Monitoring report form for CDM programme of activities
(Version 02.0)

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

MONITORING REPORT		
Title of the PoA	Co-composting and Composting Program of Activities for Palm Oil Mills in Indonesia	
UNFCCC reference number of the PoA	6511	
Version numbers of the PoA-DD applicable to this monitoring report	Version 04	
Version number of this monitoring report	Version 05	
Completion date of this monitoring report	11/11/2018	
Monitoring period number	First Monitoring Period	
Duration of this monitoring period	01/01/2013 – 30/06/2018	
Monitoring report number for this monitoring period	Monitoring Report 1	
Coordinating/managing entity	PT. Socfin Indonesia	
Host Parties	Host Party of the PoA	Is this the host Party of a CPA covered in this monitoring report? (yes/no)
	Indonesia	Yes
Sectoral scopes	13	
Applied methodologies and standardized baselines	AMS-III.F version 10 Avoidance of methane emissions through composting	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by all CPAs covered in this monitoring report in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	N/A	27,656
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the CPA-DDs for the CPAs	55,715	

covered in this monitoring report	

PART I Monitoring of programme of activities (PoA)

SECTION A. Description of PoA

A.1. General description of PoA

The purpose of this proposed PoA is to facilitate commercial crude palm oil mill and plantation owners in Indonesia to adopt and implement aerobic composting or co-composting as a more sustainable waste management practice at their Crude Palm Oil Mills (**Mills**), and to use the compost produced in the palm plantations to supplement inorganic fertilier use. The aim is to make these practices become the baseline practice for the commercial palm oil industry in Indonesia.

The PoA will include small-scale project activities that conduct aerobic decomposition of:

(i) solid empty fruit branches (**EFB**); and

(ii) liquid Palm Oil Mill Effluent (**POME**) as well as other organic waste from Mills.

POME and EFB are the major organic waste streams generated from Mills during the process of extracting Crude Palm Oil from Fresh Fruit Branches (**FFB**). The output of the co-composting process will be organic compost which can be recycled back onto the Mill's palm plantation or onto other neighboring plantations.

The aerobic co-composting process will avoid methane emissions from:

(i) Outdoor open air anaerobic digestion of POME. This POME treatment in the baseline situation is the common practice of POME treatment in Indonesia utilizes a series of outdoor open air ponds and therefore emits significant levels of methane into the atmosphere; and

(ii) Potentially from EFB depending on the baseline disposal practice at the Mill. In the event that they are disposed of and left to decay in unmanaged solid waste disposal sites or dumped which is a common practice at Mills in Indonesia methane will be emitted in the baseline which will be avoided by the composting and thus methane emissions from EFB dumping will also be claimed.

The PoA will consist of CDM Programme activities (CPAs) that each represents one composting project located at a single Mill.

A.1.1. Corresponding generic component project activities (CPAs)

Title and reference number of the corresponding generic CPA	Version of the PoA-DD	Sectoral scopes	Applied methodologies and standardized baselines

Title and reference number of the corresponding generic CPA	Version of the PoA-DD	Sectoral scopes	Applied methodologies and standardized baselines
Generic CPA 01[1]	03	13	•AMS-III.F (version 10) *Avoidance of methane emissions through composting* •In case produced compost is treated thermally/mechanically, the provisions in AMS-III.E related to thermal/mechanical treatment. • Baseline from the wastewater co-composted will be calculated based on AMS-III.H version 16. •Where applicable, baseline emissions from manure composted by the project activities, as per the procedures of AMS-III.D •Methodological tool: "*Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" (version 05.1)* •Methodological tool: "*Tool to calculate baseline, project and/or leakage emissions from electricity consumption*" (version 1.0) •*Methodological Tool: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion*" (version 2.0)

A.1.2. CPAs included in the PoA

Title and UNFCCC reference number of the CPA	Title and reference number of the corresponding generic CPA	Version of the PoA-DD	Crediting period type and duration	Covered in this monitoring report? (yes/no)
CPA001 - Socfindo EFB plus POME Co-composting Project	Generic CPA 01	04	Renewable crediting period 01/01/2013 – 01/01/2034	Yes

A.2. Coordinating/managing entity

PT. Socfin Indonesia (**Socfindo**) is the Coordinating Entity (**CME**) for the PoA.

The CME was switched from PT. Carbon Agro Indo to PT. Socfin Indonesia, approved by the Republic of Indonesia Designated National Authority on 23/07/2018.

[1] There is only one single generic CPA-DD attached to the PoA. This is defined as "Generic CPA 01 in this Monitoring Report for ease of reference.

SECTION B. Implementation of PoA

B.1. Description of implemented PoA

1. **Provide information on how the management system described in the PoA-DD was implemented in accordance with applicable provisions on the implementation of the management system for a PoA in the project standard.**

As per section A.4.4 of the PoA-DD, The Coodinating Entity (**CME**) has implemented its roles in relation to the PoA by:

Implementation of Management System

The CME has implemented the PoA as set out in section A.4.4. of the PoA-DD, specifically by following the approved Management Plan referred to into that section (*Management Plan for the inclusion of CPAs into the PoA*). In this regard it has implemented the management system, structure and procedures within the CME for inclusion of CPA's in accordance with the Management Plan to:

- o screen and validate projects for inclusion in the PoA;
- o carry out the inclusion process;
- o train the CPA Implementers;

Thus far the PoA only has one CPA, CPA-001 the subject of this Monitoring Report. No new CPAs have been added to this PoA since the original CPA (CPA001) included with the original validation and registration.

Implementation of PoA Data Management and Reporting Systems

The CME has also implemented a data management and reporting system within the CME and between the CPA owner and the CME, which was prepared in accordance with applicable provisions on the implementation of the management system for a PoA in the Project Standard[2].

The CME has also ensured a record keeping system for each CPA under the PoA has been established which meets all the requirements in the PoA Project Standard, and captures all the required data and requirements as set out in the registered CPA-DD.

Implementation of Specifc Monitoring Plan in CPA001

As per section A.4.4 of the PoA-DD, the CME has establisehd an adequate and accurate monitoring system for CPA001 which meets the monitoring requirements as set out in *AMS-III.F version 10*.

Specfically, in this regard the CME has:

- conducted training for data monitoring as required;
- assisted with monitoring system establishment and calibration as required.
- managed the records of CPA including data required to calculate emission reductions;
- ensured rigorous reporting of the CPA Entity;
- verified information sent by the CPA Entity;
- prepared the monitoring report and all supporting documentation for Verification.

