




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

(Version 03.0)

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

### BASIC INFORMATION

<b>Title and UNFCCC reference number of the programme of activities (PoA)</b>	PoA 5979: Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines' (LBP) Carbon Finance Support Facility		
<b>Version number of the validation report</b>	1.0		
<b>Completion date of the validation report</b>	30/05/2020		
<b>Version numbers of CPA-DD to which this report applies</b>	14.0		
<b>Title and UNFCCC reference number of each CPA for renewal</b>	CPA Ref. no.	<b>Title</b>	
	CPA 5979-P1-0001-CP1	CPA-1: Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines' (LBP) Carbon Finance Support Facility	
<b>Sectoral scopes for each CPA</b>	CPA Ref. no.	<b>Sectoral scopes (indicate mandatory and conditional sectoral scopes)</b>	
	CPA 5979-P1-0001-CP1	AMS-III.D: Sectoral Scopes 13 (Mandatory) and 1 (conditional) AMS-I.F: Sectoral scope 1 (Mandatory) and 13 (conditional)	
<b>Applied methodologies and standardized baselines for each CPA</b>	CPA Ref. no.	<b>Applied methodologies and standardized baselines</b>	
	CPA 5979-P1-0001-CP1	AMS-III.D. version 21.0, Methane recovery in animal manure management systems AMS-I.F version 3.0, Renewable electricity generation for captive use and mini-grid	
<b>Number and duration of the next crediting period (CP)</b>	CPA Ref. no.	<b>No. of CP</b>	<b>Duration of the CP</b>
	CPA 5979-P1-0001-CP1	2	7 years from 01/06/2019 – 31/05/2026
<b>Coordinating/managing entity (CME)</b>	Land bank of the Philippines (LBP)		
<b>Host Parties</b>	Republic of the Philippines		
<b>Estimated amount of annual average greenhouse gas (GHG) emission reductions or GHG removals by sinks in the next crediting period (tCO<sub>2</sub>e), per CPA</b>	CPA Ref. no.	<b>Annual emission reductions or removals (tCO<sub>2</sub>e)</b>	
	CPA 5979-P1-0001-CP1	36,692 tCO <sub>2</sub> e	

<b>Name and UNFCCC reference number of the DOE</b>	TÜV NORD CERT GmbH; E-0022
<b>Name, position and signature of the approver of the validation report</b>	Evgeni Sud Final Approver 

**SECTION A. Executive summary**

&gt;&gt;

The Landbank of the Philippines has commissioned the TÜV NORD JI/CDM Certification Program to carry out validation of the request for renewal of crediting period (RCP) for the Component project activity titled:

**“CPA-1: Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines”  
(LBP) Carbon Finance Support Facility”**

with regard to the relevant requirements for CDM Component project activities.

The component Project Activity was included on 10/05/2012 under the UNFCCC registration No. CPA 5979-P1-0001-CP1. The PPs have chosen a 7 year crediting period which is now due for renewal.

The objective of this RCP validation is the review by an independent entity whether the project is still compliant with the applicable sections of:

- the CDM project standard for programmes of Activities v2.0,
- the CDM project cycle procedure for Programmes of Activities v2.0
- the updated PoA-DD applied UNFCCC Methodology AMS-III.D version 21.0 and AMS-I.F version 3.0, and
- the methodological tool “Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period”, v3.0.1.

As per the requirements of the CDM Validation and Verification Standard for programmes of activities<sup>VVS/</sup> (section 11) the validation is based on

- the registered and/or latest updated version of the CPA-DD (including revisions of the monitoring plan)<sup>CPADD/</sup>,
- the updated emission reduction calculation<sup>XLS/</sup>,
- further supporting documents made available to the validator as well as
- information collected through performing additional research.

Furthermore, publicly available information, such as the host country legislation, was considered as far as available and required.

The project reduces GHG emissions due to replacement of an open anaerobic manure management system with an anaerobic digestion system with methane recovery and combustion, and a flare system. Through construction of the wastewater methane recovery systems, the CPA will reduce GHG emissions from methane compared to the emissions that would have occurred with the open anaerobic system. With the installation of electricity generation units, GHG emissions will be further reduced by replacing grid electrical power sourced from fossil fuel plants with renewable energy from the recovered methane. The PP has in total 6 biogas engines at the site. Besides, a flare is installed.

At present, only the Engine 2 – 300 kW (Waukesha type, serial number 5283701478) is operating with the 280 kW engine (Fuso/Mitsubishi, serial no. STG170493). Another 280 kW engine (Fuso/Mitsubishi, serial no. STG170495) serves as back-up to this latter engine. The biogas Engine 1 with rated capacity of 300 kW (Waukesha type, serial number C-95222/1) that has been previously used is currently not operating. As per CME information this Engine 1 – 300 kW will no longer be repaired. Aside from the aforementioned four (4) engines, Marcela Farm has on-site 2 x 395 kW Waukesha (Serial Nos.: 5283700382 and 5283700367) engines, which are not yet connected and commissioned to the system, but are on standby for use in future operations (as per latest information from CPA implementer, planned connection and commissioning is by 2021 at the earliest).

Details of the project location are given in table A-1 below:

**Table A-1:** Project Location

No.	Project Location
Host Country	Philippines
Region:	Province of Bohol
Project location address:	Barangay Lourdes in town of Cortes
Latitude:	9.690278
Longitude:	123.870833

Basic technical details of the project are summarized in table A-2.

**Table - A-2:** Technical data of the project activity

Parameter	Unit	Value
Engine Amount	-	2 (300kW) and 2 (395 kW) Waukesha and 2 Fuso/Mitsubishi
Engine capacity	kW	Waukesha: 300 <sup>VER/</sup> or 395 Fuso/Mitsubishi: 280
Total installed capacity as of now	kW	1,160
Total installed capacity as planned from 2021	kW	1,950
Engine Model	-	Waukesha F18GLD and H24GL LCR Fuso V8
Flare height	mm	1160
Flare diameter	mm	370
Flare capacity	Nm <sup>3</sup> /h	100 <sup>VER/</sup>
Covered Lagoon Number	-	2 <sup>VER/</sup>
Layer material	-	HDPE <sup>VER/</sup>
Capacity of lagoon	m <sup>3</sup>	20,000 and 63,000 <sup>VER/</sup>

## 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	Interviews	Validation findings
1.	Team Leader/Technical Expert	IR	Winter	Stefan	TÜV NORD CERT GmbH	X	-	X	X

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	EI	Lubanga	David	-
2.	Approver	IR	Sud	Evgeni	TN CERT GmbH

**SECTION C. Means of validation****C.1. Desk/document review**

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During the desk review all documents initially provided by the client and publicly available documents relevant for the validation were reviewed. The main documents are listed below:

- the last revision of the CPA-DD including the monitoring plan<sup>/PDD/</sup>,
- the last revision of the validation report<sup>/VAL/</sup>,
- documentation of previous verifications<sup>/VER/</sup>
- the monitoring report, including the claimed emission reductions for the project<sup>/MR/</sup>,
- the emission reduction calculation spreadsheet<sup>/XLS/</sup>.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

**C.2. On-site inspection**

Duration of on-site inspection: DD/MM/YYYY to DD/MM/YYYY				
No.	Activity performed on-site	Site location	Date	Team member
1.	-			

As per VVS, no onsite inspection is required for assessing Renewal of Crediting Period. Besides, TUV NORD and the team leader has already conducted the inclusion of thirty one CPAs and has been onsite to 24 CPAs during that time.

**C.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Calado	Prudencio	LBP	17/01/2020	General set up of the PoA Contracting issues Renewal auditing plan	Stefan Winter
2.	Chua	Susana	The World Bank consultant		General set up of the PoA Changes to the PoA or any CPA therein Status of PoA Renewal auditing plan	
3.	Granadino	Renee	LBP			
4.	Segarra	Amelito	LBP			
5.	Ashida	Keiko	The World Bank			
6.	Van den Berg	Katelijn	The World Bank			

There was a general video conference on the contracting issues and PoA-Status and changes due to ongoing PoA. Besides that any issues have been exchanged via Email due to time difference between PP (The World Bank), DOE and CME (Philippines).

**C.4. Sampling approach**

No sampling has been conducted by the PP to collect data for the preparation of documents for the renewal of PoA period.

DOE has also not conducted any sampling in assessing the documents provided and during course of validating the programme of activities renewal of PoA period.

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

Area of validation findings (SECTION D)	No. of CL	No. of CAR	No. of FAR
CPAs to be renewed and corresponding generic CPAs	0	0	0
Compliance with CPA-DD form	0	1	0
Application and selection of methodologies and standardized baselines	0	0	0
Validity of original baseline or its update	2	1	0
Demonstration of eligibility of the CPAs	0	1	0
Estimated emission reductions or net anthropogenic removals	0	1	0
Validity of monitoring plan	0	2	0
Crediting period	0	0	0
CME and project participants	0	0	0
Post-registration changes	0	0	0
Others (missing supporting documents)	0	1	0
<b>Total</b>	<b>2</b>	<b>7</b>	<b>0</b>

## SECTION D. Validation findings

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

Title and UNFCCC reference number of the CPA	Version number of the CPA-DD	Host Party	Title and reference number of the corresponding generic CPA	Version number of the PoA-DD on which the RCP is based
CPA 5979-P1-0001-CP1 : CPA-1: Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines' (LBP) Carbon Finance Support Facility	14.0	Philippines	Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines's (LBP) Carbon Finance Support Facility 5979-P1-XXXX-CP1	18.0

### D.2. Compliance with CPA-DD form

<b>Means of validation</b>	<p>A draft revised CPA-DD was submitted to the validation team by the project participants.</p> <p>By means of the UNFCCC website it has been checked whether the latest applicable CPA-DD template CDM-CPA-DD-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the CPA-DD template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /CPA-DD/</li> </ul>
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	<ul style="list-style-type: none"> <li>• /unfccc/</li> </ul>
<b>Findings</b>	<input checked="" type="checkbox"/> The latest reporting template CDM-CPA-DD-FORM as listed on the UNFCCC website has been used for the PoADD.
	<input type="checkbox"/> The latest instructions for filling out the CPA-DD have been followed. No adverse finding has been identified in the course of this validation.
	<input checked="" type="checkbox"/> The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: - CAR 01
<b>Conclusion</b>	<input type="checkbox"/> No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/> The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The DOE can confirm that the information transferred from the previous version of the CPA-DD to this latest version is materially the same but the changes applied in the course of updating the CPA-DD for renewal of the programme of activities period.

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

<b>Means of validation</b>	By means of comparison of the CPA-DD with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the updated CPA-DD is in compliance with the requirements of the applied methodologies /tools/SB. The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /PDD/</li> <li>• /METH/</li> <li>• /TOOL/</li> <li>• /unfccc/</li> </ul>		
<b>CARFindings</b>	<input type="checkbox"/> The updated CPA-DD is completely in accordance with the approved methodologies applicable for the CDM programme of activities.		
	<input checked="" type="checkbox"/> The breakdown of PDD accordance of the referenced tools is as follows:		
	1	Title (of the tool)	TOOL05: Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion
		Version	3.0
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
	2	Title (of the tool)	TOOL03: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation
		Version	3.0
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	3	Title (of the tool)	TOOL14: Project and leakage emissions from anaerobic digesters
		Version	2.0
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	4	Title (of the tool)	TOOL06: Project emissions from flaring
		Version	3.0
	MP compliance	<input checked="" type="checkbox"/> full compliance	

			<input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	
	5	Title (of the tool)	Tool to determine the mass flow of a greenhouse gas in a gaseous stream	
		Version	3.0	
		MP compliance	<input type="checkbox"/> full compliance <input checked="" type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	
	6	Title (of the tool)	Tool to calculate the emission factor for an electricity system	
		Version	7.0	
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	
	<input type="checkbox"/>	The breakdown of PDD accordance of the applicable SB is as follows:		
		1	Title (of the SB)	Not applicable
			Version	
	MP compliance			
<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 02 and CL 02			
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.		
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	After related corrections have been conducted the updated CPA-DD is completely in accordance with the approved methodologies applicable for the CDM programme of activities as well as related applied tools.			

#### D.4. Validity of original baseline or its update

<b>Means of validation</b>	<p>In line with PoA-VVS §392 If data and parameters used for determining the original baseline, that were determined ex ante and not monitored during the crediting period, are no longer valid, the DOE shall confirm that the coordinating/managing entity updated such data and parameters in accordance with the “Methodological tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”.</p> <p>Accordingly and based on related TOOL11 the DOE has applied the following stepwise approach:</p> <p><i>Step 1:</i> Check of Applicability of a Standardized Baseline</p> <p><i>Step 2:</i> Check of Baseline Scenario</p> <p><i>Step 3:</i> Assessment of compliance of the current baseline with relevant mandatory national and/or sectoral policies</p> <p><i>Step 4:</i> Assessment of impact of circumstances</p> <p><i>Step 5:</i> Assessment of likeliness of investments</p> <p><i>Step 6:</i> Validity check of ex-ante determined parameters.</p> <p>All necessary documentation has been either provided by the client or the validation team has acquired appropriate information required for assessment independently. For a detailed list of reviewed documentation please refer to appendix 3.</p>
	<p><u><i>Step 1: Applicability of a Standardized Baseline:</i></u></p> <p>No standardized baseline is applicable to the project activity. This has been checked by an analysis of the current list of valid standardized baselines on the UNFCCC website/unfccc/.</p>
	<p><u><i>Step 2: Baseline Scenario:</i></u></p> <p>The baseline scenario of the project as per the registered CPA-DD can be described</p>



as follows:

As per AMS-III.D, the baseline scenario of the methane recovery component is the situation where, in the absence of the project activity, animal manure is left to decay anaerobically within the project boundary and methane is emitted to the atmosphere.

As per AMS-I.F, the baseline emission scenario of the renewable energy generation component is based on the electricity that is displaced from the electricity distribution system by the project activities.

Step 2.1: Update the current baseline

As per the project standard this scenario is not subject to re-assessment and is thus deemed to be applicable for the next crediting period.

Step 2.2: Update the data and parameters

However, the baseline itself i.e. the calculation of baseline emissions has been checked regarding the continued validity of underlying assumptions and parameter values. The assessment steps are described in the following subsections.

Step 3: Assessment of compliance of the current baseline with relevant mandatory national and/or sectoral policies:

The baseline of the registered CPA-DD has been assessed to be compliant with the national legislation and policies applicable for the project activity at the time of validation. During the first CPA crediting period the PP has frequently reviewed the legal requirements and policies relevant for the baseline of the project. On the basis of this the PP has arrived at the conclusion that the baseline is still in line with all applicable legislations and policies.

The validation team has independently reviewed the host country legislation as well as current policies, such as

- Phil. Clean Water Act of 2004
- Clean Air Act of 1999
- Philippine Environment Code  
Presidential Decree No. 1152
- Philippine Environmental Policy  
Presidential Decree No. 1151
- The Water Code of the Philippines  
Presidential Decree No. 1067
- National Pollution Control Commission  
Presidential Decree No. 984
- Marine Pollution Decree of 1976  
Presidential Decree No. 979
- Presidential Decree No. 522
- Code on Sanitation of the Philippines  
Presidential Decree No. 856
- Penalty for Improper Garbage Disposal Presidential Decree No. 825
- Environmental Impact Statement System – Areas/Types of Projects  
Proclamation No. 2146
- PROCLAMATION NO. 1134
- PROCLAMATION NO. 1136
- PROCLAMATION NO. 1127
- PROCLAMATION NO. 1119
- JOINT AO DENR-DOST 2006-01
- Besides, the information on national grid emission factor published by Philippine Department of Energy<sup>/grid/</sup>

On the basis of this analysis the validation team confirms that the baseline is still in compliance with the currently applicable national legislation and other national and/or

sectoral policies. No changes have been occurred based on the host country law which would affect the CPA. The requirements from national laws and regulations are the same as during initial request for registration. Therefore the baseline did not need to be adjusted due to changes in this respect.

Step 4: Impact of circumstances:

As the baseline scenario might be affected by changed circumstances, e.g. market conditions, market prices etc. the PP has checked the baseline against such changes that have occurred since validation. This is of special importance if the baseline scenario is the continuation of the pre-project scenario.

One barrier identified during initial registration is related to access to finance. Initially a study by the Agricultural Credit Policy Council from 2009 has been stated. DOE has checked the related webpage of ACPC and found the following in a related study covering the period June 2014 to May 2015 (most recent study available):

Primary reasons why small-scale farmers borrow includes agricultural purposes (buying farm inputs, improving land, etc.) and personal use (household consumption, consumer durables, bills, etc.).

Therefore, the initial statement "farm improvement loans are targeted to agricultural production and facilities given that this is intended to have a positive effect on revenue streams for the farm, but this does not happen with waste management investments." can still be considered as given. /ACPC/

Also, the following statement in the PoA-DD is unchanged: "Farmers interviewed by the Global Methane Initiative study; said they have difficulty of accessing finance because they "are not able to put up enough collateral to secure the loan. In general, Philippine banks don't want to get involved in chattel mortgages and prefer accepting land as collateral". According to the interviews conducted with officials from five different banks in the Philippines, "(bank officials) mentioned that chattel mortgages, was not encouraged because it increased the bank's burden should the borrower default on the loan payment". /PoA-DD/

The study states that on farmer borrowers the "[...] average interest rates of loans sourced from informal lenders are much higher than those sourced from the formal type." And additionally the study states that "For formal lenders, the average annual interest rate is 11% for agricultural and 11% non-agricultural loans while for informal lenders, the rate is 14% for agricultural loans and 11% percent for non-agricultural loans. Majority formal lenders require collateral especially if it involves high amount of loan [...]" and "Lenders from both sector experienced various problems such as delayed payment of borrowers, unsecure funds, management issues, and lack of assistance." /ACPC/

Finally, as per report on Bank Lending to Agricultural Sector in 2017 only 1.6% of the Bank Loans granted have been in the Agricultural sector. This is a slight increase to 2016 which states a 1.3% share however the absolute number can still be stated as very low. /ACPC/

Accordingly the initial circumstances to access to finance are still applicable and those have no impact on the baseline. The installation and operation of an anaerobic open lagoon is still the common practice in the baseline as per assessment above. /ACPC/dna/

Besides, even though the initial baseline is the continuation of current practice also the current practice requires some investment for constructing a lagoon and related channel system and/or pumping equipment whereas the related tool requires an assessment "In the situation where the baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment, [...]"

