CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM-SSC-PoA-DD) Version 01

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NOTE:

(i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.

(ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).

SECTION A. General description of small-scale programme of activities (PoA)

A.1 Title of the small-scale programme of activities (PoA):

AeroPod Composting and Co-composting Programme in Malaysia.

Version: 03
Date: 04/12/2012

A.2. Description of the small-scale programme of activities (PoA):

With over 400 palm oil mills in the country[1], Malaysia is the one of the world's largest producers of palm oil. The annual palm oil production in 2011 is 19.0 million tons[2], accounting for 39% of world palm oil production[3]. During the production process, wastes are generated in the forms of palm oil mill effluent (POME), empty fruit bunches (EFBs), mesocarp fibre and shell. For treatment of EFBs and other solid wastes, since incineration/ open burning has been prohibited in Malaysia as it leads to heavy air pollution[4], the potential ways of treating bio-solid wastes are either disposing in a landfill, or mulching. Mulching is not a wide–spread practice, not only because of the high cost for transportation and labour, but also because it attracs beetles that will destroy crops[5]. Thus, the common practice of the waste treatment in Malaysia is to send POME to a series of anaerobic and aerobic lagoons, and EFBs and other solid wastes to landfill[6]. These treatment processes result in the release of a large quantity of methane into the atmosphere.

General operating and implementing framework of PoA

The AeroPod Composting and Co-composting Programme in Malaysia (the "PoA"), to be coordinated and administered by Natural Objective Sdn Bhd ("NOSB") as the PoA coordinating/managing entity (CME), consists of multiple projects which will use bio-solid wastes including EFBs currently being landfilled, as well as a portion of wastewater (palm oil mill effluent, POME) currently treated in open lagoons to produce bio-organic fertiliser that can be used by the surrounding palm oil estates.

Policy/measure or stated goal of the PoA

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[1] Malaysian Palm Oil Council (MPOC), Palm Oil News (23rd October 2010) "Demand For Carbon Credits Will Continue": http://www.mpoc.org.my/Demand_For_Carbon_Credits_Will_Continue.aspx

[2] Malaysian Palm Oil Council (MPOC), Monthly Palm Oil Trade Statics (Dec 2011): http://www.mpoc.org.my/Monthly_Palm_Oil_Trade_Statistics.aspx

[3] Malaysian Palm Oil Council (MPOC), Malaysia Palm Oil Industry: http://www.mpoc.org.my/Malaysian_Palm_Oil_Industry.aspx

[4] Law of Malaysia Act 127, Environmental Quality Act 1974, section 29A: http://www.agc.gov.my/Akta/Vol.%203/Act%20127.pdf

[5] CTE-15 Composting of Empty Oil Palm Fruit Bunch (EFB) with Simultaneous Evaporation of Oil Mill Waste Water (POME), Frank Schuchardt, D. Darnoko, Purboyo Guritno

[6] Industrial Processes & The Environment (Handbook No.3) Crude Palm Oil Industry, published by the Department of Environment

The goal of the PoA, in recognition of the environmental burden caused by the lack of a sustainable waste management practice in the palm oil industry, is to introduce a zero-waste concept to palm oil mills by introducing an advanced technology for co-composting.

According to Chapter 6 of the 10th Malaysia Plan[7], one of the focuses to enhance the quality of life is to value the nation's environmental endowments. By recovering and recycling waste into bio-fertilizer, not only will the PoA reduce the volume of waste disposed at landfills, but also make full use of Malaysia's environmental endowments. The PoA's goal is thus fully consistent with the nation's stated goals.

The PoA and its CPAs contribute to the sustainable development of Malaysia in the following ways:

- The improvement of the local environment through the introduction of a sustainable solution to waste management. Apart from the reduction in methane, a potent GHG, the PoA will improve the environmental performance of the CPAs by (a) eliminating the need for EFBsand other solid wastes to be landfilled, and (b) reducing the wastewater that is otherwise left to degrade in open lagoons. The effect will be both a reduction in the stench coming from putrescible waste, as well as reduction in a flammable gas (methane) that is freely being emitted to the atmosphere.

- Reduction in the use of chemical fertilizers. The bio-organic fertiliser product from the CPAs is an effective natural replacement to chemical fertilizers. Such replacement has multiple benefits including, significantly, the reduction of chemical run off into waterways.

- The use of bio-organic fertilizers leads to better fruit yield and plant health, thereby improving the earnings of local farmers. Moreover, a steady and consistent supply of bio-fertilzer at a lower cost will encourage displacement of imported chemical fertilizers, which helps mitigate foreign exchange risk that the farmers are exposed to.

Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity

As discussed above, the wastes generated during palm oil production are usually treated in open lagoons and/or applied to land. There are no mandatory laws or regulations in Malaysia that require the treatment of solid palm oil mill wastes through composting. The only regulation with regard to the treatment of liquid waste is to meet a certain biological oxygen demand (BOD)[8]. It is confirmed that the PoA is a voluntary action by the CME.

A.3. Coordinating/managing entity and participants of SSC-POA:

Coordinating or managing entity of PoA as the entity which communicates with the Board
Natural Objective Sdn Bhd will be the Coordinating/Managing Entity of Programme of Activities which communicates with the CDM Executive Board.

Project participants being registered in relation to the PoA. Project participants may or may not be involved in one of the CPAs related to the PoA.

[7] Tenth Malaysia Plan (2011 – 2015), published by the Economic Planning Unit, Prime Minister's Department, Putrajaya, 2010: http://www.epu.gov.my/html/themes/epu/html/RMKE10/rmke10_english.html

[8] BOD discharge limits depend on the region and industry.

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Malaysia (host)	Natural Objective Sdn Bhd (Private entity)	No
Netherlands	Carbon Partners Asiatica (Hong Kong) Co., Ltd. (Private entity)	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

A.4. Technical description of the small-scale programme of activities:

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A.4.1. Location of the programme of activities:

The PoA will cover the whole country of Malaysia

A.4.1.1. Host Party(ies):

The host party for the PoA is Malaysia.

A.4.1.2. Physical/ Geographical boundary:

The geographical boundary of the PoA will be the country of Malaysia, within which all small-scale CDM programme activities (SSC-CPAs) included in the PoA will be implemented, taking into consideration all applicable national and/or sectoral policies and regulations of Malaysia.

Figure 1: Map of Malaysia, the geographical boundary of the PoA[9]

A.4.2. Description of a typical small-scale CDM programme activity (CPA):

A.4.2.1. Technology or measures to be employed by the SSC-CPA:

The typical CDM programme activity (CPA) under this PoA will prevent the atmospheric release of methane that is emitted when solid bio-wastes and POME decompose anaerobically in the landfill and open lagoons, thereby reducing greenhouse gas (GHG) emission, by employing a co-composting system. The composting system of each CPA will be newly constructed at or in close proximity to either an existing or new palm oil mill.

Each CPA will produce bio-organic fertiliser in an aerobic environment. The process technology to be applied in the CPA is a high-tech organic composting system called AeroPod®, a new invention under patents over the decades-old tunnel composting system. The unique composting apparatus has since 2008 been customised for palm oil mill waste, and its operational parameters configured for the specific characteristics of palm oil mill waste materials. The process will convert the mixture of solid bio-wastes and POME into high-value bio-organic fertilizers.

The apparatus is unique in that it was developed specifically for palm oil mill waste, unlike the old tunnel composting system for municipal solid waste. The unique features of AeroPod® include: enhanced aeration, air-jacketed aeration exchange for more stable controlled environment, adaptive air flow control for improved moisture balancing and temperature distribution, simplified construction method to cater to local labour and material availability, and optimized mechanical equipment (i.e. single fan operation).

[9] Source: http://www.nationsonline.org/oneworld/map/malaysia_map.htm

A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:

In accordance with EB 70 Annex 5, the *"Standard: Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (Version 02.0)"*, the eligibility criteria for inclusion of a CPA under the PoA are described in the table below.