2. **Indicate whether a sampling approach was applied for monitoring of a group of CPAs or each CPA covered in this monitoring report, and elaborate details in section** Error! Reference source not found.

Not Applicable - As per section B.6.1 of the Generic CPA-01, a specific operation and monitoring plan will be established at the CPA level for each CPA under the PoA.

[2] *CDM Project Standard for Programmes of Activities Version 01.0, CDM-EB93-A07-STAN*, refered to in this Monitoring Report as the "Project Standard".

Currently, there is only one CPA, (CPA001) under this PoA, and included in this Monitoring Report. Therefore a sampling approach has not been used for monitoring.

3. **Provide the description of installed technology, technical processes and equipment for the included CPAs, and the information on the implementation and actual operation of the included CPAs in section** Error! Reference source not found..

   CPA001: Please see Section C.1. below for details.

4. **If applicable, present information on any post-registration changes to the PoA and CPAs in sections** Error! Reference source not found. **and** Error! Reference source not found.**, respectively.**

   Not Applicable

B.2. Post-registration changes to PoA

B.2.1. Corrections

Not Applicable

B.2.2. Inclusion of monitoring plan

Not Applicable

B.2.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

Not Applicable.

B.2.4. Changes to programme design

Not Applicable

PART II Monitoring of CPAs

SECTION C. Implementation of CPAs

C.1. Description of implemented CPAs

As set out in section A.2 above, The CME has been switched from PT. Carbon Agro Indo to PT. Socfin Indonesia, approved by the Republic of Indonesia Designated National Authority on 23/07/2018.

Description of CPA001

As per the CPA-DD, The **Project Activity** has installed and operates a sophisticated Aerated Bunker Co-composting (**ABC**) plant at PT. Socfin Indonesia's (**Socfindo's**) Bangun Bandar Crude Palm Oil Mill (**Mill**) (See section C2 below for location details).

The Project Activity utilizes 2 main key organic waste streams produced from the Mill in its production of Crude Palm Oil from Fresh Fruit Branches (**FFB**):

- Empty Fruit Bunches (**EFB**); and
- Liquid Palm Oil Mill Effluent (**POME**).

EFB and POME waste are co-composted in the ABC plant producing organic compost which is reapplied as organic fertilizer to Socfindo's neighboring plantations.
The project activity reduces methane emissions (and thus greenhouse gas emissions) by:

- Reducing the baseline anaerobic digestion of POME treatment in open air anaerobic wastewater treatment system; and
- Avoiding methane emissions from the baseline practice of EFB solid waste disposal situated in the oil palm plantation area.

The ABC Plant has operated continuously during the monitoring period. It runs 24 hours a day, 365 days a year, constantly receiving EFB from the adjacent mill, composting through its bunkers and producing organic compost.

Trend for Utilisting POME Wastewater During the Monitoring Period.

POME wastewater produced and processed is proportional to the amount of Fresh fruit branches (**FFB**) the mill processes and the amount of EFB produced per annum. Thus the less FFB processed by the mill, the less POME and EFB produced as waste products and as feedstock for the ABC Plant. During the Monitoring Period, the annual FFB processed by the mill has steadily reduced from 110,504.35 tons per year in 2013 to 76,103.60 tons per year in 2017. This decrease in turn has decreased the amount of EFB available for the ABC Plant (15,659.20 tons/year in 2013 compared to 8,680.78 tons per year in 2017) as well as the compost produced (17,988.61 tons produced in 2013 compared to 10,514.50 tons in 2017). Likewise the amount of POME that is able to be absorbed into the EFB and used in the ABC Plant has also reduced from 22,884.20m^3 per year in 2013 to 13,335.00m^3 per year in 2017.

The reduction in FFB being processed in the mill has been due to climatic conditions affecting yield as well as the decision by Socfindo in June 2016 to only process its own FFB grown in its own plantations.

Diesel Use During the Montoring Period.

Throughout the Monitoring Period, there has been an annual decreasing trend in the amount of diesel used which tracks the trend in compost produced and EFB and POME utilized by the ABC Plant (for details on this see above and accompanying Emission Reduction Spreadsheet). For example 40,912 liters of diesel fuel

were used in 2013 vs 18,755 liters in 2017. Thus the amount of diesel fuel used generally tracks the amount of raw materials entering the ABC Plant and compost produced. Month to month variation in a year generally tracks the variation in EFB and POME input (which in turn match the peaks of production processing of FFB in the mill) where the peak processing months are usually June to September annually. This peak is not an exact science in that it can move forward or back, however it is a general trend. Year on year, the FFB processed at the mill experiences a slight slowdown which is due to annual holidays that move forward every year. The rest of the annual intra-variation are usually a reflection of the meteorological events that have affected the palm trees previously (wet or dry spells).

Specific spikes in monthly consumption (for example during the end of the year, 2013) were due to the blocks for compost application being furtherr from the mill and the additional use of the front end loader to level the humps in the interrows in the blocks. This was done to create a smoother track for the compost application and to avoid the risk of the compost spreader getting stuck during wet conditions.

1. **Provide information on the implementation status of the CPAs in accordance with the applicable provisions on the description of implemented CPAs in the project standard, including:**

Technology: CPA001

(a) **Description of the installed technology, technical processes;**

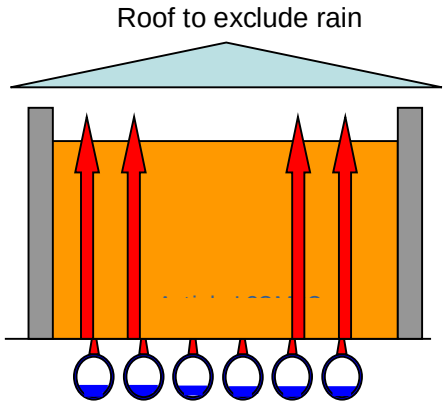
The ABC Plant, is an enclosed co-composting system with a computer controlled environment which continually monitors O_2 to ensure the optimum ambient environment for natural aerobic decomposition of the waste streams.

How will the system ensure the aerobic conditions in the compost?