The validation team has independently checked whether there are changes in circumstances which have an impact on the baseline. No such changes have been identified and thus it is deemed appropriate not to revise the baseline due to changes in circumstances.

Step 5: Likelihood of investments

This sub-step should only be applied if the baseline scenario identified at the validation of the project activity was the continuation of use of the current equipment(s) without any investment, so it's not applicable for the project. Besides, see assessment under Step 4 above. No equipment is used in the baseline for electricity generation but taken from the connected grid.

Step 6: Validity of ex-ante determined parameters:

The parameters which have been determined ex-ante in the registered CPA-DD are basically still valid. Only the following changes were required:

Parameter	Previous value	Updated value	Reference and assessment
$W_{site}$	48 for market; 200 for breeding	62 for market; 185 for breeding	The value is based on farm records which have been checked. Accordingly the values have been updated and are in line with related supporting documents.
$W_{default}$	50 for market; 198 for breeding.	50 for market; 198 for breeding.	The applied value derived from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories <sup>/IPCC/</sup> , Volume 4, and Chapter 10, Table 10A-7 (swine) and 10A-8 (breeding), the value for the average market swine of Western European. DOE has checked latest breeding certificate as well as crosschecked with IPCC guideline and found the value is correctly chosen and applied.
$N_{da,y}$	150 days for market sold; 365 for breeders	150 days for market sold; 365 for breeders	The value applied is based on farm records. DOE has checked related farm records and can therefore confirm the values stated. Besides, based on sectoral knowledge and experience the lifetime of a market swine is max 180 days. Therefore the value is considered plausible and reasonable considering the host country.
$N_{p,y}$	N breed 4,151 N market sold 99,767	N breed 4,127 N market sold 115,016	The value applied is based on farm records. DOE has checked related farm records and considering previous CPA-DD version for 1 <sup>st</sup> CP the values are reasonable and plausible.
$MCF_j$	0.8	0.8	The value is derived from Table 10.17 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 Chapter 10, "Uncovered Anaerobic Lagoon". As per PAGASA "Based on the average of all weather stations in the Philippines, excluding

				<p>Baguio, the mean annual temperature is 26.6°C. [...]The difference between the mean annual temperature of the southernmost station in Zamboanga and that of the northernmost station in Laoag is insignificant. In other words, there is essentially no difference in the mean annual temperature of places in Luzon, Visayas or Mindanao measured at or near sea level." Therefore, considering an MAT &gt;26°C the related value in the IPCC Guidelines is 80% = 0.8. Therefore, the chosen value is correct and still valid.</p>
	B <sub>0,LT</sub>	<p>B<sub>0,breed</sub> = 0.45 ; B<sub>0,market</sub> = 0.45</p>	<p>B<sub>0,breed</sub> = 0.45 ; B<sub>0,market</sub> = 0.45</p>	<p>The applied value derived from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories<sup>/IPCC/</sup>, Volume 4, and Chapter 10, Table 10A-7 (market swine) &amp; 10A-8 (breeding). Conservative standard value for Western European swine is applied for all animals in the calculations of emission reduction of the proposed PoA. Value is 0.45 which is verified still valid for the next crediting period as per IPCC. Related genetic source certificate has also been checked.</p>
	VS <sub>LT,y</sub>	<p>VS<sub>breed</sub> = 169.6; VS<sub>market, sold</sub> = 105.1;</p>	<p>VS<sub>breed</sub> = 156.5; VS<sub>market, sold</sub> = 136.8;</p>	<p>The applied value derived from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories<sup>/IPCC/</sup>, Volume 4, and Chapter 10, Table 10A-7 (market swine) &amp; 10A-8 (breeding), the value for the daily solid excreted by Western European swines multiplied with 365 days.</p> <p>As per provided pedigree certificate the origin of the pigs is France and therefore Western Europe values are considered to be applied correct and reasonable.</p> <p>Application of default values of mass of 198 kg and VS of 0.46 and 50 kg and VS of 0.3 are correct as per IPCC and related results of 156.5 = 185 (exact value of 184.6 applied in ER)/198x0.46x365 and 62/50x0.3x365 = 135.8. Therefore, these values are valid for the next crediting period</p>

				as per IPCC and related tool.
	FE	90%	80%	<p>Derived from related methodology AMS-III.D and Tool for "Project emissions from flaring".</p> <p>Accordingly for enclosed flares that are defined as low height flares, the flare efficiency shall be adjusted, as a conservative approach, by subtracting 10 percentile points. For example, the default value applied shall be 80%, rather than 90%.</p> <p>DOE has checked related supporting documents and can confirm that an enclosed flare is installed as well as it is a low height flare. Further, the default value is applied which is in line with the tool and conservative.</p>
	GWP <sub>CH4</sub>	21 in 2012, 25 from 2013 onwards	25	<p>In this crediting period global warming potential for CH<sub>4</sub> is 25 according to para. 66 of EB69 meeting report "the Board agreed that the second commitment period global warming potentials (GWPs) shall apply to all calculations of emissions reductions or removals achieved from 01/01/2013".</p> <p>Value is 25 which is verified still valid for the next crediting period as per EB decision.</p>
	MS <sub>%BI,j</sub>	1.0	1.0	<p>This is the fraction of manure treated in the baseline. Based on the previous validation report for inclusion of this CPA, all (100%) of the manure was treated in open anaerobic lagoons prior to the installation of the project activity. Further, as per PoA open anaerobic lagoons are considered common practice in the host country. Therefore, the DOE considers that the value is still valid.</p>
	W <sub>CH4,y</sub>	60%	60%	<p>The value is derived from related applied methodology AMS-III.D v21.0.</p> <p>As per Section 5.1, Data / Parameter table 6, measurement procedure the methodology states that alternatively a default value of 60% methane content can be used.</p> <p>Therefore, this value is still valid</p>

				and correct.
	n <sub>dy</sub>	365	365	<p>The value is derived from the basic project design. As per CPA validation report all manure is treated in the treatment plant all year long. No manure is emitted by other means or guided to natural waters.</p> <p>This is based on sectoral and host country knowledge and experience besides check of previous validation and latest verification report.</p> <p>This value is still valid.</p>
	EG <sub>y</sub>	5,499 MWh	3,323 MWh/a for 2019-2020; 4,526 MWh/a for 2021-2026	<p>The value is derived by full year operation less 24 days for maintenance and 70% availability of one engine with capacity of 300 kW and one of 280 kW. One of the four engine for back-up.</p> <p>This results in (280kW + 300kW) x 70% x (365-24) d x 24 h/d = 3,322.7 MWh. The ex-ante estimation of 3,322.7 MWh is for the years 2019 and 2020. From 2021 it is planned to operate two more 395 kW engines. Annual generation is estimated to be 4,525.8 MWh from 2021 onwards.</p> <p>Considering the data as per latest verification the assumption is considered reasonable and plausible. Besides, with provided name plate pictures.</p> <p>Therefore the valid applied is accepted.</p>
	EF <sub>CO2,y</sub>	No final value given but only the related calculation method	0.6265 tCO <sub>2</sub> e/MWh for the Luzon-Visayas Grid	<a href="https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef">https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef</a>
<p>These changes have been appropriately considered in the updated CPA-DD. Further, as per check of related webpage of Department of Energy of the Philippines this is the latest data available at time of validation. Besides, the data is correctly stated as per Department of Energy.</p>				
<b>Findings</b>	<input checked="" type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:		
		CL 01, CAR 02, CAR 03		
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.		
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		

	<p>The original baseline scenario of the project as per the registered PDD is still valid for the 2<sup>nd</sup> CPA crediting period.</p> <p>Most of the data and parameters determined ex-ante are still valid except for the emission factor <math>W_{site}</math>, <math>N_{p,y}</math>, and <math>VS_{LT,y}</math>, <math>EF_{CO_2,y}</math>, GWP of methane and annual elec. generation. The emission factor <math>EF_{CO_2,y}</math> was re-determined for the baseline emission calculation and the GWP for methane has been updated in accordance with IPCC or para. 66 of EB69 meeting report.</p> <p>The grid emission factor is correctly determined by applying weighing factors 0.25 for OM and 0.75 for BM as per latest related tool §86 (b):</p> <p>For Luzon-Visayas Grid: <math>0.25 \times 0.7122 + 0.75 \times 0.5979 = 0.6265 \text{ tCO}_2\text{e/MWh}</math></p> <p>The applied values are therefore correct and determined in line with methodology and related tools.</p>
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## D.5. Demonstration of eligibility of the CPAs

Means of validation	<p>The DOE has assessed whether the coordinating/managing entity, in accordance with the relevant requirements in the “CDM project standard for programmes of activities”:</p> <p>Updated the eligibility criteria for inclusion of CPAs in the latest CDM PoA submitted for renewal of crediting period of the PoA and if so whether the CPAs renewed under this report are in compliance with the updated eligibility criteria.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /PoA-DD/</li> <li>• /CPA-DD/</li> <li>• /AMS-I.F/</li> <li>• /AMS-III.D/</li> <li>• /unfccc/</li> </ul>
	<input checked="" type="checkbox"/> DOE can confirm based on its assessment and document check that the eligibility criteria for inclusion of CPAs in the updated CDM PoA, including the conditions that the CPAs meet the requirement pertaining to the demonstration of additionality, are not changed comparing with the latest approved PoA-DD according to the relevant requirements in the “CDM project standard for programmes of activities” considering the use of latest version of methodology, methodological tools and/or applied standardized baseline, original and updated baseline, current national legislation and/or sectoral policies and circumstances, estimation of GHG emission reductions and validity of the monitoring plan.
	<input checked="" type="checkbox"/> As the eligibility criteria for then inclusion of the CPAs, including the conditions that the CPAs meet the requirement pertaining to the demonstration of additionality, have not been updated, the CPA is still in compliance with all related eligibility criteria as per registered PoA-DD.
	<input checked="" type="checkbox"/> As per check with latest PoA-DD submitted for renewal of crediting period of the PoA the eligibility criteria have been updated. Please refer to Appendix 5 w.r.t. the current list of eligibility criteria as well as related assessment for compliance with the same.
Findings	<input checked="" type="checkbox"/> The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: CAR 04
Conclusion	<input type="checkbox"/> No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/> The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>The eligibility criteria for inclusion of CPAs in this CPA-DD are updated in line with the latest PoA-DD after renewal of the crediting period of the PoA. Besides editorial updates, the criteria have been updated to be fully consistent with the description of the applicability criteria as per related applied methodology versions. Further, no changes and updates have been conducted. Thus the latest approved CPA-DD has complied with the latest applicable versions of the methodologies and related PoA-DD and generic CPA-DD. No further changes to the eligibility criteria are required. It is noted that the applicability criteria as per AMS-III.D v21.0 §5 and 6 and AMS-I.F v3.0, §4 as no hydro, §9 and §10 as no combined heat and power generation and</p>

§11 as no biomass is used, are not provided in the PoA-DD as they are not applicable to the PoA and therefore also not considered for the CPA.

## D.6. Estimated emission reductions or net anthropogenic removals

<b>Means of validation</b>	<p>For validation of the estimated GHG emission reductions the client has provided the validation team with the following documentation:</p> <ul style="list-style-type: none"> <li>- Updated CPA-DD<sup>/CPADD/</sup></li> <li>- XLS spreadsheet<sup>/XLS/</sup>.</li> </ul> <p>Further, the validation team has downloaded from the UNFCCC website the applicable version of the CDM methodologies and all referenced methodological tools<sup>/unfccc/</sup>.</p> <p>The ER calculation process has been duly checked. Further, it has been checked whether the formulae have been correctly transferred to the updated CPA-DD for determination of ex-ante ER.</p> <p>In the updated CPA-DD, the version of methodology AMS-III.D. is changed from 17 to 21 and AMS-I.F from version 2 to 3, via checking the latest version, it is confirmed that no change to the ER calculation from version 17 to 21 or 2 to 3 besides the specification of determination of <math>N_{LT,y}</math> and mass flow of methane in residual gas <math>F_{CH4,RG,m}</math> to calculate <math>PE_{flare}</math> and determination of flare efficiency as per latest applicable methodological TOOL06.</p> <p>Thus in the updated CPA-DD, there is no change to the formulae of estimated GHG emission reductions which will be used by this specific CPAs for ER calculation.</p> <p>Based on verification of the related updated CPA-DD, it is confirmed that the calculation of ERs is done as per the applied methodologies and applied tools as well as with generic CPA-DD with follow steps listed below.</p> <p>Ex ante emission reductions of this component project activity are calculated using the following formula:</p> $PER_y = MER_y + GER_y$ <p>Where :</p> <p><math>MER_y</math> Emission reduction in year "y" (tCO<sub>2</sub>-e) from methane recovery (as per AMS-III.D)</p> <p><math>GER_y</math> Emission reduction in year "y" (tCO<sub>2</sub>-e) from renewable electricity generation (as per AMS-I.F)</p> <p><i>Ex ante</i> emissions from methane recovery are calculated using the following formula:</p> $MER_y = MBE_y - (MPE_y + MLeakage_y)$ <p>Where :</p> <p><math>MER_y</math> Emission reduction in year "y" (tCO<sub>2</sub>e)</p> <p><math>MBE_y</math> Baseline emissions in year "y" (tCO<sub>2</sub>e)</p> <p><math>MPE_y</math> Project emissions in year "y" (tCO<sub>2</sub>e)</p> <p><math>MLeakage_y</math> Project leakage in year "y" (tCO<sub>2</sub>e)</p> <p>Based on AMS-III.D, baseline emissions (<math>MBE_y</math>), project emissions (<math>MPE_y</math>) and leakage (<math>MLeakage_y</math>) are calculated as follows:</p> <p><b><u>Baseline Emissions from methane recovery and destruction (<math>MBE_y</math>)</u></b></p> <p>Baseline emissions are calculated using the amount of the waste or raw material that would decay anaerobically in the absence of the project activity. The following formula was used:</p> $MBE_y = GWP_{CH4} \times D_{CH4} \times Uf_b \times \sum_{j,LT} MCF_j \times B_{0,LT} \times N_{LT,y} \times VS_{LT,y} \times MS\%_{BI,j}$ <p>Where:</p> <p><math>MBE_y</math> baseline emissions in year "y" (tCO<sub>2</sub>-e/yr)</p> <p><math>GWP_{CH4}</math> Global Warming Potential (GWP) of CH<sub>4</sub></p> <p><math>D_{CH4}</math> CH<sub>4</sub> density (0.00067 t/m<sup>3</sup> at room temperature (20 °C) and 1 atm pressure).</p> <p><math>LT</math> Index for all types of livestock</p>
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$j$	Index for animal waste management system
$MCF_j$	Annual methane conversion factor (MCF) for the baseline animal waste management system “j” in percentages (digester in project scenario).
$B_{0,LT}$	Maximum methane producing potential of the volatile solid generated for animal type “LT” ( $m^3$ CH <sub>4</sub> /kg dm)
$N_{LT,y}$	Annual average number of animals of type “LT” in year “y” (numbers) calculated using the formula below.
$VS_{LT,y}$	Volatile solids for livestock “LT” entering the animal manure management system in year “y” (on a dry matter weight basis, kg dm/animal/year)
$MS\%_{Bl,j}$	Fraction of manure handled in baseline animal manure management system “j”
$Uf_b$	Model correction factor to account for model uncertainties (0.94)

Annual average animal population ( $N_{LT,y}$ ) for breeding and market pigs is determined from actual pig census for Marcela, which is not further expected to increase:

Population projections (based on January- July 2019 population)

Breeding Swine				Market Swine	
Sow		Boar		Finisher	
Average population	Average weight	Average population	Average weight	Average population	Average weight
4,019	183	108	248	47,267	62

Calculation of VS: VS are calculated by adjusting default VS using site specific animal weights as follows:

$$VS_{site,LT,y} = (W_{site} / W_{default}) \times VS_{default} \times nd_y$$

Where:

$VS_{site,LT,y}$	Adjusted volatile solid excretion for livestock “LT” entering the animal manure management system in year “y” (on a dry matter weight basis, kg dm/animal/year)
$W_{site}$	Average site animal weight for defined population, in kg
$W_{default}$	Default average animal weight for defined population, in kg.
$VS_{default}$	Default value (IPCC) for the volatile solid excretion per day on a dry- matter basis for defined livestock population, in kg-dm/animal/day
$nd_y$	Number of days in year “y” where the treatment plant was operational

Parameter	$W_{site}$	$W_{default}$	$VS_{default}$	$nd_y$	Calculated value ( $VS_{LT,y}$ )
<b>VS<sub>breed,y</sub></b>	184.5	198	0.46	365	156.5
<b>VS<sub>market-sold,y</sub></b>	62	50	0.3	365	136.8

Summary of Calculation of Annual Baseline Emissions: Summarized below are the constants and outcome of the calculation from the formula above for  $MBE_y$ .