Table 1: Eligibility criteria for the PoA

	Eligibility criteria	Documentary Evidence
1	The geographical boundary of the CPA.	Official documents such as mill license
2	Conditions to avoid double counting: (a) The location of the CPA and its GPS coordinates are uniquely identified. (b) Measures as elaborated in Section A.4.4.1 (ii) of the PoA-DD are followed to avoid double counting.	(a) Specific CPA-DD Section A.4.1.2 (b) Confirmation from the CPA implementer
3	Specifications of technology/measure: The composting process is based on the AeroPod system and plant design, a new in-vessel composting technology developed specifically for palm oil mill biowaste for quality assurance of compost production and operating procedures unique to AeroPod system.	Proposal / technical specification, including the level and type of service, performance specifications including compliance with testing/certification, from the technology provider
4	The start date of the CPA will be checked through documentary evidence, the date which will be defined as the start date of the CPA. This date shall not precede the PoA-DD global stakeholder consultation publication.	Contract between each CPA implementer and NOSB to agree to proceed with the construction of the co-composting facility for the CPA, or contracts for purchasing main equipments/ construction services. The earlier date should be chosen. In case that no contract has been signed and therefore the underlying project has not started, the expected date when the EPC (Engineering Procurement and Construction) contract signed shall be used as the Project started date.
5	Each CPA shall comply with the applicability and other requirements stipulated in AMS-III.F.	Specific CPA-DD Section B.2
6	Each CPA shall meet the requirements pertaining to the demonstration of additionality in Section E.5 of the PoA-DD.	Specific CPA-DD Section B.3
7	The PoA-specific requirements stipulated by the CME. (a) Local stakeholder consultations must be held by the CPA (b) As at current, an environmental impact analysis (EIA) is not required for co-composting projects. In case of EIA related regulation changes in the future, the CPA will follow the latest regulation.	(a) Minutes of meeting and the attendance list of the local stakeholder consultation (b) EIA exemption letter from the Department of Environmental or EIA report (if required by the government)

8	Each CPA shall affirm that it will not source public funding from Annex I parties. In case a CPA sources public funding from an Annex I party, that CPA shall obtain a CPA-level confirmation that such funding does not result in a diversion of official development assistance.	Declaration of no public funding signed by the CPA implementer.
9	The small-scale CPA shall meet the threshold criterion described in *"General Guidelines to SSC CDM methodologies (version 17)"*. For methane recovery projects, the emission reductions every year will not go beyond the limits of 60 ktCO_2e/y over the entire crediting period.	CER calculation spreadsheet for each specific CPA-DD.
10	Demonstration of whether the CPA is a de-bundled component.	Specific CPA-DD Section A.4.6

The criteria for demonstrating additionality of each CPA is described in section E.5.

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

The following information presents the demonstration of additionality of the PoA as a whole:

(i) The proposed PoA is a voluntary coordinated action.
NOSB, as the CME, is coordinating and encouraging palm oil mills in Malaysia to implement the composting facility. Apart from the revenue from CER sales, NOSB does not receive any incentive to carry out the PoA. In addition, there are no mandatory laws or regulations in Malaysia that require the treatment of palm oil mill wastes through composting, thus, it is confirmed that the composting PoA is a voluntary action.

(ii) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;

- Investment and institutional barrier
  Having said that the PoA's goal is fully consistent with the nation's stated goals, the government does not offer any incentive for the palm oil mills' owner to collect wastes for co-composting. The only source of revenue for composting plants is the sales of compost, which in fact is not attractive when compared to the high capital cost and operating cost. Palm oil mills have little incentive to carry out a financially unattractive project that is not a part of their core business in the absence of the PoA.[10]

- Technological barrier
  The core technology to be implemented in each CPA is AeroPod®, which is a new technology and has only been customised for palm oil mill waste since 2008. There is a

[10] CDM/JI Research Project for the Year 2007: Research Project on Methane Emissions Reduction by Composting Wastes from Palm Mill in Malaysia, published by Daiwa Institute of Research Ltd, March 2008

reluctance on the part of the palm oil mills to solve a nuisance (i.e. management of mill waste) with a technology measure they are not familiar with. As mentioned in Section A.2, most of the palm oil millers employed the conventional method for waste treatment.

- Prevailing practice barrier
  Nowadays, there are several methods to treat palm oil mill wastes. The most common practice in Malaysia is to send POME to a series of anaerobic and aerobic lagoons, and EFBs and other solid wastes to landfill. Although these kinds of treatment would lead to significant methane emissions, there are no mandatory laws or regulations in Malaysia to prohibit such kind of treatment[11]. As discussed in Section A.2, the only regulation with regard to the treatment of liquid waste is to meet a certain biological oxygen demand (BOD).

The PoA will not be implemented in the absence of the CDM, due to investment, technological, prevailing practice and institutional barriers. At the CPA level, additionality will be demonstrated via the investment barrier analysis. The procedures and criteria are described in sections E.5.1 an E.5.2.

(iii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced.
Not applicable. The PoA is not implementing a mandatory policy/ regulation.

(iv) If a mandatory policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.
Not applicable. No mandatory policy/regulation is enforced.

A.4.4. Operational, management and monitoring plan for the programme of activities (PoA):

A.4.4.1. Operational and management plan:

The CME will implement the following operational and management arrangement for the implementation of the PoA.

(i) A record keeping system for each CPA under the PoA

A database will be created to record the following information for each CPA:

- Title of each CPA
- Name and contact details of the CPA implementer
- The location and geographical coordinates of the CPA
- Starting date of the CPA
- Starting date and length of the crediting period

In addition, the CPA implementers will, in relation to the monitoring plan elaborated in Section E:

[11] *"Study on Clean Development Mechanism Potential in the Waste Sectors in Malaysia"* published by the Ministry of Energy, Water and Communications (MEWC), PTM, Danish International Development Assistance (DANIDA) in December 2004.

a. Provide the CME with electronic data in relation to all monitoring parameters which are stored and captured locally in the SQL (Structured Query Language) database.
b. Retain electronic data as well as, where relevant, the original hardcopy data for the entire crediting period and two years thereafter.

(ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA

Prior to the inclusion of a new CPA in the PoA, the CME as coordinating entity will

a. Check that the CPA is not already listed in the database as described in (i) above;
b. Check the UNFCCC website to ensure the CPA is not an existing CDM project activity that is registered as a CDM project or as a CPA of another PoA.
c. Should there be any overlap of project boundaries with an existing CDM project, the CPA implementer shall provide a written confirmation that:
   - There is no sharing of feedstock (i.e. EFB, POME etc.) and hence there is no overlap of activities; or
   - If there is a sharing of feedstock (e.g. 10% of POME is used as part of the CPA, whilst 90% of the POME is used for a separate biogas CDM project), then an explanation of measures taken, such as sufficient metering, to ensure there can be no double counting.
d. In addition, the implementer of each CPA shall provide a written confirmation that should it carry out another CDM activity on the same premises as the CPA in future, it will ensure there is no double-counting of CERs by making sufficient provisions in the documentation for that future activity.

(iii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

The CME will follow the *"Guidelines on Assessment of Debundling for SSC Project Activity (version 03)"* to confirm the CPA to be included in the PoA is not a de-bundled component of another CPA or CDM project activity.

1. A proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity, which satisfies both conditions (a) and (b) below:

   a. Has the same activity proposed small scale CPA implementer, or as the same coordinating or managing entity, which also manages a large scale PoA of same technology/ measure, and
   b. The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point

   The database at the UNFCCC website will be used to verify whether there is other activity registered as small-scale CPA of a PoA, or applied to register another small-scale CPA of a PoA, or registered as CDM project activity,

2. If a proposed small-scale CPA of the PoA is deemed to be a debundled component in accordance with the paragraph 1 above, but the total size of such a CPA combined with a registered small-scale CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM as set out in paragraph 28 of the decision 1/CMP.2, the CPA can qualify to use simplified modalities and procedures for small-scale CDM project activities.

3. If each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of the PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied, then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity.

(iv) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA;

To confirm that the entity implementing the CPA is aware and agreed that their activity is being subscribed to the PoA, contract will be signed between the CME and the CPA implementer before inclusion of the CPA in the PoA.

The Operational and Management Plan developed by the CME was submitted to DOE at the time of validation.

A.4.4.2. Monitoring plan:

The CME opts for a verification method that does not use sampling but verifies each CPA. The database, as described in Section A.4.4.1, will be used to ensure there is no double accounting occurs. The monitoring parameters shall be identified in accordance with the selected methodology AMS-III.F. Depending on the negotiation between the CME and CPA implementers, either the CPA implementer or CME will collect the monitoring data for CER calculations in accordance with the monitoring plan. The collected data will be submitted to the CME (i.e. NOSB), who is responsible for the monitoring report and supporting documentation. The completed monitoring report for all CPAs included in the PoA during the specific monitoring period will be submitted to the selected Designated Operational Entity (DOE) for verification.

A.4.5. Public funding of the programme of activities (PoA):

The PoA does not receive any public funding.

SECTION B. Duration of the programme of activities (PoA)

B.1. Starting date of the programme of activities (PoA):

20/04/2012

The start date of the PoA was determined based on the date of publication of the PoA-DD for global stakeholder consultation.

B.2. Length of the programme of activities (PoA):

28 years

SECTION C. Environmental Analysis

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C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

1. Environmental Analysis is done at PoA level ☐
2. Environmental Analysis is done at CPA level ☑

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

The environmental impacts analysis will be done at CPA level.

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA),:

Composting industrial waste is not listed as activities prescribed under *Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987"*[12], thus, an environmental impact assessment (EIA) for a typical CPA is not required by the host country. An EIA exemption letter will be obtained for each individual CPA.

SECTION D. Stakeholders' comments

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D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

1. Local stakeholder consultation is done at PoA level ☐
2. Local stakeholder consultation is done at CPA level ☑

D.2. Brief description how comments by local stakeholders have been invited and compiled:

Not applicable. Comments from local stakeholders will be invited at CPA level.

D.3. Summary of the comments received:

Not applicable. Comments from local stakeholders will be invited at CPA level.

D.4. Report on how due account was taken of any comments received:

[12] Department of Environment (Malaysian) http://www.agc.gov.my/Akta/Vol.%203/Act%20127.pdf

Not applicable. Comments from local stakeholders will be invited at CPA level.

