CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for submission of CPAs that apply a small-scale approved methodology using the provision of the proposed small scale CDM PoA.

(ii) The coordinating/managing entity shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)[1,2] that is specified to the proposed PoA by using the provisions stated in the SSC PoA DD. At the time of requesting registration the SSC PoA DD must be accompanied by a CDM-SSC CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC CPA-DD.

[1] The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

[2] At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

SECTION A. General description of small scale CDM programme activity (CPA)

A.1. Title of the small-scale CPA:

Fetty Mina Jaya Co-composting – Under PoA Composting and Co-composting Programme of Activities (PoA) in Indonesia

Version 4
Date: 9 August 2011

A.2. Description of the small-scale CPA:

The CPA developed by PT Fetty Mina Jaya (hereafter referred to as the "project developer") is a composting project in the province of Riau, on the island of Sumatra in Indonesia (hereafter referred to as the "host country"). The project will be located at Fetty Mina Jaya palm oil mill.

This project aims to avoid methane emissions from the solid waste that is currently disposed of and left to decay in unmanaged solid waste disposal sites situated in the oil palm plantation area. The project will also reduce the methane emissions from anaerobic digestion of palm oil mill effluent (POME) treatment by avoiding the current anaerobic wastewater treatment method, which uses a series of lagoons, and instead applying POME onto windrows of shredded empty fruit bunches (EFB) as part of an aerobic co-composting technique. The project will support the change of the conventional way of waste management in palm oil mills to aerobic co-composting technology.

At the moment, there are no laws or regulations in Indonesia that requires change of the current waste management system in palm oil mill, among all laws and regulations linked to waste treatment in the palm oil sector in Indonesia[3].

The Project utilizes both solid and liquid waste (co-composting) from the palm oil mill, which as a capacity to process up to 30 tonnes per hour Fresh Fruit Bunches (FFB). Based on last 3 years historical data, the mill processed on an average of 102,034 tonnes FFB per year which is depend on FFB supply. Since the palm oil mill does not have own plantation, all FFB will come from small holders' plantations. In the process of producing Crude Palm Oil (CPO), four types of waste are produced: EFB, fibers, palm kernel shells (PKS), and liquid waste known as palm oil mill effluent (POME). Whilst fiber and a proportion of PKS will be used as fuel for the mill boilers to generate heat and electricity for the whole plant, EFBs are discharged as waste and left to decay in an unmanaged dumpsite. POME is treated in the anaerobic and aerobic ponds before being discharged into a waterway or river. Fetty Mina Jaya is a

[3] Regulation of the State Minister of Environment_No_11_Year_2006, Environmental Impact Assessment; Decree of the State Minister of Environment_No_51_Year_1995, Liquid Waste Standards for Industrial Activities; Government Regulation_No_41_Year_1999, Air Pollution Control; Decree of the State Minister of Environment_No_111_Year_2003, Guidelines of Requirements, Permit Procedures and Study for Wastewater Disposal into Water or Water Resources; Decree of the State Minister of Environment_No_13_Year_1995, Quality Standards for Stationary Source Emission.

conventional palm oil mill where it does not use an advanced oil separation technologies in the process. EFB accounts for about 22%[4] and POME accounts for about 0.65 m^3 per ton[5] of the FFB processed.

In the baseline, Solid waste (EFB) is dumped and left to decay in unmanaged solid waste disposal site at the mill area, releasing methane into the atmosphere. POME is treated in a standard anaerobic open lagoon wastewater treatment system, sized to treat the palm oil mill wastewater, within legal limits[6], before final discharge to the river. The above anaerobic wastewater treatment process results in the formation of a large quantity of methane gas released in an uncontrolled manner into the atmosphere. No methane gas capture or utilization exists.

The project activity will divert the EFBs and POME to a controlled aerobic composting plant that will prevent the emission of methane. POME is sprayed over shredded EFBs to maintain adequate moisture levels throughout the process cycle and provide additional nitrogen content that contributes to produce mature compost faster. The subsequent process is aerobic due to mechanical aeration. The compost product is ready in around 6-8 weeks. The EFB and POME composition makes the compost sufficiently rich in nutrients to be used as a soil conditioner in the plantation, and will partly substitute the use of chemical fertilizers. Since the project owner does not have own plantation, all the compost produced will be sold to compost buyer who owns the plantation where the compost will be applied. The composting process will utilize 100% of the POME and EFBs, eliminating the need for existing anaerobic lagoons and solid waste disposal sites.