Parameter	Value
$GWP_{CH_4}$	25
$D_{CH_4}$	0.00067
$Uf_b$	0.94
$MCF_j$	0.80
$Bo_{breed,y}$	0.45
$Bo_{market,y}$	0.45
$VS_{breed,y}$	156.5
$VS_{market,y}$	136.8
$N_{breed,y}$	4,127

N <sub>market sold, y</sub>	47,267
MS% <sub>BI, j</sub>	1.0
<b>MBE<sub>y</sub></b>	<b>40,324 tCO<sub>2</sub>e/yr</b>

### **Project Emissions from methane recovery and destruction (MPE<sub>y</sub>)**

Project emissions are calculated using the following formula:

$$MPE_y = PE_{PL,y} + PE_{flare,y} + PE_{power,y}$$

Where:

<b>MPE<sub>y</sub></b>	Project emissions in year “y” (tCO <sub>2</sub> e)
<b>PE<sub>PL,y</sub></b>	Emissions due to physical leakage of biogas in year “y” (tCO <sub>2</sub> e)
<b>PE<sub>flare,y</sub></b>	Emissions from flaring of the biogas stream in the year “y” (tCO <sub>2</sub> e)
<b>PE<sub>power,y</sub></b>	Emissions from the use of fossil fuel or electricity for the operation of the installed facilities in the year “y” (tCO <sub>2</sub> e)

*Emissions due to physical leakage (PE<sub>PL,y</sub>)* are estimated as per AMS III.D as 10% of: the maximum methane producing potential of the manure fed into the management systems implemented by the project activity. As the Marcela Farms system is not a sequential treatment system no adjustment (RVS) is necessary to account for sequential stages.

$$PE_{PL,y} = 0.10 \times GWP_{CH_4} \times D_{CH_4} \times \sum_{j,LT} B_{0,LT} \times N_{LT,y} \times VS_{LT,y} \times MS\%_{BI,j}$$

Parameter	value
GWP <sub>CH<sub>4</sub></sub>	25
D <sub>CH<sub>4</sub></sub>	0.00067
Bo <sub>breed,y</sub>	0.45
Bo <sub>market,y</sub>	0.45
VS <sub>breed,y</sub>	156.5
VS <sub>market,y</sub>	136.8
N <sub>breed,y</sub>	4,127
N <sub>market sold, y</sub>	47,267
MS% <sub>BI, j</sub>	1.0
<b>MPE<sub>PL, y</sub></b>	<b>5,362 tCO<sub>2</sub>e/yr</b>

*Emissions due to flaring (PE<sub>flare,y</sub>)* The Marcela Farms system will flare gas when the energy generator is not in use. The ex-ante project emissions are calculated using the calculated amount of gas that will be sent to the flare during downtime of the energy generator. Ex-post, these will be calculated using the methodological tool “Project emissions from flaring” through the following formula:

$$PE_{flare} = \sum FCH_{4,RG,m} * (1 - FE_{,m}) * GWP_{CH_4} / 1000$$

Where:

<b>FCH<sub>4,RG,m</sub></b>	is the mass flow rate of methane in residual gas in minute, m
<b>FE<sub>,m</sub></b>	is the flare efficiency in minute m
<b>GWP<sub>CH<sub>4</sub></sub></b>	is the GWP of methane according to IPCC.

Mass flow of methane in the residual gas in the minute m

$$FCH_{4,RG,m} = FV_{RG,m} * fv_{CH_4,RG,m} * \rho_{CH_4}$$

Where:

<b>FV<sub>RG,m</sub></b>	Volumetric flow rate of the residual gas in dry basis at normal (Nm <sup>3</sup> ) conditions in minute, m (also volumetric flow rate of gas going to the flare)
<b>fv<sub>CH<sub>4</sub>,RG,m</sub></b>	Volumetric fraction of methane in the residual gas on dry basis in min, m (this corresponds to w <sub>CH<sub>4</sub></sub> ).

$\rho_{CH_4,n}$  Density of methane at normal conditions (0.716 kg/m<sup>3</sup>)

As per methodology AMS III.D. (version 21 paragraph 6), "If recovered methane is used to power auxiliary equipment of the project it should be taken into account accordingly, using zero as its emission factor." Thus when the project activities include the generation of electricity using the recovered methane to power auxiliary equipment i.e. blowers of minimal consumption, electricity generation will be taken into account and zero will be used as its emission factor. The power is derived from the biogas system which emits no greenhouse gases relative to the baseline.

$$PE_{power,y} = EC_{AE} * 0$$

In the event that there is not enough gas, or for any other reason the energy generator is not operating, the project activity shall monitor the energy consumption from the grid  $EC_{PJ,y}$ , and shall consider it as project activity emissions, where the emission factor will be that for the Philippine grid it is connected to. Where:

$$PE_{power,y} = EC_{PJ,y} * EF_y$$

Emission for power use ( $PE_{power,y}$ ) is conservatively estimated at 14 from the average yearly value reported of the first verification report for Marcela.<sup>/VER/</sup> The power is derived from the biogas system which emits no greenhouse gases relative to the baseline.

***Total project emissions from methane recovery and destruction (MPE<sub>y</sub>)***

Parameter	Value
$PE_{PL,y}$	5,362
$PE_{flare,y}$	920
$PE_{power,y}$	14
<b><i>MPE<sub>y</sub></i></b>	<b>6,296 tCO<sub>2</sub>e/yr</b>

***Leakage from methane recovery and destruction (MLeakage<sub>y</sub>)***

The Marcela CPA does not involve replacement of equipment and therefore leakage is zero.

There are no leakage emissions associated with storage of digestate as determined by following the relevant procedure in the methodological tool "Project and leakage emissions from anaerobic digesters".

**The annual emission reduction from methane recovery** is estimated as:

$$\begin{aligned} MER_y &= MBE_y - (MPE_y + MLeakage_y) \\ MER_y &= 40,323 \text{ tCO}_2\text{e/yr} - (6,296 \text{ tCO}_2\text{e/yr} + 0) \\ MER_y &= 34,027 \text{ tCO}_2\text{e/yr} \end{aligned}$$

***Ex ante emissions from renewable electricity generation*** are calculated using the following formula:

$$GER_y = GBE_y - (GPE_y + GLeakage_y)$$

Where:

$GER_y$	Emission reduction in year "y" (tCO <sub>2</sub> -e) from electricity generation
$GBE_y$	Baseline emissions in year "y" (tCO <sub>2</sub> -e) from renewable electricity generation
$GPE_y$	Project emissions in year "y" (tCO <sub>2</sub> -e) from renewable electricity generation
$GLeakage_y$	Project leakage in year "y" (tCO <sub>2</sub> -e) from renewable electricity generation

Baseline emissions ( $GBE_y$ ), project emissions ( $GPE_y$ ) and leakage ( $GLeakage_y$ ) from renewable electricity generation are to be calculated based on AMS-I.F as shown

below:

**Baseline Emissions from electricity generation (GBE<sub>y</sub>)**

Baseline emissions related to the use of the recovered methane for electricity generation that displaces electricity from a fossil fuel based electricity distribution system are equivalent to the amount of electricity (MWh/yr) produced by the project activity multiplied by the emission factor (tCO<sub>2</sub>/MWh) of the relevant electrical grid.

$$GBE_y = (EG_y - EG_{baseline}) \times EF_{CO_2,y}$$

Where:

GBE <sub>y</sub>	Baseline emissions in year y (tCO <sub>2</sub> ) from renewable electricity generation
EG <sub>y</sub>	Electricity generated by the project in year y (MWh/yr)
EG <sub>baseline</sub>	Baseline electricity supplied to the grid in case of modified or retrofit units (MWh/yr)
EF <sub>CO<sub>2</sub>,y</sub>	Baseline emissions factor (tCO <sub>2</sub> e/MWh)

*Electricity generated by the project (EG<sub>y</sub>)* where estimated based on the rated capacity of 1 x 300 kW and 1 x 280 kW gas engines (with a back up engine 1 x 280 kW) that will be used for electricity generation utilizing the recovered methane. The engines are assumed to run 24 hours a day, (365-n) days a year, where n=24 is the amount of days that the generator is expected to be on maintenance, for a total of 8,184 hours a year at an operating rate of 70%. The total annual amount of electricity displaced from the grid (until 2020) by the project activity is estimated as:

$$EG_y = 1 * 0.3 \text{ MW} * 70\% * 8,184 \text{ hours} + 1 * 0.28 \text{ MW} * 70\% * 8,184 \text{ hours}$$

$$EG_y = 3,322.7 \text{ MWh / year}$$

In the future (estimated starting 2021), there is a plan to use 2x 395 kW gas engines that will be used for electricity generation utilizing the recovered methane. The engines are assumed to run 24 hours a day, (365-n) days a year, where n=24 is the amount of days that the generator is expected to be on maintenance, for a total of 8,184 hours a year at an operating rate of 70%. The other engines will be used as back up engines. The average annual EG<sub>y</sub> for the crediting period is estimated at 4,253 MWh.

*Baseline electricity generated (EG<sub>baseline</sub>)* is considered zero as the project does not involve any modification / retrofit or addition to an existing generating facility. This has been checked based on previous validation report and latest verification report of this CPA.

$$EG_{baseline} = 0 \text{ MWh}$$

*Baseline emissions factor (EF<sub>y</sub>)* are from the published National Grid Emission Factor by the Philippine Department of Energy using the combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system'. The electricity system considered is the Luzon-Visayas grid.

DOE has checked the 2015-2017 National Grid Emission Factor as published by the Philippine Department of Energy<sup>1</sup>. Tables below shows the computed grid emission factor derived using the 2015-2017 power statistics. These are the latest available data at time of validation.

Table 1. Summary of the NEG for Luzon-Visayas Grid

**a. Simple Operating Margin (OM) Emission Factor**

Parameters	(t-CO <sub>2</sub> /MWh)
2015-2017 Average EF <sub>grid, OMsimple,y</sub>	0.7122

<sup>1</sup> <https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef>

**b. Build Margin (BM) Emission Factor**

Parameters	(t-CO <sub>2</sub> /MWh)
BM Emission Factor	0.5979

**c. Combined Margin (CM) Emission Factor**

Parameters	(t-CO <sub>2</sub> /MWh)
2015-2017 EF <sub>grid, CM,y</sub> (Wind and solar)	0.6836
2015-2017 EF <sub>grid, CM,y</sub> (Other projects)	0.5979

$$EF_y = 0.7122 \times 0.25 + 0.5979 \times 0.75 = 0.6265 \text{ tCO}_2\text{e/MWh}$$

The total annual baseline emission to be considered in electricity generation is estimated as:

$$GBE_y = (3,322.7 \text{ MWh} - 0 \text{ MWh}) \times 0.6265 \text{ tCO}_2\text{e/MWh}$$

$$GBE_y = 2,082 \text{ tCO}_2\text{e / year}$$

**Project emission from electricity generation (GPEy)**

As per methodology AMS-III.D. (version 21.0 paragraph 6), "If recovered methane is used to power auxiliary equipment of the project it should be taken into account accordingly, using zero as its emission factor." Thus when the project activities include the generation of electricity using the recovered methane to power auxiliary equipment i.e. blowers of minimal consumption, electricity generation will be taken into account and zero will be used as its emission factor.

$$PE_{\text{power},y} = EC_{\text{AE}} \times 0$$

In the event that there is not enough gas, or for any other reason the energy generator is not operating, the project activity shall monitor the energy consumption from the grid ECPJ,y, and shall consider it as project activity emissions, where the emission factor will be that for the Philippine grid it is connected to. Where:

$$PE_{\text{power},y} = EC_{\text{PJ},y} \times EF_y$$

**Leakage from electricity generation (GLEakagey)**

As per AMS-I.F version 3.0 paragraph 25, "General guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues". [not applicable]. There is no leakage to be considered as the energy generating equipment is not transferred equipment from another activity. The annual emission reduction by the generation of electricity from recovered methane that displaces fossil fuel based electricity from the grid is estimated as:

$$GER_y = GBE_y - (GPE_y + GLEakage_y)$$

$$GER_y = 2,664 \text{ tCO}_2\text{e} - (0 + 0)$$

$$GER_y = 2,664 \text{ tCO}_2\text{e / year}$$

**The total annual emission reduction of the project activity is estimated as:**

$$PER_y = MER_y + GER_y$$

$$PER_y = 34,027 \text{ tCO}_2\text{e/yr} + 2,664 \text{ tCO}_2\text{e/year}$$

$$\text{PERy} = \mathbf{36,692 \text{ tCO}_2\text{e/yr}}$$

The estimated amount of GHG emission reductions of the project is **256,847 tCO<sub>2</sub>e** during the second crediting period (7 years) from 01/06/2019 to 31/05/2026, resulting in estimated average annual emission reductions of **36,692 tCO<sub>2</sub>e**.

The ER calculation sheet has been duly checked. Further it has been checked whether the results have been correctly transferred to the updated PDD for determination of ex-ante ER. The validation team has further checked the updated PDD against the latest

	version of the applicable methodology incl. the referenced methodological tools for consistency. Special focus was laid on the changes against the previous crediting period.	
<b>Findings</b>	<input type="checkbox"/>	The calculation of ERs is done as per the applied methodologies (AMS-III.D ver 21.0 and AMS-I.F ver 3.0). The calculation in the Excel spreadsheet and the corresponding calculation tables in the CPA-DD have been checked and no mistakes have been identified. The estimation of emission reductions for the 2 <sup>nd</sup> crediting period is deemed plausible and conservative.
	<input checked="" type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: CAR 02, CAR 03
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
All changes due to the upgraded methodologies and the re-assessment of the baseline have been considered appropriately and in line with the CDM-PoA-PS. The calculation in the Excel spreadsheet and the corresponding calculation tables in the CPA-DD have been checked and no mistakes have been identified. The estimation of emission reductions for the 2 <sup>nd</sup> crediting period is deemed plausible and conservative.		

### D.7. Validity of monitoring plan

<b>Means of validation</b>	<p>The validation team has checked the monitoring plan of the updated CPA-DD against the required changes due to the update of the baseline and other methodological changes.</p> <p>Further, changes due to editorial updates of the applicable templates have been checked.</p> <p>The monitoring plan in the CPA-DD has been updated to comply with the latest applicable versions of the monitoring methodologies (AMS-III.D. ver 21.0 and AMS-I.F ver 3.0). The basic changes from the current crediting period can be summarized as follows:</p> <p><b>Monitoring Parameters:</b></p>	
	<b>BG<sub>burnt,y</sub></b>	Biogas flared or combusted in year "y" (Nm <sup>3</sup> )
	<b>FV<sub>RG,m</sub></b>	Parameter related to project emissions from flaring of the residual gas stream in year y -Volumetric flow rate of the residual gas in dry basis at normal conditions in minute, m; also volumetric flow rate of gas going to the flare (Nm <sup>3</sup> )
	<b>T</b>	Temperature of the biogas (°C)
	<b>P</b>	Pressure of the biogas (Pa)
	<b>FE</b>	Flare efficiency in the year "y" (%)
	<b>T<sub>EG,m</sub></b>	Temperature in the exhaust gas of the enclosed flare in minute m (°C)
	<b>Flame<sub>m</sub></b>	Flame detection of flare in the minute m (Flame on or off)
	<b>nd<sub>y</sub></b>	The number of days that the animal manure management system was operational. (days)
	<b>MS<sub>oi,y</sub></b>	Fraction of manure handled in system i in project activity in year y (fraction)
	<b>N<sub>p,y</sub></b>	Number of animal produced annually of type "LT" for the year y (Number)
	<b>N<sub>da,y</sub></b>	Number of days animal is alive in the farm in the year "y" (days)
	<b>W<sub>site</sub></b>	Average animal weight of the farm's livestock population. (kg)
	<b>Genetic source of the production operations</b>	Genetic source of the production operations livestock originating from an Annex I Party. (-)

<b>livestock originating from an Annex I Party</b>	
<b>FFR</b>	Use of formulated feed rations. (-)
<b>EG<sub>y</sub></b>	Total electricity generated from the recovered biogas in the year y (MWh)
<b>EC<sub>AE</sub></b>	Electricity consumed by the auxiliary equipment within the project activity during the year y (kWh)
<b>EC<sub>PJ,i,y</sub></b>	Quantity of electricity from the grid consumed by the project activity during the year (MWh)
<b>EE<sub>y</sub></b>	Energy conversion efficiency of the project equipment (%)

For the parameter  $W_{site}$  a sampling plan may be applied by the CPA implementer to obtain the value (average animal weight for defined population). The sampling design described below is in line with the requirements of the "Standard for sampling and surveys for CDM project activities and programme of activities":

- Target population: categories of pigs: breeding / market / sow / boar / finisher / nursery / suckling etc.
- Sampling method: stratified random sampling approach with a level of confidence and precision of 90/10. This method is applicable because population is homogeneous within each category of pigs
- Sample size: it will depend on the total number of heads per category in the farm during the monitoring period (parameter to be monitored as NLT)
  - Parameter of interest: average value of animal weight per type of animal ( $W_{site}$ )
  - Target value: it will depend on the practice of the farm during the monitoring period
- Data to be collected: total number of heads per type of animal, animal weight per type and number of samples.

Besides, further elements of the monitoring plan have been established in line with the generic CPA-DD. As per CPA-DD a CPA operations plan is described which outlines the following:

**Monitoring:** To be monitored are those parameters described in the tables above which also detail the means of measurement and QA/QC procedures. These parameters were adapted to the situation of this CPA. In particular:

Type of flare or combustion system: The type of combustion system affects the default flare efficiency used as outlined below. Marcela will use a gas combustion engine(s) with an enclosed flare. Marcela will monitor and record the use and compliance with manufacturers specifications as described in the monitoring plan.

Use of sequential manure management systems: Marcela farm manure management system will not be sequential and therefore no special monitoring protocols for treatment stages are necessary.

Type of fuel used: The monitoring of the emissions from power will depend on the source of energy used in powering the system.

Use of Annex I country VS and Bo: Marcela will use VS and Bo values from Annex I countries and therefore the genetic source of the livestock will need to be monitored.

**Quality Assurance and Quality Control:** The proponent will have a quality assurance and quality control plan in order to ensure that monitoring is done accurately and with properly calibrated instruments. The basic requirements are outlined in the tables in the monitoring plan section. In particular, scales, methane measurement devices, waste flow measurement devices, biogas flow meters, thermometers, pressure meters and electricity meters will be calibrated as per manufacturer specifications.

**Data recording:** Proper management processes and systems records will be required

by the operator, as the auditors will request copies of such records to judge compliance with the required management systems. All data recording of the monitored data will include paper and/or electronic versions, backup systems and periodic checking for data entry mistakes.

**Reporting:** Monitoring data will be reported quarterly to LBP along with any major issues related to the monitoring system that may need attention. The estimation of emission reductions and reporting of the data for verification purposes will be done annually by LBP.

Calculation of emissions reductions: Based on the monitoring data the emission reductions will be calculated ex-post using the following approach:

$$PER_y = MER_{y, \text{ex-post}} + GER_{y, \text{ex-post}}$$

Where:

$MER_{y, \text{ex-post}}$  Emission reduction in year “y” (tCO<sub>2</sub>-e) from methane recovery (as per AMS III.D)

$GER_{y, \text{ex-post}}$  Emission reduction in year “y” (tCO<sub>2</sub>-e) from renewable electricity generation (as per AMS I.F)

The emission reductions achieved in any year from methane recovery are the lowest value of the following:

$$MER_{y, \text{ex-post}} = \min [(MBE_{y, \text{ex-post}} - MPE_{y, \text{ex-post}}), (MD_y)]$$

Where:

$ER_{y, \text{ex-post}}$  Emission reductions achieved by the project activity based on monitored values for year “y” (tCO<sub>2</sub> e)

$BE_{y, \text{ex-post}}$  Baseline emissions calculated using the formula found in Section B.4.3 using ex post monitored values of  $N_{LT, y}$  and if applicable  $VS_{LT, y}$

$PE_{y, \text{ex-post}}$  Project emissions calculated using the formula found in Section B.4.3 using ex post monitored values of  $N_{LT, y}$ ,  $MS\%_{i, y}$  and if applicable  $VS_{LT, y}$

$MD_y$  Methane captured and destroyed or used gainfully by the project activity in year “y” (tCO<sub>2</sub>e)

$$MD_y = BG_{\text{burnt}, y} * W_{\text{CH}_4, y} * D_{\text{CH}_4} * FE * GWP_{\text{CH}_4}$$

Where:

$BG_{\text{burnt}, y}$  Biogas flared or combusted in year “y” (m<sup>3</sup>).