The ABC system is specifically designed as an aerobic composting system. Firstly the compost is moved through a series of roofed bunkers within concrete walls, a concrete aerated floor and under a roof which are designed to enable the ambient environment to be controlled and to allow passive ventilation of the compost by air (see photo of bunker below). To further facilitate the addition of POME, the compost is systematically cycled every few days through each of the bunkers. The finished product is an organic compost which is spread in a thin layer in the plantation using a specifically designed spreader machine which is towed behind a tractor in the field.

Empty Composting Bunker

The compost environment is computer controlled with real time monitoring and recording of oxygen and temperature of the compost mass through probes which are strategically placed into the compost mass. The computer system will control the fans to ensure that the compost is not in anaerobic conditions. Oxygen is injected into the compost from the fans through a specifically designed concrete floor which allows air to be injected up into the compost mass (see figure below). The power for the ABC plant is supplied from the adjacent CPO Mill which uses biomass as its fuel source.



Aerated floor keeps compost in aerobic condition and drains excess POME back to sump

How does the system ensure that there is no run off or leakage?

Any liquid that percolates through the aerated floor will go through the compost drains and is piped into a sump where it is re-circulated back to the compost. The bunkers are covered so ambient rainwater is eliminated from the bulk of the composting area. All the run-off water from the compost is kept within the system and constantly recycled.

The Aerated Bunker Composting System (ABC) Process:

The ABC System at the Mill operates as follows:

a) Pressed EFB collected in Hoppers at the Mill are transported to the adjacent ABC Plant via truck. The trucks will directly tip the EFB into the first bunker which is a mixing bunker. The Project has 6 bunkers including this first mixing bunker.

b) POME utilized by the ABC Plant is piped directly from the Mill's Fat Pit. POME is sprayed onto the compost through a sprinkler system in the roof of each bunker. POME can also be added to the EFB / compost through a specially designed Bunker Filler Machine. The compost is moved periodically through the set of bunkers using a front end loader and specialized Bunker Filler Machine. After a specified number of days the compost will be moved and restacked in the next bunker. Additional POME can again be added to the surface through the sprinkler system as required during the period in the Bunker. At each move the compost is taken out of the bunker with a front end loader, and transferred to the next bunker where the Bunker Filling Machine mixes the EFB with more POME and re stacks the compost. The Bunker Filling Machine helps to re-blend the compost and at the same time add an even amount of fresh POME to the compost. It breaks up any lumps that may be formed allowing air to easily penetrate the whole mass during the next period.

c) This process is then repeated until the end of the composting period. The exact application rate of POME and final composting period will be determined through both calculation and analysis. Any free liquid added to the compost which is not absorbed, drains through the specially designed floor system into the sump then is pumped back into the system for reuse.

d) Throughout the process, the compost material is continually monitored by probes inserted within the compost which are connected to the control computer. Records are kept automatically and real time performance of temperature and levels of oxygen within the compost mass can be monitored 24 hours a day. These probes are connected to the computer which controls the activity of the fans. These fans control the air flow to maintain the compost in an aerobic state ideal for the micro-flora to be fully active and prevent methane being generated. When required, the fans will be activated to inject and force air through the specially designed bunker floor into the compost to ensure optimum aerobic conditions are maintained.

e) At the end of the process, each batch of finished compost is weighed at the weigh bridge, then taken to the plantation via truck and spread by spreader and tractor as an organic fertilizer in the neighboring plantation.

Description of Equipment for CPA001:

Specific Equipment used in the ABC Plant are as follows:

Machine	Type	Specification
01	Truck	PS 136
02	Bunker Filler Machine Traymaster	112 HP
03	Tractor	TD 90 TS 6030, 118HP
04	Wheel Loader	ZIP-2; 167 HP
05	Spreader	This is a trailor does not require fuel

(b) **Information on the implementation and actual operation of the CPAs, including relevant dates (e.g. construction, commissioning, start of operation).**

CPA001:

Matter	Date	Source
Start Date of Project Activity	04/07/2011	CPA-DD section A.4.2.1.
Construction Completed	01/02/2012	Letter from Technology Provider
Commissioning	01/02/2012-08/03/2012	Letter from Technology Provider
Start Date of Operation	08/03/2012	Letter from Technology Provider

2. **If applicable, present information on any post-registration changes to the CPAs in section** Error! Reference source not found.**.**

Not Applicable

C.2. Location of CPAs

The project activity is located at PT. Socfin Indonesia's Bangun Bandar crude palm oil mill, Martebing village, Dolok Masihul district, Serdang Bedagai regency, and North Sumatra province, Indonesia. The project location is about 3 hours from Medan city and has geographical location of 98˚57'58.70"- 99˚4'36.33" E and 3˚16'24.46" - 3˚20'32.54" N.

The map of the project location is shown in following figure[3]:

[3] Source from http://maps.google.co.id/

C.3. Post-registration changes to CPAs

C.3.1. Temporary deviations from the monitoring plans in the included CPA-DDs, applied methodologies or standardized baselines

Not Applicable.

C.3.2. Corrections

Not Applicable

C.3.3. Changes to the start date of the crediting period

Not Applicable

C.3.4. Inclusion of monitoring plan

Not Applicable

C.3.5. Permanent changes to the included monitoring plans, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