SECTION E. Application of a baseline and monitoring methodology

This section shall demonstrate the application of the baseline and monitoring methodology to a typical SSC-CPA. The information defines the PoA specific elements that shall be included in preparing the PoA specific form used to define and include a SSC-CPA in this PoA (PoA specific CDM-SSC-CPA-DD).

E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:

The type and categories of the PoA are defined using the categorization of Appendix B[13] to the "*Simplified Modalities and Procedures for Small-Scale CDM Project Activities*":

Type III: Other project activities
Category III.F: Avoidance of methane emissions through controlled biological treatment of biomass (Version 10)
Sectoral Scope 13: Waste Handling and Disposal

The tools referenced in the above methodologies include:

- *"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"*, version 02
- *"Emission from solid waste disposal sites"*, version 06.0.0
- *"Tool to calculate baseline, project and/or leakage emissions from electricity consumption"*, version 01

E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:

Each CPA meets all the applicability conditions of the methodologies as described below.

Table 2: Applicability conditions for AMS-III.F version 10

Applicability condition		Project case
1	*This methodology comprises measures to avoid the emissions of methane to the atmosphere from biomass or other organic matter that would have otherwise been left to decay anaerobically in a solid waste disposal site (SWDS), or in an animal waste management system (AWMS), or in a wastewater treatment system (WWTS). In the project activity, controlled aerobic treatment by composting of biomass is introduced.*	Each CPA avoids the emissions of methane to the atmosphere from biomass or other organic matter that would have otherwise been left to decay anaerobically in a solid waste disposal site (SWDS), and in a wastewater treatment system (WWTS). A controlled aerobic treatment by composting of biomass will be introduced for each CPA.
2	*The project activity does not recover or combust landfill gas from the disposal site (unlike AMS-III.G "Landfill methane recovery"), and does not undertake controlled combustion of the waste that is not treated biologically in a first*	The CPA does not recover or combust landfill gas, undertake controlled combustion of the waste, recover biogas from wastewater treatment, or involve co-digestion of organic matters.

[13] Appendix B "*Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-scale CDM Project Activity Categories*": http://cdm.unfccc.int/Projects/pac/ssclistmeth.pdf

	step (unlike AMS-III.E "Avoidance of methane production from decay of biomass through controlled combustion, gasification or mechanical/thermal treatment"). Project activities that recover biogas from wastewater treatment shall use methodology AMS-III.H "Methane recovery in wastewater treatment". Project activities involving co-digestion of organic matters shall apply methodology AMS-III.AO "Methane recovery through controlled anaerobic digestion".	
3	*Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually.*	Annual emission reductions of a CPA will be less than or equal to 60 kt CO_2 equivalent.
4	*This methodology is applicable to the composting of the organic fraction of municipal solid waste and biomass waste from agricultural or agro-industrial activities including manure.*	Each CPA involves the composting of the organic fraction of biomass waste from agro-industrial activities (palm oil milling).
5	*This methodology includes construction and expansion of treatment facilities as well as activities that increase capacity utilization at an existing facility. For project activities that increase capacity utilization at existing facilities, project participant(s) shall demonstrate that special efforts are made to increase the capacity utilization, that the existing facility meets all applicable laws and regulations and that the existing facility is not included in a separate CDM project activity. The special efforts should be identified and described.*	The CPA includes the construction of a new treatment facility. Expansion and increase capacity utilization at existing co-composting facility will not be involved.
6	*This methodology is also applicable for co-composting wastewater and solid biomass waste, where wastewater would otherwise have been treated in an anaerobic wastewater treatment system without biogas recovery. The wastewater in the project scenario is used as a source of moisture and/or nutrients to the biological treatment process e.g. composting of empty fruit bunches (EFB), a residue from palm oil production, with the addition of palm oil mill effluent (POME) which is the wastewater co-produced from palm oil production.*	The CPA involves co-composting wastewater and solid biomass wastes, where the wastewater would have otherwise been treated in the anaerobic open lagoon system located at the palm oil mill. In the CPA, the wastewater will be used as a source of moisture, pH balance and nutrients for the composting process.
7	*In case of co-composting, if it can not be demonstrated that the organic matter would otherwise been left to decay anaerobically, baseline emissions related to such organic matter shall be accounted for as zero, whereas project emissions shall be calculated according to the procedures presented in this methodology*	Baseline emissions related to anaerobic decay of solid bio-wastes and POME will be accounted for as zero.

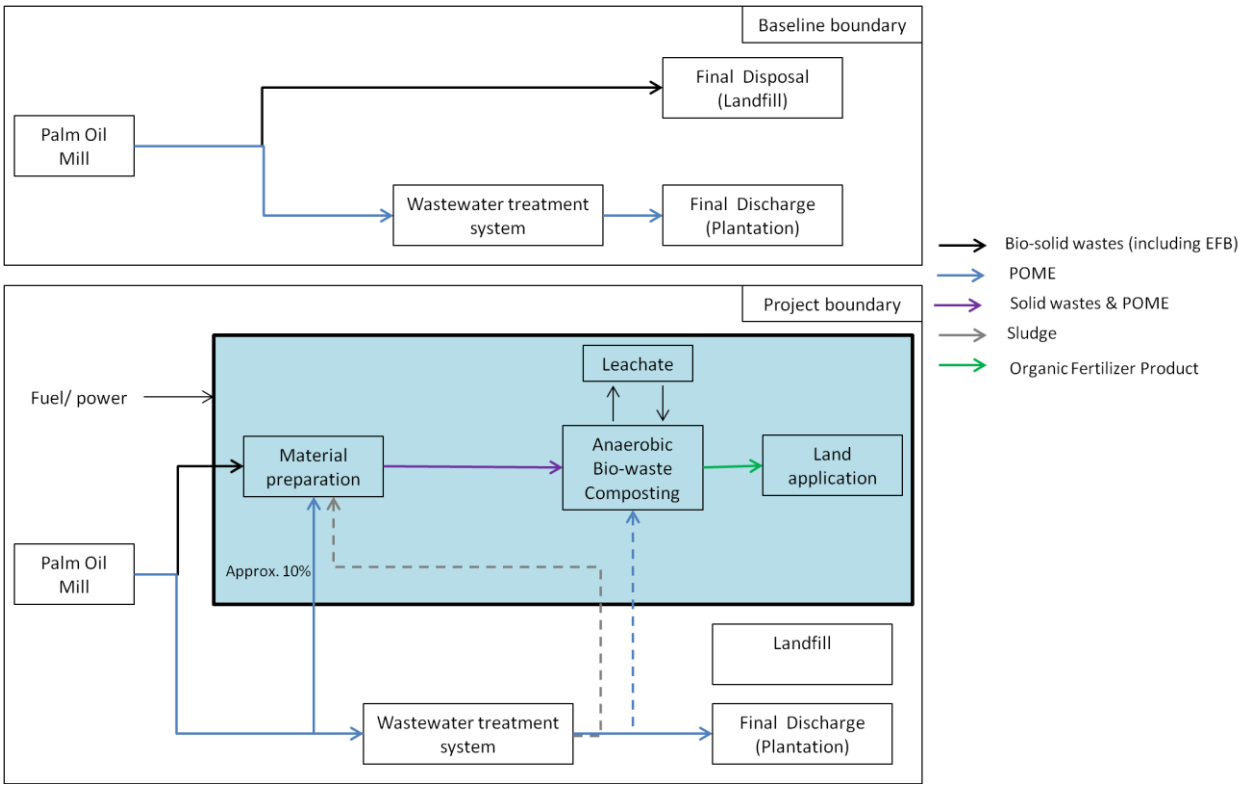
	for all co-composted substrates.	
8	*The location and characteristics of the disposal site of the biomass, animal manure and co-composting wastewater in the baseline condition shall be known, in such a way as to allow the estimation of its methane emissions, using the provisions of AMS-III.G, AMS-III.E (concerning stockpile), AMS-III.D "Methane recovery in animal manure management systems" or AMS-III.H respectively.* *Project activities for composting of animal manure shall also meet the requirements under paragraphs 1, and 2 (c) of AMS-III.D. Further no bedding material is used in the animal barns or intentionally added to the manure stream in the baseline. Blending materials may be added in the project scenario to increase the efficiency of the composting process (e.g. to achieve a desirable C/N ratio or free air space value), however, only monitored quantity of solid waste or manure or wastewater diverted from the baseline treatment system is used for emission reduction calculation. The following requirement shall be checked ex ante at the beginning of each crediting period:* *(a) Establish that identified landfill(s)/stockpile(s) can be expected to accommodate the waste to be used for the project activity for the duration of the crediting period;* *or* *(b) Establish that it is common practice in the region to dispose off the waste in solid waste disposal site (landfill)/stockpile(s)*	The location and characteristics of the disposal site of the biomass and co-composting wastewater in the baseline condition will be identified. AMS-III.H will be employed to estimate the methane emissions. No composting of animal manure will be involved in the CPA. Blending materials may be added in the project scenario to increase the efficiency of the composting process. The monitored quantity of solid waste or wastewater diverted from the baseline treatment system is used for emission reduction calculation. It will be checked ex ante at the beginning of each crediting period that the landfill can be expected to accommodate the waste to be used for the project activity for the duration of the crediting period.
9	*The project participants shall clearly define the geographical boundary of the region referred in paragraph 8 (b), and document it in the CDM-PDD. In defining the geographical boundary of the region, project participants should take into account the source of the waste i.e. if waste is transported up to 50 km, the region may cover a radius of 50 km around the project activity. In addition, it should also consider the distance to which the final product after composting will be transported. In either case, the region should cover a reasonable radius around the project activity that can be justified with reference to the project circumstances but in no case it shall be more than 200 km. Once defined, the region should not be changed during the crediting*	Not applicable, a criterion 8(a) is chosen.