A.3. Entity/individual responsible for the small-scale CPA:

PT. Fetty Mina Jaya is the responsible project implementer of the CPA.

A.4. Technical description of the small-scale CPA:

The composting technology used in the CPA is known as “turned windrow composting”. Windrow composting is a process for producing organic material aerobically. This process produces heat that destroys pathogens and produces a compost product for use as mulch, soil conditioner, and topsoil additive. The organic material is decomposed outdoors, helped by watering and mechanical turning for air circulation. The technologies that have a significant role in this composting process are the turning machine and the shredder machine. The shredder machine will be used to press and shred EFB into smaller parts. This process will be required in order to facilitate the composting process. The turning

[4] Lim, K C. and Zaharah, A R., “Decomposition and N & K Released by Oil Palm Empty Fruit Bunches Applied Under Mature Palms”. Journal of Oil Palm Research Vol. 12 No. 2, December 2000, p. 55-62.

[5] F. Schuchardt, K. Wulfert, D. Darnoko, T. Herawan, “Effect of new palm oil mill processes on the EFB and POME utilization”.

[6] Indonesian Environment Ministry Decree no.51/10/1995

machine will be used to turn the compost (to provide mechanical aeration), which is required to ensure the maintenance of an aerobic process in the windrows[7].

In the project activity, EFB are firstly shredded at the mill site using a shredder machine and then transported by trucks to the composting site. The composting site is open, with a concrete base. The shredded EFB is stacked into long piles called windrows using a skid-loader. POME with high Chemical Oxygen Demand (COD) levels is then pumped from the cooling pond and sprayed onto these windrows periodically. Any leachate from the process will be collected at the perimeter around the composting plant and then re-circulated. In the case that excess POME quantities are available (e.g. during a particularly intense monsoon period), excess flow of POME will be diverted to the existing aerobic lagoons. The windrows are turned regularly using a windrow-turner for better mixing, aeration and temperature control. The compost is mature after approximately 6 to 8 weeks and be ready for use.

Since the project entity has no experience with the composting technology, the project entity is required to organize training for its staff that will operate and maintain the machinery. The training includes preventative maintenance, repair, overhaul, et cetera, and will be organized in collaboration with the machine suppliers. Additionally, training on compost production management will also be organized. The consultant that has designed this composting system provides the training and supervises the composting production during the commissioning of this plant for at least a year, in order to guarantee that compost production and data gathering, recording, and filing required to ensure CER generation will all be done correctly.

Table 1. Project data

Palm oil mill	30 MT/hour FFB processing capacity
Available EFB for composting	23,491 t/year
EFB / FFB ratio (by weight)	0.22
Available POME for composting	69,404 m^3/year
POME / FFB ratio (by weight)	0.65
Shredding machine	
Model	LAJU Type LM - 8
Capacity	2 x 8 MT/hour EFB
Motor	2 x 37 kW
Composting turning machine	
Model	Kubota M9000
Maximum Capacity	3000m^3/d
Engine	Diesel engine 4 stroke
Composting area	About 10,000 m^2
Wastewater channel	Intake and drainage channel, using circulating pump and flow meter system
Storage and handling works	Compact Loader Medium-sized trucks (8 - 10 tons capacity) Manual loading works in compost storage (located adjacent to composting field)

[7] Freestanding compost mounds can be made up to different size depending on the type of the turning machine. In larger heaps, the weight of compost tends to force air out resulting in an anaerobic process. Once a heap has reached 2.0 m or so in height, it is extended lengthways, making what is known as a windrow.

Electricity generation	Electricity consumed by composting equipments is generated by the palm-oil mill steam turbine, using 100% biomass fuel (palm fiber & shell). Composting equipments will not run during palm-oil mill idle period/evening time. The electricity generation equipment is pre-existing.