Not Applicable

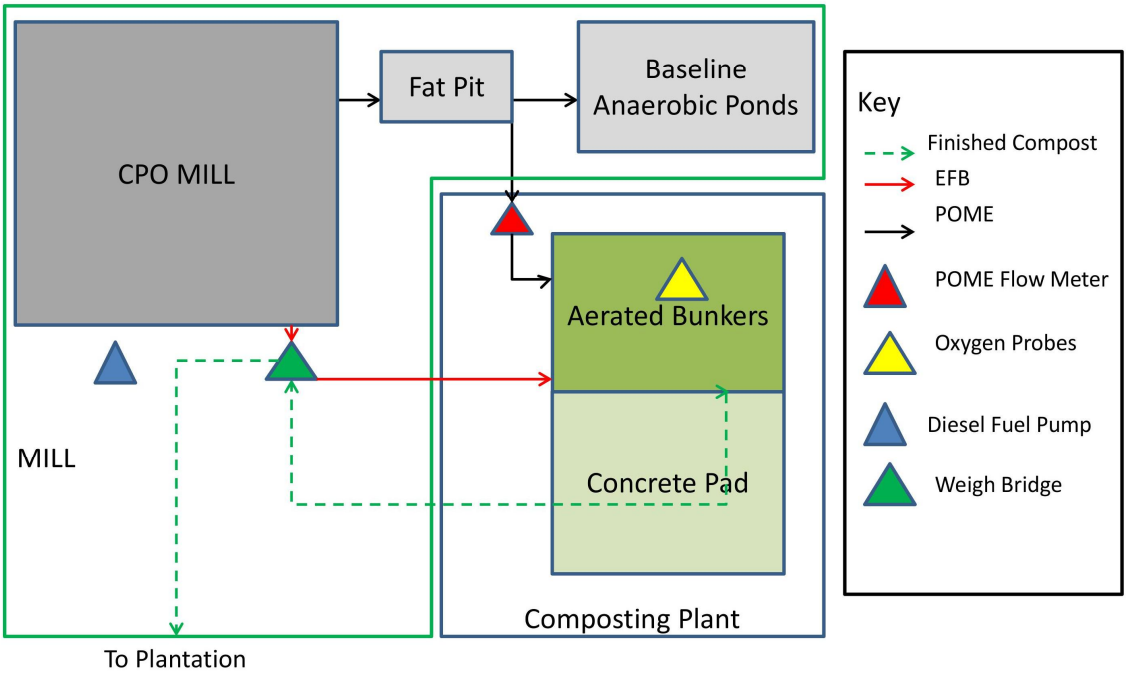
C.3.6. Changes to project design

Not Applcable

SECTION D. Description of monitoring system of CPAs

CPA001

CPA001:Line Diagram Showing Relevant Monitoring Points



SECTION E. Data and parameters

E.1. Data and parameters fixed ex ante

(Copy this table for each data or parameter.)

Data/Parameter	**Φ**
Unit	-
Description	Model correction factor to account for model uncertainties
Source of data	-
Value(s) applied	0.9
Choice of data or measurement methods and procedures	In accordance with the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site” version 05.1
Purpose of data/parameter	Baseline Emissions

Additional comments	Oonk et el. (1994) have validated several landfill gas models based on 17 realized landfill gas projects. The mean relative error of multi-phase models was assessed to be 18%. Given the uncertainties associated with the model and in order to estimate emission reductions in a conservative manner, a discount of 10% is applied to the model results.

Data/Parameter	**OX**
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	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, Volume 5, chapter 3
Value(s) applied	0
Choice of data or measurement methods and procedures	The shredded EFB is directly dumped in the plantation and therefore categorized as unmanaged and uncategorized SWDS.
Purpose of data/parameter	Baseline Emissions
Additional comments	-

Data/Parameter	**F**
Unit	-
Description	Fraction of methane in the SWDS gas (volume fraction)
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.5
Choice of data or measurement methods and procedures	In accordance with the "*Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05.1*
Purpose of data/parameter	Baseline Emissions
Additional comments	-

Data/Parameter	**MCF**
Unit	-
Description	Methane correction factor
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0
Choice of data or measurement methods and procedures	None of solid waste disposal site meets the requirement of solid waste disposal site categorised in the "*Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05.1* found by DOE during site visit, therefore the MCF is considered as 0.
Purpose of data/parameter	Baseline Emissions
Additional comments	The methane correction factor (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.

Data/Parameter	DOC_j
Unit	-
Description	Fraction of degradable organic carbon (by weight) in the waste type j
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 2.4 and 2.5)
Value(s) applied	20%
Choice of data or measurement methods and procedures	As per the "*Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05.1,* 'In the case of empty fruit bunches (EFB), as their characteristics are similar to garden waste, the parameter value correspondent of garden shall be used'.
Purpose of data/parameter	Baseline Emissions
Additional comments	-

Data/Parameter	DOC_f
Unit	-
Description	Fraction of degradable organic carbon (DOC) that can decompose
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.5
Choice of data or measurement methods and procedures	As per the "*Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05.1*
Purpose of data/parameter	Baseline Emissions
Additional comments	-

Data/Parameter	k_j
Unit	-
Description	Decay rate for the waste type j
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 3.3)
Value(s) applied	0.17
Choice of data or measurement methods and procedures	As per "*Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05.1*, 'In the case of empty fruit bunches (EFB), as their characteristics are similar to garden waste, the parameter values correspondent of garden waste shall be used.' Tropical (MAT > 20oC) Wet climate (MAP > 1000 mm)
Purpose of data/parameter	Baseline Emissions
Additional comments	-

Data/Parameter	$n_{COD,BL,i}$
Unit	-
Description	COD removal efficiency of the baseline treatment system i
Source of data	Calculation, based on COD historical data of wastewater entering and leaving the baseline wastewater treatment system.

Value(s) applied	99.4%
Choice of data or measurement methods and procedures	Parameter is used to determine the COD removal of the wastewater treatment in the baseline scenario
Purpose of data/parameter	Baseline Emissions
Additional comments	The wastewater leaving the baseline of wastewater treatment system refers to the wastewater discharged to the river

Data/Parameter	**$NCV_{diesel\ oil}$**
Unit	TJ/Gg
Description	Net Calorific Value of Diesel Oil
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	43.3
Choice of data or measurement methods and procedures	Value is obtained from default value of the IPCC 2006, volume 2: Energy (Table 1.2)
Purpose of data/parameter	Project Emissions
Additional comments	-

Data/Parameter	**$EF_{CO2,\ diesel\ oil}$**
Unit	kg/TJ
Description	CO_2 emission factor of Diesel Oil
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	74,800
Choice of data or measurement methods and procedures	Value is obtained from default value of the IPCC 2006, volume 2: Energy (Table 1.3)
Purpose of data/parameter	Project Emissions
Additional comments	-

E.2. Data and parameters monitored

(Copy this table for each data or parameter.)