	period(s).	
10	*In case produced compost is handled aerobically and submitted to soil application, the proper conditions and procedures (not resulting in methane emissions) must be ensured.*	The produced compost will be handled aerobically and submitted to soil application. The proper conditions and procedures for the soil application will be ensured such that methane emissions will not occur.
11	*In case produced compost is treated thermally/mechanically, the provisions in AMS-III.E related to thermal/mechanical treatment shall be applied*	Not applicable. Compost produced will not be treated thermally/mechanically.
12	*In case produced compost is stored under anaerobic conditions and/or delivered to a landfill, emissions from the residual organic content shall to be taken into account and calculated as per the latest version of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site".*	Not applicable. Compost produced will not be stored under anaerobic conditions and/or landfilled.
26	*In case the project activity involves the replacement of equipment, and the leakage effect of the use of the replaced equipment in another activity is neglected, because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.*	Not applicable. The CPA involves the construction of new co-composting facility.

E.3. Description of the sources and gases included in the SSC-CPA boundary

In line with paragraph 13 of AMS-III.F (Version 10), the project boundary is the physical, geographical site:

(a) Where the solid waste would have been disposed and the methane emission occurs in absence of the proposed project activity;
(b) In the case of projects co-composting wastewater, where the co-composting wastewater would have been treated anaerobically in the absence of the project activity;
(c) Where the treatment of biomass through composting takes place;
(d) Where the products from composting (compost) is handled, disposed, submitted to soil application, or treated thermally/mechanically;
(e) And the itineraries between them (a, b, c, and d), where the transportation of waste, wastewater, where applicable manure, product of treatment (compost) occurs.



1) Sludge is an optional input raw materials for composting
2) Approximately 10% POME will be used as composting input before the existing wastewater treatment system
3) A quantity of POME may be drawn after the existing wastewater treatment system, and varies for each CPA

Figure 2: Baseline and project boundary

Table 3 summarizes the GHGs and emission sources included in or excluded from the project boundary for the emission reductions calculation.

Table 3: Overview on emissions sources included in or excluded from the project boundary

	Source	Gas	Included?	Justification / Explanation
Baseline	Disposal of biomass in landfills	CO_2	No	CO_2 emissions from biomass decay in landfills is considered GHG neutral.
		CH_4	Yes	Methane emission from biomass decay in the landfills.
		N_2O	No	Not significant. Excluded for simplification and conservativeness.
	Wastewater treatment processes (open lagoons)	CO_2	No	CO_2 emissions from biomass decay in landfills is considered GHG neutral.
		CH_4	Yes	Methane emission from anaerobic process
		N_2O	No	Not significant. Excluded for simplification and conservativeness.
Project activity	Composting process	CO_2	No	CO_2 emissions from biomass decay in landfills is considered GHG neutral.
		CH_4	Yes	Methane emissions for composting of organic waste.
		N_2O	No	Excluded for simplification.
	Runoff water	CO_2	No	CO_2 emissions from biomass source is considered

				GHG neutral.
		CH_4	No	No runoff water leaving the composting facility. This emission source is not accounted.
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small.
	Transportation of biomass and wastewater	CO_2	Yes	CO_2 emissions from combustion of fossil fuel in transport vehicles.
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small.
	Electricity and/or fossil fuel consumption	CO_2	Yes	CO_2 emissions from energy consumption of all equipment/devices installed by the project activity.
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small.

E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

According to AMS-III.F (Version 10), the baseline scenario is identified as follow:

"The baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter (including manure where applicable) are left to decay within the project boundary and methane is emitted to the atmosphere. The baseline emissions are the amount of methane emitted from the decay of the degradable organic carbon in the biomass solid waste or manure. When wastewater is co-composted, baseline emissions include emissions from wastewater co-composted in the project activity. The yearly Methane Generation Potential for the solid waste is calculated using the first order decay model as described in the latest version of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site"."

Prior to the implementation of the CPA, bio-solid wastes including EFBs are disposed to landfill, while wastewater (POME) is treated in a series of open lagoons. Methane is emitted from biomass decay in landfills and anaerobic digestion process.

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA):

E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:

According to the EB70 Annex 5 *"Standard: Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (version 02.0)"*, additionality shall be demonstrated by establishing that in the absence of CDM, none of the implemented CPAs would occur. For PoAs that consist of one or more small-scale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of *"Guidelines for demonstrating additionality of small-scale project activities"*. The project participants shall demonstrate the project activity is additional, i.e. the project activity would not have occurred anyway, due to at least one of the following barriers:

(a) Investment barrier;
(b) Technological barrier;
(c) Barrier due to prevailing practice; and
(d) Other barriers.

Investment barrier

To demonstrate additionality, an investment analysis will be carried out at CPA level to determine whether the CPA is financial feasible without the sale of certificated emission reductions (CERs).

In accordance with EB35, Annex 34 *"Non-binding best practice examples to demonstrate additionality for SSC project activities"*, the best practice examples for investment barrier include the application of investment comparison analysis using a relevant financial indicator, application of a benchmark analysis or simple cost analysis. Simple cost analysis is inappropriate since the CPA generates financial/ economic benefits not only from CDM related income, but also from the selling bio-fertilizer to farmers. Benchmark analysis is the suitable analysis method for the proposed project activity to determine its economic feasibility. This selection is consistent with the EB62, Annex 5 *"Guideline on the Assessment of Investment Analysis (Version 05)"*.

The project internal rate of return (IRR) is considered as an appropriate financial indicator for the investment analysis of each CPA, in line with the *"Guidance on the Assessment of Investment Analysis (Version 05)"*, the weighted average cost of capital (WACC) is the appropriate benchmark for a project IRR.

WACC (post – tax benchmark) calculation
WACC is the average of the costs of the source of financing (debt and equity). By incorporating the tax effects, WACC is determined using the equation below:

$$r = w_d k_d (1 - T) + w_e k_e$$

Where:

r	*WACC*
w_d	*Percentage of debt financing*
w_e	*Percentage of equity financing*
k_d	*Average cost of debt financing*
k_e	*Average cost of equity financing*
T	*Applicable corporate tax rate*

<u>Average cost of equity financing</u>
The cost of equity, which is the rate of return of an asset, is determined using the Capital Asset Pricing Model (CAPM). CAPM takes into account the market risk of the asset, expected return of the market and expected return of a risk free asset, as follow:

$$k_e = R_f + \beta_L \left(R_{m,premium} - R_f \right)$$

Where:

R_f	*Risk free rate*
β_L	*Beta of the security*
$R_{m,premium}$	*Expected market return*
$(R_{m,premium} - R_f)$	*Equity risk premium*

- *Risk free rate:* The risk free rate is the rate of return of an investment with zero risk, which can be determined by the government bond yield for 10 year (or with maturity which is closest to 10 years). Thus, the Malaysian Government Securities (MGS), which is the interest bearing long-term bonds issues by the Government of Malaysia, is appropriate for CAPM calculation. The MGS indicative prices are published on the website of Central Bank of Malaysia[14].

- *Beta:* Beta is a measure of the market risk of an asset in comparison to the market as a whole. For the CPAs, estimation of beta is not necessary, see details in the next paragraph.

- *Expected market return:* The market return is the return on the market portfolio, which can be determined using of the historical return of the stock market index. For the CPAs, the FTSE Bursa Malaysia Palm Oil Plantation Index will be employed. This Index is used to determine the return which incorporated the market risk of the palm oil industry. Thus, calculation of beta is not required.

For each CPA, WACC will be calculated to determine the attractiveness of the Project. A project activity is considered to be financially feasible when the project IRR is above or equal to the corresponding financial benchmark. Alternatively, if a WACC has already been calculated for another CPA (CPA-1) that has a CPA start date within 2 years of that CPA (CPA-2), then that CPA (CPA-2) may opt to apply the same WACC as the other CPA (CPA-1), the reasoning being that but for a change of regulations, there is unlikely to be a substantial change to the risk premiums that project owners in the same industry and implementing the same technology face.

Post – tax Project IRR calculation

The parameters required for IRR calculation will be presented in the CPA-DD. It is noted that the input values shall be valid and applicable at the time of decision making and will be explained and/ or submitted to the DOE.

As referred to Section A.2, the PoA and its CPAs will contribute to the sustainable development of Malaysia by reducing the use of chemical fertilizers. For the purpose of the investment analysis, cost saving from this switch on the part of the plantation owners is not assumed as (i) the plantations will not reduce the amount of nutrients applied. It is only replacing chemical fertiliser with bio-fertilizer, and (ii) the price of bio-fertilizer will be determined through price benchmarking where the price is proportional to the market price of the nutrients (NPK) per unit weight found in inorganic fertiliser and no discount factor is applied, though in reality there may be a need for the CPA owners to give a discount to encourage the switch. This is a conservative assumption.

