of FAR				
CME has proposed that the values for parameters: 1. N_{LT} (Annual average animal population in a household (number of heads of dairy cow, buffalo and other cattle), 2. $MS\%_{manure}$ (MS_{liquid}, $MS_{liquid\ with\ crust}$, MS_{solid} and MS_{dry}) (Fraction of livestock category T's manure handled using manure management system S in climate region k (fraction of livestock manure handled using liquid/slurry manure management system, fraction of livestock manure handled using liquid/slurry with natural crust cover, fraction of livestock manure handled using solid storage manure management system and ,fraction of livestock manure handled using dry storage manure management system)), 3. Total $B_{biomass}$ (Total quantity of biomass that is used in an average household), 4. $B_{biomass}$ (Quantity of biomass that is substituted or replaced in an average household) and 5. $FC_{kerosene}$ (Quantity of kerosene that is substituted or replaced in average household per year) will be re-assessed during the first monitoring period of the second crediting period by conducting a new survey immediately after the expiration of first crediting period. Also, it will carry out a new baseline survey study in the 1st monitoring period of second crediting period to fix values of data/parameters $FC_{kerosene}$ (Quantity of kerosene that is substituted or replaced in average household per year), $B_{biomass}$ (Quantity of biomass that is substituted or replaced in an average household), Total $B_{biomass}$, (Total quantity of biomass that is used in an an average household for baseline), $MS\%_{manure}$ (MS_{liquid}, $MS_{liquid\ with\ crust}$, MS_{solid} and MS_{dry}). *This is to be confirmed during first verification of the second crediting period.*				
CME response				**Date:** 10/02/2021
The values of the five parameters described above will be updated during the first monitoring period of the second crediting period by conducting a new baseline survey (when the health conditions because the pandemic allow us to do this activity without risking the team and the households surveyed).				
Documentation provided by CME				
DOE assessment				**Date:** 16/02/2021
Accepted. FAR 3 is closed.				

FAR ID	4	**Section no.**	C.2	**Date:** 25/01/2021
Description of FAR				
As no site visit has been performed during the validation of the renewal of crediting period of the CPA and all validation of technical data of equipment has been done based on documents, pictutes and interview, the verifier shall reconfirm the technical data.				
CME response				**Date:** 10/02/2021
Accepted.				
Documentation provided by CME				
DOE assessment				**Date:** 16/02/2021
CME has accepted the FAR and DOE carrying out verification and certification activity for the first monitoring period under second crediting period shall re-confirm technical data of equipment by carring out site visit.				

Document information

Version	*Date*	*Description*
03.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM validation and verification standard for programmes of activities" (CDM-EB93-A08-STAN); • Make editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the "CDM validation and verification standard for programme of activities" (version 01.0). Change form symbol from CDM-CPA-RCP-FORM to CDM-CPA-RCPV-FORM.
01.0	3 August 2015	Initial publication.

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