Data/Parameter	**$W_{j,x}$**
Unit	tons
Description	Amount of organic waste type j prevented from disposal in the SWDS in year x
Measured/calculated/ default	Measured
Source of data	Data recorded from weighing bridge
Value(s) of monitored parameter	Refer to Emission Reduction Spreadsheet

<table>
<tr><td>Monitoring equipment</td><td>Electronic Weighing Bridge, technical and calibration details as set out in table below:

<table>
<tr><td>Parameter</td><td>Details</td></tr>
<tr><td>Type</td><td>Electronic Weigh Bridge</td></tr>
<tr><td>Make / Model</td><td>AVERY WEIGH TRONIX E 1205</td></tr>
<tr><td>Accuracy</td><td>Min 10kg - max 40,000kg</td></tr>
<tr><td>Load Cell Details</td><td>•Type: T 302 X 22.5t

•Accuracy: 22.5t /1.7 Kg

•Calibration: Not required</td></tr>
<tr><td>Serial numbers</td><td>074350113 and 134750202
There is only one weigh bridge, however there have been two serial numbers used over the monitoring period due to a repair to the weigh bridge on the night of 29/09/2014, when the indicator of the electronic scale of the weighbridge was replaced due to lightning strike. The first serial number 074350113 is used up to 29/09/2014, with the last calibration certificate on 10/07/2014 covering this period (see below for details on calibration certificates). From the 30/09/2014 onwards the new serial number 134750202 is used and the first calibration certificate for this serial number starts on 30/09/2014. Please note there is some overlap in the period of the last calibration certificate of the first serial number (074350113) and first period of the second serial number (134750202).</td></tr>
<tr><td>Calibration frequency</td><td>Annual</td></tr>
<tr><td>Date of Calibration</td><td>•Date of Initial calibration (serial No 074350113): 16/07/2012

•Date of Second Calibration (serial No 074350113): 10/07/2013

•Date of Third Calibration (serial No 074350113): 10/07/2014

•Date of Fourth Calibration (serial No 134750202): 30/09/2014[4]

•Date of Fifth Calibration (serial No 134750202) : 22/07/2015

•Date of Sixth Calibration (serial No 134750202): 21/07/2016

•Date of Last Calibration (serial No 134750202): 18/08/2017</td></tr>
</table>
</td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>The weighing is done each time a truck transporting the organic waste passes the weighing bridge. Data will be recorded daily in a log sheet and aggregated weekly and monthly.</td></tr>
</table>

[4] This is the first calibration certificate for serial no 134750202. There is an overlap with the last calibration certificate for serial no. 074350113 for the reasons explained above.

Calculation method (if applicable)	-
QA/QC procedures	The weighing bridge will undergo maintenance/calibration based on manufacturer specification or international standard or at least once per year. Calibration is to be conducted by accredited party.
Purpose of data/parameter	Baseline Emissions
Additional comments	Amount of organic waste type j prevented from disposal in the SWDS in year x is quantity of EFB treated for composting facility.

Data/Parameter	$Q_{y,\ treatment}$
Unit	tons
Description	Quantity of produced compost
Measured/calculated/ default	Measured
Source of data	Data recorded from weighing bridge
Value(s) of monitored parameter	Refer to Emission Reduction Spreadsheet
Monitoring equipment	Electronic Weighing Bridge same as for $W_{j,x}$. Thus for technical and calibration details please see $W_{j,x}$, row "*Monitoring Equipment*" above.
Measuring/reading/recording frequency	The weighing is done each time a truck transporting the produced compost passes the weighing bridge. Data will be recorded daily in a log sheet and aggregated weekly and monthly.
Calculation method (if applicable)	-
QA/QC procedures	The weighing bridge will undergo maintenance/calibration based on manufacturer specification or international standard or at least once per year. Calibration is to be conducted by accredited party.
Purpose of data/parameter	Baseline Emissions
Additional comments	-

Data/Parameter	$FC_{diesel\ oil,y}$
Unit	litre
Description	Fossil fuel (diesel oil) consumption in year y
Measured/calculated/ default	Measured
Source of data	Fuel meter at the fuel station
Value(s) of monitored parameter	Refer to Emission Reduction Spreadsheet

<table>
<tr><td>Monitoring equipment</td><td>Fuel meter, technical and calibration details as set out in table below:

<table><tr><th>Parameter</th><th>Details</th></tr><tr><td>Type</td><td>Fuel Meter</td></tr><tr><td>Make / Model</td><td>PIUSI 46029</td></tr><tr><td>Accuracy</td><td>60 L (Max) – 6 L (Min)</td></tr><tr><td>Serial no</td><td>737B00</td></tr><tr><td>Calibration frequency</td><td>Annual</td></tr><tr><td>Date of Calibration</td><td>•Date of Initial Calibration: 14/052012
•Date of Second Calibration: 14/05/2013
•Date of Third Calibration: 12/05/2014
•Date of Fourth Calibration: 11/05/2015
•Date of Fifth Calibration: 15/05/2016
•Date of Sixth Calibration: 13/05/2017
•Date of Last Calibration: 16/05/2018</td></tr></table></td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Fuel (diesel oil) consumption of each machine or engine for mill operation purpose is recorded in the fuel station located within the project boundary. The recording systems will also be applied in machines which are operated for cocomposting operational purpose (i.e. wheel loader, traymaster bunker filler, and spreader machine). The amount of fuel sent to machines or engines is measured by a fuel meter installed in the fuel station, manually recorded daily by operator and data to be aggregated monthly. Operator will also manually calculate and record in unit of kg, where the density as parameter used for conversion is obtained from the supplier delivery note of the diesel oil.</td></tr>
<tr><td>Calculation method (if applicable)</td><td>Measured</td></tr>
<tr><td>QA/QC procedures</td><td>Fuel meter will undergo maintenance/calibration based on manufacturer specification or international standard or at least once per year. Calibration is to be conducted by accredited party.

Accordance with ‘Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion’, the consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes.</td></tr>
<tr><td>Purpose of data/parameter</td><td>Project Emissions</td></tr>
<tr><td>Additional comments</td><td>-</td></tr>
</table>

Data/Parameter	**$Density_{diesel\ oil}$**
Unit	kg/litre
Description	Density of Diesel Oil
Measured/calculated/ default	Measured
Source of data	Provided by fuel supplier in delivery note
Value(s) of monitored parameter	Refer to Emission Reduction Spreadsheet
Monitoring equipment	Provided by fuel supplier in delivery note

Measuring/reading/recording frequency	Data is available in the fuel delivery note made by supplier and will be manually recorded by operator. Due to uncertainty number of fuel delivery per month, data to be aggregated and averaged monthly. Therefore one monthly averaged density will be used for monthly project emission calculation of fossil fuel consumption during crediting period.
Calculation method (if applicable)	-
QA/QC procedures	No fuel delivery in certain months might occur in Bangun Bandar, so therefore previous monthly average density is deemed valid in this condition.
Purpose of data/parameter	Project Emissions. The density is used to convert volumetric (litre) reading from fuel meter in the fuel station to mass unit (kg) in the ER calculation during crediting period.
Additional comments	-

Data/Parameter	***Oxygen content***
Unit	%
Description	Percentage of dissolvent oxygen content
Measured/calculated/ default	Measured
Source of data	Oxygen online sensor
Value(s) of monitored parameter	Refer to Emission Reduction Spreadsheet

<table>
<tr><td>Monitoring equipment</td><td>Online Oxygen sensor

Each of the 5 composting bunkers[5] have 2 oxygen sensors, taking the total number of sensors for the ABC Plant to 10. All of the sensors are identical, and they are all calibrated at the same time. The technical and calibration details in table below is the same for all 10 of the Oxygen sensors.