Sensitivity analysis

In order to verify whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions, a sensitivity analysis will be performed. The major financial parameters of each CPA are capital cost, O&M cost, bio-fertilizer price and bio-fertilizer quantity, these parameters with variations covering a range of 10% and – 10% will be used in the analysis.

The CPA is concluded to be finically unattractive when the IRRs remain below the benchmark after variations on the chosen financial parameters. Thus, the CPA is additional.

[14] Central Bank of Malaysia - Malaysia Government Securities Indicative Prices: http://www.bnm.gov.my/index.php?ch=12&pg=444

E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:

When a CPA is proposed to be included in the registered PoA, it shall demonstrate additionality through the investment analysis as described in Section E.5.1.

To confirm whether the CPA is financially unattractive, the following information shall be included:

WACC (benchmark) calculation

Table 4: CAPM calculation

Parameter	Description	Value	Source
k_e	Average cost of equity financing	[To be inserted]	[To be inserted]
R_f	Risk-free rate at the time of decision making	[To be inserted]	[To be inserted]
$R_{m,\ premium} - R_f$	Equity risk premium	[To be inserted]	[To be inserted]
$R_{m,\ premium}$	Market Return	[To be inserted]	[To be inserted]
	Average risk-free return	[To be inserted]	[To be inserted]

Table 5: WACC calculation

Parameter	Description	Value	Source
r	WACC	[To be inserted]	[To be inserted]
w_d	Percentage of debt financing	[To be inserted]	[To be inserted]
w_e	Percentage of equity financing	[To be inserted]	[To be inserted]
k_d	Average cost of debt financing	[To be inserted]	[To be inserted]
k_e	Average cost of equity financing	[To be inserted]	[To be inserted]
T	Applicable corporate tax rate	[To be inserted]	[To be inserted]

Post-tax Project IRR calculation

Table 6: Basic parameters for investment analysis

Input parameter		Value	Unit	Notes
Project Cost		[To be inserted]	RM	[To be inserted]
O&M cost		[To be inserted]	RM	[To be inserted]
	Technical lifetime	[To be inserted]	Year	[To be inserted]
Depreciation	Depreciation rate	[To be inserted]	-	[To be inserted]
	Depreciation period	[To be inserted]	years	[To be inserted]
	Salvage value	[To be inserted]	RM	[To be inserted]
Revenue	Amount of bio-fertilizer produced	[To be inserted]	t shell	[To be inserted]
	Bio-fertilizer price	[To be inserted]	RM /t	[To be inserted]
Tax	Tax rate	[To be inserted]	-	[To be inserted]
	Debt ratio	[To be inserted]	-	[To be inserted]
	Loan repayment period	[To be inserted]	years	[To be inserted]
	Interest rate	[To be inserted]	-	[To be inserted]
CERs	CER amount	[To be inserted]	CERs/yr	[To be inserted]
	CER sales price assumption	[To be inserted]	EUR/CER	[To be inserted]

Sensitivity analysis

Table 7: Results of sensitivity analysis (without CDM)

Sensitivity test	Variation	IRR
Base	-	[To be inserted]
Capital cost	-10%	[To be inserted]
O&M costs	-10%	[To be inserted]
Bio-fertilizer price	10%	[To be inserted]
Amount of bio-fertilizer produced	10%	[To be inserted]

E.6. Estimation of Emission reductions of a CPA:

E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:

Emission reductions for each CPA will be calculated in accordance with the small-scale approved methodology *"AMS-III.F. Avoidance of methane emissions through composting (Version 10)"*. In accordance with the methodology, the emission reduction achieved by each CPA will be measured as the difference between the baseline emission and the sum of the project emission and leakage.

Baseline emissions

- Methane generation potential of the solid waste composted will be calculated using the *"Emissions from solid waste disposal sites (version 06.0.1)"*.
- Methane emissions from the wastewater co-composted will be calculated using *"AMS-III.H. Methane recovery in wastewater treatment (version 16)"*.

Project emissions

The CPA emissions are sourced from transportation of raw materials and compost, electricity and/or fossil fuel consumption, and composting process. No methane emissions from anaerobic storage and/or disposal in a landfill of the compost are expected, as all compost will be used for land application.

Leakage

The project technology does not involve equipment transferred from other activities, and the existing equipment will not be transferred to another activity. Therefore, no leakage is expected.

Leakage assessment shall be carried in accordance to the *"General guidance on leakage in biomass project activities (version 03)"* (attachment C to Appendix B) at CPA-level.

E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:

According to AMS-III.F (version 10), in the case of construction of new composting facilities, the annual emission reductions for the proposed project (ER_y) are measured as follow:

$$ER_y = BE_y - \left(PE_y + LE_y\right)$$

Where:

ER_y	*Emission reduction in year y (tCO_2e).*
BE_y	*Baseline emissions in year y (tCO_2e).*
PE_y	*Project activity emissions in year y (tCO_2e).*
$LE_{y,}$	*Leakage emissions in year y (tCO_2e).*

Baseline emissions

Baseline emissions shall exclude emissions of methane that would have to be captured, fuelled or flared to comply with national or local safety requirement or legal regulations.

$$BE_y = BE_{CH4,SWDS,y} + BE_{ww,y} + BE_{CH4,manure,y} - MD_{y,reg} * GWP_CH_4$$

Where

$BE_{CH4,SWDS,y}$	*Yearly methane generation potential of the solid waste composted by the project activity during the years x from the beginning of the project activity (x=1) up to the year y estimated as per the latest version of the 'Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site' (tCO2e). With the definition of year x as 'the year since the project activity started diverting wastes from landfill disposal, x runs from the first year of crediting period (x=1) to the year for which emissions are calculated (x=y)''*
$BE_{ww,y}$	*Baseline emissions from the wastewater co-composted, calculated as per the procedures in AMS-III.H*
$BE_{CH4,manure,y}$	*Baseline emissions from manure composted by the project activities, calculated as per the procedures in AMS-III.D*
$MD_{y,reg}$	*Amount of methane that would have to be captured and combusted in the year y to comply with the prevailing regulations (tonne)*
GWP_CH_4	*GWP for CH_4*

Baseline methane emissions occurring in year y generated from waste disposal at a SWDS during a time period ending in year y ($BE_{CH4,SWDS,y}$)

As per the *"Emissions from solid waste disposal sites (version 06.0.1)"*, the amount of methane generated from disposal of waste at the SWDS is calculated based on a first order decay (FOD) model.

The tool can be used to determine emissions for the following types of applications:

- Application A: The CDM project activity mitigates methane emissions from a specific existing SWDS
- Application B: The CDM project activity avoids or involves the disposal of waste at a SWDS.

For each CPA, bio-solid wastes will be composted, which is then prevented from being disposed of in a landfill. The methane is generated from waste disposed or avoided from disposal during the crediting period. Thus, Application B is chosen for determining parameters in the tool. $BE_{CH4,SWDS,y} = \varphi_y \cdot \left(1 - f_y\right) \cdot GWP_{CH4} \cdot (1 - OX) \cdot \frac{16}{12} \cdot F \cdot DOC_{f,y} \cdot MCF_y \cdot \sum_{x=1}^{y} \sum_j W_{j,x} \cdot DOC_j \cdot e^{-k_j(y-x)} \cdot \left(1 - e^{-k_j}\right)$

Where

φ_y	*Model correction factor to account for model uncertainties for year y*
f_y	*Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y*
OX	*Oxidation factor (reflecting the amount of methane from SWDS that is oxidised in the soil*

	or other material covering the waste)
F	*Fraction of methane in the SWDS gas (volume fraction)*
$DOC_{f,y}$	*Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y (weight fraction)*
MCF_y	*Methane correction factor for year y*
$W_{j,x}$	*Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t)*
DOC_j	*Fraction of degradable organic carbon in the waste type j (weight fraction)*
k_j	*Decay rate for the waste type j (1 / yr)*
j	*Type of residual waste or types of waste in the MSW*
x	*Years in the time period in which waste is disposed at the SWDS, extending from the first year in the time period (x = 1) to year y (x = y).*
y	*Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months)*

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

According to *"AMS-III.H Methane recovery in wastewater treatment (version 16.0)"*, the methane emissions from the baseline wastewater treatment systems affected by the project are determined using the COD removal efficiency of the baseline plant:

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

Where:

$Q_{ww,i,y}$	*Volume of wastewater treated in baseline wastewater treatment system i in year y (m^3). For ex ante estimation, forecasted wastewater generation volume or the designed capacity of the wastewater treatment facility can be used. However, the ex post emissions reduction calculation shall be based on the actual monitored volume of treated wastewater*
$COD_{inflow,y}$	*Chemical oxygen demand of the wastewater inflow to the baseline treatment system in year y (t/m^3).*
$\eta_{COD,BL,i}$	*COD removal efficiency of the baseline treatment system i.*
$MCF_{ww,treatment,BL,i}$	*Methane correction factor for baseline wastewater treatment system i.*
$B_{o,ww}$	*Methane producing capacity of the wastewater ($kgCH_4/kgCOD$).*
UF_{BL}	*Model correction factor to account for model uncertainties.*
GWP_{CH4}	*Global Warming Potential for methane (tCO_2/tCH_4).*

Baseline emissions from manure composted by the project activities ($BE_{CH4,manure,y}$)

No manure is composted by the project activity, thus, this term shall be neglected.