The CPA co-composting project will be constructed adjacent to the mill and existing wastewater treatment plant. A shredding machine will be installed at the mill. A concrete floor with an area of around 10,000 m^2 and a wastewater circulation system for collecting excess POME from the composting windrows and re-circulating it will be constructed. In order to guarantee sufficient aeration and avoid methane generation, a turning machine will mix the compost in regular intervals. Prior to the commissioning of the project, training will be provided to co-composting plant operators and management, especially in the fields of:

- Operation and maintenance of shredder machine (training provided by manufacturer)
- Operation and maintenance of turning machine (training provided by manufacturer)
- Co-composting plant operation and management (training provide by composting consultant)
- Quality control of co-composting process (training provided by composting consultant)
- CDM Monitoring of the co-composting project (training provided by Swiss Carbon Assets Ltd).

A.4.1. Identification of the small-scale CPA:

A.4.1.1. Host Party:

The host party of this CPA is Republic of Indonesia.

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

The project will be located adjacent to the Fetty Mina Jaya palm oil mill and wastewater treatment plant in Lukud – Kampung Jawa village, Rumbai Pesisir subdistrict, Pekanbaru, Riau province, Indonesia.

The mill is about 50 km or 90 minutes by car from the city of Pekanbaru, the capital city of the province. It can be accessed via the provincial road and is situated about 10 km from that road. The access road to the mill is in good condition. The total area for the palm oil mill is 30 ha, in which about 1.2 ha will be reserved for the co-composting area.

The geographical coordinates of the project activity at Fetty Mina Jaya are:
N 0.65014° latitude and E 101.48678° longitude

The location of the project site is shown in the following map:

Figure 1. Location map of the project site

A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

The starting date of the CPA is 6 March 2009.

Explanation on the choice of the project start date is being provided in section B.3.

A.4.2.2. Expected operational lifetime of the small-scale CPA:

The expected operational lifetime of this CPA is 15 years.

A.4.3. Choice of the crediting period and related information:

Renewable crediting period.

A.4.3.1. Starting date of the crediting period:

The starting date of the crediting period is the registration date of the related CPA or the 1st January 2012, whichever occur later.

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

The length of the crediting period for this CPA is 7 years, and can be renewed for three periods of seven years.

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

The estimated amount of emission reduction was calculated for the CPA of Fetty Mina Jaya from the equations described in the PoA-DD for the Composting and Co-composting Programme of Activities (PoA) in Indonesia. The table below demonstrates the total emission reduction estimated for the first crediting period for this proposed CPA.

Table 2. Estimated amount of emission reductions over the chosen crediting period

Years	Annual estimation of emission reductions in tonnes of $tCO_2.eq$
2012	15,140
2013	18,263
2014	20,898
2015	23,121
2016	24,996
2017	26,578
2018	27,913
Total emission reductions (tonnes of CO_2-eq)	156,910
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO_2-eq)	22,416

A.4.5. Public funding of the CPA:

The proposed CDM Programme Activities (CPA) does not receive any public funding.

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

The "Guidance for determining the occurrence of de-bundling under a programme of activities (PoA)" (EB54 annex 13) is used to demonstrate that the CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

At the date this CPA is being included into the PoA, there is no other registered small-scale CPA of a PoA, an application to register another small-scale CPA of a PoA or another registered CDM project activity which:

a) has the PT. Fetty Mina Jaya as an activity implementer
b) the boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.

Moreover, PT. Composting Program International does not manage another PoA of the same sectoral scope within Indonesia.

Therefore, as the proposed CPA is the first CPA included in the proposed Composting and Co-

composting Programme of Activities (PoA) in Indonesia, the project is not a de-bundled component.

A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

The proposed CPA is not registered as an individual CDM project and is not part of another PoA.

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

Composting and Co-composting Programme of Activities (PoA) in Indonesia

B.2. Justification of the why the small-scale CPA is eligible to be included in the Registered PoA:

Fetty Mina Jaya is eligible to be included to the Composting and Co-composting Programme of Activities (PoA) in Indonesia because it fulfils all eligibility requirement of the PoA:

i. consist of only one composting or co-composting plant producing compost from palm oil mill waste, situated in Indonesia. Project shall be implemented at Palm Oil Mill site where no composting or co-composting activity was taking place before.	i. Fetty Mina Jaya co-composting is a greenfield project.
ii. The requirements including applicability criteria of AMS-III.F version 8 will be met by CPA.	ii. Fetty Mina Jaya meets all the applicability requirements of AMS III-F as described in the table below.
iii. an agreement shall be in place between the co-composting project owner (CPA operator) and the Coordinating and Managing Entity (CME), authorizing the CME to include the CPA into the PoA and therefore ceding the carbon rights to the CME.	iii. PT. Fetty Mina Jaya has a cooperation agreement and contractually ceded its rights to claim and own emission reductions under the Clean Development Mechanism or any voluntary scheme to PT. CPI as the managing entity of the Composting and Co-composting Programme of Activities (PoA) in Indonesia.
iv. prior to CPA implementation; where the EFB is disposed in dumping site. The dumping site must have the capacity to accommodate EFB for the whole crediting period. Where the EFB is burnt or land applied, no baseline emission from solid waste will be claimed.	iv. Fetty Mina Jaya palm oil mill is currently disposing all the EFB in an unmanaged solid waste disposal site next to the mill where it has been decayed anaerobically. The dumping site has the capacity to accommodate EFB for the whole crediting period.
v. prior to CPA implementation; POME must be treated in anaerobic ponds without biogas recovery systems.	v. Fetty Mina Jaya palm oil mill is currently treating the POME an anaerobic wastewater treatment system consisting of open lagoons without biogas recovey
vi. only EFB & POME will be composted out of all	vi. Fetty Mina Jaya will composting only EFB &

the palm oil mill residues.	POME.
vii. at the time of inclusion of the CPA in the PoA, there is no enforced regulation in Indonesia that prohibits the current disposal of EFB in an unmanaged solid waste disposal site/landfilling and (for co-composting CPAs) there is no regulation to require the recovery of methane from anaerobic ponds treating POME.	vii. At the time of inclusion of Fetty Mina Jaya in the PoA, there is no regulation in Indonesia that prohibits the current disposal of EFB in an unmanaged solid waste disposal site/landfilling and there is no regulation to require the recovery of methane from anaerobic ponds treating POME.
viii. residual waste or compost produced shall not be stored under anaerobic conditions.	viii. All compost produced will be sold to the compost buyer who owns the plantation. The compost will be submitted to the plantation for soil application.
ix. the maximum distance for transporting POME and EFB for the composting process by the CPA is 200 km.	ix. The distance for transporting the raw material for the composting process by the project activity is less than 1 km.
x. must be in compliance with all laws and regulations of Indonesia.	x. Fetty Mina Jaya is in compliance with all laws and regulation of Indonesia.
xi. The CPA Operator shall demonstrate that this project activity shall not lead to double counting of Emission Reduction by confirming that this project activity shall not be a part of any of the below mentioned category post approval of the project activity under CDM: (1) Standalone CDM project activity, (2) Bundled CDM project activity, (3) Another registered PoA.	xi. Fetty Mina Jaya is not listed under any other CDM project activity
xii. The Proposed CPA Project activity shall demonstrate the compliance with the EB 54 Annex 13 "Guidelines on assessment of de-bundling for SSC project activities". The CPA is considered as debundled if both conditions (a) and (b) below are satisfied: a. Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same technology/measure, and; b. The boundary is within 1 km of the boundary of the proposed small-scale CPA at the closest point.	xii: The activity implementer or the CME does not have any other activities within 1km of the boundary of the proposed small-scale CPA[8]. Palm-oil mills and therefore there attached composting facilities are situated with a certain distance to each other and close to their Fresh Fruit Bunches (FFB) source as transporting of the raw material is expensive.

Fetty Mina Jaya meets all the applicability criteria of AMS III-F as follows:

[8] http://wikimapia.org/#lat=0.6473481&lon=101.4867532&z=18&l=0&m=b, shows that not other Palm Oil Mill is close to Fetty Mina Jaya