<table>
<tr><th>Parameter</th><th>Details</th></tr>
<tr><td>Type</td><td>Online Oxygen sensor</td></tr>
<tr><td>Make / Model</td><td>FANCOM IOM O2-Unit & O2 Sensor</td></tr>
<tr><td>Measurement Range</td><td>0.0-25.0%</td></tr>
<tr><td>Accuracy</td><td>±1% at 20°C and 1013mbar</td></tr>
<tr><td>Serial no</td><td>Not Available – Sensors do not have specific serial numbers but are identified in reference to bunker number as follows[6]:
•B2-01 / B2-02
•B3-01 /B3-02
•B4-01/ B4-02
•B5-01/ B5/02
•B6-01 / B6/02</td></tr>
<tr><td>Calibration frequency</td><td>Annually</td></tr>
<tr><td>Date of Calibration</td><td>•Date of Initial calibration: 16/07/2012
•Date of Second Calibration: 12/07/2013
•Date of Third Calibration: 11/07/2014
•Date of Fourth Calibration: 10/07/2015
•Date of Fifth Calibration: 12/07/2016
•Date of Last Calibration: 12/07/2017</td></tr>
</table></td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>The ABC system is equipped with an automatic oxygen control system. The operator can adjust the maximum and minimum oxygen level. The default minimum oxygen level is set at 10% for the project activity. Once the oxygen levels near the minimum set points (10%), the fans are activated, thus forcing fresh air into the compost mass and raising the oxygen levels within the compost back to near ambient levels/maximum levels. The system will be operated continuously and will keep the co-composting process under aerobic condition.</td></tr>
<tr><td>Calculation method (if applicable)</td><td>-</td></tr>
<tr><td>QA/QC procedures</td><td>The oxygen sensor will undergo maintenance/calibration based on manufacturer specification.</td></tr>
<tr><td>Purpose of data/parameter</td><td>The 10% is set as minimum oxygen content level for conservativeness since the AMS-III.F version 10 requires the minimum level of 8%.</td></tr>
<tr><td>Additional comments</td><td>-</td></tr>
</table>

[5] Bunkers 2 to 6 are composting bunkers, the first bunker (Bunker 1) is only a mixing bunker as per technical description set out in section C.1.1. above

[6] Calibration Certificates specifically reference these identification numbers.

<table>
<tr><td>Data/Parameter</td><td>Q_{ww,i,y}</td></tr>
<tr><td>Unit</td><td>m^3</td></tr>
<tr><td>Description</td><td>Volume of wastewater treated in baseline wastewater treatment system i in year y</td></tr>
<tr><td>Measured/calculated/ default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Flow meter</td></tr>
<tr><td>Value(s) of monitored parameter</td><td>Refer to Emission Reduction Spreadsheet</td></tr>
<tr><td>Monitoring equipment</td><td>Electronic Flow Meter, technical and calibration details as set out in table below:

<table>
<tr><td>Parameter</td><td>Details</td></tr>
<tr><td>Type</td><td>Electromagnetic Flow Meter</td></tr>
<tr><td>Make / Model</td><td>ENDRES+HAUSER/EH (PROMAG P) E90F1C19000</td></tr>
<tr><td>Accuracy class</td><td>14.776 M^3/H (Max) – 0.24626 M^3/H (Min)</td></tr>
<tr><td>Serial no</td><td>2629662</td></tr>
<tr><td>Calibration frequency</td><td>Annual</td></tr>
<tr><td>Date of Calibration</td><td>•Date of Initial calibration: 14/05/2012
•Date of Second Calibration: 14/05/2013
•Date of Third Calibration: 12/05/2014
•Date of Fourth Calibration: 11/05/2015
•Date of Fifth Calibration: 15/05/2016
•Date of Sixth Calibration: 13/05/2017
•Date of Last Calibration: 16/05/2018</td></tr>
</table></td></tr>
<tr><td>Measuring/reading/recording frequency</td><td>Volume of the wastewater treated in baseline wastewater treatment/wastewater enters the co-composting project in the project situation is continuously measured by flow meter and manually recorded daily by operator. Monitored data will be aggregated monthly and annually.</td></tr>
<tr><td>Calculation method (if applicable)</td><td>-</td></tr>
<tr><td>QA/QC procedures</td><td>Flow meters will undergo maintenance/calibration based on manufacturer specification or international standard once per year. Calibration is to be conducted by accredited party.</td></tr>
<tr><td>Purpose of data/parameter</td><td>Baseline Emissions</td></tr>
<tr><td>Additional comments</td><td>-</td></tr>
</table>

Data/Parameter	***COD_{inflow,i,y}***
Unit	t/ m^3
Description	Chemical oxygen demand of the wastewater inflow to the baseline treatment system i in year y
Measured/calculated/ default	Measured
Source of data	Measurement is conducted by accredited third party.

Value(s) of monitored parameter	Refer to Emission Reduction Spreadsheet
Monitoring equipment	-
Measuring/reading/recording frequency	Measurement is to be conducted once in a month.
Calculation method (if applicable)	
QA/QC procedures	-
Purpose of data/parameter	Baseline Emissions
Additional comments	-

Data/Parameter	$COD_{ww,discharge,BL,y}$
Unit	t/ m^3
Description	Chemical oxygen demand of the treated wastewater discharged into the river in the baseline situation in the year y
Measured/calculated/ default	Calculated
Source of data	Calculated based on $n_{COD,BL,i}$ and $COD_{inflow,i,y.}$
Value(s) of monitored parameter	-
Monitoring equipment	-
Measuring/reading/recording frequency	Calculation is to be conducted once in a month by monitoring officer.
Calculation method (if applicable)	Calculated based on $n_{COD,BL,i}$ and $COD_{inflow,i,y.}$
QA/QC procedures	Calculation shall be done in a spread sheet and checked by the CDM coordinator
Purpose of data/parameter	-
Additional comments	The value above is taken from 3 years historical data prior to project activity implementation as for ex-ante calculation. In the project condition, the wastewater discharge into the river will be greatly reduced since wastewater (POME) will be utilized for co-composting process; therefore to get expost value, the calculation is taken as conservative. In practise, the COD level of the POME prior to discharge is also measured for regulatory reporting to the local government.