Amount of methane that would have to be captured and combusted in the year y to comply with the prevailing regulations ($MD_{y,reg}$)

In Malaysia, there are no prevailing regulations which require methane to be captured and combusted. Therefore, this term is not accounted for.

Project emission

$$PE_y = PE_{y,transp} + PE_{y,power} + PE_{y,comp} + PE_{y,runoff} + PE_{y.res\ waste}$$

Where

PE_y	*Project activity emissions in the year y (tCO_2e)*
$PE_{y,transp}$	*Emissions from incremental transportation in the year y (tCO_2e)*
$PE_{y,power}$	*Emissions from electricity or fossil fuel consumption in the year y (tCO_2e)*
$PE_{y,comp}$	*Methane emissions during composting process in the year y(tCO_2e)*
$PE_{y,runoff}$	*Methane emissions from runoff water in the year y (tCO_2e)*
$PE_{y,res\ waste}$	*Methane emissions from the anaerobic decay of the residual organic content (tCO_2e)*

Emissions from** incremental transportation **in the year y ($PE_{y,transp}$)

Project emissions due to incremental transport distances are calculated based on the incremental distances between:

i. The collection points of biomass and/or manure and the compost treatment site as compared to the baseline solid waste disposal site or manure treatment site;
ii. When applicable, the collection points of wastewater and treatment site as compared to baseline wastewater treatment site;
iii. Treatment sites and the sites for soil application, landfilling and further treatment of the produced compost.

$$PE_{y,transp} = \left(Q_y/CT_y\right) * DAF_w * EF_{CO2} + \left(Q_{y,treatment}/CT_{y,treatment}\right) * DAF_{treatment} * EF_{CO2}$$

Where

Q_y	*Quantity of raw waste/manure treated and/or wastewater cotreated in the year y (tonnes)*
CT_y	*Average truck capacity for transportation (tonnes/truck)*
DAF_w	*Average incremental distance for raw solid waste/manure and/or wastewater transportation (km/truck)*
EF_{CO2}	*CO_2 emission factor from fuel use due to transportation ($kgCO_2$/km, IPCC default values or local values may be used)*
$Q_{y,treatment}$	*Quantity of compost produced in year y (tonnes)*
$CT_{y,treatment}$	*Average truck capacity for compost transportation (tonnes/truck)*
$DAF_{treatment}$	*Average distance for compost transportation (km/truck)*

Emissions from electricity or fossil fuel consumption in the year y ($PE_{y,power}$)

For the calculation of project emissions from electricity and/or fossil fuel consumption by the project activity facilities all the energy consumption of all equipment/devices installed by the project activity shall be included e.g. energy used for aeration and/or turning of compost piles/heaps, chopping of biomass for size reduction, screening, drying of the final compost product and for the runoff wastewater treatment. The project emission from electricity is:

$$PE_{y,power} = PE_{EC,y} + PE_{FC,j,y}$$

$$PE_{y,power} = \sum_{j} EC_{PJ,j,y} \times EF_{EL,j,y} + \sum_{i} FC_{i,j,y} \times EF_{FF,j,y}$$

Where:

$PE_{EC,y}$	*Project emissions from electricity consumption in year y(tCO_2/yr)*
$PE_{FC,j,y}$	*Project emissions from fossil fuel combustion in process j during the year y (tCO_2/yr)*
$EC_{PJ,j,y}$	*Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)*
$EF_{EL,j,y}$	*Emission factor for electricity generation for source j in year y(tCO_2/ MWh)*
$FC_{i,j,y}$	*Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr);*
$EF_{FF,j,y}$	*Emission factor for fuel type i in year y (tCO_2/mass or volume unit)*

Methane emissions during composting process in the year y ($PE_{y,comp}$)

Methane emissions during composting shall be calculated as follows:

$$PE_{y,comp} = Q_y * EF_{composting} * GWP_CH_4$$

Where

$EF_{composting}$	*Emission factor for composting of organic waste and/or manure (t CH_4/ton waste treated). Emission factors can be based on facility/site-specific measurements, country specific values or IPCC default values.*

Methane emissions from runoff water in the year y ($PE_{y,runoff}$)

There is no runoff water leaving the composting facility. All leachate from the AeroPod process will be collected and recycled.

Methane emissions from the anaerobic decay of the residual organic content ($PE_{y,res\ waste}$)

The produced compost is not subjected to anaerobic storage or disposed in a landfill. Thus, this term is not relevant.

Leakage (LE_y)
If the project technology is the equipment transferred from another activity or if the existing equipment is transferred to another activity, leakage effects are to be considered

For each CPA, biomass wastes are collected and used, according to the *"General guidance on leakage in biomass project activities (version 03)"* (attachment C to Appendix B), the biomass type of each CPA is "biomass residues or wastes", the emission source that is potentially significant and attributable to the CPAs is "competing uses of biomass". Assessment on whether the quantity of available biomass in the CPA region, is 25% larger than the quantity of biomass that is utilised including the CPA will be done ex-ante at CPA-level.

E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:

Data / Parameter:	φ_y

Data unit:	-
Description:	*Model correction factor to account for model uncertainties*
Source of data used:	*Default value as per "Emission from solid waste disposal sites (version 06.0.1)"*
Value applied:	*To be determined at CPA level based on the characteristics of the climate.*
Justification of the choice of data or description of measurement methods and procedures actually applied :	*Option 1 was chosen.* *The appropriate factor shall be determined based on the climate where the SWDS is located.* - *Humid/wet conditions: 0.85* - *Dry conditions: 0.8*
Any comment:	-

Data / Parameter:	***OX***
Data unit:	-
Description:	*Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)*
Source of data used:	*Based on an extensive review of published literature on this subject, including the IPCC 2006 Guidelines for National Greenhouse Gas Inventories*
Value applied:	*0.1*
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	*When methane passes through the top-layer, part of it is oxidized by methanotrophic bacteria to produce CO_2. The oxidation factor represents the proportion of methane that is oxidized to CO_2 This should be distinguished from the methane correction factor (MCF) which is to account for the situation that ambient air might intrude into the SWDS and prevent methane from being formed in the upper layer of SWDS*

Data / Parameter:	***F***
Data unit:	*Volume fraction*
Description:	*Fraction of methane in the SWDS gas*
Source of data used:	*IPCC 2006 Guidelines for National Greenhouse Gas Inventories*
Value applied:	*0.5*
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	*Upon biodegradation, organic material is converted to a mixture of methane and carbon dioxide*

Data / Parameter:	$DOC_{f,y}$
Data unit:	*Weight fraction*

Description:	*Fraction of degradable organic carbon (DOC) in MSW that decomposes in the SWDS*
Source of data used:	*IPCC 2006 Guidelines for National Greenhouse Gas Inventories*
Value applied:	*0.5*
Justification of the choice of data or description of measurement methods and procedures actually applied :	*For Application B, default value was chosen.*
Any comment:	-

Data / Parameter:	***MCF_y***
Data unit:	-
Description:	*Methane correction factor*
Source of data used:	*IPCC 2006 Guidelines for National Greenhouse Gas Inventories*
Value applied:	*To be determined at CPA level based on the characteristics of the SWDS.*
Justification of the choice of data or description of measurement methods and procedures actually applied :	- *1.0 for anaerobic managed solid waste disposal sites. These must have controlled placement of waste (i.e. waste directed to specific deposition areas, a degree of control of scavenging and a degree of control of fires) and will include at least one of the following: (i) cover material; (ii) mechanical compacting; or (iii) leveling of the waste;* - *0.5 for semi-aerobic managed solid waste disposal sites. These must have controlled placement of waste and will include all of the following structures for introducing air to the waste layers: (i) permeable cover material; (ii)leachate drainage system; (iii) regulating pondage; and (iv) gas ventilation system;* - *0.8 for unmanaged solid waste disposal sites – deep. This comprises all SWDS not meeting the criteria of managed SWDS and which have depths of greater than or equal to 5 meters;* - *0.4 for unmanaged-shallow solid waste disposal sites or stockpiles that are considered SWDS. This comprises all SWDS not meeting the criteria of managed SWDS and which have depths of less than 5 meters. This includes stockpiles of solid waste that are*
Any comment:	*MCF accounts for the fact that unmanaged SWDS produce less methane from a given amount of waste than managed SWDS, because a larger fraction of waste decomposes aerobically in the top layers of unmanaged SWDS. In case of a water table above the bottom of the SWDS, a larger proportion of the SWDS is anaerobic and MCF shall be estimated according to the tool "Emissions from solid waste disposal sites (version 06.0.0)"*