$W_{\text{CH}_4, y}$  Methane content in biogas in the year “y” (mass fraction)

$FE$  Flare efficiency in the year “y” (fraction) when biogas is flared

Methane content in biogas,  $W_{\text{CH}_4}$ : As per AMS-III.D version 21 there are three options to monitor/determine the fraction of methane in the biogas: a) should be measured with a continuous analyzer or alternatively, b) with periodical measurements at a 90/10 confidence/precision level or, alternatively c) a default value of 60% methane content can be used. For all CPAs under this PoA option c) will be adopted: a default value of 60% methane content

Flare efficiency will be determined using default values.  $PE_{\text{flare}, y}$  will be calculated using this default flare efficiency value.

Ex-post, these will be calculated using the Tool for “Project emissions from flaring” through the following formula:

$$PE_{\text{flare}} = \sum F_{\text{CH}_4 \text{ RG}, m} * (1 - FE_{, m}) * GWP_{\text{CH}_4} / 1000$$



Where:

$F_{CH_4\text{ RG},m}$  is the mass flow rate of methane in residual gas in minute m

$FE_m$  is the flare efficiency in minute m

$GWP_{CH_4}$  is the GWP of methane according to IPCC.

$PE_{\text{flare},y}$  is calculated using an ex-ante default value of 80% for flare efficiency.

Alternatively, if the CPA utilizes the recovered methane for power generation,  $MD_y$  may be calculated as follows, based on the amount of monitored electricity generation, without monitoring methane flow and concentration:

$$MD_y = EG_y \times 3600 / (NCV_{CH_4} \times EE_y) \times D_{CH_4} \times GWP_{CH_4}$$

Where:

$EG_y$  Total electricity generated from the recovered biogas in year y (MWh)

3600 Conversion factor (1 MWh = 3600 MJ)

$NCV_{CH_4}$  NCV of methane (MJ/Nm<sup>3</sup>) use default value: 35.9 MJ/Nm<sup>3</sup>)

$EE_y$  Energy conversion efficiency of the project equipment, which is determined by adopting one of the following criteria:

- Specification provided by the equipment manufacture. The equipment shall be designed to utilize biogas as fuel, and efficiency specification is for this fuel. If the specification provides a range of efficiency values, the highest value of the range shall be used for the calculation;
- Default efficiency of 40% (more likely option to be used by the proposed CPA)

As per AMS III.D version 21 § 33 “Project activities where a portion of the biogas is destroyed through flaring and the other portion is used for energy may consider applying the flare efficiency to the portion of the biogas used for energy, if separate measurements of the respective flows are not performed. When the amount of methane that is combusted for energy and that is flared is separately monitored, or when only the biogas flow to the flare is monitored and the biogas used for energy is calculated based on electricity generation, a destruction efficiency of 100% can be used for the amount that is combusted for energy”.

In the case of § 33 wherein no separate flows are performed, and flare efficiency is applied on  $BG_{\text{burnt},y}$ ,  $BG_{\text{burnt},y} = FV_{\text{RG},m}$  and corresponding  $PE_{\text{flare}}$  will be calculated.

Project emissions are estimated using the equations given in section B.4.3. of the PoA-DD.

The Physical leakage ( $PE_{\text{PL},y}$ ) calculation will be based on monitored parameters of  $MS\%_{oi,y}$ ,  $N_{\text{LT},y}$ ,  $V_{\text{SLT},y}$ .

For  $PE_{\text{power},y}$  as per the methodology methane used to power auxiliary equipment of the project (ECAE) will be taken into account accordingly, using zero as its emission factor.

The emission reductions achieved in any year from renewable electricity generation are the following:

$$GBE_{y,\text{ex-post}} = (EG_{y,\text{ex-post}} - EG_{\text{baseline}}) \times EF_{y,\text{ex-ante}}$$

Where:

$GBE_{y,\text{ex-post}}$  Baseline emissions based on monitored values for year “y” (tCO<sub>2</sub>) from renewable electricity generation

$EG_{y,\text{ex-post}}$  Electricity generated based on monitored values and calculated using

	<p>the formula found in Section B.4.3. for year “y” (MWh/yr)</p> <p><math>EG_{baseline}</math> Baseline electricity supplied to the grid in case of modified or retrofit units based on monitored values and calculated using the formula found in Section B.4.3</p> <p><math>EF_{y,ex-ante}</math> Baseline emissions factor calculated using the formula found in Section B.4.3 (tCO<sub>2</sub>-e/MWh) ex-ante values applied throughout the crediting period</p> <p>In detail all parameters, ex-ante values and applicable formulae have been checked to determine the required changes for the next crediting period with provided supporting documents such as technical descriptions, farm layout including grid connection, weighing details, pictures of engine and flare and logbooks as well as previous verification report and related generic CPA-DD. The above stated and the monitoring plan as given in the updated CPA-DD is therefore in line with the provisions given in the related generic CPA-DD, PoA-DD as well as related applied methodologies and tools.</p> <p>Besides, based on that the validation team has assessed the feasibility of the required changes.</p>				
<b>Findings</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td> <p>The validation team has duly assessed. All required changes due to the upgraded methodological requirements and the re-assessment of the monitoring plan. The validation team has concluded that</p> <ul style="list-style-type: none"> <li>- all necessary changes have been appropriately reflected in the updated CPA-DD,</li> <li>- the monitoring plan in the updated CPA-DD is in compliance with the applied monitoring methodology,</li> <li>- the monitoring arrangements described in the updated CPA-DD can be implemented and are feasible within the project design.</li> </ul> </td></tr> <tr> <td><input checked="" type="checkbox"/></td><td> <p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>CAR 05 and CAR 06</p> </td></tr> </table>	<input checked="" type="checkbox"/>	<p>The validation team has duly assessed. All required changes due to the upgraded methodological requirements and the re-assessment of the monitoring plan. The validation team has concluded that</p> <ul style="list-style-type: none"> <li>- all necessary changes have been appropriately reflected in the updated CPA-DD,</li> <li>- the monitoring plan in the updated CPA-DD is in compliance with the applied monitoring methodology,</li> <li>- the monitoring arrangements described in the updated CPA-DD can be implemented and are feasible within the project design.</li> </ul>	<input checked="" type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>CAR 05 and CAR 06</p>
<input checked="" type="checkbox"/>	<p>The validation team has duly assessed. All required changes due to the upgraded methodological requirements and the re-assessment of the monitoring plan. The validation team has concluded that</p> <ul style="list-style-type: none"> <li>- all necessary changes have been appropriately reflected in the updated CPA-DD,</li> <li>- the monitoring plan in the updated CPA-DD is in compliance with the applied monitoring methodology,</li> <li>- the monitoring arrangements described in the updated CPA-DD can be implemented and are feasible within the project design.</li> </ul>				
<input checked="" type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>CAR 05 and CAR 06</p>				
<b>Conclusion</b>	<table border="1"> <tr> <td><input type="checkbox"/></td><td>No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table> <p>All necessary changes have been appropriately reflected in the updated CPA-DD, the monitoring plan in the updated CPA-DD is in compliance with the applied monitoring methodology, and the monitoring arrangements described in the updated CPA-DD can be implemented and are feasible within the project design.</p>	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.				
<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.				

#### D.8. Crediting period

<b>Means of validation</b>	<p>The CPA has been included and registered on 10/05/2012 under the UNFCCC registration No. 5979-P1-0001-CP1. The PPs have chosen a 7 year crediting period which the first crediting period started from 01/06/2012 and has expired on 31/05/2019.</p> <p>Hence, it is confirmed the project's 2<sup>nd</sup> crediting period may start immediately after the expiration of the 1<sup>st</sup> one, given that all other applicable criteria are met.</p>				
<b>Findings</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td> <p>As the respective requirements are met, the project's 2<sup>nd</sup> crediting period may start immediately after the expiration of the 1<sup>st</sup> one, given that all other applicable criteria are met.</p> <p>It is further confirmed that the start date (01/06/2019) and the length of the crediting period (7 years) are in compliance with the project standard.</p> </td></tr> <tr> <td><input type="checkbox"/></td><td> <p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>- N/A</p> </td></tr> </table>	<input checked="" type="checkbox"/>	<p>As the respective requirements are met, the project's 2<sup>nd</sup> crediting period may start immediately after the expiration of the 1<sup>st</sup> one, given that all other applicable criteria are met.</p> <p>It is further confirmed that the start date (01/06/2019) and the length of the crediting period (7 years) are in compliance with the project standard.</p>	<input type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>- N/A</p>
<input checked="" type="checkbox"/>	<p>As the respective requirements are met, the project's 2<sup>nd</sup> crediting period may start immediately after the expiration of the 1<sup>st</sup> one, given that all other applicable criteria are met.</p> <p>It is further confirmed that the start date (01/06/2019) and the length of the crediting period (7 years) are in compliance with the project standard.</p>				
<input type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>- N/A</p>				
<b>Conclusion</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</td></tr> </table>	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.		
<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.				

	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		It is thus confirmed that the start date and the length of the 2 <sup>nd</sup> crediting period (7 years) are in compliance with the project standard.

**D.9. CME and project participants**

<b>Means of validation</b>	The validation team has checked the revised CPA-DD/ <sup>PDD/</sup> and the UNFCCC website/ <sup>unfccc/</sup> esp. the latest version of the Modalities of Communication/ <sup>MOC/</sup> to check whether the listed CME and project participants have duly been authorized and if communication requirements are met. The information on the CPA implementer has been checked with the latest business licence and other permits. <sup>/BP//ECC//DP/</sup>	
<b>Findings</b>	<input checked="" type="checkbox"/>	The names of the CME and project participants as listed in the revised CPA-DD are consistent with those listed on the dedicated UNFCCC project website as well as in the last version of the modalities of communication/ <sup>MOC/</sup> .
	<input type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: - N/A
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The names of the CME and project participants are consistent with those listed on the dedicated UNFCCC project website as well as in the last version of the modalities of communication/ <sup>MOC/</sup> .

**D.10. Post-registration changes**

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents <sup>2</sup>	N	-	-
Corrections	N	-	-
Changes to the start date of the crediting period of component project activity	N	-	-
Inclusion of monitoring plan	N	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from applied methodologies, standardized baselines, or other methodological regulatory documents	N	-	-
Changes to the project design	N	-	-
Changes specific to afforestation and reforestation activities	N	-	-
Others (please specify)	N	-	-

**SECTION E. Internal quality control**

Before the submission of the final VAL RCP report a technical review of the whole validation procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the validation team and thus not involved in the decision making process up to the technical review.

<sup>2</sup> Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation team leader may have been confirmed or revised. Furthermore reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete validation has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting the renewal of programme of activities period is conducted.

## SECTION F. Validation opinion

The Landbank of the Philippines has commissioned the TÜV NORD JI/CDM Certification Program to re-validate the component project activity titled: "CPA-1: Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines' (LBP) Carbon Finance Support Facility" for the purpose of renewal of the CPA crediting period. The validation is based on the relevant UNFCCC requirements.

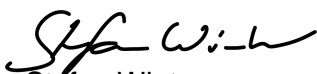
The review of the updated CPA design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews have provided TÜV NORD JI/CDM Certification Program with sufficient evidence to validate the fulfilment of the stated criteria applicable for RCP.

In detail the conclusions can be summarized as follows:

- (i) The updated CPA-DD has been completed using the valid version of the applicable CPA-DD form, following the instructions therein;
- (ii) The information transferred to the later valid version of the CPA-DD form is materially the same as that in the registered CPA -DD;
- (iii) The methodologies were applied in accordance with the applicable requirements in the "CDM project standard for programmes of activities";
- (iv) The baseline, the estimated GHG emission reductions or net anthropogenic GHG removals, and the monitoring plan in the updated CPA -DD comply with the applicable requirements in the "CDM project standard for programmes of activities", and the valid versions of the methodologies and, where applicable, the standardized baselines that are applicable to the CPA;
- (v) The next duration of the CPA commences on the day immediately after the expiration of the current duration;
- (vi) The names of the coordinating/managing entity and the project participants in the updated CPA -DD are consistent with the names of the coordinating/managing entity and the project participants in the latest version of the MoC statement;
- (vii) Updated the eligibility criteria for inclusion of CPAs as per latest PoA-DD after renewal of PoA crediting period;
- (viii) The current baseline of the CPA is in line with the national and/or sectoral policies and circumstances at the time of requesting renewal of CPA period.
- (ix) The monitoring plan is transparent and adequate and in line with the applicable monitoring methodology (AMS-III.D version 21.0 and AMS-I.F version 03.0).

The conclusions of this report show, that the CPA, as it is described in the component project activity documentation, is in line with all CDM criteria applicable for the renewal of the CPA.

Essen, 10/07/2020




Stefan Winter  
TÜV NORD JI/CDM Certification Program  
Validation Team Leader

## Appendix 1. Abbreviations

Abbreviations	Full texts
BAU	Business as usual
BM	Build Margin
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CFSF	Carbon Finance Support Facility
CL	Clarification Request
CM	Combined Margin
CME	Coordinating / Managing Entity
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
COP/MOP	Conference of Parties / Meeting of Parties
CP	Certification Program
CRECOM	Land Bank of the Philippines Credit Commission Board
CPA	Component Project Activity
CPA-DD	Component Project Activity Design Document
DENR	Department of Environmental and Natural Resources
DNA	Designated National Authority
EIA	Environmental Impact Assessment
ECC	Environmental Compliance Certificate
EMB	Environmental Management Bureau
FAR	Forward Action Request
GE	General Electric
GHG	Greenhouse gas(es)
GT	Glossary of Terms
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
LBP	Land Bank of the Philippines
MOA	Memorandum of agreement
MoC	Modalities of Communication
MP	Monitoring Plan
OM	Operating Margin
ONS	National Operator of the Electric System
OSV	On-site visit
PA	Project Activity
PoA	Programme of Activities
PoA-DD	CDM Programme of Activities Design Document
PP	Project Participant(s)
QA/QC	Quality assurance/Quality control
UNFCCC	United Nations Framework Convention on Climate Change

## Appendix 2. Competence of team members and technical reviewers



**Statement of Competence**  
Apprenticeship and authorization according to the procedures of the TÜV NORD JICDM Certification Program

**Mr. David Lubanga**


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2021-10-20
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2021-10-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.2	Manure

251 - Rev. 7, Date: 2018-10-19

251\_2011-04205-F20-2018-10-19-13-10-19.doc



**Statement of Competence**  
Apprenticeship and authorization according to the procedures of the TÜV NORD JICDM Certification Program

**Mr. Stefan Winter**

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27
VCS / ISO 14064-2	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
9.1	Aluminum and magnesium production
9.2	Iron, steel and Ferro-alloy production
10.1	Fugitive emissions from oil and gas
13.1	Solid waste and wastewater
13.2	Manure

163 - Rev. 6, Date: 2019-10-21

163\_2011-04205-F20-2019-10-21-13-10-21.doc

## Appendix 3. Documents reviewed or referenced

No.	Reference	Author	Title	References to the document	Provider
1.	/CPADD-T/	UNFCCC	Component project activity design document form for CDM component project activities (CDM-CPA-DD-FORM) –version 9.0	<a href="https://cdm.unfccc.int/Reference/PD_Ds_Forms/index.html">https://cdm.unfccc.int/Reference/PD_Ds_Forms/index.html</a>	Other
2.	/CPM/	DOE	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)	-	Other
3.	/GOT/	UNFCCC	Glossary “CDM terms” – version 10.0	<a href="https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu">https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu</a>	Other

No.	Reference	Author	Title	References to the document	Provider
4.	<b>/IPCC/</b>	IPCC	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a>	Other
5.	<b>/KPI/</b>	UNFCCC	Kyoto Protocol (1997)	<a href="http://unfccc.int/kyoto_protocol/items/2830.php">http://unfccc.int/kyoto_protocol/items/2830.php</a>	Other
6.	<b>/MA/</b>	UNFCCC	Decision 3/CMP. 1 (Marrakesh – Accords)	<a href="http://cdm.unfccc.int/Reference/CO2PMOP/index.html">http://cdm.unfccc.int/Reference/CO2PMOP/index.html</a>	Other
7.	<b>/METH/</b>	UNFCCC	AMS-III.D. ver. 21.0: Methane recovery in animal manure management systems  AMS-I.F. ver. 3.0: Renewable electricity generation for captive use and mini-grid	<a href="https://cdm.unfccc.int/methodologies/DB/2C25M4WA2W2XCMG5ETXE2CBHZOPRZU">https://cdm.unfccc.int/methodologies/DB/2C25M4WA2W2XCMG5ETXE2CBHZOPRZU</a> <a href="https://cdm.unfccc.int/methodologies/DB/9KJWQ1G0WEG6LKHX21MLPS8BQR7242">https://cdm.unfccc.int/methodologies/DB/9KJWQ1G0WEG6LKHX21MLPS8BQR7242</a>	Other
8.	<b>/TOOL/</b>	UNFCCC	Methodological Tools: - “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” version 3.0, - “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” version 3.0, - “Project and leakage emissions from anaerobic digesters” version 2.0, - “Project emissions from flaring” version 3.0, - “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” version 3.0, - “Tool to calculate the emission factor for an electricity system” version 7.0 - “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 - “Assessment of debundling for small-scale project activities” version 4	<a href="http://cdm.unfccc.int/Reference/tools/index.html">http://cdm.unfccc.int/Reference/tools/index.html</a>	Other
9.	<b>/PS/</b>	UNFCCC	CDM project standard for programmes of activities version 2.0	<a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
10.	<b>/SAMPLE/</b>	UNFCCC	- Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities – version 04.0 Standard for Sampling and Surveys for CDM Project Activities and Programme Activities – version 8.0	<a href="https://cdm.unfccc.int/Reference/Guidclarif/index.html">https://cdm.unfccc.int/Reference/Guidclarif/index.html</a> <a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
11.	<b>/VVS/</b>	UNFCCC	- CDM validation and verification standard for programmes of activities version 2.0	<a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
12.	<b>/CON/</b>	DOE	Signed Contract for carrying out the validation of the CPA Renewal of CP		Other