Data/Parameter	***f***
Unit	-
Description	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
Measured/calculated/ default	-
Source of data	Written information from the operator of the solid waste disposal site
Value(s) of monitored parameter	-
Monitoring equipment	-
Measuring/reading/recording frequency	Monitoring will be done annually.
Calculation method (if applicable)	-
QA/QC procedures	-

Purpose of data/parameter	-
Additional comments	-

Data/Parameter	GWP_{CH4}
Unit	tCO_2e/tCH_4
Description	Global Warming Potential (GWP) of methane, valid for the relevant commitment period
Measured/calculated/ default	Decision under UNFCCC and the Kyoto Protocol
Source of data	25
Value(s) of monitored parameter	Monitoring will be done annually.
Monitoring equipment	-
Measuring/reading/recording frequency	-
Calculation method (if applicable)	
QA/QC procedures	-
Purpose of data/parameter	Baseline Emissions
Additional comments	-

Data/Parameter	$NCV_{diesel\ oil}$
Unit	TJ/Gg
Description	Net Calorific Value of Diesel Oil
Measured/calculated/ default	Default
Source of data	The following data sources may be used if the relevant conditions apply:

Data source	Conditions for using the data source
a.Values provided by the fuel supplier in invoices	This is the preferred source if the carbon fraction of the fuel is not provided (Option A)
b.Measurements by the project participants	If a) is not available
c.Regional or national default values If a) is not available	If a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).
d.IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If a) is not available

Value(s) of monitored parameter	43.3
Monitoring equipment	-
Measuring/reading/recording frequency	For a) and b): Measurements should be undertaken in line with national or international fuel standards

Calculation method (if applicable)	-
QA/QC procedures	Verify if the values under a), b) and c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in a), b) or c) should have ISO17025 accreditation or justify that they can comply with similar quality standards
Purpose of data/parameter	Project Emissions
Additional comments	-

Data/Parameter	$EF_{CO2,\ diesel\ oil}$
Unit	kg/TJ
Description	CO_2 emission factor of Diesel Oil
Measured/calculated/ default	Default
Source of data	The following data sources may be used if the relevant conditions apply:

Data source	Conditions for using the data source
a.Values provided by the fuel supplier in invoices	This is the preferred source if the carbon fraction of the fuel is not provided (Option A)
b.Measurements by the project participants	If a) is not available
c.Regional or national default values If a) is not available	If a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).
d.IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If a) is not available

Value(s) of monitored parameter	74,800
Monitoring equipment	-
Measuring/reading/recording frequency	For a) and b): The CO_2 emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated. For c): Review appropriateness of the values annually For d): Any future revision of the IPCC Guidelines should be taken into account.
Calculation method (if applicable)	
QA/QC procedures	-
Purpose of data/parameter	Project Emissions
Additional comments	Applicable where option B of the '*Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion*' is used. For a): If the fuel supplier does provide the NCV value and the CO_2 emission factor on the invoice and these two values are based on measurements for this specific fuel, this CO_2 factor should be used. If another source for the CO_2 emission factor is used or no CO_2 emission factor is provided, Options b), c) or d) should be used.

E.3. Implementation of sampling plan

Not Applicable

SECTION F. Calculation of emission reductions or net anthropogenic removals

F.1. Calculation of baseline emissions or baseline net removals

There is no manure disposal in the absence of the project activity. Hence, the baseline emissions for the composting activity are calculated using the following equation:

$$BE = BE_{CH4,SWDS,y} + BE_{ww,y} - MD_{y,reg} * GWP\_CH_4$$

Where:

$BE_{CH4,SWDS,y}$	Yearly methane generation of potential 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" (tCO_2e). The tool may be used with the factor "f=0.0" assuming that no biogas is captured and flared. 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*)'
$MD_{y,reg}$	Amount of methane that would have to be captured and combusted in the year *y* to comply with the prevailing regulations (ton)
$BE_{ww,y}$	Where applicable, baseline emissions from the wastewater co-composted, calculated as per the procedures in AMS-III.H
GWP_CH_4	GWP for CH_4

Baseline emission due to methane generation potential of the solid waste composted:

$$BE_{CH4,SWDSy} = \varphi \bullet (1-f) \bullet GWP_{CH4} \bullet (1-OX) \bullet \frac{16}{12} \bullet F \bullet DOC_f \bullet MCF \bullet \sum_{x=1}^{y} \sum W_{j,x} \bullet DOC_j \bullet e^{-k_j(y-x)} \bullet \left(1-e^{-k_j}\right)$$

Where:

$BE_{CH4,SWDS,y}$	Methane emissions avoided due to prevention of waste disposal at the solid waste disposal site (SWDS) during the year *y*, from the start of project activity to the end (tCO_2e)
φ	Model correction factor to account for model uncertainties (0.9)
f	Fraction of methane captured at the SWDS and flared, combusted or used in another manner (0)
GWP_{CH4}	Global Warming Potential (GWP) of methane
OX	Oxidation factor (reflecting the amount of methane on SWDS that is oxidised in the soil or other material cover the waste) (0)
F	Fraction of methane in the SWDS gas (volume fraction) (0.5)
DOC_f	Fraction of degradable organic carbon (DOC) that can decompose (0.5)
MCF	Methane correction factor (0)
$W_{j,x}$	Amount of organic waste type j prevented from disposal to the SWDS in year *x* (ton)
DOC_j	Fraction of degradable organic carbon (by weight) in the waste type *j* (0.2)

K_j	Decay rate for the waste type *j* (0.17)
j	Waste type category (index)
x	Year during the crediting period: *x* runs from the first year of the first crediting period (*x*=1) to the year y for which avoided emission calculated (*x*=*y*) (1)
y	Year for which methane emission are calculated (1)

As MCF is zero, the $BE_{CH4,SWDS,y}$ for the entire crediting period is zero.

