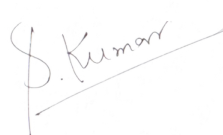




**Validation report form for renewal of CDM programme of activities period
(Version 02.0)**

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)	Recovery and Avoidance of Methane from Industrial Wastewater Treatment Projects UNFCCC reference number 7864
Number and duration of the next period	Crediting Period number: 02 Duration: 7 years
Version number of the validation report	03
Completion date of the validation report	17/01/2020
Version number of PoA-DD to which this report applies	14
Coordinating/managing entity (CME)	PT. Knowledge Integration Services (Indonesia)
Host Parties	Indonesia
Applied methodologies and standardized baselines	AMS-III.H "Methane Recovery in Wastewater Treatment" Version 18
Mandatory sectoral scopes	13: Waste handling and disposal
Conditional sectoral scopes, if applicable	None
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next programme of activities period	53,791 tCO ₂ e
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited E-0066
Name, position and signature of the approver of the validation report	 Director Sanjeev Kumar

SECTION A. Executive summary

This PoA “Recovery and avoidance of methane from industrial wastewater treatment projects” is a small scale PoA that comprises methane recovery from agricultural product based wastewater treatment process in Indonesia. The PoA involves implementation of CPAs which are either greenfield or replacement CPAs. The PoA has been set up to capture methane that is produced by the decomposition of organic content in the industrial wastewater treatment processes. As part of the project, the recovered biogas may be fully or partially flared; if partially flared, the balance would be utilized for energy generation, for instance, heat/steam generation in a burner or boiler or electricity generation in an engine. The capture and use of methane leads to reduction of methane emissions which would have been otherwise allowed to escape into the atmosphere. However, the PoA is not claiming ERs from the use of recovered methane and is claiming CERs only for methane avoidance.

The Coordinating/managing entity of the PoA is PT. Knowledge Integration Services (Indonesia)

The total estimated annual average emission reduction for this crediting period is 53,791 tCO₂e.

Scope of Validation

The scope of the services provided by Earthood Services Private Limited for the project is to perform validation of the renewal of CDM programme of activities period. The scope of validation is to assess the claims and assumptions made in the revised project design document (PoA DD)/06/ against the UNFCCC criteria, including but not limited to, CDM PoA PS, CDM PoA VVS, applied methodology and other relevant rules and requirements established for CDM PoA.

Validation Process

The validation process is undertaken by the validation team that involves the following:

- The desk review of documents and evidence submitted by the project participant in the context of the reference CDM rules and guidelines issued by CDM EB.
- Interview and/or interactions with the representative of the CME.
- Reporting audit findings with respect to clarification and non-conformities and the closure of the findings as appropriate.
- Preparing a draft validation report for renewal of CDM programme of activities period complying with the CDM requirement.

An independent Technical Review team reviews the validation report prepared by the validation team. The final validation report that is accepted by Technical Reviewer is then approved on behalf of Earthood Services Private Limited and processed further as per CDM procedures.

Conclusion

The review of the PoA DD, supporting documentation and subsequent follow-up actions (interviews) has provided Earthood with sufficient evidence to determine the fulfilment of stated criteria.

Earthood is of the opinion that the PoA “ Recovery and avoidance of methane from industrial wastewater treatment projects, Indonesia” as described in the final PoA DD version 14 dated 17/01/2020 /6/meet all relevant requirements of CDM, meets host country criteria and has correctly applied the methodology AMS-III.H.: Methane recovery in wastewater treatment - Version 18.0/8/. Therefore, the project is being recommended to CDM EB for the request for its renewal of CDM programme of activities period.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	Garg	Shreya	Central Office	Y	N	N	Y
2.	Methodological	IR	Singh	Kaviraj	Central	Y	N	N	Y

	Expert (AMS III.H)				Office				
3.	Technical Expert (TA 13.1)	IR	Singh	Kaviraj	Central Office	Y	N	N	Y
4.	Local Expert	EI	Ginanjari Yudhistira	Ganis	Central Office	Y	N	N	Y
5.	Trainee Validator	IR	Shresth	Gaurav	Central Office	Y	N	N	Y

B.2. Technical reviewer and approver of the validation report for renewal of PoA period

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	IR	Gautam	Ashok	Central Office
2.	Technical Expert (TA 13.1)	IR	Gautam	Ashok	Central Office
3.	Approver	IR	Kumar	Sanjeev	Central Office

SECTION C. Means of validation

C.1. Desk/document review

The validation for the renewal of programme of activities period is performed primarily as a document review of the project design document version 10 dated 16/04/2019/6/. The cross-check between information provided in the PoA DD and information from a source other than those used, if available, the validation team's sectoral or local expertise and, if necessary, independent background investigations.

The complete list of documents/evidence assessed by validation team is included under Appendix 3.

C.2. On-site inspection

Duration of on-site inspection: NA				
No.	Activity performed on-site	Site location	Date	Team member
1.	NA	NA	NA	NA

In the context of the renewal of PoA period, the VVS-PoA (ver. 02.0)/3/, para 380 requires the DOE to apply the requirements in its section 7.1.3 mutatis mutandis to validate the information provided by the coordinating/managing entity. The referred section describes the standard auditing techniques, which includes, on-site inspection and telephone or e-mail interviews as examples:

Para 183 of the VVS-PoA (ver.02.0)/3/ for the purpose of validation mentions that it is mandatory for the DOE to conduct an on-site inspection for the proposed CPA if:

- (a) Its estimated annual average of GHG emission reductions or net anthropogenic GHG removals is more than 100,000 t CO₂ eq; or
- (b) There is pre-project information that is relevant to the requirements for inclusion of the CPA and may not be traceable after the inclusion.

Since, both the conditions are not applicable to a PoA during renewal of crediting period the case can be described as not mandatory. The assessment team opted for alternate means for the follow-up actions, telephonic interviews in this case to assess the information provided by the coordinating/managing entity. Representative of the CME was interviewed who is responsible for the implementation of the PoA in the Host country. the information provided was also cross-checked with the consultant involved in the PoA. The details of the interviews can be found in the section below.

The assessment team underwent independent checks for information available on the public platforms. Additionally, the Local Expert was consulted to verify the information on the Host country sectoral policies provided in the PoA DD.

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	-	Phoolchand	Director PA Research & consultants Pvt. Ltd.	22/08/2019	Monitoring Plan, Management plan, Waste regulation update in Indonesia	Shreya Garg
2.	K	Amarnath	Sr. Manager (Process & Projects) Global Knowledge Integration	22/08/2019	PoA design, MOC change, Monitoring plan	Shreya Garg

C.4. Sampling approach

The current assignment is renewal of crediting period, hence no sampling was conducted by the CME or the DOE.

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

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Programme of activities			
Compliance with PoA-DD form	-	-	-
Programme of activities period	-	CAR#04	-
Coordinating/managing entity and the project participants	-	-	-
Post-registration changes	-	-	-
Generic component project activities			
Application and selection of methodologies and standardized baselines	CL#02	CAR#05 CAR#08	-
Validity of original baseline or its update	CL#01	CAR#03	-
Estimated emission reductions or net anthropogenic removals	-	CAR#06	-
Validity of monitoring plan	-	-	-
Eligibility criteria for inclusion of CPAs	-	-	FAR#07
Others (please specify)	-	-	-
Total	02	05	01

SECTION D. Validation findings**D.1. Programme of activities****D.1.1. Compliance with PoA-DD form**

Means of validation	The PoA DD form used is CDM-PoA-DD-FORM version 09.0/4/, which is a valid version available at the time of validation. All the sections of the aforesaid form were filled as per the guidelines and gave all the relevant details.
Findings	No findings
Conclusion	The updated PoA DD has been found to be completed using the valid version of the PoA DD form. The information that is transferred in the current version of the PoA DD is materially the same as that in the registered PoA DD/05/ and in line with the VVS for PoA version 02.0/3/.

D.1.2. Programme of activities period

Means of validation	The PoA 'Recovery and Avoidance of Methane from Industrial Wastewater Treatment Projects' got registered on 29/10/2012 and have a duration of 28 years starting from 13/10/2011 to 12/10/2039. The first crediting period for the PoA
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	spaned from 29/10/2012 ending on 28/10/2019. The request for renewal in crediting period has been done using the latest available template for PoA DD, applying a valid approved methodology AMS-III.H.: Methane recovery in wastewater treatment - Version 18.0/8/. The transfer of information in the updated PoA DD/06/ is materially the same as that in the registered PoA DD/05/ only updating the sections as required by the latest applicable standard for PoA/1-3/.
Findings	CAR#04 had been raised and resolved.
Conclusion	The PoA crediting period has been found inline to the requirements of section 11.1 of the VVS for PoA version 02.0/3/. the PoA as described in the final PoA-DD /6/ has correctly applied the AMS-III.H.: Methane recovery in wastewater treatment - Version 18.0/8/ Therefore, the project is being recommended to CDM EB for request for renewal of crediting period.

D.1.3. Coordinating/managing entity and the project participants

Means of validation	The coordinating/managing entity of the PoA is PT. Knowledge Services (Indonesia), which is also the Project Participant for the PoA as per the registered documentation.
Findings	No Findings
Conclusion	The PT. Knowledge Services (Indonesia) is the CME and PP for the PoA.

D.1.4. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Corrections	N	NA	NA
Inclusion of monitoring plan	N	NA	NA
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	NA	NA
Changes to the programme design	N	NA	NA
Addition of CPA inclusion template	N	NA	NA
Changes specific to afforestation and reforestation activities	N	NA	NA
Change of coordinating/managing entity	N	NA	NA

D.2. Generic component project activities

D.2.1. Application and selection of methodologies and standardized baselines

Means of validation	The PoA DD employs methodology AMS-III.H.: Methane recovery in wastewater treatment - Version 18.0/8/ which is not the latest version however the request under this version can be submitted till 08/02/2020.		
	The applicability condition of the methodology AMS-III.H (Version 18.0) is presented as follows:		
	Applicability conditions	Justification by CME	Means of validation
	Para 2-This methodology comprises measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination, of the following options: a)e) f) Introduction of a sequential stage of wastewater treatment	Each proposed SSC-CPA under this PoA will be in relation to recovery of methane (i.e. biogas) from anaerobic treatment of industrial wastewater in the anaerobic tank based technologies/system, which would have otherwise been emitted	The validation team confirms that the para 2 point (f) of AMS.III.H version 18 /8/ is applicable to the PoA as the eligibility criteria for inclusion of each CPA has been included as the applicability condition.

	with biogas recovery and combustion, with or without sludge treatment, to an anaerobic wastewater treatment system without biogas recovery (e.g. introduction of treatment in an anaerobic reactor with biogas recovery as a sequential treatment step for the wastewater that is presently being treated in an anaerobic lagoon without methane recovery).	into the atmosphere.	
	<p>Para 3-In cases where baseline system is anaerobic lagoon the methodology is applicable if:</p> <p>The lagoons are ponds with a depth greater than two meters, without aeration. The value for depth is obtained from engineering design documents, or through direct measurement, or by dividing the surface area by the total volume. If the lagoon filling level varies seasonally, the average of the highest and lowest levels may be taken;</p> <p>Ambient temperature above 15°C, at least during part of the year, on a monthly average basis;</p> <p>The minimum interval between two consecutive sludge removal events shall be 30 days.</p>	<p>In cases where the baseline system is anaerobic lagoons, the CME will ensure that the lagoons are in compliance with these conditions.</p> <p>The average ambient temperature in Indonesia is 27.7°C, above the required temperature of 15°C.</p>	<p>The validation team confirms the applicability of the methodology AMS.III.H version 18/8/ para 3. The depth of the minimum 2 meters, without aeration of the lagoon, has been included as the eligibility criteria of the inclusion of the CPA.</p> <p>The temperature at the PoA location was verified from the weather data available online and was found more than 15°C/25/.</p>
	<p>Para 4-The recovered biogas from the above measures may also be utilised for the following applications instead of combustion/flaring:</p> <p>Thermal or mechanical electrical energy generation directly.....</p>	<p>This applicability condition has been included as part of the Eligibility Criteria for including a CPA under this PoA.</p>	<p>The validation team confirms that the recovered biogas may also be utilised instead of combustion/flaring as this applicability condition is the eligibility criteria for inclusion of CPA under this POA. Hence, para 4 of the methodology is applicable to this PoA.</p>
	Para-5-If the recovered biogas is used for project	The PoA will not claim any emission reductions	The validation team confirms that this section

	activities covered under paragraph 4 (a), that component of the project activity can use a corresponding methodology under Type I.	resulting from controlled combustion for energy generation. Thus, this applicability condition is not applicable.	of the methodology is not applicable to the PoA as the PoA is not claiming any emission reductions resulting from controlled combustion for energy generation.
	Para 6-For project activities covered under paragraph 4(b), if bottles with upgraded biogas are sold outside the project boundary, the end-use of the biogas shall be ensured via a contract between the bottled biogas vendor and the end-user. No emission reductions may be claimed from the displacement of fuels from the end use of bottled biogas in such situations. If, however, the end use of the bottled biogas is included in the project boundary and is monitored during the crediting period CO2 emissions avoided by the displacement of fossil fuel can be claimed under the corresponding Type I methodology, e.g. "AMS-I.C.: Thermal energy production with or without electricity".	The PoA will not claim any emission reductions resulting from controlled combustion for energy generation. Thus, this applicability condition is not applicable.	The validation team confirms that this section of the methodology is not applicable to the PoA as the PoA is not claiming any emission reductions resulting from controlled combustion for energy generation.
	Para 7-For project activities covered under paragraph 4(c)(i), emission reductions from the displacement of the use of natural gas are eligible under this methodology, provided the geographical extent of the natural gas distribution grid is within the host country boundaries.	The PoA will not claim any emission reductions resulting from controlled combustion for energy generation. Thus, this applicability condition is not applicable.	The validation team confirms that this condition of the methodology is not applicable to the PoA as the PoA is not claiming any emission reduction from controlled combustion for energy generation so there is no involvement of transportation of biogas.
	Para-8 For project activities covered under paragraph 4(c)(ii), emission reductions for the displacement of the use of fuels can be claimed following the provision in the corresponding Type I methodology, e.g. AMS-I.C.	The PoA will not claim any emission reductions resulting from controlled combustion for energy generation. Thus, this applicability condition is not applicable.	The validation team confirms that this condition of the methodology is not applicable to the PoA as the PoA is not claiming any emission reduction from controlled combustion for energy generation so there is no involvement of

			transportation of biogas.
	Para-9 In particular, for the case of paragraph 4(b) and (c)(iii), the physical leakage during storage and transportation of upgraded biogas, as well as the emissions from fossil fuel consumed by vehicles for transporting biogas shall be considered. Relevant procedures in paragraph 18 of the appendix of "AMS-III.H.: Methane recovery in wastewater treatment" shall be followed in this regard.	The PoA will not claim any emission reductions resulting from controlled combustion for energy generation. Thus, this applicability condition is not applicable.	The validation team confirms that this condition of the methodology is not applicable to the PoA as the PoA is not claiming any emission reduction from controlled combustion for energy generation so there is no involvement of storage and transportation of biogas.
	Para 10-For project activities covered under paragraph 4(b) and (c), this methodology is applicable if the upgraded methane content of the biogas is in accordance with relevant national regulations (where these exist) or, in the absence of national regulations, a minimum of 96 per cent (by volume).	The PoA will not claim any emission reductions resulting from controlled combustion for energy generation. Thus, this applicability condition is not applicable.	The validation team confirms that this condition of the methodology is not applicable to the PoA as the PoA is not claiming any emission reduction from controlled combustion for energy generation so there is no involvement of storage and transportation of biogas.
	Para 11-If the recovered is utilized for the production of hydrogen (project activities covered under paragraph 3(d)), that component of the project activity shall use the corresponding methodology "AMS-III.O.: Hydrogen production using methane extracted from biogas".	The PoA will not claim any emission reductions resulting from controlled combustion for energy generation. Thus, this applicability condition is not applicable.	The validation team confirms that this condition of the methodology is not applicable to the PoA as the PoA is not claiming any emission reduction from controlled combustion for energy generation so there is no involvement of production of hydrogen.
	Para 12-If the recovered biogas is used for project activities covered under paragraph 4(e), that component of the project activity shall use corresponding methodology "AMS-III.AQ.: Introduction of Bio-CNG in transportation applications".	The PoA will not claim any emission reductions resulting from controlled combustion for energy generation. Thus, this applicability condition is not applicable.	The validation team confirms that this condition of the methodology is not applicable to the PoA as the programme of activities applies condition (f)/6/.
	Para 13-New facilities (Greenfield projects) and project activities	In cases where the proposed SSC-CPA is a Greenfield project, this	The validation team confirms that applicability of the para 13 has been

	<p>involving a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system compared to the designed capacity of the baseline treatment system are only eligible to apply this methodology if they comply with the relevant requirements in the "General guidelines for SSC CDM methodologies". In addition the requirements for demonstrating the remaining lifetime of the equipment replaced, as described in the general guidelines shall be followed</p>	<p>requirement will be considered and complied with.</p> <p>This applicability condition has been included as part of the Eligibility Criteria for including a CPA under this PoA.</p>	<p>fulfilled as this applicability condition has been included as part of the Eligibility Criteria for including a CPA under this PoA where the proposed CPA is a Greenfield project.</p>
	<p>Para 14-The location of the wastewater treatment plant as well as the source generating the wastewater shall be uniquely defined and described in the PoA-DD.</p>	<p>The location of the wastewater treatment plant as well as the source generating the wastewater will be uniquely defined and described in the specific SSC-CPA-DD.</p> <p>This applicability condition has been included as part of the Eligibility Criteria for including a CPA under this PoA.</p>	<p>The validation team confirms that the geographical boundary of the PoA is the entire country of Indonesia. The geographical boundary of the PoA has been defined in the PoA-DD and the location of the source generating wastewater will be defined in the respective CPA-DD. This physical boundary condition has been included as part of the Eligibility Criteria for including a CPA under this PoA. Hence, the applicability of the para 14 of the methodology is fulfilled.</p>
	<p>Para 15-Measures are limited to those that result in aggregate emissions reductions of less than or equal to 60 kt CO₂ equivalent annually from all Type III components of the PoA-DD.</p>	<p>A typical SSC-CPA will result in emission reductions less than or equal to 60,000 tCO₂e. This applicability condition has been included as part of the Eligibility Criteria for including a CPA under this PoA.</p>	<p>The DOE confirms that the CPA included under this PoA will result in emission reductions less than or equal to 60,000 tCO₂e as this applicability condition has been included as part of the eligibility criteria for inclusion of a CPA under this PoA. Hence, the applicability of the para 15 of the methodology is fulfilled.</p>

Findings	CL#02, CAR#05 and CAR#08 are raised and resolved.
Conclusion	The PoA was found to be in accordance with the applied methodology and the applicable requirements in the CDM project standard PoA PS.