No.	Reference	Author	Title	References to the document	Provider
			among TÜV Nord and LandBank of the Philippines		
13.	<b>/ACPC/</b>	ACPC	Costs of Agricultural Credit and Interest Rate Sensitivity of Small Farmers: An Empirical Study, Agricultural Credit Policy Council, Agham C. Cuevas, DURATION: June 11, 2014 – May 10, 2015  Report: 2017 BANK LENDING TO AGRICULTURE	<a href="http://www.acpc.gov.ph/wp-content/uploads/2017/05/Cost-of-Agricultural-Credit.pdf">http://www.acpc.gov.ph/wp-content/uploads/2017/05/Cost-of-Agricultural-Credit.pdf</a>  <a href="http://www.acpc.gov.ph/wp-content/uploads/2018/11/2017-Bank-Lending-to-Agriculture.pdf">http://www.acpc.gov.ph/wp-content/uploads/2018/11/2017-Bank-Lending-to-Agriculture.pdf</a>	Other
14.	<b>/EL/</b>	-	Environmental Legislation: <ul style="list-style-type: none"> <li>- Phil. Clean Water Act of 2004</li> <li>- Clean Air Act of 1999</li> <li>- Philippine Environment Code Presidential Decree No. 1152</li> <li>- Philippine Environmental Policy Presidential Decree No. 1151</li> <li>- The Water Code of the Philippines Presidential Decree No. 1067</li> <li>- National Pollution Control Commission Presidential Decree No. 984</li> <li>- Marine Pollution Decree of 1976 Presidential Decree No. 979</li> <li>- Presidential Decree No. 522</li> <li>- Code on Sanitation of the Philippines Presidential Decree No. 856</li> <li>- Penalty for Improper Garbage Disposal Presidential Decree No. 825</li> <li>- Environmental Impact Statement System – Areas/Types of Projects Proclamation No. 2146</li> <li>- PROCLAMATION NO. 1134</li> <li>- PROCLAMATION NO. 1136</li> <li>- PROCLAMATION NO. 1127</li> <li>- PROCLAMATION NO. 1119</li> <li>- JOINT AO DENR-DOST 2006-01</li> </ul> DENR Administrative Order No 2005-10: Implementing Rules and Regulations of the Philippine Clean Water Act of 2004 as of May 16 2005	<a href="http://www.chanrobles.com/legal9.htm#.Vq3Ma13UjIU">http://www.chanrobles.com/legal9.htm#.Vq3Ma13UjIU</a> <a href="http://www.denr.gov.ph/laws-and-policies.html">http://www.denr.gov.ph/laws-and-policies.html</a>	Other
15.	<b>/GEN/</b>	Hypor France	Genetic source pedigree certificate No 133023 by Hypor France dated 04/06/2015 - Genetic source pedigree certificate No 134728 by Hypor France dated 04/06/2013		PP
16.	<b>/FFR/</b>	PP	Feed Formulation Ratio and Feed Composition Documents for different piggery type and age dated 11/01/2020		PP
17.	<b>/ECC/</b>	EMB	Env. Compliance Certificate No: ECC-96K-07BO-097 dated 07/11/1996		PP



No.	Reference	Author	Title	References to the document	Provider
			Env. Compliance Certificate No: 070401-290051116-A dated 29/01/2004		
18.	<b>/DP/</b>	EMB	Discharge Permit DP-09-A-071216-002 dated 07/01/2009 Application for Discharge Permit for 2020 dated 05/07/2019		PP
19.	<b>/BP/</b>	Municipal Mayor	Business Permit for Marcela Farms for Piggery and Poultry No: BP2019-00153 dated 12/02/2019 No: BP2020-00128 dated 12/02/2020 Application for Business Permit dated 31/01/2020		PP
20.	<b>/OP/</b>	PP	<ul style="list-style-type: none"> <li>Picture of Biogas engine logbook Dec 20 2019</li> <li>Picture of Biogas engine operation records Excel listing for December 2019 including remarks on shutdown</li> <li>Document "Biogas Engine Running Hours" for Year 2019 including total values as well as pictures of logbook for months Dec 2018 and Aug 2019 for Engine 2 and Dec 2018 and Dec 2019 for Engines 3A and 3B</li> <li>Document "Biogas Engines Total Running Hours" as of March 2020 for Engine 1, 2, 3A and 3B since 2017 including picture of Engines hour meters and further logbook pictures</li> </ul> Hourly flare operation spreadsheet for Dec 2019	-	PP
21.	<b>/LOA/</b>	DNA	Letter of Approval for PoA	-	Other
22.	<b>/CPADD/</b>	PP	Component Project Activity: "CPA-1: Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines" (LBP) Carbon Finance Support Facility" version 13 – 31/05/2017 version 14 – 29/05/2020		PP UNFCCC
23.	<b>/XLS/</b>	PP	CPA 1 Ex-ante Emission Reduction spreadsheet 01/2020 5979 1 CER Calculation 1.2 - May 26 5979 1 CER Calculation 1.3 - May 29		PP
24.	<b>/POADD/</b>	PP	Programme of Activities: "Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines" (LBP) Carbon Finance Support Facility" version 17 – 14/01/2020 version 18 – 10/02/2020	-	PP UNFCCC
25.	<b>/CENSUS/</b>	PP	Excel spreadsheets on weighing details for sows, gilts, farrowing, nursery and growing Excel spreadsheets on daily stock movement for 2019		PP
26.	<b>/INCL/</b>	DNV	CPA inclusion report for CPA titled		UNFCCC

No.	Reference	Author	Title	References to the document	Provider
			"CPA-1: Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines' (LBP) Carbon Finance Support Facility" dated 15/04/2010 by DNV		
27.	<b>/TD/</b>	PP	<p><u>Project technical description:</u></p> <ul style="list-style-type: none"> <li>- Farm and Project Layout including grid connection wires dated 05/01/2015</li> <li>- Electricity bill Ref 116SCPCRES-1912 for Period 26/11/2019 – 25/12/2019</li> <li>- Technical data sheet of Engine Waukesha F18GLD VGF Series Gas Engine 265-440BHP</li> <li>- Name plate of Engine Waukesha Model F18GLD Serial number C-95222/1</li> <li>- Name plates of engines Fuso/Mitsubishi</li> <li>- Name plates of engines Waukesha H24GL LCR</li> <li>- Contract between Ermie's Biogas with Marcela Farms on 350kVA Biogas genset dated 24/01/2018</li> <li>- Contract between Ermie's Biogas with Marcela Farms on 2<sup>nd</sup> 350kVA Biogas genset dated 09/03/2018</li> <li>- Pictures taken dated 11/04/2019 during Quarterly monitoring visit to Marcela Farms 10<sup>th</sup> and 11<sup>th</sup> April 2019 by LBP</li> <li>- Meeting report on Quarterly monitoring visit to Marcela Farms 10<sup>th</sup> and 11<sup>th</sup> April 2019 by LBP</li> <li>- Pictures of the flare with dimension details</li> </ul>	-	PP
28.	<b>/VER/</b>		Verification report on Programme of Activities: "Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines' (LBP) Carbon Finance Support Facility" dated 06/04/2016 by Bureau Veritas Certification		
29.	<b>/SNV/</b>	SNV	Feasibility Study titled: "Feasibility Study of a National Biogas Program on Domestic Biogas in the Philippines." by SNV Netherlands Development Organization and Winrock International. April 2010.	-	PP
30.	<b>/dna/</b>	-	Republic of the Philippines Environmental Management Bureau	<a href="http://emb.gov.ph/">http://emb.gov.ph/</a>	Other
31.	<b>/ipcc/</b>	-	IPCC publications  For GWP methane (page 214 of document as per link)	<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a> <a href="https://www.ipcc.ch/site/assets/uplo">https://www.ipcc.ch/site/assets/uplo</a>	Other

No.	Reference	Author	Title	References to the document	Provider
				<a href="#">ads/2018/02/ar4-wg1-chapter2-1.pdf</a>	
32.	/unfccc/	-	UNFCCC	<a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a>	Other
33.	/pagasa/	-	Philippine Atmospheric Geophysical & Astronomical Services Administration (PAGASA)	<a href="http://www.pagasa.dost.gov.ph/">http://www.pagasa.dost.gov.ph/</a>	Other
34.	/grid/	-	<ul style="list-style-type: none"> <li>- Philippine Department of Energy</li> <li>- Link to data for the national grid emission factor for Luzon-Visayas and Mindanao Grid</li> <li>- 2016 Philippine Power Situation Report by Electric Power Industry Management Bureau, Department of Energy</li> <li>- List of existing power plants Luzon Grid as of Dec 2019</li> <li>- List of existing power plants Mindanao grid as of June 2019</li> <li>- List of existing power plants Visayas Grid as of June 2019</li> <li>- List of existing off-grid power plants Luzon, Visayas and Mindanao grid as of June 2019</li> </ul>	<a href="https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef">https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef</a> <a href="https://www.doe.gov.ph/sites/default/files/pdf/electric-power/power_situationer/2016_philippine_power_situation_report.pdf">https://www.doe.gov.ph/sites/default/files/pdf/electric-power/power_situationer/2016_philippine_power_situation_report.pdf</a> <a href="https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef?q=list-existing-power-plants">https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef?q=list-existing-power-plants</a>	Other

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

Table 3. CL from this validation

CL ID	01	Section no.	B.4.2	Date: 31/01/2020
<b>Description of CL</b>				
Please clarify why under choice of data for Bo <sub>LT</sub> reference to "The use of Annex I species defaults for VS" is given. Besides, clarification is requested how the values of 156.75 and 136.78 for parameter VS <sub>LT,y</sub> are determined. For market VT calculates $0.3 \times 365 \times 62 / 50 = 135.78$ and for breeding $0.46 \times 365 \times 185 / 198 = 156.88$ . Pls clarify.				
<b>Project participant response</b>				Date: 03/02/2020
Under choice of data for Bo <sub>LT</sub> reference to "The use of Annex I species defaults for VS", "VS" is a typographical error and is revised to "Bo". The market VSLT calculates $0.3 \times 365 \times 62.46 / 50 = 136.78$ and for breeding $0.46 \times 365 \times 184.64 / 198 = 156.57$ with two decimal places considered for the weights in the calculation.				
<b>Documentation provided by project participant</b>				
Revised CPA-DD				
<b>DOE assessment</b>				Date: 14/05/2020
Not Ok. The reference description has been corrected accordingly and refers to the correct related parameter now. Besides, clarification has been provided w.r.t. the determination of the values for VS <sub>LT,y</sub> . The method of determination is understood, reasonable and correct. However, there is an inconsistency in the statement of the value in the CPA-DD. It is either stated 136.78 / 156.57 or 136.8 / 156.6 (rounded values). Values should be consistent throughout the CPA-DD. Further, revision requested.				

<b>Project participant response</b>		<b>Date:</b> 20/05/2020
Values for $VS_{LT,y}$ have been made consistent/corrected to reflect 136.8 and 156.5 throughout the CPA-DD.		
<b>Documentation provided by project participant</b>		
Revised CPA-DD, revised ER calculation spreadsheet		
<b>DOE assessment</b>		<b>Date:</b> 25/05/2020
Ok. The values for parameter are now consistent throughout the CPA-DD. Therefore, this finding is closed.		
<b>Conclusion</b> Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

<b>CL ID</b>	02	<b>Section no.</b>	B.4.2, Appendix 3	<b>Date:</b> 31/01/2020
<b>Description of CL</b>				
<p>Clarification is requested w.r.t. the <math>EF_{grid,CM,y}</math> value of 0.5979 tCO<sub>2</sub>e/MWh as indicated in section B.4.2 and especially Appendix 3 of the CPA-DD. DOE has checked this value with the stated source and found it consistent. However, as per related tool to calculate the grid emission factor §86 (b) for other projects than wind and solar the weighing factors shall be 0.25 for <math>w_{OM}</math> and 0.75 for <math>w_{BM}</math> for the 2<sup>nd</sup> and 3<sup>rd</sup> crediting period. Considering this the <math>EF_{grid,CM,y}</math> would result in <math>(0.25 \times 0.7122 + 0.75 \times 0.5979)</math> tCO<sub>2</sub>e/MWh = 0.626475 tCO<sub>2</sub>e/MWh. Clarification is requested how the value given by Philippines government for Luzon-Visayas Grid 2015-2017 <math>EF_{grid,CM,y}</math> (Other projects) of 0.5979 is determined. As per stated values it is equal to BM Emission Factor.</p>				
<b>Project participant response</b>				<b>Date:</b> 03/02/2020
<p>The <math>EF_{grid,CM,y}</math> value of 0.5979 tCO<sub>2</sub>e/MWh as indicated in section B.4.2 and Appendix 3 of the CPA-DD has been revised to 0.6265. The CME has communicated and verified with the Philippine Department of Energy (PDOE); and as per email communication dated February 14, 2020, the PDOE has affirmed that 0.5979 refers to the correct BM Emission Factor Value only; and that the value for CM Emission Factor, for <i>Other Projects</i>, as published in the PDOE website (<a href="https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef">https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef</a>), is indeed a typographical error. We further note that, as of this writing, the PDOE has made no correction of said typographical error in its webpage.</p> <p>As guided by CDM Methodological Tool 07 version 7, and using the OM and BM values, the <math>EF_{grid,CM,y}</math> value is calculated using the tool for the second crediting period for other projects and this value is 0.6265 for the Luzon-Visayas grid.</p>				
<b>Documentation provided by project participant</b>				
Communication – Confirmation of the error from PDOE (emails dated February 13-20, 2020); Revised CPA-DD; ER calculation spreadsheet				
<b>DOE assessment</b>				<b>Date:</b> 14/05/2020
<p>OK. As per provided communication with PDOE, the <math>EF_{grid}</math> is calculated based on the CDM approved methodology and tool. Besides, the combined margin EF as per PDOE webpage is based on 50:50 weighing factors. As based on related tool for 2<sup>nd</sup> and 3<sup>rd</sup> crediting period for this type of project different weighing factors have to be applied the PP correctly revised the <math>EF_{grid}</math> value to 0.6265 tCO<sub>2</sub>e/MWh. The CPA-DD has been updated accordingly.</p>				
<b>Conclusion</b> Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

Table 2. CAR from this validation

<b>CAR ID</b>	01	<b>Section no.</b>	A.4	<b>Date:</b> 31/01/2020
<b>Description of CAR</b>				

Following issues w.r.t. filling the CPA-DD as per instructions have been identified:

1. Title page: the title of the CPA is inconsistent with the title given on related UNFCCC CPA webpage.
2. Title page: The box w.r.t. "Title and UNFCCC reference number of the registered CDM PoA" has not been filled. Please provide
3. Title page: The number of the corresponding generic CPA is not provided in box "Title and reference number of the corresponding generic CPA"
4. A.1: The following is missing as per instructions: A summary of the location of the CPA, the project boundary, the estimation of annual average and total GHG emissions reductions for the chosen crediting period., indication of the small scale project type (Type I, Type II and/or Type III)
5. A.7: The following is missing:
  - a. Confirmation that:
    - i. The proposed CPA is neither registered as a CDM project activity nor included in another registered CDM PoA;
    - ii. The proposed CPA is not a project activity that has been deregistered.
  - b. Declaration whether:
    - i. The proposed CPA was a CPA that has been excluded from a registered CDM PoA;
    - ii. A registered CDM project activity or a CPA under a registered CDM PoA whose crediting period has or has not expired (hereinafter referred to as former project) exists in the same geographical location as the proposed CPA.
    - iii. If the declaration on b.i. or b.ii. above is positive, demonstrate that the proposed CPA meets all conditions for inclusion in the PoA in accordance with the applicable provisions in the project standard relating to re-inclusion of an excluded CPA in a registered CDM PoA or inclusion of a CPA that is in the same geographical location as a former project.
  - c. Besides clarify why reference to PRC is made in this section as not requested by the instructions to fill the CPA-DD.
6. B.2: As per instructions the diagram has to "indicate in the diagram the emissions sources and GHGs included in the project boundary and the data and parameters to be monitored" However, not all related GHG emissions are indicated and related monitored parameters are missing.

<b>Project participant response</b>	<b>Date: 03/02/2020</b>
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| <ol style="list-style-type: none"> <li>1. Title page: the title of the CPA is now consistent with the title given on related UNFCCC CPA webpage.</li> <li>2. Title page: The box w.r.t. "Title and UNFCCC reference number of the registered CDM PoA" has been provided</li> <li>3. Title page: The number of the corresponding generic CPA is now provided in box "Title and reference number of the corresponding generic CPA"</li> <li>4. A.1 has been revised to include as per instructions: A summary of the location of the CPA, the project boundary, the estimation of annual average and total GHG emissions reductions for the chosen crediting period., indication of the small scale project type (Type I, Type II and/or Type III).</li> <li>5. A.7: The following was added to the CPA-DD:           <ol style="list-style-type: none"> <li>a. Confirmation that:               <ol style="list-style-type: none"> <li>i. The proposed CPA is neither registered as a CDM project activity nor included in another registered CDM PoA;</li> <li>ii. The proposed CPA is not a project activity that has been deregistered.</li> </ol> </li> <li>b. Declaration that:               <ol style="list-style-type: none"> <li>i. The proposed CPA was not a CPA that has been excluded from a registered CDM PoA;</li> <li>ii. A registered CDM project activity or a CPA under a registered CDM PoA whose crediting period has or has not expired (hereinafter referred to as former project) does not exist in the same geographical location as the proposed CPA.</li> </ol> </li> <li>c. Reference to PRC is made in this section has been deleted.</li> </ol> </li> <li>6. B.2: As per instructions the diagram is revised to "indicate in the diagram the emissions sources and GHGs included in the project boundary and the data and parameters to be monitored" .All related GHG emissions and related monitored parameters are now indicated in the diagram.</li> </ol> |  |
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<b>Documentation provided by project participant</b>	
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Revised CPA-DD	
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<b>DOE assessment</b>	<b>Date: 14/05/2020</b>
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1. Not ok. The title of the CPA is still not 100% consistent. CPA-DD states "CPA-1 Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines' (LBP) Carbon Finance Support Facility" whereas UNFCCC project webpage states "CPA-1: Methane recovery and combustion with renewable energy generation from anaerobic animal manure management systems under the Land Bank of the Philippines' (LBP) Carbon Finance Support Facility". Further revision requested.
2. Ok. The box has now been filled with PoA ref number PoA 5979 and related title which is consistent with UNFCCC PoA webpage.
3. Ok. CPA-DD has been updated and provides now the related correct title consistent with UNFCCC CPA webpage.
4. Not Ok. The description in section A.1 has been revised to provide the required information as per instructions to fill the CPA-DD. Indication of Type of SSC is still missing.
5. Ok. Section A.7 has been revised accordingly and provides
  - a. Confirmation that
    - i. Project is not registered as CDM PA or included in another PoA
    - ii. CPA is not deregistered other PA
  - b. Declaration that
    - i. The CPA was not an excluded CPA from another PoA
    - ii. NO other CDM PA or PoA exists in the geographical location / region whose CP has been expired or not.
    - iii. Not applicable as i. and ii. Have been declared and are correct as per check of UNFCCC project registry.
  - c. Ok. Related PRC reference has been deleted in line with instructions to fill DD.
6. Ok. The diagram in section B.2 provides now the related required emission sources.