As per AMS-III.H version 16, baseline emission from the wastewater co-composted may comprise of methane emissions from baseline wastewater treatment systems (*BEww,treatment,y*) and methane emissions on account of inefficiencies in the baseline wastewater treatment systems and the presence of degradable organic carbon in the treated wastewater discharged into river/lake/sea (*BEww,discharge,y*).

Baseline emission due to methane emission from baseline wastewater treatment system:

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

Where:

$Q_{ww,i,y}$	Volume of wastewater treated in baseline wastewater treatment system *i* in year *y*. For ex ante estimation, forecasted wastewater generation volume or the designed capacity of wastewater treatment facility can be used. (m^3)
$COD_{inflow,i,y}$	Chemical oxygen demand of the wastewater inflow to the baseline treatment system *i* in year *y*
$\eta_{COD,BL,I}$	COD removal efficiency of the baseline treatment system *i* (99.4 %)
$MCF_{ww,treatment,BL,I}$	Methane correction factor for baseline wastewater treatment systems *i* (0.8)
i	Index for baseline wastewater treatment system
$Bo_{,ww}$	Methane producing capacity of the wastewater (IPCC value of 0.25 kg CH_4/kg COD)
UF_{BL}	Model correction factor to account for model uncertainties (0.89)
$GWPCH_4$	Global Warming Potential for methane

Details for the *BEww,treatment,y* calculation can be found under the worksheet “Baseline Emission” in the CER spreadsheet.

Baseline net removals calculated as below:

Year	Baseline Emission (ton CO_2)
2013	5,928.69
2014	5,094.97
2015	5,260.48
2016	5,485.70
2017	4,133.62
2018	2,127.07
Total	28,030.53

F.2. Calculation of project emissions or actual net removals

Project emissions that might occur due to the co-composting process is listed as following:

a) CO_2 emissions due to incremental transportation distances;
b) CO_2 emissions from electricity and/or fossil fuel consumption by the project activity facilities;
c) Methane emissions during composting process;
d) Methane emissions from runoff water;
e) In case the compost is stored under anaerobic conditions and/or delivered to a landfill: the methane emissions from the disposal/storage of compost.

Project emission from incremental transportation:

The co-composting facility is located in the boundary of the project activity; this means no incremental transportation distance for both POME and EFB, therefore project emissions due to transportation of EFB and POME to the co-composting facility is considered as zero

Project emission due to fossil fuel combustion for final compost transportation:

The project emission due to fossil fuel (diesel oil) combustion is calculated based on the monitored fossil fuel consumption ($FC_{diesel\ oil,y}$) of the spreader machine.

The project emission from fossil fuel combustion is calculated as following:

$PE_{FC,y} = FC_{dieseloil,y} * NCV_{dieseloil} * EF_{CO2,dieseloil}$

Where:

$FC_{diesel\ oil,y}$	Fossil fuel (diesel oil) consumption in year *y* (kg)
$NCV_{dieseloil}$	Net calorific value of diesel oil (TJ/Gg) (43.3)
$EF_{CO2,dieseloil}$	CO_2 emission factor of diesel oil (kg/TJ) (74,800)

Details for the $PE_{FC,y}$ calculation can be found under the worksheet "Project Emission" in the CER spreadsheet.

Project emissions from electricity or fossil fuel consumption:

The Mill Facility is equipped with two biomass steam turbines power generation which have capacity of 500 kW and 520 kW, and therefore the emission from the electricity generation is considered as carbon neutral.

Project emissions due to methane emission during composting activity:

As per methodology AMS-III.F version 10, '$EF_{composting}$ can be set to zero for the portions of Q_y if the monitored oxygen content of the composting process in all points within the window are above 8%. This can be done via sampling with maximum margin of error of 10% at a 90% confidence level. For this purpose, a portable oxygen meter can be used with lancets of at least 1 m length. In the case of forced aerated in-vessel and forced aerated pile composting systems, continuous measurements may also be done using online sensor(s)'. Since the Project Activity involves the forced aerated bunker system, which comprise of oxygen and temperature continuous online monitoring system, the project emission from co-composting process is considered as zero as long as the oxygen content can be maintained above 8%.

Project emissions from runoff water from the composting yard:

The Project Activity is using the roofed Aerated Bunker Co-composting System or ABC System. The roof will cover the bunker from the rain; therefore the runoff water from the rain will not occur ($Q_{y,ww,runoff}$ and $COD_{y,ww,runoff}$ are not necessarily monitored). Furthermore, the ABC system will re-apply or re-circulate the un-utilized POME in the co-composting process through a circulator POME pump, and therefore the emission due to runoff water is considered as zero.

Project emission due to methane emissions from anaerobic storage and/or disposal in a landfill:

The final compost product will be directly spread in the plantation and will not be stored in anaerobic storage and/or dispose in a landfill; therefore the project emission from anaerobic storage and/or disposal in a landfill is considered as zero.

Total project emissions calculated as below:

Year	Project Emission (ton CO_2)
2013	109.98
2014	88.01
2015	58.79
2016	40.84
2017	49.81
2018	26.24
Total	373.67

F.3. Calculation of leakage emissions

Project technology implemented is brand new and not transferred from another facility, hence the leakage emission is considered as zero.

F.4. Calculation of emission reductions or net anthropogenic removals

CPA UNFCCC reference number	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)		
				Before 01/01/2013	From 01/01/2013	Total amount
CPA001	28,030.53	373.67	0	N/A	27,656.86	27,656 (rounded down)

F.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the included CPA-DDs

CPA UNFCCC reference number	Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante (t CO_2e)
CPA001	27,656	55,715

F.6. Remarks on increase in achieved emission reductions

The amount of emission reductions achieved in this monitoring period is lower than the estimated value in the registered CPA-DD. The Project activity's achieved emission reductions during the Monitoring Period are lower than the estimated emission reductions due to less POME used in the actual running of the project activity vs the estimated POME used in the baseline. This reduction in POME utilization is due to the following two reasons:

1. The mill which provides the ABC Plant with its key composting inputs of POME and EFB has provided less than estimated in the baseline due to it processing steadily less and less FFB throughout the Monitoring Period (see section C.1 for details); and
2. The amount of POME able to be proportionally absorbed into the compost by the EFB during the composting process was in actual practice not as high as estimated in the baseline.

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Document information

Version	*Date*	*Description*
02.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for programmes of activities (CDM-EB93-A07-STAN); • Make editorial improvements.
01.0	1 April 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
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