D.2.2. Validity of original baseline or its update

Means of validation	<p>Baseline scenario applicable to the project is in accordance with the applied methodology/8/ for both of CPAs (replacement of existing technology/system and Greenfield projects) has been discussed below:</p> <p>The continuation of existing baseline was validated as per the Methodological Tool/14/ "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" version 03.0.1.</p> <p>Step 1: Assess the validity of the current baseline for the next crediting period</p> <p>Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies</p> <p>The registered PoA as per the registered PoA DD and included CPAs has two types of CPAs a) replacement of existing technology/system b) Greenfield projects.</p> <p>The plausible baseline scenarios (business-as-usual) identified for Greenfield CPAs by the CME were found in accordance with AMS III.H and the registered documentation:</p> <ul style="list-style-type: none"> (a) Aerobic wastewater treatment system without biogas recovery (b) Anaerobic wastewater treatment system (such as lagoon, septic tank or an on-site industrial plant) without biogas recovery (c) Untreated wastewater stream. <p>The plausible baseline scenario (business-as-usual) for replacement of an existing wastewater treatment system is a continuation of current practice identified by the CME was found in accordance with AMS III.H and the registered documentation.</p> <p>The current baseline options in both cases were found in compliance with the most recent relevant mandatory national and/or sectoral policies/12/. There is no mandatory legal requirement on the selection of technology for treatment of wastewater in Indonesia as per latest regulation on wastewater on palm oil industries "Peraturan Menteri Lingkungan Hidup Nomor 5 tahun 2014 tentang Baku Mutu Air Limbah"/15/. The project is only required to treat the wastewater stream and sludge to achieve COD level specified by the host country in the regulation. Therefore, no update in the current baseline by the CME was found acceptable.</p> <p>Step 1.2 Assess the impact of circumstances</p> <p>In the absence of any regulation/rules, the most plausible baseline scenario (business-as-usual) identified for the CPAs under this PoA remain same as identified at the time of initial registration. It is the continuation of current practice which is treatment of the industrial wastewater with either aerobic or anaerobic technology without and recovery of methane hence the atmospheric release of the CH₄. The PoA has been correctly identified as type III Greenfield project, and as per paragraph 28 of AMS-III.H Version 18, the baseline scenario has been done in accordance the baseline determination provided in "General Guidelines to SSC CDM methodologies" Version 22.1/18/.</p> <p>As evident from the most recent regulation/15/ no changes in market characteristics that is related with or/and has any impacts to wastewater treatment in palm oil mills have been found acceptable by the assessment team. Hence, the continuation of the current baseline was found applicable.</p> <p>.</p> <p>Step 1.3 Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.</p>
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	The step is not applicable as per the description provided under step 1.2						
	Step 1.4 Assessment of the validity of the data and parameters The only parameter which is determined at the PoA level at the start of the crediting period required to be updated is:						
	<table><tr><th>Parameter</th><th>Value</th><th>Justification</th></tr><tr><td>Global Warming Potential for methane (GWP_CH₄)</td><td>25</td><td>The value has been updated as per EB 69 annexe 3/16/</td></tr></table>	Parameter	Value	Justification	Global Warming Potential for methane (GWP_CH ₄)	25	The value has been updated as per EB 69 annexe 3/16/
	Parameter	Value	Justification				
	Global Warming Potential for methane (GWP_CH ₄)	25	The value has been updated as per EB 69 annexe 3/16/				
Step 2: Update the current baseline and the data and parameters							
Step 2.1: Update the current baseline The baseline established at the time of initial registration is applicable as per the applied version of the methodology and tools. Hence, no update in the current baseline was found acceptable.							
	Step 2.2: Update the data and parameters The only parameter determined at PoA level at the start of the crediting period and which is not monitored during the crediting period as per the monitoring plan is GWPC _{H4} (Global Warming Potential (GWP) of methane). The latest value from decision 4/CMP7 and paragraph 66 of the EB 69 Meeting Report, for the second commitment period of the Kyoto Protocol, the global warming potentials used by Parties has been applied. The update in the values was therefore accepted by the assessment team. Based on the above steps the continuation of the original baseline has been established and therefore the current baseline does not require to be updated.						
Findings	CL#01 and CAR#03 are raised and resolved.						
Conclusion	The DOE has accepted and validated the original baseline for this monitoring period in the updated PoA-DD/6/. The baseline scenario is found to be valid in accordance with the methodology/8/ and VVS for PoA version 02/3/.						

D.2.3. Estimated emission reductions or net anthropogenic removals

Means of validation	<p>The PoA comprises of projects that recover biogas generated from wastewater and avoid GHG emission, which could be either Greenfield and replacement projects.</p> <p>The PoA framework has kept all the options provided in the applied methodology for the calculation of emission reductions; the information was found consistent with the methodology. The options as provided in AMS III H/8/ are as follows:</p> <ol style="list-style-type: none"> I. If the CPA falls under case 2(a) and 2(e) of paragraph 2 in baseline and monitoring methodology AMS.III.H version 18.0, the emission reduction achieved by the CPA (ex-post) shall be calculated as follows: $ER_y = BE_{y,ex\ post} - (PE_{y,ex\ post} + LE_{y,ex\ post})$ <p>Where:</p> <ul style="list-style-type: none"> ER_{y,ex post} is Ex-post emission reduction in year y (tCO₂e) BE_{y,ex post} is Ex-post baseline emissions in year y (tCO₂e) PE_{y,ex post} is Ex-post project emissions in year y (tCO₂e) LE_{y,ex post} is Ex-post leakage emissions in year y (tCO₂e) II. If the CPA falls under cases 2(b), 2(c), 2(d) and 2(f) of para 2 of the baseline and monitoring methodology AMS.III.H version 18.0/8/, ex-post emission reductions will be based on the lowest value of the following: <ul style="list-style-type: none"> • The amount of biogas recovered and fuelled or flared (MDy) during the crediting period, that is monitored ex-post. • Ex-post calculated baseline, project and leakage emissions based on actual monitored data for the CPA. <p>The emission reductions shall be calculated as follows:</p>
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$$ER_{y,ex\ post} = \min((BE_{y,ex\ post} - PE_{y,ex\ post} - LE_{y,ex\ post}), (MD_y - PE_{power,y} - PE_{biomass,y} - LE_{y,ex\ post}))$$

where:

$ER_{y,ex\ post}$ = Emission reductions achieved by the CPA based on monitored values for year y (tCO₂e)
 $BE_{y,ex\ post}$ = Baseline emissions calculated as per paragraph 29 of AMS-III.H version 18 using ex post monitored values (tCO₂e)
 $PE_{y,ex\ post}$ = Project emissions calculated as per paragraph 32 of AMS-III.H version 18/8/ using ex post monitored values (tCO₂e)
 MD_y = Methane captured and destroyed/gainfully used by the CPA in the year y (tCO₂e)
 $LE_{y,ex\ post}$ = Leakage as per paragraph 46 of AMS-III.H version 18 (tCO₂e)/8/

The calculation of methane destroyed in case of flaring/combustion has been specified as per equation 16 of the methodology

$$MD_y = BG_{burnt,y} * W_{CH4,y} * D_{CH4} * FE * GWP_{CH4}$$

Where

$BG_{burnt,y}$ = Annual volume of biogas burnt in year y (m³/year)
 $W_{CH4,y}$ = Methane content of the biogas in the year y (volume fraction)
 D_{CH4} = Density of methane at the temperature and pressure of the biogas in the year y (t/m³)
 FE = Flare efficiency in year y (fraction).

If the biogas is combusted for gainful purposes, e.g. fed to an engine, an efficiency of 100% will be applied

GWP_{CH4} = Global warming potential of methane

The choice of emission reduction calculation shall be fixed at the CPA level and the cases were taken from the applied methodology/8/ hence it was found acceptable to the assessment team.

The detailed assessment of each component for emission reduction calculation has been rendered under the respective heads.

Baseline Emission

Applied methodology AMS.III.H version 18.0/8/ para 27, presents various systems that might be impacted by the project; these have been effectively included in the PoA DD.

- Emissions on account of electricity or fossil fuel used ($BE_{power,y}$);
- Methane emissions from baseline wastewater treatment systems ($BE_{ww, treatment,y}$);
- Methane emissions from baseline sludge treatment systems ($BE_{s, treatment,y}$);
- Methane emissions on account of inefficiencies in the baseline wastewater treatment systems and the presence of degradable organic carbon in the treated wastewater discharged into river/lake/sea ($BE_{ww, discharge,y}$);
- Methane emissions from the decay of the final sludge generated by the baseline treatment systems ($BE_{s, final,y}$).

Hence, the total baseline emissions due to the project shall be an aggregate of all the components:

$$BE_y = BE_{power,y} + BE_{ww,treatment,y} + BE_{s,treatment,y} + BE_{ww,discharge,y} + BE_{s,final,y}$$

The equation was found in line to the applied methodology, the explanation to each component has been adequately included in the PoA DD and discussed briefly here:

- Baseline emissions from electricity consumption $BE_{power,y}$**

The Baseline emissions from electricity consumption shall be calculated the tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation". The reference to the tool is as per the para 28 of the applied methodology; the further scenarios as per the tool discussed in detail in the PoA DD were found adequate as discussed below:

The selection of the scenarios shall be done at the CPA level, which was found appropriate by the assessment team

Scenario A: Electricity consumption from the grid.

The applicability condition for this scenario has been included in the PoA DD sufficiently in accordance with the applied tool. the tool provides two options under this scenario

Option A1:

In this case, the combined margin emission factor of the applicable electricity system shall be calculated as per the procedures in the latest approved version of the "Tool to calculate the emission factor for an electricity system"/13/ ($EF_{EL,j/k/l,y} = EF_{grid, CM,y}$) at CPA level.

Option A2:

The tool also gives an option of using the default values which has been included in the PoA. It was checked by the assessment team that the default values and their use clause have been included in the PoA as per the applied tool/13/ and were found satisfactory.

Scenario B: Electricity consumption from an off-grid fossil fuel fired captive power plant.

The applicability condition for this scenario has been included in the PoA DD sufficiently in accordance with the applied tool. Of the two options provided by the applied tool/13/ under this scenario, the CME has chosen to fix Option B2 which is the use of conservative default values. The default values along with their use clause have been adequately included in the PoA DD, the description was found inline to the applied tool/13/, and the selection of conservative default values was found appropriate by the team.

Scenario C: Electricity consumption from the grid and fossil fuel fired captive power plant(s).

This scenario as per the applied tool/13/ has three cases that could be applied by the project proponent. All the cases have been included in the PoA DD which was verified by the assessment team, however, the choice of the cases shall be done at the CPA level.

b) Baseline emissions from fossil fuel consumption $BE_{power,y}$

The Baseline emissions from fossil fuel consumption shall be calculated by the tool "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion". The reference to the tool is as per the para 28 of the applied methodology; the calculation procedure discussed in detail in the PoA DD were as per the tool/26/ and found adequate.

The applied tool/26/ Equation 1,

$$BE_{FC,j,y} = \sum_i FC_{i,j,y} * COEF_{i,y}$$

Where:

$BE_{FC,j,y}$ The CO₂ emissions from fossil fuel combustion in process j during the year y (tCO₂/yr)

$FC_{i,j,y}$ Quantity of fuel type i combusted in process k during the year y

(mass or volume unit/yr).

$COEF_{i,y}$ CO_2 emission coefficient of fossil fuel type i in year y (tCO_2 /mass or volume unit).

i Fuel type combusted in process j during the year y .

- (a) The tool provides two options for the calculation of CO_2 emission coefficient $COEF_{i,y}$. Out of the two options the CME has chosen option B. Under Option B the CO_2 emission coefficient is calculated, as follows:

$$COEF_{i,y} = NCV_{i,y} * EF_{CO2,i,y}$$

Where,

$COEF_{i,y}$ Is the CO_2 emission coefficient of fuel type i (tCO_2 /mass or volume unit);

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

$EF_{CO2,i,y}$ Weighted average CO_2 emission factor of fuel type i in year y (tCO_2 /GJ).

i Are the fuel types combusted in process k during the year y

The choice of option B was found acceptable since the values for NCV and emission factor can be cross-checked with publically available sources.

- c) **Baseline emissions of the wastewater treatment systems affected by the project activity** ($BE_{ww, treatment,y}$)

The baseline emission of the wastewater treatment systems affected by the project activity has been calculated using equation 2 in para 29 of applied methodology AMS.III.H version 18.0/8/.

$$BE_{ww,treatment,y} = \sum_i (Q_{ww,i,y} * COD_{inflow,i,y} * \eta_{COD,BL,i} * MCF_{ww,treatment,BL,i}) * B_{o,ww} * UF_{BL} * GWP_{CH4}$$

Where:

$Q_{ww,i,y}$ Volume of wastewater treated in baseline wastewater treatment system i in year y (m^3). For ex-ante estimation, forecasted wastewater generation volume or the designed capacity of the wastewater treatment facility can be used. However, the ex-post emissions reduction calculation shall be based on the actual monitored volume of treated wastewater

$COD_{inflow,i,y}$ Chemical oxygen demand of the wastewater inflow to the baseline treatment system i in year y (t/m^3). Average value may be used through sampling with the confidence/precision level 90/10

$\eta_{COD,BL,i}$ COD removal efficiency of the baseline treatment system i , determined as per the paragraphs 40 of AMS III.H version 18.0/8/.

$MCF_{ww,treatment,BL,i}$ Methane correction factor for baseline wastewater treatment systems i (MCF values as per Table.2 of AMS III.H)

i Index for baseline wastewater treatment system

$B_{o,ww}$ Methane producing capacity of the wastewater (IPCC value of 0.25 kg CH_4 /kg COD)

UF_{BL} Model correction factor to account for model uncertainties (0.89)

GWP_{CH4} Global Warming Potential for methane (value of 25)

The formulae mentioned in the PoA DD was found consistent to the applied methodology hence was found acceptable to the assessment team.

- d) **Baseline methane emissions from sludge treatment system affected by the project activity**

The baseline emission of the sludge treatment systems affected by the project activity has been calculated using equation 3 in para 32 of the applied methodology AMS.III.H version 18.0/8/.

$$BE_{treatment,s,y} = \sum S_{j,BL,y} * MCF_{s,treatment,BL,j} * DOC_s * UF_{BL} * DOC_F * F * 16/12 * GWP_{CH4}$$

Where,

$S_{j,BL,y}$ Amount of dry matter in the sludge that would have been treated by the sludge treatment system j in the baseline scenario (t). For ex-ante estimation, forecasted sludge generation volume or the designed capacity of the sludge treatment facility can be used. However, the ex-post emissions reduction calculation shall be based on the actual monitored volume of treated sludge

j Index for baseline sludge treatment system

$MCF_{s,treatment,BL,j}$ Methane correction factor for the baseline sludge treatment system j

DOC_s Degradable organic content of the untreated sludge generated in the year y (fraction, dry basis). Default values of 0.5 for domestic sludge and 0.257 for industrial sludge shall be used

UF_{BL} Model correction factor to account for model uncertainties (0.89)

DOC_F Fraction of DOC dissimilated to biogas (IPCC default value of 0.5)

F Fraction of CH_4 in biogas (IPCC default of 0.5)

The formulae mentioned in the PoA DD was found consistent with the applied methodology hence was found acceptable to the assessment team. However, the PoA does not envisage sludge treatment in baseline hence the component would not be considered.

e) Baseline methane emissions from degradable organic carbon in treated wastewater discharged into sea/river/lake

The baseline emission from degradable organic carbon in treated wastewater discharged into sea/river/lake have been calculated using equation 6 of para 35 of the applied methodology AMS.III.H version 18.0/8/

$$BE_{ww,discharge,y} = Q_{ww,y} * GWP_{CH_4} * B_{o,ww} * UF_{BL} * COD_{ww,discharge,BL,y} * MCF_{ww,BL,discharge}$$

Where:

$Q_{ww,y}$ Volume of treated wastewater discharged in year y (m^3)

$COD_{ww,discharge,BL,y}$ Chemical oxygen demand of the treated wastewater discharged into sea, river or lake in the baseline situation in the year y (t/m^3). If the baseline scenario is the discharge of untreated wastewater, the COD of untreated wastewater will be used.