Data / Parameter:	***DOC_j***
Data unit:	*Weight fraction*
Description:	*Fraction of degradable organic carbon in the waste type j*
Source of data used:	*IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 2.4 and 2.5)*
Value applied:	*To be determined at CPA level based on the type of waste.*
Justification of the choice of data or	*For MSW, the following values for the different waste types j should be applied:*

Waste type *j*	**DOCj (% wet waste)**

description of measurement methods and procedures actually applied :	

Wood and wood products	*43*
Pulp, Paper and cardboard (other than sludge)	*40*
Food, food waste, beverages and tobacco (other than sludge)	*15*
Textiles	*24*
Garden, yard and park waste	*20*
Glass, plastic, metal, other inert waste	*0*

For the following residual waste types, project participants may use or derive default values, as follows:

- *For empty fruit brunches (EFB), as their characteristics are similar to garden waste, the value for garden, yard and park waste in table above may be used as a default.*
- *For industrial sludge, either a value of 9% (% wet sludge) shall may be used as a default, assuming an organic dry matter content of 35 percent, or alternatively, if the percentage of organic dry matter content is known, then the DOC value may be calculated as follows: DOCj (% wet sludge) = 9 * (% organic dry matter content/35).*
- *For domestic sludge, either a value of 5% (% wet sludge) may be used as a default, assuming an organic dry matter content of 10 percent, or alternatively, if the percentage of organic dry matter content is known, then the DOC value may be calculated as follows: DOCj (% wet sludge) = 5 * (% organic dry matter content/10).*

If a waste type is not comparable to MSW and can not clearly be described as a combination of waste types in the table above or if a default value is not available or if the project participants wish to measure DOCj, then, project participants should measure DOC_j in an ignition loss test according to the procedure in EN 15169 or similar national or international standards. This measurement is only required once for each waste type j and the value determined for DOC_j remains valid during the crediting period.

Any comment:	*The procedure for the ignition loss test is described in BS EN 15169:2007 "Characterization of waste. Determination of loss on ignition in waste, sludge and sediments".* *The percentages listed in table above are based on a wet waste basis which are concentrations in the waste as it is delivered to the SWDS. The IPCC Guidelines also specify DOC values on a dry waste basis, which are the concentrations after complete removal of all moist from the waste, which is not believed practical for this situation.*

Data / Parameter:	k_j
Data unit:	*1/yr*
Description:	*Decay rate for the waste type j*
Source of data used:	*IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 3.3)*
Value applied:	*To be determined at CPA level based on the type of waste.*
Justification of the choice of data or description of	*Apply the following default values for the different waste types j*

Waste type j	*Boreal and Temperate (MAT≤20°C)*	*Tropical (MAT>20°C)*

measurement methods and procedures actually applied :	

		Dry (MAP/PT <1)	*Wet (MAP/PET >1)*	*Dry (MAP< 1000mm)*	*Wet (MAP> 1000mm)*
Slowly degrading	*Pulp, paper, Cardboard (other than sludge), textiles*	*0.04*	*0.06*	*0.045*	*0.07*
	Wood, wood products and straw	*0.02*	*0.03*	*0.025*	*0.035*
Moderately degrading	*Other (nonfood) organic putrescible garden and park waste*	*0.05*	*0.10*	*0.065*	*0.17*
Rapidly degrading	*Food, food waste, sewage sludge, beverages and tobacco*	*0.06*	*0.185*	*0.085*	*0.40*

NB: MAT- mean annual temperature, MAP- Mean annual precipitation, PET- potential evapotranspiration. MAP/PET is the ratio between the mean annual precipitation and the potential evapotranspiration

If a waste type disposed in a SWDS can not clearly be attributed to one of the waste types in the table above, project participants should choose, among the waste types that have similar characteristics, the waste type where the values of DOC_j and k_j result in a conservative estimate (lowest emissions), or request a revision of/deviation from this methodology
In the case of EFB, as their characteristics are similar to garden waste, the parameter values correspondent of garden waste shall be used. In case of sludge from pulp and paper industry, a conservative value of 0.03 shall be used for all precipitation and temperature combinations

Any comment:	*Document in the CDM-SSC-CPA-DD the climatic conditions at the SWDS site (temperature, precipitation and, where applicable, evapotranspiration). Use longterm averages based on statistical data, where available. Provide references*

Data / Parameter:	$MCF_{ww,treatment,BL,i}$
Data unit:	-
Description:	*Methane correction factor for baseline wastewater treatment systems i*
Source of data used:	*Table III.H.1 in AMS-III.H, version 16.*
Value applied:	*To be determined at CPA level based on the characteristics of the baseline wastewater treatment system i*
Justification of the choice of data or description of measurement methods and procedures actually applied :	

Type of wastewater treatment system	***MCF value***
Discharge of wastewater to sea, river or lake	*0.1*
Aerobic treatment, well managed	*0.0*
Aerobic treatment, poorly managed or overloaded	*0.3*
Anaerobic digester for sludge without methane recovery	*0.8*
Anaerobic reactor without methane recovery	*0.8*

	Anaerobic shallow lagoon (depth less than 2 metres)	*0.2*
	Anaerobic deep lagoon (depth more than 2 metres)	*0.8*
	Septic system	*0.5*
Any comment:	*"2006 IPCC Guidelines for National Greenhouse Gas Inventories" default values (Chapter 6 of Volume 5, Table 6.8).*	

Data / Parameter:	$\eta_{COD,BL,i}$
Data unit:	-
Description:	*Chemical oxygen demand removal efficiency of the baseline treatment system i*
Source of data used:	*Calculated*
Value applied:	*To be determined at CPA level*
Justification of the choice of data or description of measurement methods and procedures actually applied :	*According to AMS-III.H (version 16.0), COD removal efficiency shall be determined as per paragraph 26, 27 or 28 of AMS-III.H.*
Any comment:	-

Data / Parameter:	UF_{BL}
Data unit:	-
Description:	*Model correction factor to account for model uncertainties (baseline)*
Source of data used:	*Default value from AMS-III.H, version 16.*
Value applied:	*0.89*
Justification of the choice of data or description of measurement methods and procedures actually applied :	*FCCC/SBSTA/2003/10/Add.2, page 25.*
Any comment:	-

Data / Parameter:	$B_{o,\,ww}$
Data unit:	*kg CH_4/kg COD*
Description:	*Methane producing capacity of the wastewater.*
Source of data used:	*2006 IPCC Guidelines*
Value applied:	*0.25*
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

Data / Parameter:	EF_{CO2}
Data unit:	*kg CO_2/km*
Description:	*CO_2 emission factor from fuel use due to transportation*

Source of data used:	*2006 IPCC Guidelines*
Value applied:	*To be determined at CPA level based on the fuel type use for transportation*
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

Data / Parameter:	$EF_{EL,j,y}$
Data unit:	*t CO_2/MWh*
Description:	*Emission factor for electricity generation for source j in year y*
Source of data used:	*IPCC , Pusat Tenaga Malaysia (PTM) and third party data*
Value applied:	*To be determined at CPA level based on the most recent publication*
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-
	-

Data / Parameter:	$EF_{FF,i,y}$
Data unit:	*t CO_2/ mass or volume unit*
Description:	*Emission factor of fuel type i in year y*
Source of data used:	*2006 IPCC Guidelines*
Value applied:	*To be determined at CPA level based on the most recent publication*
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

E.7. Application of the monitoring methodology and description of the monitoring plan:

D.7.1. Data and parameters to be monitored by each SSC-CPA:

Data / Parameter:	f_y
Data unit:	-
Description:	*Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y*
Source of data to be used:	*Select the maximum value from the following:* *(a) contract or regulation requirements specifying the amount of methane that must be destroyed/used (if available) and*

	(b) historic data on the amount captured
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*Monitoring frequency* *Annually*
QA/QC procedures to be applied:	-
Any comment:	*For Application B.*

Data / Parameter:	$W_{j,x}$
Data unit:	*t*
Description:	*Total amount of waste type j disposed in a SWDS in year x*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*Measure on wet basis* *Monitoring frequency* *Continuously, aggregated at least annually for year x*
QA/QC procedures to be applied:	-
Any comment:	*For Application B.*

Data / Parameter:	GWP_{CH4}
Data unit:	*t* CO_2e / *t* CH_4
Description:	*Global Warming Potential of methane*
Source of data to be used:	*IPCC 2006 Guidelines for National Greenhouse Gas Inventories*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*21 for the first commitment period.*
Description of measurement methods and procedures to be applied:	*Shall be updated for future commitment periods according to any future COP/MOP decisions*
QA/QC procedures to be applied:	-

Any comment:	-

Data / Parameter:	$Q_{ww,i,y}$
Data unit:	*m^3/month*
Description:	*The flow of wastewater*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*Measurements are undertaken using flow meters.* *<u>Monitoring frequency</u>* *Monitored continuously (at least hourly measurements are undertaken, if less, confidence/precision level of 90/10 shall be attained).*
QA/QC procedures to be applied:	*Calibration will be undertaken from one of the following, from most to least preferred:* *(a) According to the manufacturer's instructions;* *(b) According to national / industry standards, if available;* *(c) At least once every three years.*
Any comment:	-