<b>Project participant response</b>		<b>Date:</b> 18/05/2020
1. The title page has been revised as required.		
<b>Documentation provided by project participant</b>		
Revised CPA-DD		
<b>DOE assessment</b>		<b>Date:</b> 25/05/2020
1. OK. The title in the revised CPA-DD is now consistent with related UNFCCC project webpage.		
4. Not ok. Still not updated in line with instructions.		
<b>Project participant response</b>		<b>Date:</b> 29/05/2020
4. Revised in line with instructions		
<b>Documentation provided by project participant</b>		
Revised CPA-DD		
<b>DOE assessment</b>		<b>Date:</b> 29/05/2020
4. OK. The title in the revised CPA-DD is now consistent with related UNFCCC project webpage.		
As all remaining issues have been resolved, this finding is closed.		
<b>Conclusion</b> Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

<b>CAR ID</b>	02	<b>Section no.</b>	B.4.2	<b>Date:</b> 31/01/2020
<b>Description of CAR</b>				

1. For parameter  $W_{\text{default}}$  reference is made to IPCC default tables. However, it is not mentioned which Volume and Chapter of the IPCC Guidelines. Please specify.
2. For parameter  $GWP_{\text{CH}_4}$  reference is made that the source would be AMS-III.D ("As per methodology"). However, related latest version of AMS-III.D does not provide related value anywhere. Pls clarify and correct accordingly.
3. Flare efficiency: The CPA-DD states a value of 90% and that "the default value corresponds to that of an enclosed flare" however the revised PoA-DD states the following:  
As per the Tool for "Project emissions from flaring" the value will be set depending on the following conditions:  
For enclosed flares  
0.9 If (a) the temperature of the flare and the flow rate of the residual gas to the flare is within the manufacturer's specification for the flare in minute m; and  
(b) The flame is detected in minute m .  
0 otherwise.  
Otherwise flare efficiency ,m is 0%.  
For enclosed flares that are defined as low height flares, the flare efficiency shall be adjusted, as a conservative approach, by subtracting 10 percentile points. For example, the default value applied shall be 80%, rather than 90%.  
For open flares,  
0.5 flare efficiency in the minute m is 50% when the flame is detected in the minute m  
0 otherwise  
Therefore, the description and justification und choice of data in the CPA-DD is not complete compared to the related PoA-DD. Revision requested. Besides, the title of the related tool06 is stated wrongly.
4. EGy: The value applied is given with 5,499.65 whereas section 4.3 gives a value of 3,666.43 MWh. Pls clarify the inconsistency and provide related evidence for this value.
5. Please clarify why  $SPEC_{\text{flare}}$  is not considered as an ex-ante fixed parameter in line with related TOOL06.

**Project participant response****Date:** 24/02/2020

1. This is now specified: IPCC default Tables 10 A-7 & A-8 of IPCC 2006 Vol 4 Chapter 10 Emissions from livestock and manure management.
2. For parameter  $GWP_{\text{CH}_4}$  reference is default value from IPCC. This is now revised in the CPA-DD.
3. The CPA-DD has been revised to be consistent with the description and justification and choice of data in the related PoA-DD Title of the Tool06 has been corrected.
4. EGy: The value applied is 3,666.43 MWh and the inconsistency has been corrected. Values are calculated as evidenced in the ER spreadsheet submitted,
5.  $SPEC_{\text{flare}}$  is now included as an ex-ante fixed parameter in line with related Tool 06.

**Documentation provided by project participant**

Revised CPA-DD,

**DOE assessment****Date:** 15/05/2020

1. OK. The related Volume and chapter has been provided now which is correct as per check with the source.
2. Ok. The related source for GWP methane has been corrected accordingly.<sup>/ipcc/</sup> Besides, para. 66 of EB69 meeting report "the Board agreed that the second commitment period global warming potentials (GWPs) shall apply to all calculations of emissions reductions or removals achieved from 01/01/2013".
3. OK. The determination of the flare efficiency as stated under choice of data or measurement methods and procedures is now in line with related updated PoA-DD submitted for renewal of crediting period of the PoA.
4. OK. The value has been correct and is now consistent throughout the CPA-DD. Besides, the values is reasonable and plausible considering the installed capacity of 280 kW, two engines operation hours of 8,184 (576h or 24 days a year for maintenance, overhaul and repair) and 80% availability.
5. OK. Parameter  $SPEC_{\text{flare}}$  is now considered as an ex-ante fixed parameter as per related tool and in line with updated PoA-DD recently submitted for renewal of crediting period of the corresponding PoA.

As all outstanding issues have been resolved this finding is closed.

**Conclusion**

Tick the appropriate checkbox

- ☐ Additional action should be taken (finding remains open)
- ☒ The finding is closed

**CAR ID** 03**Section no.**

B.4.3

**Date:** 29/01/2020**Description of CAR**

<ol style="list-style-type: none"> <li>1. Please clarify why equation (4) as per methodology AMS-III.D for determination of <math>N_{LT,y}</math> is not provided in the CPA-DD.</li> <li>2. Besides, the value stated under section B.4.3 for Market swine is stated as "Average population" whereas under section B.4.2 it is given as <math>N_{market}</math> sold. Please clarify and justify whether the value stated of 47,267 is the number of market swine sold in calendar year 2019 or the average population in the farm.</li> <li>3. Additionally, for breeding the value between B.4.2 and B.4.3 is inconsistent. B.4.2 refers to 4,127 and B.4.3 states in average 4,019. Pls clarify and revise accordingly.</li> <li>4. Further, please justify the assumption made for annual elec generation based on latest generation data as given in 1st verification report and ER spreadsheet. Esp the generator operating rate of 80%.</li> <li>5. Also clarify why the emission reductions states that "Emission for power use (<math>PE_{power,y}</math>) is zero as Marcela Farms relies on no electricity" even though a related finding has been raised (CAR 13) in 1<sup>st</sup> verification report.</li> </ol>	
<b>Project participant response</b>	<b>Date: 06/03/2020</b>
<ol style="list-style-type: none"> <li>1. Annual average animal population (<math>N_{LT,y}</math>) for breeding and market pigs is determined from actual pig census in the farm, thus equation (4) as per methodology AMS-III.D for determination of <math>N_{LT,y}</math> is not provided in the CPA-DD.</li> <li>2. The table was revised to reflect <math>N_{market,y}</math> (47,267) since the parameter <math>N_{LT,y}</math> pertains to average market swine population alive in the farm in a year taken from actual census data and not the market swine sold.</li> <li>3. For breeding the value between B.4.2 and B.4.3 is consistent in the CPA-DD. B.4.2 refers to 4,127 which is the total population for sow and boar and the table in B.4.3 states averages 4,019 for sow, 108 for boar, resulting in total of 4,127 for breeding animals.</li> <li>4. The first verification report does not reflect the operating rate which is targeted or planned for normal operation of the power plant and thus cannot be used to replace the assumption of 80% operating load. The low operating loads during the first verification were due to breakdown of the generator sets which are not expected for this crediting period.</li> <li>5. CAR 13 in 1<sup>st</sup> verification report was for CPA-2 (Biotech) and not for CPA-1 (Marcela), Emission for power use (<math>PE_{power,y}</math>) is estimated conservatively as 14 based on first verification report for Marcela Farms. Attached is PoA5979 ER Summary (2012-2015), for reference on how <math>PE_{power,y}</math> is estimated.</li> </ol>	
<b>Documentation provided by project participant</b>	
Revised CPA-DD; PoA5979 ER Summary (2012-2015)	
<b>DOE assessment</b>	<b>Date: 15/05/2020</b>
<ol style="list-style-type: none"> <li>1. Not ok. The description of the CPA-DD is not consistent with the related PoA-DD submitted for renewal of PoA CP. Accordingly, the related values have to be determined too. Further revision requested.</li> <li>2. Not ok. As per response the value stated is the number of swine sold during a year however the table still refers to "average population". Pls clarify this contradiction. Further, if the value stated is number of animals sold in this year then please specify how this is in line with the determination of the parameter <math>N_{LT,y}</math> as per methodology (AMS-III.D v21 equation (4)) and as described in the related PoA-DD.</li> <li>3. Ok. Clarification provided. For breeding there are two types sow and boar. Number of sow is 4,109 and boar 108 and weight of sow is 183 and boar 243. The weighted average weight therefore for breeding (sow and boar) is <math>(4,109 \times 183 + 108 \times 243) / (4,109 + 108) = 4,127 = 184.6</math> rounded to 185. Accordingly, the value given in section B.4.2 of the CPA-DD is consistent with B.4.3. values.</li> <li>4. Not ok. CPA-DD section 4.3 states that <math>EG_y</math> is <math>2 \times 0.28MW \times 80\% \times 8,184</math> hours. This is based on rated capacity of engine of 280 kW for each engine. As per related first verification report including this CPA it is stated on page 14 as following: "CPA owner has installed two Gas engines for generating electricity and generating capacity of these gas engines are found identical i.e. 300kw." Therefore the applied capacity for ex-ante estimation in this renewal of CP for CPA1 is inconsistent with related first verification report. Besides, the verification report refers on the same page 14 that since commissioning of the 1<sup>st</sup> engine in December 2010 the engine was under repair and it was resumed operation from 05/07/2013. 2<sup>nd</sup> engine was commissioned on 06/03/2013. Even though, as per ER summary on 1<sup>st</sup> verification, the electricity generation from March 2013 until end of first monitoring period 30/06/2015 is continuously low at a monthly average generation of 34.2 MWh. This is an availability of as low as 11.2% <math>(34.2 / 305.5 [3666.43/12 \text{ for monthly generation}] \times 100\% = 11.2\%</math>. Please provide further justification with evidence that the 80% operating rate is reasonable for the next crediting period.</li> <li>5. Ok. CAR 13 of first verification is on Biotech CPA2, therefore not relevant as crosschecked with the report again. As per ER summary spreadsheet of first verification for this CPA, the monthly average <math>PE_{power,y}</math> is 1.13 tCO<sub>2</sub>e. Therefore considering 0 zero as an ex-ante estimate is considered reasonable as the project emissions are almost negligible.</li> </ol>	
<b>Project participant response</b>	<b>Date: 18/05/2020</b>



<p>1. The description of the CPA-DD is now consistent with the related latest PoA-DD submitted for renewal of PoA CP, the calculation of <math>N_{LT,y}</math> (equation 4) is included. Accordingly, the related values have been determined at the farm level and the values submitted reflect <math>N_{LT,y}</math>.</p> <p>2. As per previous response, "The table was revised to reflect <math>N_{market,y}</math> (47,267) since the parameter <math>N_{LT,y}</math> pertains to average market swine population alive in the farm in a year taken from actual census data <u>and not the market swine sold</u>". To further clarify, the farm has submitted this value taking into consideration the number of days the market swine stay alive in the farm for the year using equation 4 and they have reported <math>N_{LT,y}</math> which is now reflected in the revised CPA-DD.</p> <p>4. Upon checking, the rated capacity of the engines are 1x 300 kW (Waukesha, engine 2), and 2 x 280 kW engines (Mitsubishi, engine 3a/3b) are usually operated, with 1 unit of 280 kW serving as back-up. One of the mentioned engines for the first verification is for repair since April 2017 and is not currently in use. Availability of engines is now decreased to 65% and this is used in the revised ER calculation spreadsheet. To date, Marcela has also on site 2x 395 kW Waukesha engines which are not yet connected to the system and may be used in the future.</p>	
<b>Documentation provided by project participant</b>	
Revised CPA-DD, Revised ER calculation spreadsheet	
<b>DOE assessment</b>	<b>Date: 25/05/2020</b>
<p>1. Ok. The description has been revised accordingly and is now in line with corresponding PoA-DD submitted for renewal of crediting period. Also the values for <math>N_{LT,y}</math> for breeding and market are determined correctly. E.g. <math>N_{LT,market} = 115,016 \times 150 / 365 = 47,267</math>. As a breeding pig's lifetime is longer than 365 days the related value is equal to the value of average number of animals in the farm for that year e.g. <math>(4,019+108) \times 365 / 365 = 4,127</math>.</p> <p>2. Ok. As the missing description for determination of <math>N_{LT,y}</math> is now provided the related numbers could be reproduced. E.g. <math>N_{LT,market} = 115,016 \times 150 / 365 = 47,267</math>. As a breeding pig's lifetime is longer than 365 days the related value is equal to the value of average number of animals in the farm for that year e.g. <math>(4,019+108) \times 365 / 365 = 4,127</math>.</p> <p>4. Not Ok. Further specification has been provided. As per provided pictures of engine hour meters and summary document, the operation rate of 70% and an availability of 65% (<math>= 8184/8760 \times 70\%</math>) is reasonable and plausible esp based on 2017 data for engine 1 and 2 and 2018 data and one engine for back-up. However, based on evidence provided number 11.1a Biogas Engines 1 and 2 plates the rated capacity of engine 1 is 300 kW (Waukesha type, serial number C-95222/1) and that of engine 2 is also 300 kW (Waukesha type, serial number 5283701478) . Based on that two (2) Waukesha of 300 kW capacity and two (2) Fuso/Mitsubishi of 280 kW capacity are installed. Further, please clarify the EGy result of 3,322.7 MWh/ year as the given values <math>EGy = 1 \times 0.3 \text{ MW} \times 70\% \times 8,184 \text{ hours} + 2 \times 0.28 \text{ MW} \times 70\% \times 8,184 \text{ hours}</math> result in <math>0.86 \text{ MW} \times 0.7 \times 8184 \text{ h/a} = 4,926.8 \text{ MWh}</math>.</p>	
<b>Project participant response</b>	<b>Date: 26/05/2020</b>
<p>4. At present, only the Engine 2 – 300 kW (Waukesha type, serial number 5283701478) is operating with the 280 kW engine (Fuso/Mitsubishi, serial no. STG170493); the other 280 kW engine (Fuso/Mitsubishi, serial no. STG170495) serves as back-up to this latter engine. The biogas Engine 1 with rated capacity of 300 kW (Waukesha type, serial number C-95222/1) that has been previously used is currently not operating. It is assumed that this Engine 1 – 300 kW will no longer be repaired. Aside from the aforementioned three (3) operating engines, Marcela has also on-site 2 x 395 kW Waukesha (Serial Nos.:5283700382 and 5283700367) engines, which are not yet connected and commissioned to the system, but are on standby for use in future operations (as per latest information from proponent, planned connection and commissioning is by 2021 at the earliest). Technical specifications included in documentation pack provided. CPA-DD and ER calculation spreadsheets are revised, using engine specifications and assumptions described herein.</p>	
<b>Documentation provided by project participant</b>	
Revised CPA-DD; Revised ER calculation spreadsheet; supporting documents/attachments, as included documentation pack provided.	
<b>DOE assessment</b>	<b>Date: 26/05/2020</b>

4. OK. Further, specification and supporting documents have been provided. The set up and plan of the installed and available as well operating and to be operated engines is now clarified and corrected as per CPA-DD. Based on that the elec generation could be recalculated and is correct:  $EGy = 1 * 0.3 \text{ MW} * 70\% * 8,184 \text{ hours} + 1 * 0.28 \text{ MW} * 70\% * 8,184 \text{ hours}$  result in  $0.56 \text{ MW} \times 0.7 \times 8184 \text{ h/a} = 3,322.7 \text{ MWh}$ . Finally, the ER spreadsheet contains an operation plan for each engine for the 2<sup>nd</sup> crediting period on which basis the ER calculation is conducted. The plan is in line with the response provided. In total six (6) engine are considered for the component project activity of which 2 are currently actually operating one is for back-up and one is broken down and will not be repaired. Further two engines are already available but not connected yet. Related name plate pics of all engines have been provided and checked and related capacities and serial numbers are in line with the name plate pictures.

As all outstanding issues have been resolved this finding is closed.