$MCF_{ww,BL,discharge}$ Methane correction factor based on the discharge pathway in the baseline situation (e.g. into sea, river, lake or land) of the wastewater (MCF values as per Table 2 of AMS-III.H version 18)

The provision for calculation of $COD_{ww,discharge,BL,y}$ has been included in the PoA DD in accordance with para 36 of the applied methodology. The information contained was found complete.

f) Baseline methane emissions from anaerobic decay of the final sludge produced

The baseline emission from anaerobic decay of the final sludge produced has been calculated using equation 7 of para 37 of the applied methodology AMS.III.H version 18.0/8/

$$BE_{s,final,y} = S_{final,BL,y} * DOC_s * UF_{BL} * MCF_{s,BL,final} * DOC_F * F * 16/12 * GWP_{CH_4}$$

Where:

$S_{final,BL,y}$ Amount of dry matter in the final sludge generated by the baseline wastewater treatment systems in the year y (t)

$MCF_{s,BL,final}$ Methane correction factor of the disposal site that receives the

final sludge in the baseline situation

DOC_s Degradable organic content of the untreated sludge generated in the year y (fraction, dry basis). Default value 0.257¹ for industrial sludge will be used

DOCF Fraction of DOC dissimilated to biogas (IPCC default of 0.5)

F Fraction of CH₄ in biogas (IPCC default of 0.5)

Calculation of the methane correction factor of the disposal site that receives the final sludge (MCF_{s,BL,final}) in the PoA DD has been conducted inline to tool "Emissions from solid waste disposal sites"/27/. The calculations for MCF determination have been done as per section 6.3.4. of the applied tool, the assessment team was able to confirm the procedure mentioned, hence was found acceptable.

The baseline calculations in the PoA have been considered applying the latest available methodology and tools referred therein. The assessment team is in a position to conclude that the calculation procedure mentioned shall lead to conservative estimates of baseline emissions.

The ex-ante baseline emission for wastewater treatment has been calculated using the following equation as per the applied methodology/8/-

$$BE = Q_{ww,i,y} * COD_{inflow,i,y} * \eta_{COD,BL,i} * MCF_{ww,treatment,BL,i} * B_{o,ww} * UF_{BL}$$

Where:

$Q_{ww,i,y}$ Volume of wastewater treated in baseline wastewater treatment system i in year y (m³). For ex ante estimation, forecasted wastewater generation volume or the designed capacity of the wastewater treatment facility can be used. However, the ex post emissions reduction calculation shall be based on the actual monitored volume of treated wastewater

$COD_{inflow,i,y}$ Chemical oxygen demand of the wastewater inflow to the baseline treatment system i in year y (t/m³). Average value may be used through sampling with the confidence/precision level 90/10

$\eta_{COD,BL,i}$ COD removal efficiency of the baseline treatment system i, determined as per the paragraphs 28(2) of the applied methodology AMS.III.H version 18.0

$MCF_{ww,treatment,BL,i}$ Methane correction factor for baseline wastewater treatment systems i (MCF values as per Table III.H.2 of the applied methodology AMS.III.H version 18.0)

i Index for baseline wastewater treatment system

$B_{o,ww}$ Methane producing capacity of the wastewater (IPCC value of 0.25 kg CH₄/kg COD)

UF_{BL} Model correction factor to account for model uncertainties (0.89)

The, ex-ante baseline emissions in year y have been checked by the assessment team and found inline to the applied methodology/8/.

For estimation of ex-ante emission reduction calculation of the baseline emission calculation for wastewater treatment (i.e. equation 2 of AMS-III.H) but without the consideration of GWP for CH₄ in accordance with para 41(g) AMS-III.H version 18 page 21. The ex-post emission reduction shall be calculated as per "Tool to determine project emissions from flaring gases

containing methane" by using actual monitored data.

Project emission

As per the applied methodology AMS.III.H. version 18.0/8/ project activity emissions from the systems affected by the project activity consist:

- a. CO2 emission from electricity and fuel used by the project facilities, $PE_{power,y}$
- b. Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery in the project scenario, $PE_{ww,treatment,y}$
- c. Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery in the project situation, $PE_{s,treatment,y}$
- d. Methane emissions on account of inefficiency of the project activity wastewater treatment systems and presence of degradable organic carbon in treated wastewater, $PE_{ww,discharge,y}$
- e. Methane emissions from the decay of the final sludge generated by the project activity treatment systems, $PE_{s,final,y}$
- f. Methane fugitive emissions due to inefficiencies in capture systems, $PE_{fugitive,y}$
- g. Methane emissions from biomass stored under anaerobic conditions which would not have occurred in the baseline situation, $PE_{biomass,y}$
- h. Methane emissions due to incomplete flaring, $PE_{flaring,y}$

Hence, the project emissions as per equation 8 of applied methodology is:

$$PE_y = PE_{power,y} + PE_{ww,treatment,y} + PE_{s,treatment,y} + PE_{ww,discharge,y} + PE_{s,final,y} + PE_{fugitive,y} + PE_{biomass,y} + PE_{flaring,y}$$

The project emissions from each component have been validated below:

a) Project emissions from electricity and fuel used by the project facilities $PE_{power,y}$

This component includes Emissions from electricity and fuel consumption, each component has been calculated applying the respective tools as required by the applied methodology/8/.

Project emissions from electricity consumption

The project emissions from electricity consumption shall be calculated the tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation"/24/. The reference to the tool is as per the para 41 and 28 of the applied methodology; the further scenarios as per the tool discussed in detail in the PoA DD were found adequate. The scenarios in the context of the project emission have been adequately discussed and include provisions for the determination of project emissions.

Project emissions from fossil fuel consumption

The project emissions from fossil fuel consumption shall be calculated the tool "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"/26/. The reference to the tool is as per the para 41 and 28 of the applied methodology; the calculation procedure discussed in detail in the PoA DD were as per the tool/26/ and found adequate. The options/choices provided in the tool// have been sufficiently elaborated for clarity.

b) Project emissions from wastewater treatment systems affected by the project activity $PE_{ww,treatment,y}$

This component shall be calculated as per equation 2 in para 29 of the applied methodology/8/ as that of $BE_{ww,treatment,y}$.

$$PE_{ww,treatment,y} = \sum (Q_{ww,i,y} * COD_{inflow,i,y} * \eta_{PJ,k,y} * MCF_{ww,treatment,PJ,k} * B_{o,ww} * UFBL * GWPCH4)$$

The formula which is originally for the calculation of baseline emissions has been prescribed with the following changes

- applying an uncertainty factor of 1.12 and data applicable to the project situation
- The values for Methane correction factor for project wastewater treatment system shall be as per Table 2 of AMS-III.H version 18
- COD removal efficiency of the project wastewater treatment shall be based on inflow and outflow COD in the system

The calculation procedure for the component included in the PoA DD was found in accordance with the applied methodology/8/, hence was found acceptable by the assessment team.

c) Project emissions from sludge treatment systems affected by the project activity $PE_{s,treatment,y}$

This component shall be calculated as per equation 3 and 4 in para 32 and 33 of the applied methodology/8/

$$PE_{treatment,S,y} = \sum_j S_{j,PJ,y} * MCFS_{treatment,l} * DOC_s * UFBL * DOC_F * F^{16/12} * GWPCH4$$

The formula which is originally for the calculation of baseline emission has been prescribed with the following changes

- applying an uncertainty factor of 1.12 and data applicable to the project situation
- Methane correction factor for the project sludge treatment system value shall be as per Table 2 of AMS-III.H version 18
- $SI_{PJ,y}$ is the amount of dry matter in the sludge treated by the sludge treatment system l in the project scenario in year y (t)

The calculation procedure for the component included in the PoA DD was found in accordance with the applied methodology/8/, hence was found acceptable by the assessment team.

d) Project emissions on account of inefficiency of the CPA wastewater treatment systems and presence of degradable organic carbon in treated wastewater $PE_{ww,discharge,y}$

This component shall be calculated as per equation 6 in para 35 of the applied methodology/8/

$$PE_{ww,discharge,y} = Q_{ww,discharge,y} * GWPCH4 * B_{o,WW} * UF_{PJ} * COD_{ww,discharge,PJ,y} * MCF_{ww,discharge,PJ,y}$$

The formula which is originally for the calculation of baseline emission has been prescribed with the following changes

- applying an uncertainty factor of 1.12 and data applicable to the project situation
- $COD_{ww,discharge,PJ,y}$ is the chemical oxygen demand of the treated wastewater discharged to the sea, river or lake in the project scenario in year y (t/m3)
- $MCF_{ww,PJ,discharge}$ is the methane correction factor based on the discharge pathway of the wastewater in the project scenario (e.g. into the sea, river or lake) value shall be as per Table 2 of AMS-III.H version 18 /8/

The calculation procedure for the component included in the PoA DD was found in accordance with the applied methodology/8/, hence was found acceptable by the assessment team

e) Project emissions from the decay of the final sludge generated by the

CPA treatment systems $PE_{s,final,y}$

This component shall be calculated as per equation 7 in para 37 of the applied methodology/8/

$$PE_{s,final,y} = S_{final,PJ,y} * DOC_s * UF_{PJ} * B_{o,WW} * UF_{PJ} * MCF_{s,PJ,final} * DOC_F * F * 16/12 * GWP_{CH4}$$

In case sludge is controlled combusted, disposed in a landfill with biogas recovery or used for soil application in aerobic conditions in the CPA, this component shall be neglected as per the applied methodology. The sludge treatment and/or use and/or final disposal shall be monitored during the crediting period using formulae which is originally for the calculation of baseline emission has been prescribed and with the changes in the definition of the parameters

- applying an uncertainty factor of 1.12 and data applicable to the project situation
- $MCF_{s,PJ,final}$ is the methane correction factor of the disposal site that receives the final sludge in the project situation and shall be estimated as per the procedures described in the "Tool for emissions from solid waste disposal sites"
- $S_{final,PJ,y}$ is the amount of dry matter in final sludge generated by the project wastewater treatment systems in the year y (t)

The calculation procedure for the component included in the PoA DD was found in accordance with the applied methodology/8/, hence was found acceptable by the assessment team

f) Project emissions due to inefficiencies in capture systems

Project activity emissions from methane release in capture systems can be stipulated using one of the two options provided under para 42 of the applied methodology AMS.III.H version 18.0 /8/. The options as included in the PoA DD are as follows (Equation 9 as reference):

a) Based on the methane emission potential of wastewater and/or sludge:

$$PE_{fugitive,y} = PE_{fugitive,ww,y} + PE_{fugitive,s,y}$$

Where,

$PE_{fugitive,ww,y}$ Fugitive emissions through capture inefficiencies in the anaerobic wastewater treatment systems in the year y (tCO₂e)

$PE_{fugitive,s,y}$ = Fugitive emissions through capture inefficiencies in the anaerobic sludge treatment systems in the year y (t CO₂e)

The CME envisages no sludge treatment system, hence equation simplifies to

$$PE_{fugitive,y} = PE_{fugitive,ww,y}$$

Therefore, as per equation 10 of the applied methodology,

$$PE_{fugitive,ww,y} = (1 - CFE_{ww}) * MEP_{ww,treatment,y} * GWP_{CH4}$$

where:

CFE_{ww} Capture efficiency of the biogas recovery equipment in the wastewater treatment systems (a value of 0.9 is prescribed by applied methodology),

$MEP_{ww,treatment,y}$ Methane emission potential of wastewater treatment systems equipped with biogas recovery system in year y (tonne).

This component has been further elaborated below:

$$MEP_{ww,treatment,y} = Q_{ww,i,y} * B_{o,ww} * UF_{PJ} * COD_{removed,PJ,k,y} * MCF_{ww,treatment,PJ,k}$$

where:

$Q_{ww,i,y}$ Amount of wastewater to be treated in the wastewater treatment system ($m^3/year$)

$COD_{removed,PJ,k,y}$ The Chemical Oxygen Demand removed by the treatment system k of the CPA equipped with biogas recovery in the year y (t/m^3)

$MCF_{ww,treatment,PJ,k}$ Methane correction factor for the project

wastewater treatment system k equipped with biogas recovery equipment

UF_{PJ} Model correction factor to account for model uncertainties

- b) As per the other option CPA implementer may take a default value of $0.05m^3$ of biogas leaked per m^3 of biogas produced.

The choice shall be made at the CPA level to either calculate or take the fixed value for this component of project emissions. Both provisions have been included in the PoA DD in accordance with the applied methodology. Hence, it was found acceptable to the assessment team.

g) Project emission due to incomplete flaring

For the ex-post calculation of this component, the methodology prescribes the application of the tool "Project emissions from flaring"/11/. The PoA DD has correctly enlisted the applicability conditions of the tool and since the PoA involves implementation of wastewater treatment plants the tool would be applicable in case of the CPAs.

The steps for the calculation of emissions due to flaring have been included in the PoA DD conforming to the applied tool/11/. The stepwise approach has been validated as follows:

Step 1. Determination of the methane mass flow in the residual gas

The tool further directs to the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" version 3/23/ for the determination of Mass flow of methane in the residual gaseous stream in the minute m ($F_{CH4,m}$).

There are further conditions for the application of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream", which have been included in the PoA DD transparently as checked by the assessment team.

The "Tool to determine the mass flow of a greenhouse gas in a gaseous stream (Version 3)", provides six measurement options also listed in the PoA DD. The PoA DD further elaborates the calculation procedure for cases where the residual gas stream is wet; the final calculation procedure shall be fixed at the CPA level.

As per tool for cases where the residual gas stream is wet, absolute humidity of gaseous stream shall be determined.

For determination of absolute humidity of gaseous stream two options have been included in the PoA DD as per the applied tool/23/

Option1: Calculation using measurement of the moisture content

Option2: Simplified calculation without measurement of the moisture content

The CME has chosen Option 2 where it is identified that the gaseous stream is dry or saturated depending on which is the conservative situation. The situations have been discussed in detail in PoA DD as per the applied tool/23/

This option provides a simple approach to determine the absolute humidity by assuming the gaseous stream is dry or saturated depending on which is the conservative situation.

The CME has chosen option 2, where a selection has to be made based on if it is conservative to assume that the gaseous stream is dry/saturated. The calculation procedure, in either case, has been included in the PoA DD in accordance with the tool/23/. The choice of calculation shall be made at the CPA level, however, sufficient provisions have been included in the PoA DD.

Depending on the gaseous stream will be dry or wet the CME has opted for Option A (para 23-25)) out of the six options provided in the tool/23/. The conditions associated with applying the option have been included in the PoA DD. It shall be demonstrated at the CPA level, the requirement has been clearly laid out in accordance with the tool/23/.

Step2. Determination of flare efficiency

In accordance with the tool "Project emissions from flaring (Version 3)" the flare efficiency depends on the combustion efficiency of in the flare and the time that the flare is operating. Separate calculation/monitoring methods have been indicated for open flares and enclosed flares in the PoA DD as per the applied tool/11/.

The calculation method shall be determined at the CPA level corresponding to the kind of flare. The provisions of calculation for both the cases has been clearly indicated in the PoA DD as per the applied tool/11/.