The applicability criteria of AMS III.F.v8	Methodology AMS III.F.v8 is applicable to a CPA because:
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). In the project activity, controlled biological treatment of biomass is introduced through one, or a combination, of the following measures: (a) aerobic treatment by composting and proper soil application of the compost. (b) Anaerobic digestion in closed reactors equipped with biogas recovery and combustion/flaring system.	1. Fetty Mina Jaya is currently disposing the EFB in an unmanaged solid waste disposal site close to the mill where it has been decayed anaerobically. In the project activity, decay is prevented through aerobic treatment by composting and proper soil application of the compost and therefore complies with measure (a).
2. The project activity does not recover or combust landfill gas from the disposal site (unlike III G) and does not undertake controlled combustion of the waste that is not treated biologically in a first step (unlike AMS III.E). Project activities that recover biogas from wastewater treatment shall use methodology AMS-III.H.	2. This is not applicable to the project activity as disposal site is not covered to collect landfill gas, no combustion facility exists and no biogas is recovered from the wastewater treatment.
3. Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2e annually	3. The project activity will not reduce more than 60 kt CO_2e annually.
4. This methodology is applicable to the treatment of the organic fraction of municipal solid waste and biomass waste from agricultural or agro- industrial activities including manure. Project activities involving anaerobic digestion and biogas recovery from manure shall apply AMS-III.D or AMS-III.R.	4. No manure is involved in the project activity, only waste from palm-oil industry is treated under the project activity.
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.	5. The co-composting site is newly established.
6. This methodology is also applicable for co-treating wastewater and solid biomass waste, where wastewater (Palm Oil Mill Effluent, POME) would otherwise have been treated in an anaerobic wastewater treatment system without biogas	6. In the absence of the project, POME was and would have been treated in a simple anaerobic wastewater treatment system. The anaerobic wastewater system is already in use and is composed of several lagoons where the organic

recovery.	matter from the wastewater is left to decay in anaerobic conditions without any biogas recovery system.
7. The location and characteristics of the disposal site of the biomass in the baseline condition shall be known, in such a way as to allow the estimation of its methane emissions. Guidance in paragraphs 4, 6 and 7 in AMS III.E shall be followed in this regard.	7. EFB landfill in the baseline condition is clearly located and characterized. The landfill leans against Fetty Mina Jaya palm oil mill.
8. The following requirement shall be checked ex-ante at the beginning of each crediting period in the case of composting of solid waste: ▪ Establish that identified landfill(s) can be expected to accommodate the waste to be used for the project activity for the duration of the crediting period; or ▪ Establish that it is common practice in the region to dispose off the waste in solid waste disposal site (landfill).	8. - The landfill will be able to accommodate the solid waste (EFB) during the whole crediting period. - It is a common practice in the Sumatra to dispose off the EFB in a solid waste disposal site as incineration is forbidden and mulching of EFB lacks of benefits and is bound to high transportation costs[9]
9. The project participants shall clearly define the geographical boundary of the region and document it in the CDM-PDD. In defining the geographical boundary of the region, project participants should take the usual distances for transporting the waste utilized by the project activity into account, i.e., if waste is transported up to 50 km, the region may cover a radius of 50 km around the project activity. In any 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 period(s).	9. The composting facility is located adjacent to the Palm Oil Mill, providing POME/EFB, and hence cover a boundary of less then 200 km
10. In the case of stockpiles of wastes baseline emission calculations as described in the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" shall be adjusted. Stockpiles can be characterised as waste disposal sites that consist of wastes of a homogenous nature with similar origin (e.g., rice husk, empty fruit bunches of oil palm, sawmill waste, etc.). Paragraph 22 in AMS III.E vs.16 provides specific instructions for the calculation of baseline emissions where the baseline is stockpiling of the waste.	10. All EFB from the palm oil mill is dumped in a landfill before the project activity implementation. leaning against the palm oil mill. The EFB disposed in the landfill is not burned or used for other applications. It is dumped and left to decay indifinetely, the landfill cannot therefore be considered as a stockpile of EFB. The EFB produced after the project implementation is entirely used for co-composting purposes and hence is not dumped in a landfill anymore.

[9] As per confirmation letter of D. Darnoko, Previous Senior Researcher at the Indonesian Oil Palm Research Centre IOPRI