Data / Parameter:	$COD_{ww,untreated,y}$
Data unit:	*t COD /m^3*
Description:	*Chemical oxygen demand of the wastewater before the treatment system affected by the project activity*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*Measure the COD according to national or international standards. COD is measured through representative sampling.* *<u>Monitoring frequency</u>* *Samples and measurements shall ensure a 90/10 confidence/precision level.To meet this 90/10 confidence/precision level comfortably, COD measurements will be carried out on a weekly basis in-house.*
QA/QC procedures to be applied:	*Calibration will be carried out according to manufacturer's instructions.*
Any comment:	-

Data / Parameter:	Q_y
Data unit:	*tonnes*

Description:	*Quantity of raw waste/manure treated and/or wastewater cotreated in the year y*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*On-site data sheets recorded monthly using weigh bridge.* *Weighbridge will be subject to periodic calibration (in accordance with stipulation of the weighbridge supplier), also cross check with sales of compost* *Monitoring frequency* *Monthly*
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	CT_y
Data unit:	*Tonnes/ truck*
Description:	*Average truck capacity for transportation*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	-
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	$Q_{y,treatment}$
Data unit:	*tonnes*
Description:	*Quantity of compost produced in the year y*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods	*On-site data sheets recorded monthly using weigh bridge.* *Weighbridge will be subject to periodic calibration (in accordance with*

and procedures to be applied:	*stipulation of the weighbridge supplier), also cross check with sales of compost* *<u>Monitoring frequency</u>* *Monthly*
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	$CT_{y,treatment}$
Data unit:	*Tonnes/ truck*
Description:	*Average truck capacity for compost transportation*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	-
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	DAF_w
Data unit:	*km/ truck*
Description:	*Average incremental distance for raw solid waste/manure and/or wastewater transportation*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*<u>Monitoring frequency</u>* *Annually*
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	$DAF_{w,treatment}$
Data unit:	*km/ truck*
Description:	*Average distance for compost transportation*

Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*Monitoring frequency* *Annually*
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	$EC_{PJ,y}$
Data unit:	*kWh*
Description:	*Quantity of electricity consumed by the project electricity consumption in year y*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*This parameter will be measured continuously by electricity meters. Alternatively the consumption can be calculated by assuming that all relevant electrical equipment operate at full rated capacity for 8,760 hours per year, with 10% added to account for distribution losses.*
QA/QC procedures to be applied:	*Industry standards will be adhered to for calibration. In the absence of industry standards, the electricity meters will either be calibrated or replaced every 12 months*
Any comment:	-

Data / Parameter:	$FC_{PJ,y}$
Data unit:	*litre*
Description:	*Amount of fossil fuel consumed by the project activity in year y*
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	-
QA/QC procedures to	-

be applied:	
Any comment:	-

Data / Parameter:	***$EF_{composting}$***
Data unit:	*t CH_4/ ton waste treated*
Description:	*Emission factor for composting of organic waste and/or manure*
Source of data to be used:	*Measured by the project participants/ Default value as per AMS-III.F (version 10.0)*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*To be determined at CPA level*
Description of measurement methods and procedures to be applied:	*$EF_{composting}$ can be set to zero for the portions of Q_y for which the monitored oxygen content of the composting process is above 8%.*
QA/QC procedures to be applied:	-
Any comment:	*If $EF_{composting}$ is not monitored, IPCC default values of 0.01 kg CH_4/kg waste treated on a dry weight basis and 0.004 kg CH_4/kg waste treated on a wet weight basis can be applied.*

Data / Parameter:	***Check of aerobic conditions of the composting process***
Data unit:	-
Description:	-
Source of data to be used:	*Measured by the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*N/A*
Description of measurement methods and procedures to be applied:	*For this purpose a portable oxygen meter with lancets of at least 1m length will be used. There will be 14 modules each filled daily and with a composting period of 14 days. Thus, at any one time, the 14 modules will represent the different stages of the composting process. A weekly sampling of all 14 modules will be carried out*[15]
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	***$Q_{y,ww,runoff}$***

[15] It is clarified that the methodology AMS-III. F provided a method for windrow composting. It is not applicable to the PoA which in-vessel composting technology will be employed. Thus, a measurement methods and procedures were developed

Data unit:	*The runoff wastewater from composting yard*
Description:	*m^3*
Source of data to be used:	*By the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*0*
Description of measurement methods and procedures to be applied:	*Measurements are undertaken using flow meters or direct measurement of the accumulative volume overtime. Consisting of the wastewater applied in excess (i.e. moisture over and above the field capacity of the biomass being composted) and rainwater in the case of unroofed sites* *Monitoring frequency* *Monitored with periodic measurements sufficient to comply with confidence/precision level of 90/10*
QA/QC procedures to be applied:	-
Any comment:	*This parameter will only be monitored if there is runoff. Based on the current technology configuration, there is no runoff. There is therefore expected to only be a visual confirmation.*

Data / Parameter:	***$COD_{y,ww,runoff}$***
Data unit:	*t COD/m^3*
Description:	*The chemical oxygen demand of the runoff wastewater from composting yard*
Source of data to be used:	*By the project participants*
Value of data applied for the purpose of calculating expected emission reductions in section B.5	*N/A*
Description of measurement methods and procedures to be applied:	*Measure the COD according to national or international standards. COD is measured through representative sampling* *Monitoring frequency* *Samples are representatively taken from unfiltered wastewater and measurements shall ensure a 90/10 confidence/precision level*
QA/QC procedures to be applied:	-
Any comment:	*This parameter will only be monitored if there is runoff.*

Data / Parameter:	***Soil application of the compost***
Data unit:	*Text*
Description:	-
Source of data to be used:	*By the project participants*
Value of data applied	*Soil application*

for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	*This includes documenting sales or delivery of the compost final product. It shall also include an in situ verification of the proper soil application of the compost/slurry to ensure aerobic conditions for further decay. Such verification shall be done at representative sample of user sites.*
QA/QC procedures to be applied:	-
Any comment:	-

E.7.2. Description of the monitoring plan for a SSC-CPA:

1. Implementation of the monitoring plan

The CME/ CPA implementer will be responsible for implementation of the monitoring plan. The planned operation and management structure for the CPA is described in Figure 3 below.

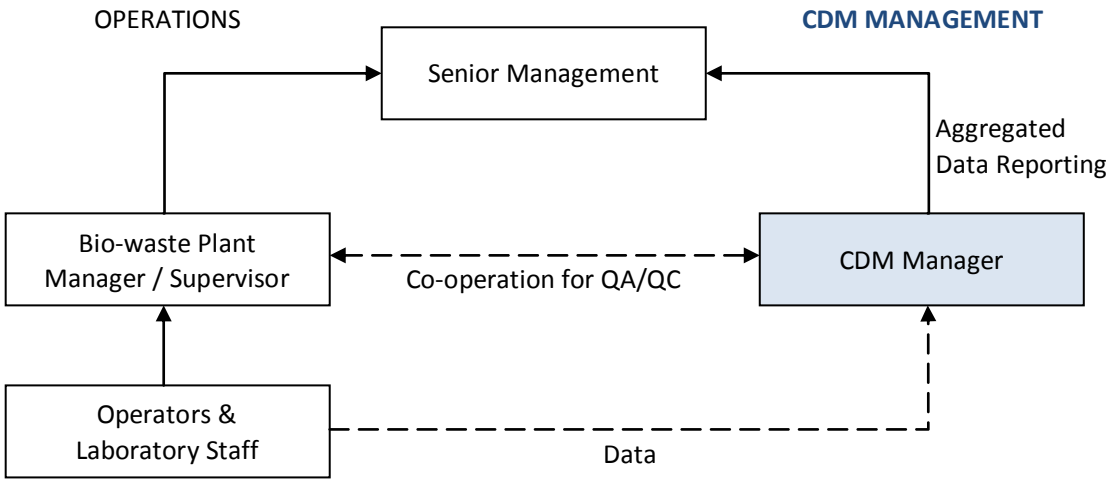


Figure 3: Operation and Management Structure for Monitoring Activities

2. Staff training

Staff will be trained on the safe and proper operation of major equipments such as the shredder, mixer, screener and AeroPod®, and will also be trained on the monitoring equipment installed. Such training will be carried out prior to the commissioning of the CPA plant, and will be documented.

3. Data recording and archiving

(a) Data recording

Recording will be done online for as many parameters as possible, though the exact meters to be connected is yet to be determined. For manual records (including backup manual recording when there is an error with the online system for parameters normally recorded online), recording will be carried out

once daily where measurement is continuous, and as and when measurements occur for when measurement is done on batch basis (e.g. weekly COD measurements).

(b) Data archiving

All monitored data will be archived for the duration of the crediting period and 2 years thereafter.

4. Emergency procedures

A standard operating procedure (SOP), which describes the operation of the composting facility, will be prepared. Emergency procedures are defined in the SOP. In case of the monitoring equipment fails, backup equipments will be in place.

E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

The baseline study was completed in 13/07/2012 by:

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Annex 1

CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAMME of ACTIVITIES

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding is involved in the PoA.

Annex 3

BASELINE INFORMATION

No additional information.

Annex 4

MONITORING INFORMATION

No additional information.

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