Step3. Calculation of project emissions from flaring

Project emission from flaring are calculated under this step in the PoA DD as per the applied tool// as follows:

$$PE_{\text{flare},y} = GWP_{\text{CH}_4} \times \sum_{m=1 \text{ to } 525600} F_{\text{CH}_4,\text{RG},m} \times (1 - \eta_{\text{flare},m}) \times 10^{-3}$$

Where:

$PE_{\text{flare},y}$ (tCO ₂ e)	Project emissions from flaring of the residual gas in year y
GWP_{CH_4}	Global warming potential of methane valid for the commitment period (tCO ₂ e/tCH ₄)
$F_{\text{CH}_4,\text{RG},m}$ (kg)	Mass flow of methane in the residual gas in the minute m
$\eta_{\text{flare},m}$	Flare efficiency in minute m
OM_y	Operating minutes in year y

The mass flow of methane in the residual gas in the minute m is further calculated as:

$$F_{\text{CH}_4,\text{RG},m} = F_{i,t} / 60 * OM_y$$

Where:

$F_{i,t}$	Mass flow of greenhouse gas i in the gaseous stream in time interval t (kg gas/h)
OM_y	Operating minutes in year y

The ex-ante estimation, have been done in accordance with AMS-III.H version 18 equation 8, baseline emission calculation for wastewater treatment (i.e. equation 2 of AMS-III.H) can be used but without the consideration of GWP for CH₄ according to AMS-III.H version 18.0/8/.

h) Project emissions from biomass stored under anaerobic conditions

This component shall be determined as per the procedure in the "Tool for

emissions from solid waste disposal sites"/27/. The PoA has identified equation 1 of the tool for the calculation of the project emissions under the sub-header:

$$PE_{\text{biomass},y} = \phi_y \cdot (1-f_y) \cdot GWP_{\text{CH}_4} \cdot (1-OX) \cdot (16/12) \cdot F \cdot DOC_{f,y} \cdot MCF_y \cdot \sum_{x=1}^y \sum_j (W_{j,x} \cdot DOC_j \cdot e^{-kj \cdot (y-x)} \cdot (1-e^{-kj}))$$

Where:

ϕ_y Model correction factor to account for model uncertainties for year y
 f_y Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y
 GWP_{CH_4} Global Warming Potential of methane
 OX Oxidation factor (reflecting the amount of methane from SWDS that is oxidised in the soil or other material covering the waste)
 F Fraction of methane in the SWDS gas (volume fraction)
 MCF_y Methane correction factor for year y
 DOC_j Fraction of degradable organic carbon in the waste type j (weight fraction) k_j Decay rate for the waste type j (1 / yr)
 j Type of residual waste or types of waste in the MSW
 x Years in the time period in which waste is disposed at the SWDS, extending from the first year in the time period ($x = 1$) to year y ($x = y$).
 y Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months)
 $DOC_{f,y}$ Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y (weight fraction)
 $W_{j,x}$ Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t)

Application B has been selected at PoA level for determining the fraction of DOC that decomposes:

$$DOC_{t,y} = DOC_{t,m} = 0.7 \cdot \frac{12}{16} \cdot \frac{BMP_j}{F \cdot DOC_j}$$

Where

$DOC_{f,y}$ Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y (weight fraction)
 BMP_j Biochemical methane potential for the residual waste type j disposed or prevented from disposal (t CH₄ / t waste)
 F Fraction of methane in the SWDS gas (volume fraction)
 DOC_j Fraction of degradable organic carbon in the waste type j (weight fraction)
 j Residual waste type applied to the tool
 y Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months)
 m Month of the crediting period for which methane emissions are calculated

Sufficient guidance is included in the PoA DD for application at the CPA level. The DOE team confirms that the project emission calculation is as per the applied methodology AMS.III.H version 18.0/8/ and applied respective tools.

Leakage

If the CPA implements equipment transferred from another facility, leakage effects at the site of the other activity are to be considered and estimated (LEy).

The model calculation for the ex ante calculation of emission reduction is as follows:

Baseline emissions

Baseline emissions are calculated as follows:

$$BE_y = \{BE_{power,y} + BE_{ww,treatment,y} + BE_{ww,discharge,y} + BE_{s,final,y}\}$$

Applicability of baseline emissions

Emissions	Explanation	Value
$BE_{power,y}$	Emissions on account of electricity or fossil fuel used.	The emission from electricity or fossil fuel used in the baseline is not considered.
$BE_{ww,treatment,y}$	Methane emissions from baseline wastewater treatment systems	Applicable. Methane is the major component in the biogas produced from the open anaerobic lagoons in the baseline scenario.
$BE_{ww,discharge,y}$	Methane emissions on account of inefficiencies in the baseline wastewater treatment systems and the presence of biodegradable organic carbon in untreated wastewater discharged to sea/river/lake	Assumption that wastewater will be discharged to Land Application. Baseline methane emission from degradable organic carbon in treated wastewater used for land application is assumed to be 0.
$BE_{s,final,y}$	Methane emissions from the decay of the final sludge generated by the baseline treatment system	Assumed that there is no sludge treatment system in the baseline as it is a greenfield project. Hence emission considered as zero, which is conservative.

Based on table above, the baseline emission is simplified as follow:

$$BE_y = BE_{ww,treatment,y}$$

$$BE_{ww,treatment,y} = \sum (Q_{ww,i,y} * COD_{untreated,i,y} * \eta_{COD,BL,i} * MCF_{ww,treatment,BL,i}) * B_{o,ww} * UF_{BL} * GWP_{CH4}$$

Values of parameters used for baseline emissions estimation

$B_{o,ww}$	0.25 kg CH ₄ /kgCOD	Value as per AMS-III.H
$COD_{untreated,i,y}$	0.06500 tCOD/m ³	The value of COD is to be obtained from 10-day measurement campaign.
$\eta_{COD,BL,i}$	92%	The COD removal efficiency value is to be obtained from 10-day measurement campaign in the existing wastewater treatment.
$Q_{ww,i,y}$	239580 m ³ /year	Assumed for <i>ex-ante</i> estimation. However, for <i>ex-post</i> estimation of emission reductions, $Q_{ww,i,y}$ will be monitored in line with the requirements of the baseline and monitoring methodology.
$MCF_{ww,treatment,BL,anaerobic}$	0.8	IPCC value as per Table 2 in AMS-III.H version 18.

UF _{BL}	0.89	Value as per AMS-III.H (version 18) paragraph 29.
GWP _{CH4}	25	IPCC default value

$$BE_{ww,treatment,y} = 239,580 \text{ m}^3 * (0.06500 \text{ t COD/m}^3 * 92\% * 0.89 * 0.8) * 0.25 \text{ t CH}_4/\text{tone COD} * 25$$

$$= 63755 \text{ tCO}_2\text{e/year}$$

$$BE_y = BE_{ww,treatment,y}$$

$$= 63755 \text{ tCO}_2\text{e/year}$$

Project emissions

The project emissions from the systems affected by the CPA are calculated as follows;

$$PE_y = PE_{power,y} + PE_{ww,treatment,y} + PE_{ww,discharge,y} + PE_{s,final,y} + PE_{fugitive,y} + PE_{flaring,y} + PE_{biomass,y}$$

Applicability of project emissions

No.	Project emissions	Descriptions	Remarks
1	$PE_{power,y}$	Emissions from electricity or fuel consumption in the year y	Assumption that the CPA is not connected to grid and electricity used to operate the project activity's facilities or power auxiliary equipment shall be supplied from biomass/biogas based captive power plant. For ex-ante calculation, emission is considered as zero. However, project emission due to project activity electricity consumption if any from DG set in emergency will be monitored ex-post and shall be calculated.
2	$PE_{ww,treatment,y}$	Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery, in year y	Not Applicable. Since the wastewater treatment system will be equipped with biogas recovery, hence emissions are considered as zero.
3	$PE_{ww,discharge,y}$	Methane emissions from degradable organic in treated wastewater in year y	Assumed that In the project activity, the treated wastewater will be utilized for land application, it can be assumed that the use of treated wastewater is in aerobic condition and well managed.
4	$PE_{s,final,y}$	Methane emissions from anaerobic decay of the final sludge produced in year y	Assumption that sludge will be used for land application after aerobic treatment. Ex-post will be calculated based on actual practice.
5	$PE_{fugitive,y}$	Methane emissions from biogas release in capture systems in year y	Applicable. The emission due to inefficiency of the capture system in anaerobic digesters will contribute to methane emission to the atmosphere.

6	$PE_{flaring,y}$	Methane emissions due to incomplete flaring in year y	The ex-ante estimation of project emission due to flaring will be estimated using baseline equation in methane terms i.e. without applying GWP. Ex-post the project emission will be calculated based on monitored value as per applied tool.
7	$PE_{biomass,y}$	Methane emissions from biomass storage under anaerobic conditions	For ex-ante assumed that CPA does not involve biomass storage under anaerobic conditions.

Based on the table above, the project emissions are simplified as follow:

$$\begin{aligned}
 PE_y &= PE_{power,y} + PE_{ww,treatment,y} + PE_{ww,discharge,y} + PE_{s,final,y} + PE_{fugitive,y} + PE_{flaring,y} + PE_{biomass,y} \\
 &= 0 + 0 + 0 + PE_{fugitive,y} + 0 \\
 &= PE_{fugitive,y}
 \end{aligned}$$

i. Project emissions from electricity and fuel used by the project facilities ($PE_{power,y}$);

In case electricity is generated with biogas:

$$PE_{power,y} = 0 \text{ tCO}_2\text{e}$$

ii. Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery in the project scenario ($PE_{ww,treatment,y}$);

Assumption that project activity does not have a wastewater treatment system without biogas recovery. Hence $PE_{ww,treatment,y} = 0 \text{ tCO}_2\text{e}$

iii. Methane emissions on account of inefficiency of the project activity wastewater treatment systems and presence of degradable organic carbon in treated wastewater ($PE_{ww,discharge,y}$);

Project emissions on account of inefficiency of the project wastewater treatment system are only relevant for those systems that are affected by the project activity and that discharge treated wastewater. In the project activity, the treated wastewater will be utilized for land application ($MCF=0$), it can be assumed that the use of treated wastewater is in aerobic condition and well managed, hence

$$PE_{ww,discharge,y} = 0$$

iv. Methane emissions from the decay of the final sludge generated by the project activity treatment systems ($PE_{s,final,y}$);

Not Applicable as sludge in the project activity used for soil application. $PE_{s,final,y} = 0 \text{ tCO}_2\text{e}$

v. Methane fugitive emissions due to inefficiencies in capture systems ($PE_{fugitive,y}$);

Project activity emissions from methane release in capture systems are determined as follows: This emission source is relevant to any project scenario as it applies to any installed biogas digester generating biogas. The calculation of this emission source is as follows

$$PE_{fugitive,y} = PE_{fugitive,ww,y} + PE_{fugitive,s,y}$$

$PE_{fugitive,ww,y}$ Fugitive emissions through capture inefficiencies in the anaerobic wastewater treatment systems (i.e. anaerobic digester) in the year y (tCO_2e)

$$PE_{fugitive,ww,y} = (1 - CFE_{ww}) * MEP_{ww,treatment,y} * GWP_{CH4}$$

CFE_{ww} = Capture efficiency of the biogas recovery equipment in the wastewater treatment systems (a value of 0.9 is used, as per AMS-III.H version 18)

$MEP_{ww,treatment,y}$ = Methane emission potential of wastewater treatment systems equipped with biogas recovery system in year y (tonne)

$$MEP_{ww,treatment,y} = Q_{ww,i,y} * B_{o,ww} * UF_{PJ} * COD_{removed,PJ,k,y} * MCF_{ww,treatment,PJ,k}$$

Values of parameters used for ex-ante estimation of project emissions

Parameter	Value	Source
$Q_{ww,i,y}$	239,580 m ³ /year	Assumed for <i>ex-ante</i> estimation. However, for <i>ex-post</i> estimation of emission reductions, $Q_{ww,i,y}$ will be monitored in line with the requirements of the baseline and monitoring methodology.
$Q_{ww,y}$	239,580 m ³ /year	Assumed for <i>ex-ante</i> estimation. However, for <i>ex-post</i> estimation of emission reductions, $Q_{ww,i,y}$ will be monitored in line with the requirements of the baseline and monitoring methodology.
GWP_{CH4}	25	Value as per AMS-III.H
$B_{o,ww}$	0.25 kg CH ₄ /kg COD	Value as per AMS-III.H
UF_{PJ}	1.12	Value as per AMS-III.H
$COD_{removed,PJ,y}$	0.05525 tCOD/m ³	For <i>ex-ante</i> estimation, it is based on assumption that (a) CODuntreated (design value) and (b) COD removal efficiency of the project system (provided by the technology provider), i.e. 85% * 0.05525. For <i>ex-post</i> monitoring, the $COD_{removed,PJ,y}$ will be calculated as the difference between the monitored values of $COD_{untreated,y}$ and $COD_{treated,y}$.
$MCF_{ww,treatment,PJ,k}$	0.8	IPCC value as per Table 6.8 Volume 5 Chapter 6 of IPCC 2006 Guideline for anaerobic reactor.
CFE_{ww}	0.9	Default value as per AMS-III.H

$$MEP_{ww,treatment,y} = Q_{ww,i,y} * B_{o,ww} * UF_{PJ} * COD_{removed,PJ,k,y} * MCF_{ww,treatment,PJ,k}$$

$$= 239,580 \text{ m}^3/\text{year} * 0.25 \text{ t CH}_4/\text{t COD} * 1.12 * 0.05525 \text{ t COD}/\text{m}^3 * 0.8$$

$$= 2965.04 \text{ t CH}_4/\text{year}$$

$$PE_{fugitive,ww,y} = (1 - CFE_{ww}) * MEP_{ww,treatment,y} * GWP_{CH4}$$

$$= (1 - 0.9) * 2965.04 * 25 = 7413 \text{ tCO}_2\text{e}$$

$$PE_{fugitive,y} = 7413 \text{ tCO}_2\text{e}/\text{year}$$

vi. Methane emissions due to incomplete flaring ($PE_{flaring,y}$);

$PE_{flaring,y}$: Methane emissions due to incomplete flaring

Ex-ante calculation of $PE_{flaring,y}$ will be calculated from the equation 2 of the applied methodology but without the consideration of GWP for CH₄ as per the para 41 of the applied methodology. The equation for the ex-ante estimation of methane emission due to incomplete flaring is-

$$PE_{flaring,y} = Q_{ww,y} * COD_{inflow,i,y} * \eta_{COD,BL,i} * MCF_{ww,treatment,BL,i} * B_{o,ww} * UF_{BL}$$

$B_{o,ww}$	0.25 kg CH ₄ /kgCOD	Value as per AMS-III.H
$COD_{untreated,i,y}$	0.06500 tCOD/m ³	The value of COD is to be obtained from 10-day measurement campaign.
$\eta_{COD,BL,i}$	92%	The COD removal efficiency value is to be obtained from 10-day measurement campaign in the existing wastewater treatment.
$Q_{ww,i,y}$	239580 m ³ /year	Assumed for <i>ex-ante</i> estimation. However, for <i>ex-post</i> estimation of emission reductions, $Q_{ww,i,y}$ will be monitored in line with the requirements of the baseline and monitoring methodology.
$MCF_{ww,treatment,BL,anaerobic}$	0.8	IPCC value as per Table 2 in AMS-III.H version 18.

	UF _{BL}	0.89	Value as per AMS-III.H (version 18) paragraph 29.
	<p>$PE_{\text{flaring},y} = 239,580 \text{ m}^3 * 0.06500 \text{ t COD/m}^3 * 92\% * 0.8 * 0.25 \text{ t CH}_4/\text{tone COD} * 0.89$</p> <p>$PE_{\text{flaring},y} = 2550 \text{ tCO}_2\text{e/ year}$</p> <p>During the monitoring period, the ex-post emission reduction shall be calculated as per the “Tool to determine project emissions from flaring gases containing methane” by using actual monitored data as below:</p> <p>Ex-post calculation will be done as per the procedure established in PoA DD.</p> <p>vii. Methane emissions from biomass stored under anaerobic conditions, which would not have occurred in the baseline situation ($PE_{\text{biomass},y}$).</p> <p>Anaerobic storage of biomass due to the project activity is excluded by the formulated eligibility criteria. Thus:</p> <p>$PE_{\text{biomass},y} = 0 \text{ tCO}_2\text{e}$</p> <p>Total project emission:</p> <p>$PE_y = 9963 \text{ tCO}_2\text{e/year}$</p> <p>Leakages</p> <p>The CPA does not involve equipment transfer from another activity thus there are no leakages to be accounted for this CPA.</p> <p>$LE_y = 0$</p> <p>Emission reduction</p> <p>As per paragraph 48 of AMS-III.H version 18/8/, the emission reduction is calculated as per following equation:</p> <p>$ER_{y \text{ ex ante}} = BE_{y \text{ ex ante}} - (PE_{y \text{ ex ante}} + LE_{y, \text{ ex ante}})$</p> <p>where:</p> <p>$ER_{y, \text{ ex ante}}$ Ex-ante emission reduction in year y (tCO₂e)</p> <p>$LE_{y, \text{ ex ante}}$ Ex-ante leakage emissions in year y (tCO₂e)</p> <p>$PE_{y, \text{ ex ante}}$ Ex-ante project emissions in year y (tCO₂e)</p> <p>$BE_{y \text{ ex ante}}$ Ex-ante baseline emissions in year y (tCO₂e)</p> <p>$ER_{y \text{ ex ante}} = BE_{y \text{ ex ante}} - (PE_{y \text{ ex ante}} + LE_{y, \text{ ex ante}})$</p> <p>$ER_{y \text{ ex ante}} = 63755 \text{ tCO}_2\text{e} - (9963 \text{ tCO}_2\text{e} + 0 \text{ tCO}_2\text{e})$</p> <p>$ER_{y \text{ ex ante}} = 53791 \text{ tCO}_2\text{e/year}$</p>		
Findings	CAR#06 has been raised and resolved.		
Conclusion	The emission reductions or net anthropogenic GHG removals in the updated PoA-DD/06/ comply with the applicable requirements in the CDM project standard for PoA version 02/1/. The final GHG estimated annual average emission reductions in the PoA-DD version 14 dated 17/01/2020 are 53,791 tCO ₂ e.		