**Conclusion**

*Tick the appropriate checkbox*

- ☐ Additional action should be taken (finding remains open)  
☒ The finding is closed

<b>CAR ID</b>	04	<b>Section no.</b>	F	<b>Date:</b> 31/01/2020
<b>Description of CAR</b>				
Following issues w.r.t. eligibility criteria have been identified:				
<ol style="list-style-type: none"> <li>1. The description of several criteria are not fully consistent with the related applicability criteria as described in the related methodology. E.g. EC11 and 14.</li> <li>2. The "Eligibility criterion – Category" and Eligibility criterion – Required condition" descriptions in the CPA-DD are not consistent with the related PoA-DD.</li> </ol>				
<b>Project participant response</b>				<b>Date:</b> 06/03/2020
Section F has been revised for issues w.r.t. eligibility criteria:				
<ol style="list-style-type: none"> <li>1. The description of several criteria are now fully consistent with the related applicability criteria as described in the related methodology. E.g. EC11 and 14.</li> <li>2. The "Eligibility criterion – Category" and Eligibility criterion – Required condition" descriptions in the CPA-DD are now consistent with the related PoA-DD.</li> </ol>				
<b>Documentation provided by project participant</b>				
Revised CPA-DD				
<b>DOE assessment</b>				<b>Date:</b> 15/05/2020
<ol style="list-style-type: none"> <li>1. Not ok. Revised CPA-DD is still not consistent with latest PoA-DD version 15 submitted recently for requesting renewal of crediting period of PoA w.r.t. description and complete number of eligibility criteria. Further, revision requested.</li> <li>2. Not ok. Revised CPA-DD is still not consistent with latest PoA-DD version 15 submitted recently for requesting renewal of crediting period of PoA w.r.t. description and complete number of eligibility criteria. Further, revision requested.</li> </ol>				
<b>Project participant response</b>				<b>Date:</b> 18/05/2020
<ol style="list-style-type: none"> <li>1. Revised CPA-DD is now consistent with latest PoA-DD version 15 submitted recently for requesting renewal of crediting period of PoA w.r.t. description and complete number of eligibility criteria.</li> <li>2. Revised CPA-DD is now consistent with latest PoA-DD version 15 submitted recently for requesting renewal of crediting period of PoA w.r.t. description and complete number of eligibility criteria.</li> </ol>				
<b>Documentation provided by project participant</b>				
Revised CPA-DD				
<b>DOE assessment</b>				<b>Date:</b> 25/05/2020
<ol style="list-style-type: none"> <li>1. The revised CPA-DD is now consistent with the PoA-DD submitted recently for renewal of CP.</li> <li>2. The revised CPA-DD is now consistent with the PoA-DD submitted recently for renewal of CP.</li> </ol>				
As all outstanding issues have been resolved this finding is closed.				
<b>Conclusion</b>				
<i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

<b>CAR ID</b>	05	<b>Section no.</b>	B.5.1, B.5.2	<b>Date:</b> 31/01/2020
<b>Description of CAR</b>				

Under measurement method as described for parameter  $W_{site}$  it is stated that "Simple random sampling approach will be preferred." Besides, under section B.5.2 it is stated that the target population is "categories of pigs: breeding / market / sow / boar / finisher / nursery / suckling etc. " and also that simple random sampling is applied. Please clarify how this is in line with the monitoring methodology as per AMS-III.D ver 21 Box 2 Non-binding best practice example 3: Procedure to measure  $W_{site}$  esp Point 2 and 3

2. Target population: The target population is the 30,000 cattle in the farm, classified into 5 age categories, i.e. dry cow, milk cow, young cow, growing cow and calf.

3. Sampling method: **Stratified random sampling will be carried out.** The cattle population will be classified into 5 age categories as above.

4. Sample size: Approximate equation from the section 2.1.8 of Appendix 1 of "Guideline: Sampling and surveys for CDM project activities and programmes of activities" version 03.0 is used. A coefficient of variation (V) of 1 is used. The sample size is calculated as 271. After applying a response rate of 90% and 10% contingency, the sample size is rounded up to 333. (Please see Appendix 1 of "Guideline: Sampling and surveys for CDM project activities and programmes of activities" version 03.0 for the example of the calculation of sampling size. Or alternatively use the sample size calculator available at <https://cdm.unfccc.int/Reference/Guidclarif/index.html>).

Please clarify in course of the above as provided by AMS-III.D v 21 simple random sampling is still a valid option for the monitoring of the parameter  $W_{site}$ .

Finally, as per AMS-III.D box 2 please clarify why the following is not considered in the updated CPA-DD for monitoring  $W_{site}$ :

#### Data

1. Field Measurements: For each sampled cow, the weight will be monthly monitored with the scale installed at the farm by project owner.

2. Quality Assurance/Quality Control: Every technician to monitor the sampled cow will fill in the date and signature; the monitor forms will be collected, summarized and kept by the project participant. In addition, the scale will be calibrated annually.

3. Data analysis: The primary monitoring data are collected and used to calculate GHG emission reductions.

#### Implementation plan

The project participant will establish the detailed measurement plan and train the employees in the farm to collect the data, and the data shall be summarized and analyzed by the CDM manager.

#### Project participant response

Date: 06/03/2020

As per non-binding practice example given in latest methodology, the sampling method for  $w_{site}$  has been revised to Stratified random sampling. The CPA-DD was revised to consider data field measurement, QA/QC for  $W_{site}$  as suggested.

#### Documentation provided by project participant

Revised CPA-DD

#### DOE assessment

Date: 15/05/2020

OK. The CPA-DD has been updated. Stratified random sampling is now applied. However, usually all sold swine are weighed. Besides, monitoring section under parameter  $W_{site}$  now is consistent in related QA/QC method. Under other elements of monitoring it is now mentioned that an operation plan is developed that defines a standard against which the project performance will be measured in terms of its emission reductions (ER) and conformance with all standards and criteria under the CPA. This operation plan is even further specified. Therefore, the requirement by the methodology is now integrated in the monitoring plan of the CPA-DD.

Finding is closed.

#### Conclusion

Tick the appropriate checkbox

☐ Additional action should be taken (finding remains open)

☒ The finding is closed

CAR ID 06

Section no. B.5.1

Date: 31/01/2020

Description of CAR

Following issues w.r.t Section B.5.1 of the CPA-DD have been identified:

1. Parameter  $BG_{burnt,y}$ : As per CPA-DD section B.4.2 default value of 60% for methane content in biogas is applied. Please clarify and specify whether in accordance with AMS-III.D v 21 "Box 3 Non-binding best practice example 4: Application of the default value of methane content in biogas" the related amount of biogas flow is also monitored on a dry basis as, as per methodology the biogas flow and methane content have to be monitored on the same basis.
2. Parameter  $MS\%_{i,y}$ : The parameter description is inconsistent between CPA-DD and methodology AMS-III.D v21. This parameter is not concerning the monitoring of any baseline data but project data. Further, please clarify how the measurement procedure and monitoring frequency as given in CPA-DD are in line with the requirements by the methodology AMS-III.D v21.
3. Parameter  $nd,y$ : The parameter description is inconsistent between CPA-DD and methodology AMS-III.D v21. Further, please clarify how the measurement procedure and monitoring frequency as given in CPA-DD are in line with the requirements by the methodology AMS-III.D v21.
4. Parameter  $\eta_{flare,h}$ : Under source of data it is referred to "Tool to determine project emissions from flaring gases containing methane" however, latest title of TOOL06 is "Project emissions from flaring". Please correct the inconsistency. Besides, the measurement method is not as per description given in related PoA-DD.
5. Parameter  $T_{flare}$ : The parameter as per latest related TOOL06 is defined as  $T_{EG,m}$  and the description in the CPA-DD is inconsistent to the description in the TOOL06. Related descriptions under measurement procedure, QA/QC and any comment are not considered in the CPA-DD. Pls clarify.
6. Other flare operation parameters: Please clarify whether this parameter is the related parameter as given in the related TOOL06  $Flame_m$ . If so clarify how the description given in the CPA-DD is in line with the requirements given in the related TOOL06.
7. Please clarify how  $FCH_{4,RG,m}$  is monitored.
8. Please clarify why parameter  $EC_{AE}$  as per PoA-DD is not considered in the CPA-DD.

**Project participant response**

**Date:** 06/03/2020

Following issues w.r.t Section B.5.1 of the CPA-DD have been addressed:

1. Parameter  $BG_{burnt,y}$ : As per CPA-DD section B.4.2 default value of 60% for methane content in biogas is applied and in accordance with AMS-III.D v 21 "Box 3 Non-binding best practice example 4: Application of the default value of methane content in biogas" the related amount of biogas flow is also monitored/reported on a dry basis since, as per methodology the biogas flow and methane content have to be monitored on the same basis.
2. Parameter  $MS\%_{i,y}$ : The parameter description is revised and now consistent between CPA-DD and methodology AMS-III.D v21. This parameter is from monitored data, ex post and not from baseline data. Further, the measurement procedure and monitoring frequency as given in CPA-DD are now in line with the requirements by the methodology AMS-III.D v21.
3. Parameter  $nd,y$ : The parameter description is now consistent between CPA-DD and methodology AMS-III.D v21. The measurement procedure and monitoring frequency as given in CPA-DD are now in line with the requirements by the methodology AMS-III.D v21.
4. Parameter FE or flare efficiency: Under source of data, the CPA-DD is revised from "Tool to determine project emissions from flaring gases containing methane" to the latest title of TOOL06 is "Project emissions from flaring". The measurement method is now as per description given in related PoA-DD.
5. Parameter  $T_{flare}$ : The parameter was revised as per latest related TOOL06 and is now  $T_{EG,m}$ . The description in the CPA-DD is now consistent to the description in the TOOL06. Related descriptions under measurement procedure, QA/QC and any comment are also considered in the CPA-DD.
6. Other flare operation parameters: This parameter is now specified as  $Flame_m$  in TOOL06. The description given in the CPA-DD is in line with the requirements given in the related TOOL06
7.  $FCH_{4,RG,m}$ , is measured as the mass flow of methane in the residual gaseous stream during minute m.  $FCH_{4,m}$  shall be determined on a dry basis. Equation 3 as described in Section 6.1 of Tool06 shall be used to determine  $FCH_{4,m}$  from volumetric flow (measured) of the exhaust gas of the flare on a dry basis at reference conditions in minute m ( $m^3$ ) sent to flare.  $FCH_{4,RG,m}$  is also included as a parameter under Section B 5.1.
8. Parameter  $EC_{AE}$  as per PoA-DD is now considered in the CPA-DD.

**Documentation provided by project participant**

Revised CPA-DD

**DOE assessment**

**Date:** 15/05/2020

<ol style="list-style-type: none"> <li>1. Ok. CPA-DD has been updated and specifies that if default methane content is applied the flow is reported on dry basis and flow measurement is on same basis as methane content measurement.</li> <li>2. Ok. CPA-DD has been updated accordingly and is now in line with related methodology.</li> <li>3. Ok. CPA-DD has been updated accordingly and is now in line with related methodology.</li> <li>4. Ok. Parameter is revised to FE and description now fully consistent with related PoA-DD ver 15 recently submitted for renewal of crediting period of PoA. Also description of the related tool is corrected.</li> <li>5. Not ok. The parameter description is now in line with related tool and PoA-DD ver 15 recently submitted for renewal of crediting period of PoA. However, please clarify and specify the stated data unit given.</li> <li>6. Ok. Parameter is revised to FE and description now fully consistent with related PoA-DD ver 15 recently submitted for renewal of crediting period of PoA. Also description of the related tool is corrected.</li> <li>7. Not OK. Related parameter is now included in the monitoring section of the CPA-DD. However, the table used for this parameter is not in line with the template table e.g. "Data / Parameter" is not given and row for "Data unit:" is missing. Description under data source is not considered a data source but measurement method. Please check the entire table and revise in line with related tool and PoA-DD. Please also check other tables some refer to Data unit others to "Unit" only e.g. EG<sub>y</sub> or EC<sub>PJ,y</sub>.</li> <li>8. Ok. Related parameter is now included in monitoring section of CPA-DD and in line with related PoA-DD ver 15 recently submitted for renewal of crediting period of the PoA.</li> </ol>	
<b>Project participant response</b>	<b>Date: 18/05/2020</b>
<ol style="list-style-type: none"> <li>5. The stated data unit given which was a typographical error is now corrected to °C.</li> <li>7. Related parameter has been removed from monitoring section and was made consistent with parameter monitored in the PoA-DD. Table used for the parameter <math>FV_{RG,m}</math> is now in line with the template table and CPA-DD is revised in line with related tool and PoA-DD. All other tables were checked and now refer to Data unit instead of "unit" e.g. EC<sub>PJ,y</sub>.</li> </ol>	
<b>Documentation provided by project participant</b>	
Revised CPA-DD	
<b>DOE assessment</b>	<b>Date: 25/05/2020</b>
<ol style="list-style-type: none"> <li>5. OK. Revised CPA-DD has been corrected accordingly and provides now clearly related data unit "°C".</li> <li>7. OK. Related parameter table is now fully consistent with the related table as per PoA-DD ver 15 recently submitted for renewal of CP of the PoA.</li> </ol> <p>As all outstanding issues have been resolved this finding is closed.</p>	

<b>CAR ID</b>	07	<b>Section no.</b>		<b>Date: 31/01/2020</b>
<b>Description of CAR</b>				
<ol style="list-style-type: none"> <li>1. CPA-DD in track changes where changes made to registered CPA-DD are clearly and transparently identifiable</li> <li>2. Recent supporting documents on average animal weight for market swine and breeding.</li> <li>3. Recent certificates on Genetic source</li> <li>4. Farm records to evidence number of days animal is alive in the farm for market swine and breeding</li> <li>5. Farm records on number of animals produced annually for market swine and breeding</li> <li>6. Most recent evidence on formulated food ratio</li> <li>7. Evidence that an enclosed none low height flare is installed is provided.</li> <li>8. Most recent evidence on actual operation hours is provided</li> <li>9. Documented evidence from Marcela site visit dated 11/04/2019 by LBP staff As per AMS-III.D, para 3 as stated under eligibility criterion 2</li> <li>10. Latest farm discharge permits</li> <li>11. Technical data sheet of installed engines and related contract</li> <li>12. Most recent ECC</li> <li>13. Supporting on installed monitoring system such as PID, flow diagram, wiring diagram, etc.</li> <li>14. Marcela Farm Company reg or business licence.</li> <li>15. Evidence that anaerobic lagoons are not restricted by Philippine law.</li> </ol>				
<b>Project participant response</b>				<b>Date: 06/03/2020</b>

1. CPA-DD in track changes using the current version of the template where changes made to registered CPA-DD is submitted. Approved registered CPA1-DD is also provided, for reference.
2. Recent supporting documents on average animal weight for market swine and breeding is submitted. Recent (2019) sales and monitoring records indicating pig weights are submitted, please refer to google drive link under documentation provided.
3. Genetic source certificates are submitted (accessible through the links below). Farm still uses the same genetic stock as was reported during its first registration into the CDM program. Please refer to google drive link under documentation provided.
4. Sample Farm records to evidence number of days animal is alive in the farm for market swine and breeding is provided. Recent farm inventory (Daily Stock Movement Report, 2019) is provided in google drive link below under "documentation provided".
5. In lieu of this, sample census for market swine and breeding alive in the farm are provided. Recent record (Daily Stock Movement Report, 2019) indicating farm production is provided in google drive link below under "documentation provided".
6. Most recent evidence on formulated food ratio is submitted. Recent feed formulation records are provided in google drive link below under "documentation provided".
7. Upon checking the dimensions, the flare is enclosed low height and the ER calculations are revised for flare efficiency of 80%. Photos of the flare showing its dimensions are accessible through google drive link below under "documentation provided".
8. Evidence of actual operating hours for engine and flare are submitted. Records and photos indicating flare and biogas gensets' running hours are provided in google drive link below under "documentation provided".
9. Marcela site visit dated 11/04/2019 report by LBP staff As per AMS-III.D, para 3 as stated under eligibility criterion 2 is submitted. LBP call report and photos taken during the visit dated 11/04/2019 are provided in google drive link below under "documentation provided".
10. Latest farm discharge permits are submitted, and accessible through google drive link below under "documentation provided".
11. Technical data sheet of installed engines and related contract are submitted; documents and photos indicating the specifications of biogas engines are provided, accessible through google drive link below under "documentation provided".
12. Most recent ECC is submitted, in the links below. Please note that with the ECC amendment, the farm's total estimated heads is 6300. Please see google drive link below under "documentation provided".
13. Support documents on installed monitoring system such as PID, flow diagram, are submitted. Diagram of grid-biogas power plant are provided in google drive link below under "documentation provided".
14. Marcela Farm Company registration is submitted. Most recent company business permit is provided in google drive link below under "documentation provided".
15. Section 14 of Republic Act 9275 (or RA 9275; also known as the Philippine Clean Water Act of 2004) states that "... the Department shall encourage the adoption of waste minimization and waste treatment technologies when such technologies are deemed cost effective."

In addition to this, Rule 12.1 of the corresponding Department of Environment and Natural Resources (DENR) Administrative Order No. 2005-10 (or DAO No. 2005-10; also known as Implementing Rules and Regulations (IRR) of the Philippine Clean Water Act of 2004) states that: "Although the guidelines are developed based upon particular technologies, these rules will not require that dischargers use the technologies on which the standards were based. Individual facilities may meet these requirements using whatever combination of treatment technologies and process changes they choose."

Neither RA 9275 nor DAO No. 2005-10 makes any reference to anaerobic lagoons, whether pertaining to restrictions or otherwise.

We attach copies of RA 9275 and DAO No. 2005-10, for reference.

#### Documentation provided by project participant

Revised CPA-DD; supporting documents/attachments, as indicated provided in: <https://drive.google.com/drive/folders/1IzIBNGIMoJmWawXlfJLeIJ-w4t60ac?usp=sharing>; Republic Act 9275; DAO No. 2005-10; approved registered CPA1-DD (pdf version).

DOE assessment

Date: 15/05/2020

1. CPA-DD in track-change mode showing all related changes is now provided.
2. To 14. Related evidence provided.
15. Related host country regulations have been checked and therefore it is confirmed that still the installation of an anaerobic digester and methane recovery and destruction facilities is not required for piggery farms. This is further supported by provided discharge permit and ECC as well as business license.

As all outstanding issues have been resolved this finding is closed.

**Conclusion**

*Tick the appropriate checkbox*

- ☐ Additional action should be taken (finding remains open)
- ☒ The finding is closed

**Table 4. FAR from this validation**

FAR ID	xx	Section no.	Date: DD/MM/YYYY
Description of FAR			
CME response			Date: DD/MM/YYYY
Documentation provided by CME			
DOE assessment			Date: DD/MM/YYYY

## Appendix 5. Eligibility Criteria Compliance

**Table A-5-1:** Assessment on CPA Compliance with Eligibility Criteria specified in the registered PoA-DD (PoA-PS, §299)

<input type="checkbox"/>	Eligibility Criteria have not been changed or updated since initial inclusion of the CPAs
<input checked="" type="checkbox"/>	Eligibility criteria have been updated as per below with related assessment.

CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
1	As per PoA Guidelines, CPA is not a component of another CDM programme, has not been registered as a project activity of another CDM project, is undergoing validation within another CDM project, nor is a debundled component of a large-scale project activity.	LBP CFSF Reply Form, with confirmation statement by the farm owner, indicating that the CPA is not a component of another CDM programme, has not been registered as a project activity of another CDM project, is undergoing validation within another CDM project, nor is a debundled component of a large scale project activity. LOI & confirmation statement is as per PoA Guidelines	N	<input checked="" type="checkbox"/>	/unfcc/ /INCL/ /VER/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Further, DOE checked UNFCCC webpage and could not identify that this CPA is also a component of another PoA and registered as a single CDM project activity.
2	Livestock farms from livestock populations managed under confined conditions.	Livestock farms from livestock populations managed under confined conditions Documented evidence from Marcela site visit dated 11/04/2019 by LBP staff As per AMS-III.D, para 3.	N	<input checked="" type="checkbox"/>	/BP/ /VER/ /TD/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures. Further, project layout has been provided, pig weighing records and daily stock movement. Therefore, EC is still valid and CPA is still in compliance.
3	Livestock farms where	Livestock farms where manure or the	N	<input checked="" type="checkbox"/>	/DP/	No update or changes to this eligibility criterion.



CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
	manure or the streams obtained after treatment is not discharged into natural water resources (e.g. rivers and estuaries).	streams obtained after treatment is not discharged into natural water resources (e.g. rivers and estuaries). Documented evidence from Marcela farms as per AMS III.D, para 3.			/VER/ /ECC/	As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked related discharge permit from 2009 and latest application for 2020 discharge permit. Therefore, EC is still valid and CPA is still in compliance.
4	Annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C	The Philippines has a mean annual temperature over 5°C. The mean annual temperature for the country is 26.6°C and Baguio is the coldest place in the country and has a mean annual temperature of 18.3°C. <a href="http://bagong.pagasa.dost.gov.ph/information/climate-philippines">http://bagong.pagasa.dost.gov.ph/information/climate-philippines</a>	N	<input checked="" type="checkbox"/>	/VER/ /INCL/	No change was conducted to this eligibility criterion. However, the related link <a href="http://bagong.pagasa.dost.gov.ph/information/climate-philippines">http://bagong.pagasa.dost.gov.ph/information/climate-philippines</a> has been checked and therefore it can be confirmed that the mean annual temperature is above 5°C with the coldest place in the country having a mean annual temperature of 18.3°C. Further, this has been crosschecked with the CPA inclusion report as well as latest verification report. Therefore, EC is still valid and CPA is still in compliance.
5	For anaerobic treatment systems in the baseline, the retention time of manure waste must be greater than 1 month.	For anaerobic treatment systems in the baseline, the retention time of manure waste must be greater than 1 month. Documented evidence on site visit along with information provided by CPA implementer: Dimension of existing lagoon/s and water consumption and/or As per para 3. AMS-III.D	N	<input checked="" type="checkbox"/>	/TD/ /VER/ /INCL/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and verification report. Therefore, EC is still valid and CPA is still in compliance.
6	For anaerobic lagoons in the baseline the depth is at least 1 meter.	For anaerobic lagoons in the baseline the depth is at least 1 meter. Depth of anaerobic lagoon is 3 m. as described in section B.3. As per para 3. AMS-III.D	N	<input checked="" type="checkbox"/>	/TD/ /VER/ /INCL/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures

CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
						as well as project layout and verification report. Therefore, EC is still valid and CPA is still in compliance.
7	The baseline system of waste management is an open anaerobic system with no methane recovery and destruction by flaring, combustion or gainful use.	The baseline system of waste management is an open anaerobic system with no methane recovery and destruction by flaring, combustion or gainful use. As per para 3. AMS-III.D, farm had an open anaerobic system with no methane recovery and destruction by flaring, combustion or gainful use in the baseline	N	<input checked="" type="checkbox"/>	/VER/ /INCL/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked CPA inclusion report and verification report. Therefore, EC is still valid and CPA is still in compliance.
8	Connection to an electricity distribution system that is supplied by at least one fossil fuel generating unit.	Connection to an electricity distribution system that is supplied by at least one fossil fuel generating unit. As per para 2. AMS-I.F. v3, CPA is connected to an electricity distribution system that is supplied by at least one fossil fuel generating unit, records are provided.	N	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked CPA inclusion report and verification report. Besides, CPA implementer provided an electricity bill demonstrating that it is connected to the local grid. Therefore, EC is still valid and CPA is still in compliance.
9	The project objective is the replacement of existing open lagoons and anaerobic ponds in livestock farms for anaerobic digesters with combustion equipment to destroy methane by utilizing either open or standardized enclosed stainless steel flares, sized to handle the generated biogas design volume to ensure high combustion efficiency, and/or	Replacement of existing open lagoons and anaerobic ponds in livestock farms for anaerobic digesters with combustion equipment to destroy methane by utilizing either open or standardized enclosed stainless steel flares, sized to handle the generated biogas design volume to ensure high combustion efficiency, and/or use of the recovered methane for electricity generation with gas engines. As per para 2. AMS-III.D, CPA	N	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/ /OP/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked CPA inclusion report and verification report. Besides, meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and engine contract and operation records as well as pictures of the flare and flare operation records. Therefore, EC is still valid and CPA is still in compliance.

CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
	use of the recovered methane for electricity generation with gas engines	provided project design documents during registration.				
10	The sludge is handled aerobically, and final application is made in proper conditions (i.e.,not resulting in methane emissions).	The sludge is handled aerobically, and final application is made in proper conditions (i.e.,not resulting in methane emissions). As per AMS-III.D, para 4. Applicability condition, this is documented in farm records	N	<input checked="" type="checkbox"/>	/VER/ /INCL/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked CPA inclusion report and verification report. Therefore, EC is still valid and CPA is still in compliance.
11	Technical measures are used (e.g. flared, combusted) to ensure that all biogas produced by the digester is utilized and combusted.	Technical measures are used (e.g. flared, combusted) to ensure that all biogas produced by the digester is utilized and combusted. As per AMS-III.D, para 4, this is documented in farm records.	N	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/ /OP/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked CPA inclusion report and verification report. Besides, meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and engine contract and operation records as well as pictures of the flare and flare operation records. Therefore, EC is still valid and CPA is still in compliance.
12	The storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. If the project proponent can demonstrate that the dry matter content of the manure when removed from the animal barns is larger than 20%, this time constraint will not apply	The storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. As per AMS-III.D, para 4. Documented evidence from Marcela farms.	Y	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/ /OP/	This eligibility criterion has been updated editorially to be consistent with the applicability condition in the related methodology, the requirement that storage time is not allowed to be longer than 45 days is still given. Besides, DOE checked CPA inclusion report and verification report. Besides, meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and engine contract and operation records as well as pictures of the flare and flare operation records. Therefore, EC is still valid and CPA is still in

CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
13	New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidelines to SSC CDM methodologies	New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidelines to SSC CDM methodologies. As per AMS-III.D, para 7. Farm records are available	N	<input checked="" type="checkbox"/>	/BP/ /INCL/ /VER/ /TD/	compliance. No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, as per provided business licence this is no greenfield project and as per engine contracts, verification and inclusion report as well as project layout, the project activity is also no capacity addition project. Therefore, EC is still valid and CPA is still in compliance.
14	The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the General Guidelines to SSC CDM methodologies.	The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the General Guidelines to SSC CDM methodologies. As per AMS-III.D, para 8.	N	<input checked="" type="checkbox"/>	/BP/ /INCL/ /VER/ /TD/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, as per provided business licence this is no greenfield project and as per engine contracts, verification and inclusion report as well as project layout, the project activity is also no capacity addition project. Therefore, this criterion is actually not applicable. Therefore, EC is still valid and CPA is still in compliance.
15	Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO <sub>2</sub> equivalent annually from all Type III components of the project activity.	Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO <sub>2</sub> equivalent annually from all Type III components of the project activity to adhere to the methodology SSC threshold. As per AMS-III.D, para 9; ER spreadsheet calculation are provided.	Y	<input checked="" type="checkbox"/>	/XLS/ /VER/ /TD/ /INCL/	This eligibility criterion has been updated editorially to be consistent with the criteria in the related methodology, the threshold of 60 ktCO <sub>2</sub> e is still given. As per provided updated ex-ante ER estimation spreadsheet for 2 <sup>nd</sup> crediting period, related verification report, the total amount is far below the threshold. Besides, as per verification report the emissions verified so far did not come near anywhere to 60 ktCO <sub>2</sub> e. Therefore it is still highly unlikely that the threshold will be exceeded. Therefore, EC is still valid and CPA is still in

CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
16	Renewable electricity generation from the recovered methane emissions with a maximum output capacity of 15 MW.	Renewable electricity generation from the recovered methane emissions with a maximum output capacity of 15 MW. As per AMS-I.F v3 para 16, aggregate capacity of the installed gensets is less than 15 MW.	N	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/ /OP/	compliance. No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked CPA inclusion report and verification report. Further the meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and engine contract and operation records as well as pictures of the flare and flare operation records. Based on that the total installed capacity and available and considering all the six engines of 1,950 kW the threshold of 15 MW is by far not reached. Therefore, EC is still valid and CPA is still in compliance.
17	The maximum capacity of the renewable energy component (in cases where it is a combination of renewable and non-renewable) is 15 MW	Maximum capacity of the renewable energy component is 15 MW in line with the small-scale threshold of AMS-I.F. As per AMS-I.F v3 para 8	N	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/ /OP/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked CPA inclusion report and verification report. Further the meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and engine contract and operation records. Based on that the total installed capacity and available and considering all the six engines of 1,950 kW the threshold of 15 MW is by far not reached. Therefore, EC is still valid and CPA is still in compliance.
18	Installation of additional generation units utilizing the recovered methane emissions at an existing	Installation of additional generation units utilizing the recovered methane emissions at an existing renewable energy facility provided that the	N	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/ /OP/	No update or changes to this eligibility criterion. As no changes occurred the initial assessment as per CPA inclusion report is still valid. Besides, DOE checked CPA inclusion report and

CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
	renewable energy facility provided that the added capacity of the project should be lower than 15 MW and is physically distinct <sup>3</sup> from the existing units.	added capacity of the project should be lower than or equal to 15 MW and is physically distinct. As per AMS-I.F v3 para 6, farm documents are available				verification report. Further the meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and engine contract and operation records as well as pictures of the flare and flare operation records. Based on that the total installed capacity and available and considering all the six engines of 1,950 kW the threshold of 15 MW is by far not reached. Therefore, EC is still valid and CPA is still in compliance.
19	Retrofitting or modification of an existing electricity generation facility to utilize the recovered methane emissions as fuel with the total output of the modified or retrofitted generating unit not exceeding 15 MW	Retrofitting or modification of an existing electricity generation facility to utilize the recovered methane emissions as fuel with the total output of the modified or retrofitted generating unit not exceeding 15 MW	N	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/ /OP/	No update or changes to this eligibility criterion. Further, as there is no retrofitting of equipment this EC is not applicable. DOE checked CPA inclusion report and verification report. Further the meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and engine contract and operation records as well as pictures of the flare and flare operation records. Based on that the total installed capacity and available and considering all the six engines of 1,950 kW the threshold of 15 MW is by far not reached. Therefore, EC is still valid and CPA is still in compliance.
20	The farm is operating an open anaerobic wastewater system in the baseline and the project technology involves higher costs of installation and operation to	The farm is operating an open anaerobic wastewater system in the baseline and the project technology involves higher costs of installation and operation to the farm owner coupled with higher technical	N	<input checked="" type="checkbox"/>	/VER/ /INCL/ /TD/ /OP/	No update or changes to this eligibility criterion. Further, as there is no retrofitting of equipment this EC is not applicable. DOE checked CPA inclusion report and verification report. Further the meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and

<sup>3</sup> Physically distinct units are those that are capable of generating electricity without the operation of existing units and that do not directly affect the mechanical, thermal or electrical characteristics of the existing facility.

CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
	the farm owner coupled with higher technical requirements for construction, operation and maintenance than continued operation of the open system. Hence this shall be demonstrated through: 1- Project technology involves the installation of a biogas collection and flare/use system 2- Project needs to be financed with future carbon revenues, used as securities to repay the loan.	requirements for construction, operation and maintenance than continued operation of the open system. As per "General guidelines for SSC CDM methodologies", farm records, letter are available.				11 <sup>th</sup> April 2019 as well as related provided pictures as well as project layout and engine contract and operation records as well as pictures of the flare and flare operation records. Based on that the total installed capacity and available and considering all the six engines of 1,950 kW the threshold of 15 MW is by far not reached. Based on that it is ensured that CPA involved installation of biogas collection and destruction equipment. Point 2 is already assessed during CPA inclusion. Therefore, EC is still valid and CPA is still in compliance.
21	The farm is compliant with the applicable Philippine environmental rules and regulations	The farm is operating an open anaerobic wastewater system in the baseline and the project technology involves higher costs of installation and operation to the farm owner coupled with higher technical requirements for construction, operation and maintenance than continued operation of the open system. As per "General guidelines for SSC CDM methodologies", farm records, letter are available.	N	<input checked="" type="checkbox"/>	/DP/ /VER/ /INCL/ /ECC/ /TD/	No update or changes to this eligibility criterion. DOE checked CPA inclusion report. Further the meeting report on quarterly inspection by LBP to the CPA conducted 10 <sup>th</sup> and 11 <sup>th</sup> April 2019 as well as related provided pictures besides, ECC and Discharge Permits have been checked. Therefore, EC is still valid and CPA is still in compliance.
22	After all the above conditions have been met and documented, the project proponent must have signed an MOA with LBP to be in a	Project proponent must have signed an MOA with LBP to be in a CPA in this program. Environmental compliance evidenced by ECC	N	<input checked="" type="checkbox"/>	/INCL/	Not update or change to initial eligibility criterion. As per validation report of the CPA for inclusion a related MOA with LBP has been provided and checked by DOE validated the inclusion. Therefore as no changes applied this criterion is

CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
	CPA in this program.					still fulfilled.
23	Emission reductions claimed under the CPA are those derived <u>only</u> from gas use for electricity generation and/or flared. No credits shall be claimed for any other uses of the gas.	Emission reductions claimed under the CPA are those derived only from gas use for electricity generation and/or flared.  Farm records are available.	N	<input checked="" type="checkbox"/>	/XLS/ /CEN SUS/	Not update or change to initial eligibility criterion. Related ex-ante ER calculation has been updated w.r.t. actual pig census of year 2019. The related values have been checked with related supporting documents such as farm records as well as previous validation and ER calculation as well as related verification documents. Accordingly, it is still confirmed that emission reductions are only claimed for gas use for electricity generation and/or flaring. Criterion fulfilled and still correct.
24	The project must have undertaken an environmental analysis as outlined in section E and a stakeholder consultation as outlined in Section F.	Conduct of Stakeholder's consultation. Invitation, list of attendees and Stakeholder comments for Marcela farms are available	N	<input checked="" type="checkbox"/>	/INCL/	Not updated or changed from initial eligibility criterion. Related stakeholder consultation has been taken place initially prior to inclusion of the CPA as per related CPA-DD as well as CPA inclusion report. Criterion fulfilled and still correct.
25	Geographical boundaries of CPAs should be consistent with the geographical boundary of the PoA	As per CDM project standard for programmes of activities (version 2), paragraph 124. Geographical location of farm/project; documented evidence from site visit by LBP staff.	N	<input checked="" type="checkbox"/>	/INCL/ /VER/ /ECC/ /DP/	Not updated or changed from the initial eligibility criterion. Based on check of CPA inclusion report as well as latest verification report the project boundary is consistent with related lates PoA-DD and generic CPA-DD as recently submitted for renewal of CP of the corresponding PoA. Besides, substantiated via ECC and discharge permit. Criterion fulfilled and still correct.
26	Double counting of GHG emission reductions or net anthropogenic GHG removals, should be avoided through measures such as unique identifications of product and end-user locations (e.g. programme	As per CDM project standard for programmes of activities (version 2), paragraph 124. Documented as per project design	N	<input checked="" type="checkbox"/>	/INCL/ /VER/ /BP/ /ECC/ /DP/	Not updated or changed from the initial eligibility criterion. This is checked vide CPA inclusion report and verification report. Besides, farms can easily be identified via GPS location as well as Business licence has been checked along with ECC and discharge permit. Criterion fulfilled and still correct.



CME Demonstration			DOE Assessment			
Nr.	Eligibility Criteria	Justification	EC changed/ updated [Y/N]	Appropriate and sufficient	Evidence used	Explanation of final result
27	logo) Start date of CPA should be checked through documentary evidence	As per CDM project standard for programmes of activities (version 2), paragraph 124. Documented evidence provided by CPA implementer.	N	<input checked="" type="checkbox"/>	/INCL/ /unfccc/	Not updated or changed from the initial eligibility criterion. As the CPA has already started this has been checked via UNFCCC project webpage as well as CPA inclusion report. Criterion fulfilled and still correct.
28	Compliance with the applicability of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents	As per CDM project standard for programmes of activities (version 2), paragraph 124. Documented as per project design	N	<input checked="" type="checkbox"/>	/INCL/ /VER/ /ECC/ /BP/ /TD/ /MET H/ /TOOL/	Not updated or changed from the initial eligibility criterion. All related applicability criteria are included in the list of eligibility criteria and where applicable have been updated in accordance with latest versions. Please refer to assessment to corresponding eligibility criteria. Besides, crosschecked with inclusion report, verification report, related supporting documents and methodologies and tools Criterion fulfilled and still correct.
29	If the generic CPA is small-scale or microscale, conditions for the de-bundling check based on the "Methodological tool: Assessment of de-bundling for small-scale project activities". However, if the generic CPA consists solely of units that qualify as "microscale CDM units", these conditions are not required.	As per CDM project standard for programmes of activities (version 2), paragraph 124. Documented as per project design	N	<input checked="" type="checkbox"/>	/INCL/ /VER/ /BP/ /ECC/ /DP/	Not updated or changed from the initial eligibility criterion. This is checked vide CPA inclusion report and verification report. Besides, farms can easily be identified via GPS location as well as Business licence has been checked along with ECC and discharge permit. Criterion fulfilled and still correct.

<sup>\*)</sup> In case clarifications have been requested by the validation team corresponding rows shall be added

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"><li>• Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN);</li><li>• Make editorial improvements.</li></ul>
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0). Change form symbol from CDM-CPA-RCP-FORM to CDM-CPA-RCPV-FORM.
01.0	3 August 2015	Initial publication.

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