D.2.4. Validity of monitoring plan

Means of validation	The monitoring plan given in the updated PoA DD/06/ complies with the registered monitoring plan. The values of ex-ante parameter and monitored parameters can be found in the table given below.			
	S.No	Parameter (Unit)	Value in updated PoA DD	Assessment

	1.	Methane correction factor for baseline wastewater treatment system i $MCF_{ww,treatment,BL,i}$	The value will be sourced from Table-2 of AMS-III.H (version 18)	The value of the parameter will be based on the type of wastewater treatment system in the baseline scenario of each CPA and will be checked at the time of CPA Inclusion.
	2.	Methane producing capacity of the wastewater; $B_{o,ww}$, Kg CH ₄ /kg COD	0.25	The value was validated from the applicable applied version of the methodology/8/ as per the IPCC.
	3.	Model correction factor to account for model uncertainties (baseline), UF_{BL} , Factor	0.89	The value has been validated from the methodology AMS III-H version 18/8/ Para 29
	4.	Global Warming Potential of Methane; $GWPC_{CH_4}$	25	As per EB 69 Annex 3, the value of the GWP of methane is 25 for the second commitment period/16/.
	5.	Degradable organic content of the untreated sludge generated in the year y (fraction, dry basis). DOC_s	Wet basis: 0.09 Dry basis: 0.257	The value applied is the default value as per paragraph 32 of AMS-III.H version 18/8/.
	6.	Fraction of DOC dissimilated to biogas, DOC_F	0.5	The value applied is the IPCC default value as per paragraph 32 of AMS-III.H version 18/8/
	7.	Fraction of CH ₄ in biogas, F	0.5	The value applied is the IPCC default value as per paragraph 32 of AMS-III.H version 18/8/
	8.	Methane correction factor based on the discharge pathway of the wastewater in the baseline situation (e.g. into sea, river or lake) of the wastewater; $MCF_{BL,discharge}$	Will be based on the discharge pathway of the wastewater treatment system of each CPA	The value will be derived at the CPA level from Table 2 of AMS-III.H version 18/8/.
	9.	Chemical oxygen demand of treated wastewater discharged into sea, river or lake, $COD_{WW,discharge,B}$	Will be determined based on the nature of CPA.	The value will be derived at the CPA level in accordance with paragraph 38, 39 or 40 of the baseline and monitoring methodology.

		L_y		
	10.	Methane correction factor of the disposal site that receives the final sludge in the baseline situation. MCF_{s,BL,final}	Will be determined based on type of sludge disposal site in the baseline scenario of each CPA	The value will be derived at the CPA level in accordance with the methodological tool "Emissions from solid waste disposal sites"/27/
	11.	COD removal efficiency of the baseline treatment system i; $\eta_{COD,BL,i}$	Will be determined based on nature of CPA	The value will be derived at the CPA level in accordance with paragraph 38, 39 or 40 of the baseline and monitoring methodology.
	12.	Amount of dry matter in the final sludge generated by the baseline wastewater treatment systems in the year y, S_{final,BL,y}; T	Will be determined based on nature of CPA	Measurement method will be determined by the CPA implementer.
	13.	10-day measurement campaign factor to account for the uncertainty range (30% to 50%), DF	0.89	The value applied is as per AMS-III.H (version 18) paragraph 39/8/
	14.	Quantity of electricity that would be consumed by the baseline electricity consumption source k in year y, EC_{BL,k,y} MWh/year	Will be determined at CPA level	The value will be derived at the CPA level in accordance with paragraph 38, 39 or 40 of the baseline and monitoring methodology.
	15.	Emission factor for electricity generation for source k in year y, EF_{EL,k,y}	Will be determined at CPA level	The value will be derived at the CPA level in accordance with the source of electricity as provided section 1.6.1 of the PoA DD/6/
	16.	Quantity of fuel type i combusted in process k during the year y, FC_{i,k,y} mass or volume unit/yr	Will be determined at CPA level	The value will be derived at the CPA level in accordance with paragraph 38, 39 or 40 of the baseline and monitoring methodology.
	17.	Methane correction factor, MCF_{default}	a- 1.0 for anaerobic managed	The value will be derived from IPCC 2006 Guidelines for National Greenhouse Gas Inventories

			solid waste disposal sites. b- 0.5 for semi-aerobic managed solid waste disposal sites. c- 0.8 for unmanaged solid waste disposal sites d- 0.4 for unmanaged-shallow solid waste disposal sites or stockpiles that are considered SWDS.	
	18.	Methane correction factor for the project wastewater treatment system k equipped with biogas recovery equipment; $MCF_{ww,treatment,PJ,k}$, Correction factor	Will be based on the type of wastewater treatment of each CPA	The value will be derived from table 2 of AMS-III.H version 18/8/ or Table 6.8 of volume 5 Chapter 6.8 IPCC 2006 guideline.
	19.	Model correction factor to account for model uncertainties (project), UF_{PJ} , Factor	1.12	The value is a default value and has been validated from the methodology AMS III-H version 18/8/Para 41
	20.	Methane correction factor based on the discharge pathway of the wastewater in the project scenario (river); $MCF_{ww,PJ,disc}$ harge	Will be based on the discharge pathway of the wastewater treatment system of each CPA	The value will be derived from table 2 of AMS-III.H version 18/8/.

	21.	Methane correction factor of disposal site that receives the final sludge in the project situation, $MCF_{s,PJ,final}$	Will be based on the sludge disposal site in the project scenario of each CPA	The value will be derived from table Table 2. of AMS-III.H version 18/8/
	22.	Capture efficiency of the biogas recovery equipment in the wastewater treatment systems, CEF_{ww}	0.9	The value is a default value as per paragraph 42 of AMS-III.H version 18/8/
	23.	Density of methane at normal conditions $\rho_{CH_4,n}$ kg/m ³	0.716	Value was validated from the tool Tool to determine project emissions from flaring" version 02.0/11/
	24.	COD removal efficiency of the project treatment system j, $\eta_{COD,PJ,j}$ %	Will be based on the technology installed in the CPA	The value of the parameter will be based on the COD removal efficiency is obtained from the supplier of the technology of each CPA and will be checked at the time of CPA Inclusion.
	25.	Flare efficiency of the biogas used for gainful purpose, $EF_{combusted}$	100	The value is a default value as per AMS-III.H (version 18)/8/.
	26.	Emission factor for electricity generation for source j in year y, $EF_{EL,j,y}$	To be determined for each CPA	The value will be determined based on the source of electricity as explained under each CPA.
	27.	Flare efficiency in hour h, $\eta_{flare,h}$	To be determined for each CPA	The value will be determined as per "Tool to determine project emissions from flaring gases containing methane" for each CPA.
	28.	Default value for the model correction factor to account for model uncertainties, $\Phi_{default}$	1	The value will be determined as per "Tool for emissions from solid waste disposal sites"/27/ for each CPA.
	29.	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the	0.1	The value is based on IPCC 2006 Guidelines for National Greenhouse Gas Inventories

	soil or other material covering the waste), OX		
30.	Fraction of methane in the SWDS gas (volume fraction), F	0.5	The value is based on IPCC 2006 Guidelines for National Greenhouse Gas Inventories
31.	Fraction of degradable organic carbon in the waste type j (weight fraction), DOC_j	--	The value is based on IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 2.4 and 2.5)
32.	Decay rate for the waste type j, K_j	Default values	The values are sourced from IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 3.3)
33.	Biochemical methane potential (BMP) of MSW or the residual waste type j disposed or prevented from disposal, BMP_j	Will be determined for each CPA	The values will be established at the time of CPA inclusion.

Monitored parameters

Sno.	Parameter and Unit	Monitoring Frequency	Equipment	Assessment
1.	The monthly volume of the wastewater entering (inflow) the wastewater treatment system; Q _{ww,i,y} , m ³ /month	The measurements will be monitored continuously.	Measurements will be undertaken using the flow meter	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
2.	The monthly volume of the wastewater entering (inflow) the wastewater treatment system; Q _{ww} m ³ /month	The measurements will be monitored continuously at the CPA level	Measurements will be undertaken using the flow meter	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
3.	Chemical oxygen	Representa	Sampling	The monitoring of

		demand of the wastewater entering the CPA treatment system $COD_{ww,untreated,y}$ $tCOD/m^3$	tive sampling	analysis with 90/10 confidence/precision level by CPA Implementer	this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	4.	Combined margin emission factor for the grid in year y, $EF_{grid,CM,y}$, tCO_2/MWh	--	Will be calculated based on the information available on the applicable electricity grid system for each CPA	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	5.	Average technical transmission and distribution losses for providing electricity to source j, k in year y, $TDL_{j,y}$, $TDL_{k,y}$	Annually	data will be collected from recent, accurate and reliable data available within the host country for each CPA	The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	6.	Chemical oxygen demand of the treated wastewater leaving the project treatment system $COD_{ww,treated,y}$ $t COD/m^3$	Representative sampling	Sampling analysis with 90/10 confidence/precision level by CPA Implementer	The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	7.	Chemical oxygen demand of the treated wastewater leaving the project treatment system $COD_{PJ,outflow,y}$ $t COD/m^3$	Representative sampling	Sampling analysis with 90/10 confidence/precision level by CPA Implementer	The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has

					not been changed materially.
8.	Chemical oxygen demand of the treated wastewater leaving the project treatment system $COD_{ww, discharge}$ t COD/m ³	Representative sampling	Sampling analysis with 90/10 confidence/precision level by CPA Implementer		The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
9.	Amount of dry matter in final sludge, $S_{final, PJ, y}$, Tonnes	Continuous monitoring	The volume (m ³) and density or direct weighing will be used to determine the sludge amount (wet basis).		The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
10.	Annual volume of biogas combusted in year y y; $BG_{burnt, y}$, m ³	Continuous monitoring	Continuous flow meter (calibrated as per manufacturer's specifications, but at least once every three years)		The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
11.	Methane content in biogas in the year y; wCH_4, y , %	At least once in a month	The fraction of methane in the gas will be measured with a continuous analyser or, alternatively, with periodical measurements.		The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
12.	Temperature of the biogas recovered, T, °C	Continuous	Measurements from the temperature indicator		The monitoring of this parameter has been the same as the previous version of the methodology

					(AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	13.	Pressure measurement device, P, Pa	Continuous	To be determined for each CPA according to the technical specification of the project systems.	The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	14.	Quantity of electricity that would be consumed by the project electricity consumption source j in year y, $EC_{PJ,i,y}$, MWh/yr	Continuousl y, aggregated at least monthly	The electricity consumption will be continuously monitored by the electricity meter and aggregated monthly.	The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	15.	Quantity of fossil fuel type combusted in process during the year y, $FC_{i,j,y}$, Tonne/year	Continuousl y	Determined at CPA level	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	16.	Average net calorific value of the fuel type i used by the project power unit(s) in year y, $NCV_{i,y}$, GJ/mass or volume unit	Annual	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines	The monitoring of this parameter has been same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.

				on National GHG Inventories.	
	17.	Emission factor for fuel "f", $EF_{CO_2,i,y}$, tCO ₂ /GJ	Annual	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in the 2006 IPCC Guidelines on National GHG Inventories.	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	18.	Volumetric fraction of component i in the residual gas in the minute m where i = CH ₄ , $V_{i,t,db}$, m ³ gas i/m ³ dry gas	Continuous analyser or at least once in a month	The fraction of methane in the gas will be measured with a continuous analyser or, alternatively, with periodical measurements taken at least once a month.	The monitoring of this parameter has been changed from the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period. The hourly monitoring of the parameter has been changed to the minutes. And also the notation of the parameter is also been changed. All the other credentials are the same.
	19.	Volumetric flow rate of the residual gas in dry basis at normal conditions in the minute m ($V_{t,db}$) m ³ dry gas/h	Continuously monitored (Recorded half-hourly)	Flowmeter (calibrated as per manufacturer's specifications, but at least once every three years)	The monitoring of this parameter has been changed from the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period. The hourly monitoring of the parameter has been changed to the minutes. And also the notation of the parameter is also been changed. All the other credentials are same.
	20.	Temperature in the	Continuous	Measure the	The monitoring of

		exhaust gas of the flare, T_{flare} , °C		temperature of the exhaust gas stream in the flare by a Type N thermocouple.	this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	21.	Other flare operation parameters	Continuous measurement	Measurements by CPA implementer	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	22.	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y , f_y	Annually	Select the maximum value from the following: (a) contract or regulation requirements specifying the amount of methane that must be destroyed/used (if available) and (b) historic data on the amount captured	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	23	Total amount of waste disposed in a SWDS in year x or month l , $W_{i,x}$, T	Continuous measurement	Measurements by project participants	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	24	Depth of SWDS, d_y , M	Annual	CPA implementer	The monitoring of this parameter has been the

					same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
	25	Height of the water table in the SWDS, $h_{w,y}$, M	Monthly	CPA implementer	The monitoring of this parameter has been the same as the previous version of the methodology (AMS.III.H version 16) used for this PoA in the previous crediting period and has not been changed materially.
A calibration log will be maintained for all equipment used.					
Findings	No findings				
Conclusion	The parameter fixed ex-ante and monitored, which are a part of the monitoring plan are in line with the PoA-DD/6/, applied tools/14,13,23,24,22,26,27/ and methodologies/8/ and was found to be acceptable as per the para 412 of the VVS version for POA 02/03/.				

D.2.5. Eligibility criteria for inclusion of CPAs

Means of validation	<p>The registered PoA included provisions for two kinds of CPAs (Replacement CPAs and Greenfield CPAs), therefore section K of the PoA DD (for renewal) also has included two sets of eligibility criteria:</p> <ol style="list-style-type: none"> 1. Replacement CPAs have been defined for situations wherein the CPA involves substitution of existing anaerobic wastewater treatment system without biogas recovery with new treatment system i.e. anaerobic digestion using anaerobic tank based technologies/system coupled with biogas recovery. 2. Greenfield CPAs have been defined for situations wherein the CPA involves the introduction of a new anaerobic digestion using anaerobic tank based technologies/system coupled with biogas recovery. <p>Eligibility criteria for inclusion of a CPA under this PoA – “Replacement CPAs”</p>				
	Applicability conditions	Justification by the Project proponent	Means of validation		
	1-The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA	Evidence document includes details on the CPA geographical location collected from the CPA implementer. Based on such information, CME to ensure that the CPA is located in Indonesia.	The eligibility criterion for inclusion of corresponding CPAs in the registered CDM PoA is defined in accordance with the project standard for PoA, para 124(a)/1/. The criterion is verifiable as well as sufficiently		

			objective and comprehensive to permit the assessment of the inclusion of corresponding CPAs in the PoA
	2-Conditions that avoid double counting of emission reductions like unique identification of product and end-user locations	The CME will check the registered PoA database as well as the registered CDM projects database (available on UNFCCC website) to ensure that the proposed CPA has not already been registered as a CDM project or a CPA of another PoA. CME shall also take a declaration from the CPA implementer that there is no double-counting of CERs.	The eligibility criterion for inclusion of corresponding CPAs in the CDM PoA is defined in accordance with the project standard for PoA, para 124(b)/1/. The criterion is verifiable as well as sufficiently objective and comprehensive to permit the assessment of the inclusion of corresponding CPAs in the PoA
	3-The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications	Evidence document will be based on the contract documents for the CPA. However, if the contract has not yet been awarded, the specifications will be based on the proposal received by the CPA implementer.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(d)/1/.
	4-Conditions to check the start date of the CPA through documentary evidence	The CPA implementer shall provide necessary documentary evidence to substantiate the start date of the CPA. Documentary evidence may be in the form of Engineering Procurement Construction (EPC) Contract for implementing the project.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(e)/1/.
	5-Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs	The principle methodology applicable to each CPA under the PoA is AMS-III.H (version 18). Following applicability conditions under AMS-III.H (version 18) to be complied by each CPA	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.
	5a-A CPA shall comprise measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination, of the following options: a) Substitution of aerobic wastewater or	An eligible CPA will involve the replacement of an existing anaerobic wastewater treatment system without methane recovery with anaerobic digestion using anaerobic tank based technologies/system	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.

	<p>sludge treatment systems with anaerobic systems with biogas recovery and combustion;</p> <p>b) Introduction of anaerobic sludge treatment system with biogas recovery and combustion to a wastewater treatment plant without sludge treatment;</p> <p>c) Introduction of biogas recovery and combustion to a sludge treatment system;</p> <p>d) Introduction of biogas recovery and combustion to an anaerobic wastewater treatment system such as anaerobic reactor, lagoon, septic tank or an on site industrial plant;</p> <p>e) Introduction of anaerobic wastewater treatment with biogas recovery and combustion, with or without anaerobic sludge treatment, to an untreated wastewater stream;</p> <p>f) Introduction of a sequential stage of wastewater treatment with biogas recovery and combustion, with or without sludge treatment, to an anaerobic wastewater treatment system without biogas recovery (e.g. introduction of treatment in an anaerobic reactor with biogas recovery as a sequential treatment step for the wastewater that is presently being treated in an anaerobic lagoon without methane recovery).</p>	<p>coupled with biogas recovery. Therefore, eligible CPAs will fall under option (f). Treatment of sludge is not covered in this PoA. Evidence document on the baseline system will include existing drawings, designs, plans for the baseline wastewater treatment system.</p>	
	<p>5b-Each CPA shall provide necessary information to demonstrate compliance with the following applicability conditions:</p> <p>In cases where baseline system under the CPA is anaerobic lagoon:</p> <p>1. The lagoons are</p>	<p>Evidence document includes:</p> <p>(a) Characteristics of the lagoon: based on the design and drawings of the existing baseline system.</p> <p>(b) Ambient temperature: based on publicly available date on</p>	<p>The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.</p>

	<p>ponds with a depth greater than two meters, without aeration. The value for depth is obtained from engineering design documents, or through direct measurement, or by dividing the surface area by the total volume. If the lagoon filling level varies seasonally, the average of the highest and lowest levels may be taken;</p> <p>2. Ambient temperature above 15°C, at least during part of the year, on a monthly average basis;</p> <p>3. The minimum interval between two consecutive sludge removal events shall be 30 days.</p>	<p>ambient temperature.</p> <p>(c) Sludge removal interval: based on the past records on wastewater treatment operations.</p>	
	<p>5c-The recovered biogas from the above measures may also be utilised for the following applications instead of combustion/flaring:</p> <p>1. Thermal or mechanical, electrical energy generation directly;</p> <p>2. Thermal or mechanical, electrical energy generation after bottling of upgraded biogas; or</p> <p>3. Thermal or mechanical, electrical energy generation after upgrading and distribution, in this case additional guidance provided in Appendix shall be followed:</p> <p>i. Upgrading and injection of biogas into a natural gas distribution grid with no significant transmission constraints;</p> <p>ii. Upgrading and transportation of biogas via a dedicated piped network to a group of end users; or</p> <p>iii. Upgrading and transportation of biogas (e.g. by trucks)</p>	<p>The recovered biogas may be used for energy generation as provided in section A.2 above. The use of recovered biogas will be documented in the CPA-DD. However, the CPA will not claim any emission reductions due to the use of biogas.</p>	<p>The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.</p>

	to distribution points for end users. 4. Hydrogen production. 5. Use as fuel in transportation applications after upgrading.		
	5d-If the recovered biogas is used for project activities covered under paragraph 4 (a), that component of the project activity can use a corresponding methodology under Type I.	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA
	5e-For project activities covered under paragraph 4 (b), if bottles with upgraded biogas are sold outside the project boundary, the end-use of the biogas shall be ensured via a contract between the bottled biogas vendor and the end-user. No emission reductions may be claimed from the displacement of fuels from the end use of bottled biogas in such situations. If however the end use of the bottled biogas is included in the project boundary and is monitored during the crediting period CO ₂ emissions avoided by the displacement of fossil fuel can be claimed under the corresponding Type I methodology, e.g. AMS-I.C "Thermal energy production with or without electricity".	Not applicable. The CPA will not claim any emission reductions due to the use of biogas. There will be no CPA under this PoA under para 4(b) category.	NA
	5f-For project activities covered under paragraph 4 (c) (i), emission reductions from the displacement of the use of natural gas are eligible under this methodology, provided the geographical extent of the natural gas distribution grid is within the host country boundaries.	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA
	5g-For project activities covered under paragraph 4 (c) (ii), emission	Not applicable. The CPA will not claim any emission reductions due	NA

	reductions for the displacement of the use of fuels can be claimed following the provision in the corresponding Type I methodology, e.g. AMS-I.C.	to the use of biogas.	
	5h-In particular, for the case of 4 (b) and (c) (iii), the physical leakage during storage and transportation of upgraded biogas, as well as the emissions from fossil fuel consumed by vehicles for transporting biogas shall be considered. Relevant procedures in paragraph 11 of Appendix of AMS-III.H "Methane recovery in wastewater treatment" shall be followed in this regard.	Not applicable. The CPA will not claim any emission reductions due to the use of biogas. There will be no CPA under this PoA under para 3(b) and (c) (iii) category.	NA
	5i-For project activities covered under paragraph 4 (b) and (c), this methodology is applicable if the upgraded methane content of the biogas is in accordance with relevant national regulations (where these exist) or, in the absence of national regulations, a minimum of 96% (by volume).	Not applicable. The CPA will not claim any emission reductions due to the use of biogas. There will be no CPA under this PoA under para 3(b) and (c) category.	NA
	5j-If the recovered biogas is utilized for the production of hydrogen (project activities covered under paragraph 3 (d)), that component of the project activity shall use the corresponding methodology AMS-III.O "Hydrogen production using methane extracted from biogas".	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA
	5k-If the recovered biogas is used for project activities covered under paragraph 4 (e), that component of the project activity shall use corresponding methodology AMS-III.AQ "Introduction of Bio-CNG in road transportation".	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA

	5l-New facilities (Greenfield projects) and CPAs involving a change of equipment resulting in a capacity addition of the wastewater and/or sludge treatment system compared to the designed capacity of the baseline treatment system shall comply with the relevant requirements in the "General guidelines to SSC CDM methodologies". In addition the requirements for demonstrating the remaining lifetime of the equipment replaced, as described in the general guidelines shall also be followed.	Not applicable- this is a list of eligibility criteria applicable to CPAs involving replacement.	NA
	5m-Detailed description of the wastewater treatment plant as well as the source generating the wastewater shall be uniquely defined and described in the CPA-DD.	Evidence document includes technical design, diagrams, plans of the existing wastewater treatment plant as well as the source generating the wastewater. Evidence document will be collected from the CPA implementer.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.
	5n-Aggregate emissions reductions are less than or equal to 60 kt CO ₂ equivalent annually from all Type III components of the CPA.	CME shall ensure that the aggregate emissions reductions are less than or equal to 60 kt CO ₂ e equivalent annually from each CPA.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.
	6-The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	Refer to additionality section of PoA DD provides the various sources from which data can be sourced by each CPA to demonstrate additionality.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(g)/1/.
	7-The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	Evidence document includes public notification or invitation to the stakeholders, minutes of the meeting for the local stakeholder consultation along with the attendance sheet identifying the attendees present at the meeting.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(i)/1/.

	8-Condition for environmental impact assessment	As per prevailing regulations, an environmental impacts assessment (EIA) is not required as the CPAs will involve the reduction of GHG emissions through recovery of methane/biogas, there are no significant environmental impacts identified. However, in case any specific CPA is required to do an EIA, the evidence documents will include the EIA report for the CPA.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(i)/1/.
	9-Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance	Evidence includes the documentation on the actual funding for the CPA. If the funding arrangement is not yet finalized, evidence will include internal minutes of meeting or any board resolution passed by the CPA implementers on the proposed financing arrangement for the CPA.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(j)/1/.
	10-Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation)	The details of CPA implementer along with industry type will be provided to DOE. The same can also be checked from consent to operate.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(k)/1/.
	11-Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities"	Specification of the sampling methods applied and compliance with the sampling requirements are established at the PoA-DD. For each CPA-DD Sampling will be undertaken as part of the PoA Sampling Plan, and in the CPA-DD describes how the PoA Sampling Plan is to be applied.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(l)/1/.
	12-Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA	Each CPA will establish the eligibility by calculating emission reduction and if required the same shall be capped.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(m)/1/ and meets the condition.

	13-Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	Evidence will be the database of PoAs and CDM projects available on the UNFCCC website. CME will ensure that the CPA is not a de-bundled project.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 120(n)/1/.
	14-Approval of CPA by CME	Evidence document for approval by CME: the agreement between CME and CPA implementers to develop the project as a CPA under the PoA. Evidence document for approval by DOE: positive validation report.	This is an additional eligibility criterion added to ensure technical review of CPA, which is required as per para 36 (c) of PS for PoA version 2.0/1/.
	15-CER ownership	Evidence document include the agreement between CME and CPA implementers to develop the project as a CPA under the PoA.	This is an additional eligibility criterion added to ensure CER ownership by the CME
	16-Awareness and agreement of those operating a CPA on PoA subscription	Evidence document include the agreement between CME and CPA implementers to develop the project as a CPA under the PoA.	This is an additional eligibility criterion added to ensure a legal agreement between CME and CPA Implementer
	17-Host country requirement if any	There are no specific CDM eligibility requirements lay down by the Indonesian DNA. However, if there are any in future, new CPAs to demonstrate compliance with such eligibility requirement through appropriate supporting document verifiable by the CME.	This is an additional eligibility criterion added to ensure the legal requirements of the Host country.
	18-Baseline	Evidence document will include the latest compliance report submitted by the CPA implementer to the relevant government department. In case the regulatory requirements are systematically not enforced, the same will be demonstrated based on the publicly available information on the current practice in the country or region.	This is an additional eligibility criterion added to ensure the legal requirements of the Host country.
	19-Remaining lifetime	If applicable, technical lifetime, operational lifetime and capacity to treat expected	This is an additional eligibility criterion added to ensure technical

	wastewater volume of the baseline equipment will be determined based on the technical specifications and past operational records of the baseline equipment.	viability of the CPA.
20-Baseline technology	Evidence document includes layout diagrams, technical specifications, pictures of the baseline system.	This is an additional eligibility criterion added to ensure applicability under the PoA.
21-Baseline technology	Evidence document includes layout diagrams, technical specifications, pictures of the baseline system.	This is an additional eligibility criterion added to ensure applicability under the PoA.

Table 2- Eligibility criteria for inclusion of a CPA under this PoA – “Greenfield CPAs”

Applicability conditions	Justification by the Project proponent	Means of validation
1-The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA	Evidence document includes details on the CPA geographical location collected from the CPA implementer. Based on such information, CME to ensure that the CPA is located in Indonesia.	The eligibility criterion for inclusion of corresponding CPAs in the registered CDM PoA is defined in accordance with the project standard for PoA, para 124(a)/1/. The criterion is verifiable as well as sufficiently objective and comprehensive to permit the assessment of the inclusion of corresponding CPAs in the PoA
2-Conditions that avoid double counting of emission reductions like unique identification of product and end-user locations	The CME will check the registered PoA database as well as the registered CDM projects database (available on UNFCCC website) to ensure that the proposed CPA has not already been registered as a CDM project or a CPA of another PoA. CME shall also take a declaration from the CPA implementer that there is no double-counting of CERs.	The eligibility criterion for inclusion of corresponding CPAs in the CDM PoA is defined in accordance with the project standard for PoA, para 124(b)/1/. The criterion is verifiable as well as sufficiently objective and comprehensive to permit the assessment of the inclusion of corresponding CPAs in the PoA
3-The specifications of technology/measure including the level and type of service, performance specifications including compliance with	Evidence document will be based on the contract documents for the CPA. However, if the contract has not yet been awarded, the specifications will be	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(d)/1/.

	testing/certifications	based on the proposal received by the CPA implementer.	
	4-Conditions to check the start date of the CPA through documentary evidence	The CPA implementer shall provide necessary documentary evidence to substantiate the start date of the CPA. Documentary evidence may be in the form of Engineering Procurement Construction (EPC) Contract for implementing the project.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(e)/1/.
	5-Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs		The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.
	5(a)-A CPA shall comprise measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination, of the following options: a) Substitution of aerobic wastewater or sludge treatment systems with anaerobic systems with biogas recovery and combustion; b) Introduction of anaerobic sludge treatment system with biogas recovery and combustion to a wastewater treatment plant without sludge treatment; c) Introduction of biogas recovery and combustion to a sludge treatment system; d) Introduction of biogas recovery and combustion to an anaerobic wastewater treatment system such as anaerobic reactor, lagoon, septic tank or an on site industrial plant; e) Introduction of anaerobic wastewater treatment with biogas recovery and combustion, with or	An eligible CPA will involve the implementation of a Greenfield wastewater treatment through anaerobic digestion using anaerobic tank based technologies/ system with methane recovery. Evidence document on the baseline system will include design document, layout plans from the consultant/technology provider for the industrial facility on the wastewater treatment system.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.

	without anaerobic sludge treatment, to an untreated wastewater stream; f) Introduction of a sequential stage of wastewater treatment with biogas recovery and combustion, with or without sludge treatment, to an anaerobic wastewater treatment system without biogas recovery (e.g. introduction of treatment in an anaerobic reactor with biogas recovery as a sequential treatment step for the wastewater that is presently being treated in an anaerobic lagoon without methane recovery).		
	5(b)-Each CPA shall provide necessary information to demonstrate compliance with the following applicability conditions: In cases where baseline system under the CPA is anaerobic lagoon: 1. The lagoons are ponds with a depth greater than two meters, without aeration. The value for depth is obtained from engineering design documents, or through direct measurement, or by dividing the surface area by the total volume. If the lagoon filling level varies seasonally, the average of the highest and lowest levels may be taken; 2. Ambient temperature above 15°C, at least during part of the year, on a monthly average basis; 3. The minimum interval between two consecutive sludge removal events shall be 30 days.	Evidence document includes: (a) Characteristics of the lagoon: design document, layout plans from the consultant/technology provider for the industrial facility on the effluent treatment system, other practices on the treatment of similar effluent in the region, industrial guidelines for treatment of similar effluent. (b) Ambient temperature: based on publicly available data on ambient temperature. (c) Sludge removal interval: design document, layout plans from the consultant/technology provider for the industrial facility on the effluent treatment system, other practices on the treatment of similar type of wastewater in the region, industrial guidelines for treatment of similar type of wastewater.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.
	5(c)-The recovered biogas from the above measures may also be utilised for the following applications instead of	The recovered biogas may be used for energy generation. The use of recovered biogas will be documented in the CPA-	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance

	<p>combustion/flaring:</p> <p>4. Thermal or mechanical, electrical energy generation directly;</p> <p>5. Thermal or mechanical, electrical energy generation after bottling of upgraded biogas; or</p> <p>6. Thermal or mechanical, electrical energy generation after upgrading and distribution, in this case additional guidance provided in Appendix shall be followed:</p> <p>i. Upgrading and injection of biogas into a natural gas distribution grid with no significant transmission constraints;</p> <p>ii. Upgrading and transportation of biogas via a dedicated piped network to a group of end users; or</p> <p>iii. Upgrading and transportation of biogas (e.g. by trucks) to distribution points for end users.</p> <p>7. Hydrogen production.</p> <p>8. Use as fuel in transportation applications after upgrading.</p>	DD. However, the CPA will not claim any emission reductions due to the use of biogas.	with the project standard for PoA, para 124(f)/1/.
	5(d)-If the recovered biogas is used for project activities covered under paragraph 4 (a), that component of the project activity can use a corresponding methodology under Type I.	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA
	5(e)-For project activities covered under paragraph 4 (b), if bottles with upgraded biogas are sold outside the project boundary, the end-use of the biogas shall be ensured via a contract between the bottled biogas vendor and the end-user. No emission reductions may be claimed from the	Not applicable. The CPA will not claim any emission reductions due to the use of biogas. There will be no CPA under this PoA under para 4(b) category.	NA

	displacement of fuels from the end use of bottled biogas in such situations. If however the end use of the bottled biogas is included in the project boundary and is monitored during the crediting period CO ₂ emissions avoided by the displacement of fossil fuel can be claimed under the corresponding Type I methodology, e.g. AMS-I.C "Thermal energy production with or without electricity".		
	5(f)-For project activities covered under paragraph 4 (c) (i), emission reductions from the displacement of the use of natural gas are eligible under this methodology, provided the geographical extent of the natural gas distribution grid is within the host country boundaries.	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA
	5(g)-For project activities covered under paragraph 4 (c) (ii), emission reductions for the displacement of the use of fuels can be claimed following the provision in the corresponding Type I methodology, e.g. AMS-I.C.	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA
	5(h)-In particular, for the case of 4 (b) and (c) (iii), the physical leakage during storage and transportation of upgraded biogas, as well as the emissions from fossil fuel consumed by vehicles for transporting biogas shall be considered. Relevant procedures in paragraph 11 of Appendix of AMS-III.H "Methane recovery in wastewater treatment" shall be followed in this regard.	Not applicable. The CPA will not claim any emission reductions due to the use of biogas. There will be no CPA under this PoA under para 4(b) and (c) (iii) category.	NA
	5(i)-For project activities covered under paragraph 4 (b) and (c), this methodology is	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA

	applicable if the upgraded methane content of the biogas is in accordance with relevant national regulations (where these exist) or, in the absence of national regulations, a minimum of 96% (by volume).	There will be no CPA under this PoA under para 4(b) and (c) category.	
	5(j)-If the recovered biogas is utilized for the production of hydrogen (project activities covered under paragraph 4 (d)), that component of the project activity shall use the corresponding methodology AMS-III.O "Hydrogen production using methane extracted from biogas".	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA
	5(k)-If the recovered biogas is used for project activities covered under paragraph 4 (e), that component of the project activity shall use corresponding methodology AMS-III.AQ "Introduction of Bio-CNG in road transportation".	Not applicable. The CPA will not claim any emission reductions due to the use of biogas.	NA
	5(l)-New facilities (Greenfield projects) and CPAs involving a change of equipment resulting in a capacity addition of the wastewater and/or sludge treatment system compared to the designed capacity of the baseline treatment system shall comply with the relevant requirements in the "General guidelines to SSC CDM methodologies". In addition the requirements for demonstrating the remaining lifetime of the equipment replaced, as described in the general guidelines shall also be followed.	The General guidelines require a "Barrier Assessment" approach for identifying the most plausible baseline scenario. Refer to section E.4 for further information on determination of baseline scenario for Greenfield CPAs.	NA
	5(m)-Detailed description of the wastewater treatment plant as well as the source generating the wastewater shall be uniquely defined and	Evidence document includes technical design, diagrams, plans of the existing wastewater treatment plant as well as the	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard

	described in the CPA-DD.	source generating the wastewater. Evidence document will be collected from the CPA implementer.	for PoA, para 124(f)/1/.
	5(n)-Aggregate emissions reductions are less than or equal to 60 kt CO2 equivalent annually from all Type III components of the CPA.	CME shall ensure that the aggregate emissions reductions are less than or equal to 60 kt CO2 equivalent annually from each CPA.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(f)/1/.
	Baseline scenario	Section E.4 of the PoA-DD provides on how the baseline scenario for Greenfield CPA will be demonstrated. Each CPA shall comply with the requirements of section E.4 of the PoA-DD.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(g)/1/.
	6-The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality	Refer to section E.5. Section E.5 provides the various sources from which data can be sourced by each CPA to demonstrate additionality.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(i)/1/.
	7-The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis	Evidence document includes public notification or invitation to the stakeholders, minutes of the meeting for the local stakeholder consultation along with the attendance sheet identifying the attendees present at the meeting.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(i)/1/.
	8-Condition for environmental impact assessment	As per prevailing regulations 3, an environmental impacts assessment (EIA) is not required as the CPAs will involve reduction of GHG emissions through recovery of methane/biogas, there are no significant environmental impacts identified. However, in case any specific CPA is required to do an EIA, the evidence documents will include the EIA report for the CPA.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(j)/1/.
	9-Conditions to provide an affirmation that funding from Annex I	Evidence includes the documentation on the actual funding for the	The eligibility criterion for inclusion of corresponding CPAs in

	Parties, if any, does not result in a diversion of official development assistance	CPA. If the funding arrangement is not yet finalized, evidence will include internal minutes of meeting or any board resolution passed by the CPA implementers on the proposed financing arrangement for the CPA.	the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(k)/1/.
	10-Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation)	The details of CPA implementer along with industry type will be provided to DOE. The same can also be checked from consent to operate.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(l)/1/.
	11-Where applicable, the conditions related to sampling requirements for the PoA in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities"	Specification of the sampling methods applied and compliance with the sampling requirements are established at the PoA-DD. For each CPA-DD Sampling will be undertaken as part of the PoA Sampling Plan, and in the CPA-DD describes how the PoA Sampling Plan is to be applied.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 124(m)/1/ and meets the condition.
	12-Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA	Each CPA will establish the eligibility by calculating emission reduction and if required the same shall be capped.	The eligibility criterion for inclusion of corresponding CPAs in the proposed CDM PoA is defined in accordance with the project standard for PoA, para 120(n)/1/.
	13-Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.	Evidence will be the database of PoAs and CDM projects available on the UNFCCC website. CME will ensure that the CPA is not a de-bundled project.	This is an additional eligibility criterion added to ensure technical review of CPA, which is required as per para 36 (c) of PS for PoA version 2.0/1/.
	14-Approval of CPA by CME	Evidence document for approval by CME: the agreement between CME and CPA implementers to develop the project as a CPA under the PoA. Evidence document for approval by DOE: positive validation report.	This is an additional eligibility criterion added to ensure CER ownership by the CME
	15-CER ownership	Evidence document include the agreement	This is an additional eligibility criterion added

		between CME and CPA implementers to develop the project as a CPA under the PoA.	to ensure a legal agreement between CME and CPA Implementer
	16-Awareness and agreement of those operating a CPA on PoA subscription	Evidence document include the agreement between CME and CPA implementers to develop the project as a CPA under the PoA.	This is an additional eligibility criterion added to ensure the legal requirements of the Host country.
	17-Host country requirement if any	There are no specific CDM eligibility requirements lay down by the Indonesian DNA. However, if there are any in future, new CPAs to demonstrate compliance with such eligibility requirement through appropriate supporting document verifiable by the CME.	This is an additional eligibility criterion added to ensure the legal requirements of the Host country.
Findings	FAR#07 has been raised and resolved.		
Conclusion	The eligibility criteria for inclusion of a CPA under this CPA has been checked thoroughly and found correct.		

SECTION E. Internal quality control

The draft validation report for renewal of crediting period prepared by the validation team was reviewed by an independent technical review team to confirm if the internal procedures established and implemented by ESPL were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of the technical review team were independent of the validation team.

The technical review process may accept or reject the validation opinion or raise additional findings in which case these must be resolved before requesting for registration. The technical review process is recorded in the internal documents of ESPL and the additional findings get included in the report.

The final report approved by the technical reviewer is authorized by the Managing Director and issued to PP and/or submitted for request for registration, as appropriate on behalf of ESPL.

SECTION F. Validation opinion

The validation of "Recovery and avoidance of methane from industrial wastewater treatment projects" for renewable of its crediting period was performed based on rules and requirements defined by UNFCCC for the CDM project activities.

The purpose of this PoA is to recover the methane generated from industrial wastewater treatment process, which would have otherwise been emitted into the atmosphere resulting in GHG emissions.

It is demonstrated that the project is not a likely baseline scenario and the emission reductions attributable to the project are, hence, additional to any that would occur in the absence of the proposed CDM PoA. The project correctly applies the approved baseline and monitoring methodology AMS-III.H.: Methane recovery in wastewater treatment - Version 18.0/8/ and is assessed against latest valid CDM PS, VVS and PS and/or other applicable CDM Decisions/Tools/Guidance/Forms.

The proposed CDM PoA is likely to achieve the anticipated emission reductions stated in the PoA-DD provided the underlying assumptions do not change. The expected emission reductions (annual average) from the PoA are estimated to be 53,791 tCO₂e per year over the selected crediting period starting. The proposed CDM PoA is likely to achieve the anticipated emission reductions stated in the PoA-DD provided the underlying assumptions do not change.

ESPL has informed the project participants of the validation outcome through the draft validation report and final validation report. In the case of negative validation outcome, the final validation report is only submitted to PP. The final validation report contains the information with regard to the fulfilment of the requirements for validation, as appropriate.

ESPL applied the following validation process and methodology using a competent validation team;

- the desk review of documents and evidence submitted by the project participant in the context of the reference CDM rules and guidelines issued by CDM EB,
- undertaking/conducting site visit, interview or interactions with the representative of the project participant,
- reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and
- preparing a draft validation opinion based on the auditing findings and conclusions
- technical review of the draft validation opinion along with other documents as appropriate by an independent competent technical review team
- finalization of the validation opinion (this report)

The review of the PoA-DD, supporting documentation and subsequent follow-up actions (onsite visit and interviews) have provided ESPL with sufficient evidence to determine the fulfilment of stated criteria.

ESPL believes the PoA "Recovery and avoidance of methane from industrial wastewater treatment projects" as described in the final PoA-DD /6/ does meet the stated criteria of CDM, meets host country criteria and has correctly applied the AMS-III.H.: Methane recovery in wastewater treatment - Version 18.0/8/ Therefore, the project is being recommended to CDM EB for request for renewal of crediting period.

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
AM	Approved Methodology
ACM	Approved Consolidated Methodology
BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification Request
CM	Combined Margin
CO ₂	Carbon di oxide
CP	Crediting Period
DNA	Designated National Authority
DR	Desk Review
DOE	Designated Operational Entity
EB	Executive Board
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
kW	kilo Watt
kWh	kilo Watt hour
LoA	Letter of Approval/Authorization
LSC	Local Stakeholder Consultation Process
MoC	Modalities of Communication
MoV	Means of Validation
MP	Monitoring Plan
ODA	Official Development Assistance
OM	Operating Margin
PA	Project Activity
PCP	Project Cycle Procedure
PDD	Project Design Document
PE	Project Emission
PoA DD	Programme of Activities Design Document
PP	Project Participant
PS	Project Standard
RCP	Renewal of Crediting Period
RFR	Request for Registration
tCO ₂ e	tonnes of Carbon di Oxide equivalent
TPH	Tonnes Per Hour
UNFCCC	United Nations Framework Convention on Climate Change
V	Version
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Gautam	Date	01/03/2018

Competence Statement			
Name	Kaviraj Singh		
Country	India		
Education	Ph.D. (Environmental Engineering), IIT Delhi Masters (Energy & Environmental), DAVV Indore		
Experience	15 Years +		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-II.D., ACM0006, AMS-I.A., AMS-I.C., AMS-II.B., AMS-III.H, ACM0002, ACM0001, AM0080		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 13.1, 13.2)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Gautam	Date	01/03/2018

Competence Statement	
Name	Ganis Ginanjar Yudhistira
Country	Indonesia

Education	Bachelor of Law, Faculty of Law Universitas Padjadjaran		
Experience	2+ years		
Field	Law		
Approved Roles			
Team Leader	No		
Validator	No		
Verifier	No		
Methodology Expert	No		
Local expert	Indonesia		
Financial Expert	No		
Technical Reviewer	No		
TA Expert	No		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

Competence Statement			
Name	Gaurav Shresth		
Education	B.Tech (Mechanical Engineering) M.E. (Thermal Engineering)		
Experience	4+ years		
Field	Mechanical and thermal engineering		
Approved Roles			
Team Leader	NO		
Validator	Yes (Trainee)		
Verifier	Yes (Trainee)		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (1.2, 3.1)		
Reviewed by	Shreya Garg	Date	01/05/2019
Approved by	Anshika Gupta	Date	02/05/2019

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AM0029, AM0025, AM0056,		

	ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shreya Garg	Date	25/01/2019
Approved by	Anshika Gupta	Date	25/01/2019

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	UNFCCC	Standard: CDM PS for PoA	Ver. 2	Others
2.	UNFCCC	Standard: CDM PCP for PoA	Ver. 2	Others
3.	UNFCCC	Standard: CDM VVS for PoA	Ver. 2	Others
4.	UNFCCC	Form: CDM-PoA-DD-FORM	Ver. 09.0	Others
5.	PP	Registered PoA-DD (for 1 st Crediting Period)	Version 09 dated 05/09/2012	PP
6.	PT. Knowledge Integration Services (Indonesia)	PoA-DD fro 2 nd crediting period Final PoA-DD For 2 nd Crediting Period	Version 10 16/04/2019 Version 14 dated 17/01/2020	PP
7.	PT. Knowledge Integration Services (Indonesia)	ER Sheet (corresponding to final PDD)	corresponding to final PDD	PP
8.	UNFCCC	Methodology: AMS-III.H Methane recovery in wastewater treatment	Version 18	Others
9.	UNFCCC	PoA webpage: https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/Y5WM381Q4L2UNPGHR6ECVZKFIAJ0OT/view	Last viewed on 15/07/2019	Others
10.	PT. Knowledge Integration Services (Indonesia)	No ODA declaration	-	PP
11.	UNFCCC	methodological tool "Project emissions from flaring"	version 3.0	Others
12.	Minister of Environment of the Republic of Indonesia	Regulation of the Ministry of Environment of the Republic of Indonesia	Number 5 of 2014	PP
13.	UNFCCC	Tool to calculate the emission factor for an electricity system	Version 7.0	Others
14.	UNFCCC	Tool for "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period"	Version 03.0.1	Others
15.	State Minister of	Fluid quality raw for Industrial	No: KEP-	PP

	Environment	activities	51/MENLH/10/1995	
16.	UNFCCC	EB 69 annex 3 'Standard for Application of The Global Warming Potentials to Clean Development Mechanism Project Activities and Programmes of Activities for the Second Commitment Period of the Kyoto Protocol'	13/09/2012	Others
17.	IPCC	2006 IPCC Guidelines for National Greenhouse Gas Inventories http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_6_Ch6_Wastewater.pdf	-	Others
18.	UNFCCC	General Guidelines to SSC CDM methodologies	Version 22.1	Others
19.	IPCC	table 1.2 of chapter 1 of volume 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html	-	Others
20.	LE	Email communication with the local expert	24/06/2019	Others
21.	UNFCCC	guidelines for sampling and surveys for CDM project activities and programme of activities version 4.0	Version 4.0	PP
22.	UNFCCC	Tool to determine the remaining lifetime of the equipment	01	PP
23.	UNFCCC	Tool to determine the mass flow of a greenhouse gas in a gaseous stream	03.0	PP
24.	UNFCCC	Tool to calculate baseline, project and/or leakage emissions from electricity consumption	03.0	PP
25.	Climatemp.com	Indonesia weather report	http://www.climatetemp.info/indonesia/	PP
26.	UNFCCC	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion	Version 3.0	PP
27.	UNFCCC	Emissions from solid waste disposal sites	Version 8.0	PP

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

Table 1. CL from this validation

CL ID	01	Section no.	B	Date : 10/05/2019
Description of CL				
CME is requested to provide evidence for the following:				
a) Measures for continuous improvements of the PoA management system.as specified in section B of the PoA DD				
b) Supportive for the lifetime of the baseline scenario				
c) MoC statement (applicable for the crediting period)				
Project participant response				Date : 20/05/2019

- a) The measure for continuous improvements is added as per PoA eligibility criteria in standard, the same shall be made available in future as per CME's record if any such improvement required is implemented
- b) The technology employed by CPAs under PoA used to have a lifetime of 20 years, however as this is the renewal of crediting period for PoA the same shall not impact the same.
- c) There no change in MoC

Documentation provided by project participant

Lifetime for Technology under CPA

PoA DD

DOE assessment**Date:** 07/06/2019

- a) PP shall provide the evidence to confirm the additional requirement as per the applied standard mentioned in the PoA DD that there is a system to ensure the annual review for continuous improvement of the PoA management system. Open.
- b) The DOE checked the technical specifications submitted by the PP to confirm that the lifetime of the technology is 20 years. The installation was done 04/03/2012. Since the PoA is getting renewed after 7years, the next CP of the PoA is within the lifetime of the technology. Closed
- c) MOC available at the UN website was checked and found to mention the names of the same PPs as listed in the PoA DD. The validation team confirms that no new PP has been added in the PoA. Closed

Thus, the CL stands open

Project participant response**Date :** 08/07/2019

- a) *The system to ensure continuous improvement in PoA is included as per new Standard for PoA and if any such changes required will be done, however as per existing system there was no changes required to PoA system management.*

Documentation provided by project participant**DOE assessment****Date:** 11/07/2019

- a) The system to ensure continuous improvement has been included in the PoA-DD. But it is not possible to provide the evidence to confirm the additional requirement as per the applied standard mentioned in the PoA DD that there is a system to ensure the annual review for continuous improvement of the PoA management system as the CME will undertake the annual review in future. So this CL has been updated as a FAR.

Thus, the CL stands closed.

CL ID	02	Section no.	B & I	Date : 10/05/2019
Description of CL				
The PoA DD submitted has the following issues:				
<ul style="list-style-type: none"> a) The document does not make reference to the latest standards (for instance section B on page 9 of the PoA DD refers to version 1 of the Project standard) b) Under section I.1 "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" has not been referred but has been applied in section i.6 of the revised PoA DD 				
Project participant response				Date : 20/05/2019
<ul style="list-style-type: none"> a) The latest version i.e. V02 available on UNFCCC website of standards is now referred in revised PoA DD. b) The reference to "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" V03 is made in revised PoA DD. 				
Documentation provided by project participant				
PoA DD				
DOE assessment				Date: 07/06/2019
<ul style="list-style-type: none"> a) The PP has applied the latest standards now. The revised PoA DD submitted was found to mention the information consistently. Closed. b) The reference to "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" has been added in Section I.1 but the access link is missing. Open. 				
Project participant response				Date : 08/07/2019
<ul style="list-style-type: none"> c) The access link for reference to "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" V03 is incorporated in revised PoA DD 				

Documentation provided by project participant	
PoA DD	
DOE assessment	Date: 11/07/2019
c) The access link has been incorporated and found correct.	
Thus, the CL stands closed.	

Table 2. CAR from this validation

CAR ID	03	Section no.	I	Date : 10/05/2019
Description of CAR				
a) CME is requested to state/list 'relevant mandatory national and/or sectoral policies, which are applicable at the time of requesting renewal of the crediting period' under sub Step 1.1 as required by the applied tool "to 'Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period' (Version 03.0.1)" in section I.5 of the PoA DD. b) Under sub step 1.2 CME has stated 'No changes in market characteristics that is related with or/and has any impacts to wastewater treatment in palm oil mills are found', kindly substantiate the statement with most recent evidence. c) CME is requested to justify information provided under sub step 1.3				
Project participant response				Date : 20/05/2019
a) The applicable national regulation on palm oil industries as referenced in registered PoA DD is still valid and no additional policies/regulation in place which has impacts on baseline of registered PoA DD. The same can be checked using weblink below MenLH Decree 51/1995, http://www.cets-iii.org/BML/Air/BMLC/kepmen5195/ b) As indicated in the response above no policies/regulation is implemented in the host country after PoA registration which has any impact on registered PoA DD during the time of renewal of crediting period. c) As the assessment is related to PoA and not the CPAs, hence the lifetime of equipment employed by CPA does not have an impact on renewal of crediting period on PoA. However, as mentioned in earlier response the technology employed by CPAs under PoA have a lifetime of 20 years.				
Documentation provided by project participant				
DOE assessment				Date: 07/06/2019
a) PP shall provide the evidence in English Language. Also, the information provided by the PP was not found inline to the information available about the latest regulation about wastewater on palm oil industries is "Peraturan Menteri Lingkungan Hidup Nomor 5 tahun 2014 tentang Baku Mutu Air Limbah" or "Ministerial Regulation of Environment number 5/2014 about Waste Water Quality Standards". PP is required to review the information provided. b) PP shall provide the evidence in English Language. Also, the information provided by the PP was not found inline to the information available about the latest regulation about wastewater on palm oil industries is "Peraturan Menteri Lingkungan Hidup Nomor 5 tahun 2014 tentang Baku Mutu Air Limbah" or "Ministerial Regulation of Environment number 5/2014 about Waste Water Quality Standards". PP is required to review the information provided. c) PP shall provide evidence to confirm that there are no changes in the market characteristics that are related to the PoA. Open				
Project participant response				Date : 08/07/2019

- a) *The policy/regulation applicable at the time of registration of PoA "STATE MINISTER OF ENVIRONMENT NUMBER: KEP-51 / MENLH / 10/1995 ABOUT FLUID QUALITY RAW FOR INDUSTRIAL ACTIVITIES" to regulate waste water quality for discharge in sea/river, however there was no regulation regarding type of technology, it was having only waste water quality standard for Palm oil industries i.e. BOD 250 mg/l and COD 500 mg/l. The same can be checked from Annex-VI "DECISION STATE MINISTER OF ENVIRONMENT NUMBER: KEP-51 / MENLH / 10/1995 ABOUT FLUID QUALITY RAW FOR INDUSTRIAL ACTIVITIES DATED OCTOBER 23, 1995 RAW OF QUALITY OF LIQUID WASTE FOR PALM OIL INDUSTRY.*
- b) *There is new regulation "REGULATION OF THE MINISTER OF ENVIRONMENT OF THE REPUBLIC OF INDONESIA NUMBER 5 OF 2014" to regulate waste water quality for discharge in sea/river, however there is no regulation regarding type of technology, the new regulation has only changed the waste water quality standard for Palm oil industries i.e. BOD 100 mg/l and COD 350 mg/l. The same can be checked from Annex-III REGULATION OF THE MINISTER OF ENVIRONMENT OF THE REPUBLIC OF INDONESIA NUMBER 5 OF 2014 ABOUT RAW QUALITY OF WASTERAW QUALITY OF PALM OIL INDUSTRIES AND / OR ACTIVITIES.*
- c) *As per assessment of new regulation and old regulation, it is concluded that there are no such changes which impacts the technological requirement, as project participant can meet the desired quality with any technology including open lagoon, hence its concluded that there is no change in market characteristics. The CPAs already included under PoA are already in compliance with new wastewater quality standard as the permission granted to establish and operated by the nodal agency is given only based on assurance to comply with discharge norms.*

Documentation provided by project articpant

STATE MINISTER OF ENVIRONMENT NUMBER: KEP-51 / MENLH / 10/1995 ABOUT FLUID QUALITY RAW FOR INDUSTRIAL ACTIVITIES
 "REGULATION OF THE MINISTER OF ENVIRONMENT OF THE REPUBLIC OF INDONESIA NUMBER 5 OF 2014

DOE assessment**Date:** 11/07/2019

- a) As per the evidence provided by CME, it has been clear that there are no changes in the regulation regarding the technology, it has only wastewater quality standard for wastewater disposal in Palm oil industry. Above statement justify the state/list 'relevant mandatory national and/or sectoral policies, which are applicable at the time of requesting renewal of the crediting period' under sub Step 1.1. Closed.
- b) As per the evidence provided by CME, it has been clear that there are no changes in the regulation regarding the technology, it has only wastewater quality standard for wastewater disposal in Palm oil industry. Above statement justify the state/list 'relevant mandatory national and/or sectoral policies, which are applicable at the time of requesting renewal of the crediting period' under sub Step 1.1. Closed.
- c) The evidence provided by CME is justified as there are no changes in the market characteristics. And the technology employed by CPAs under PoA has a lifetime of 20 years. Since the PoA is getting renewed after 7years, the next CP of the PoA is within the lifetime of the technology. Closed

Thus, the CAR stands closed.

CAR ID	04	Section No.	D.2, I.7.1	Date : 29/07/2019
Description of CAR				

- 1- In the section D.2 of the PoA-DD, It is mentioned that the duration of PoA is 28 years. The registered PoA project page indicated that at the time of registration the PoA duration mentioned is 13 Oct 11 to 12 Oct 39. The current request for the renewal of crediting period implying that the first crediting period of the PoA is already over. PP is requested to clarify why the duration of PoA is still mentioned as 28 years.
- 2- In the section I.7.1 of PoA-DD, the details of the parameter (e.g. description, monitoring frequency etc.) were found to be inconsistent with the methodology. Also, information provided about the source of data for many monitored parameters were not found to be appropriate. PP is requested to detail the parameters in accordance to the tools/methodology applied.
- 3- The contact information of the PP and CME in the PoA-DD are inconsistent in Appendix 1 with respect to LOA. PP is requested to justify the inconsistency.

Project participant response	Date : 02/08/2019
<p>1-The duration of PoA mentioned as 28 years, as though crediting period will be renewed as chosen however the duration 28 years mentioned in revised PoA DD is from date 13 Oct 2011, which is same as in registered PoA DD, hence actual duration does not increase. Further, there is no provision on revised/remaining PoA duration in template. To make it clear the duration and crediting period information included in revised PoA DD.</p> <p>2- The details of the parameter (e.g. description, monitoring frequency etc.) and sources are corrected in revised PoA DD in line with actual practice and applied methodology/tools.</p> <p>3. There was a typo the CME/PP is the same in PoA and same has been corrected in revised PoA DD.</p>	
Documentation provided by project participant	
<i>Revised PoA DD</i>	
DOE assessment	Date: 09/08/2019
<ol style="list-style-type: none"> 1- The details of the first crediting period and the second crediting period has been incorporated in the section D.2 of the PoA-DD which clarify that the first crediting period is over. The statement is justified as there is no provision in the PoA template for specification of duration and crediting period. Closed. 2- The details of the parameters in section I.7.1 of the PoA-DD has been updated and found consistent with the methodology. Closed. 3- The contact information of the PP and CME in the PoA-DD are updated and found consistent with respect to LoA. Closed. 	
Thus, the CAR has been closed.	

CAR ID	05	Section No.	I.6	Date : 29/07/2019
Description of CAR				
<ol style="list-style-type: none"> 1- Section I.1 of the PoA-DD, does not mention the "Tool to calculate the emission factor for an electricity system" and "Tool to determine the mass flow of a greenhouse gas in a gaseous stream (Version 3)" however the reference and application of the same could be found for the calculation of baseline emission. Please justify 2- Section 6.2.1.1 of the PoA-DD CME has applied tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation"; it is observed that the scenario A for calculating baseline emissions from electricity consumption has been applied. As per the tool, there are two options- A1 and A2, however, information on Page 27 of PoA-DD, is not clear on which sub option was selected by PP. please clarify 3- As per Para 7 of the tool "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" the CO2 emission coefficient $COEF_{i,y}$ can be calculated using 2 options. Page 28 of PoA-DD, It is not clear which sub option was selected by PP for different scenarios for the baseline emissions calculation from fossil fuel consumption $BE_{FC,y}$. PP is requested to clarify this. 4- On page 30 of the PoA-DD, the equation and method of calculation of 'methane correction factor of the disposal site' ($MCF_{s,BL,final}$) have been mentioned. the source of the equation and calculation method is not clear to the assessment team. Please elaborate. 5- Section I.6.1 of the PoA-DD, it's not clear on how the requirements of para 38,39,40 of applied methodology are being met. PP is requested to justify. 				
Project participant response				Date : 02/08/2019

1. The relevant tools reference incorporated in section I.1 of revised PoA DD.
2. The applicability of scenarios as per tool is incorporated in revised PoA DD for selection to specific CPAs as may be applicable.
3. The scenarios of tool clearly defined and preference on the selection of an option in actual CPA applicable is incorporated in revised PoA DD.
4. The details of sources and approach is incorporated in revised PoA DD.
5. The details on mentioned para of methodology were missing in revised PoA DD, the same has been incorporated.

Documentation provided by project participant

PoA DD

DOE assessment**Date:** 09/08/2019

- 1- The "Tool to calculate the emission factor for an electricity system" and "Tool to determine the mass flow of a greenhouse gas in a gaseous stream (Version 3)" has been incorporated in the Section I.1 of the PoA-DD. The PoA-DD has been checked and found consistent. Closed.
- 2- The two options- A1 and A2 for scenario A for calculating baseline emissions from electricity consumption has been incorporated in PoA-DD and found consistent with the methodology. The information on the selection has been explained and found correct. Closed.
- 3- The CME has decided to use OPTION B as in most of the cases NCV and emission factor will be available for fossil fuel consumption. The selection has been incorporated in page 33 of the PoA-DD and found consistent as per Para 7 of the tool "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion". Closed
- 4- The source of the equation and calculation method of 'methane correction factor of the disposal site' (MCFs,BL,final) has been incorporated in the PoA-DD and found consistent as per the applied tool "Emissions from solid waste disposal sites" and applied methodology. Closed.
- 5- The requirements of para 38,39,40 of applied methodology has been depicted in Section I.6.1 of the PoA-DD and found consistent. Closed.

Thus, The CAR stands closed.

CAR ID	06	Section No.	I.6	Date : 29/07/2019
Description of CAR				

- 1- On page 33 of the PoA-DD, It is observed that one of project emission source "Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery in the project situation ($PE_{s,treatment,y}$)" has not been included for the calculation of project emission. PP is requested to clarify.
- 2- Page 31 of PoA-DD is not clear which sub option was selected by PP for different scenarios for the project emissions calculation from electricity consumption $PE_{EC,y}$. The information as per section 6.2.2 of the tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" was found incomplete.
- 3- Page 32 of PoA-DD is not clear which sub option was selected by PP for different scenarios for the project emissions calculation from fossil fuel consumption $BE_{FC,i,y}$. The PP is required to justify the applicability of Para 7 of the tool "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion".
- 4- Page 32,33 of PoA-DD, the calculation of following project emission were found to be incomplete for sources required by the applied tool/methodology -
 - i) Project emissions from wastewater treatment systems affected by the project activity, $PE_{ww,treatment,y}$
 - ii) Project emissions on account of inefficiency of the CPA wastewater treatment systems and presence of degradable organic carbon in treated wastewater, $PE_{ww,discharge,y}$
 - iii) Project emissions from the decay of the final sludge generated by the CPA treatment systems, $PE_{s,final,y}$
- 5- Page 33 of PoA-DD the Equation of "Project emissions due to inefficiencies in capture systems" is inconsistent from the equation 9 of the applied methodology. PP is requested to clarify the inconsistency.
- 6- Page 35 of PoA-DD the Project emissions due to incomplete flaring section, for the determination of the methane mass flow in the residual gas the PoA has 2 options but It has been observed that the option B has been missing out from the description. As per the section 5 of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream (Version 3)" The PP required to describe the Option 1 and Option 2 for calculating the mass flow rate of the residual gas. Kindly clarify
- 7- The equation required for "Calculation of project emissions from flaring" and "project emission from biomass stored under anaerobic conditions" could not be found in the PoA-DD (page 36 and Page 37 respectively). PP is requested to demonstrate the application of the tools

Project participant response		Date : 03/08/2019
<ol style="list-style-type: none"> 1. The project emission source "Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery in the project situation ($PE_{s,treatment,y}$)" was missing the same has been incorporated in revised PoA DD 2. The applicability of option/sub-option of the scenario provided for project emissions calculation from electricity consumption $PE_{EC,y}$ will be determined at the CPA level. 3. The applicability of option/sub-option of the scenario provided for baseline emissions calculation from electricity consumption $BE_{EC,y}$ will be determined at CPA level. 4. The details of project emission calculation for the referenced parameter mentioned above is incorporated in revised PoA DD. 5. There was a typo error the same has been corrected. 6. The approach and applicability in line with applied tool are incorporated in revised PoA DD. 7. There was formatting error the equation erased has been incorporated in revised PoA DD. 		
Documentation provided by project participant		
PoA DD		
DOE assessment		Date: 09/08/2019

- 1- The project emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery in the project situation ($PE_{s,treatment,y}$) has been incorporated in the PoA-DD. And found consistent with the applied Methodology. Closed.
- 2- The sub options for different scenarios has been explained for the project emissions calculation from electricity consumption $PE_{EC,y}$ by the PP,. The information as per section 6.2.2 of the tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” has been incorporated and found consistent. Closed.
- 3- The sub option for different scenarios has been explained for the project emissions calculation from fossil fuel consumption $PE_{FC,i,y}$. The information as per Para 7 of the tool “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” has been incorporated and found consistent. Closed.
- 4- The calculation details of project emission sections $PE_{ww,treatment,y}$, $PE_{ww,discharge,y}$, and $PE_{s,final,y}$ have been incorporated in the PoA-DD. The source of the section is consistent as per the relevant tool. Closed.
- 5- the Equation of “Project emissions due to inefficiencies in capture systems” is incorporated in the PoA-DD as per equation 9 of the applied methodology. The equation is found consistent. Closed.
- 6- the Project emissions due to incomplete flaring section for the determination of the methane mass flow in the residual gas the PoA has been updated. The option 1 and option 2 has been incorporated and option B has been removed as it is not considered. The section is consistent as per section 5 of the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream (Version 3)”. Closed.
- 7- The equation required for “Calculation of project emissions from flaring” has been incorporated. The equation used for calculation of “project emission from biomass stored under anaerobic conditions” has been incorporated and found consistent. Closed.

Thus, The CAR stands closed.

CAR	08	Section no.	1.6	Date : 09/08/2019
Description of CAR				
<ol style="list-style-type: none"> 1. On page 36 of the PoA-DD, The Para 38,39,40 of the applied methodology has not been depicted. The PP needs to justify and incorporate the reason. 2. The reference 8 and 11 for Indonesian Pocket tax Book on page 11 of PoA-DD, is not accessible. PP is requested to incorporate the correct link. 				
Project participant response				Date : 09/08/2019
<ol style="list-style-type: none"> 1. The application of para 38,39 and 40 of the applied methodology is explained in the beginning of the section on page 27 and 28 of PoA DD. 2. The reference source no longer available, however as it mentions that “Indonesian Pocket tax Book 2011 or equivalent” and updated version reference is provided. 				
Documentation provided by project participant				
PoA DD				
DOE assessment				Date: 12/08/2019
<ol style="list-style-type: none"> 1. The Para 38, 40 of the applied methodology has been depicted on page 27 and 28 of the PoA-DD. Closed. 2. The link of Indonesian Pocket textbook 2012 has been incorporated in the PoA-DD and the reference is accessible and found consistent. Closed 				
Thus, The CAR stands closed.				

Table 1. FAR from this validation

FAR ID	07	Section No.	B	Date : 11/07/2019
Description of FAR				

The measure for continuous improvements is added as per PoA eligibility criteria in standard, the same shall be made available in future as per CME's record if any such improvement required is implemented. At the time of RCP validation, there was no evidence to confirm the additional requirement as per the applied standard mentioned in the PoA DD that there is a system to ensure the annual review for continuous improvement of the PoA management system.	
Project participant response	Date : 03/08/2019
<i>The same has been removed as it relates to system management and the same was not available at the time of registration of PoA DD.</i>	
Documentation provided by project participant	
PoA DD	
DOE assessment	Date: 09/08/2019
The measure for continuous improvement has been removed as per PoA eligibility criteria. So there is no requirement of evidence for the same. However, the Management system (Section B) in PoA-DD consist of point f) which tells that the management system has a measure for continuous improvements. Please remove this also. Open	
Project participant response	Date : 09/08/2019
<i>The same has been corrected in revised PoA DD.</i>	
Documentation provided by project participant	
DOE assessment	Date: 12/08/2019
The point f) of management system (Section B) which tells the management system has a measure for continuous improvement, is removed. Thus, The FAR stands closed.	

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN) and version 02.0 of the “CDM project cycle procedure for programmes of activities” (CDM-EB93-A09-PROC);• Make editorial improvements.
01.0	29 December 2017	Initial publication.

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