11. Where in the baseline usually there is a reduction in the amount of waste through regular open burning or removal for other applications, the use of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" shall be adjusted to take account of this burning or removal in order to estimate correctly the baseline emission.	11. In the baseline, the EFB disposed in the landfill is not burned or used for other applications.
12. The project activity does not recover or combust methane unlike AMS-III.G. Nevertheless, the location and characteristics of the disposal site in the baseline condition shall be known, in such a way as to allow the estimation of its methane emissions.	12. This is not applicable to the project activity as disposal site does not covered or combust methane. EFB disposal site in the baseline condition is clearly located and characterized. Disposal site is located leaning against Fetty Mina Jaya palm oil mill.
13. In case residual waste from the biological treatment (slurry, compost or products from those treatments) are handled aerobically and submitted to soil application, the proper conditions and procedures (not resulting in methane emissions) must be ensured.	13. Compost produced by the project activity will be used for agriculture purpose. This ensures no emission of methane.
14. In case residual wastes from the biological treatment (slurry, compost or products from those treatments) are treated thermally/mechanically, the provisions in AMS-III.E related to thermal/mechanical treatment shall be applied.	14. No thermal/mechanical treatment of compost produced involved in the project activity.
15. In case residual waste from the biological treatment (slurry, compost or products from those treatments) are stored under anaerobic conditions and/or delivered to a landfill, emissions from the residual waste 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" version 5.01.	15. No storage under anaerobic conditions and/or delivered to a landfill of compost produced involved in the project activity. Compost is either sold or applied directly to plantations. Delivery to a landfill is not an option due to the high nutrition content of compost.
16. For project activities involving controlled anaerobic digestion and production of biogas, technical measures shall be used (e.g., flared, combusted) to ensure that all biogas produced by the digester is captured and gainfully used or combusted/flared.	16. The proposed project activity does not involve controlled anaerobic digestion and production of biogas.
17. The recovered biogas from anaerobic digestion may also be utilised for the following applications instead of flaring or combustion: (a) Thermal or electrical energy generation directly; or (b) Thermal or electrical energy generation after bottling of upgraded biogas; or (c) Thermal or electrical energy generation	17. The proposed project activity does not involve anaerobic digestion

after upgrading and distribution using one of the following options: (i) Upgrading and injection of biogas into a natural gas distribution grid with no significant transmission constraints; or (ii) Upgrading and transportation of biogas via a dedicated piped network to a group of end users; or Hydrogen production.	
18. If the recovered biogas is used for project activities covered under paragraph 12 (a), that component of the project activity shall use a corresponding category under Type I.	18. The proposed project activity does not involve anaerobic digestion with biogas recovery.
19. If the recovered biogas is used for project activities covered under paragraph 12 (b) or 12 (c) relevant provisions in AMS-III.H related to upgrading of biogas, bottling of biogas, injection of biogas into a natural gas distribution grid and transportation of biogas via a dedicated piped network shall be used.	19. The proposed project activity does not involve anaerobic digestion with biogas recovery.
20. If the recovered biogas is used for project activities covered under paragraph 12 (d) that component of the project activity shall use corresponding methodology AMS-III.O.	20. The proposed project activity does not involve anaerobic digestion with biogas recovery.
21. 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.	21. Not applicable because the project activity will be a newly developed co-composting plant.

B.3. Assessment and demonstration of additionality of the small-scale CPA , as per eligibility criteria listed in the Registered PoA:

As per attachment A to appendix B to the simplified Modalities & Procedures for small-scale CDM project activities, at least one barrier listed shall be identified due to which the project would not have occurred anyway.

Prior consideration of the CDM

In the case of the present project activity, the starting date is set as the date of signing the agreement with the technology provider and contractor on 6 March 2009, therefore committed to significant expenditures for development of the co-composting project. This is the earliest conceivable start date as there can be no project can be implemented without such agreement. The project has already started the construction work and is expected to start operation in September 2011.

CPAs with starting date between 22 June 2007 and the commencement of validation of the PoA, listed and sent to the validating DOE and UNFCCC secretariat prior to 31 January 2010 (as per EB report 47):

As per "Guidelines for the Demonstration and Assessment of Prior Consideration of the CDM"[10]:

- For project activities with a start date before 02 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, are required to demonstrate that the CDM was seriously considered in the decision to implement the project activity.
- For project activities with a starting date on or after 02 August 2008, the project participant must inform a host party DNA and/or the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. Such notification must be made within six months of the project activity start date.

With a starting date on 6 March 2009, the CPA falls into the second case mentioned above.

The proposed project activity has already been proposed as CDM candidate in 2007[11] in collaboration at that time with EcoSecurities who then interrupted the validation process of the project on 16 October 2008 and its contractual agreement with PT. Fetty Mina Jaya on 6 November 2008. Therefore the UNFCCC secretariat has been informed accordingly to comply with prior consideration of CDM requirement. Further, the UNFCCC and the DNA have been informed, according to EB report paragraph 72, prior to 31 January 2010, by on the participation of the CPA in this PoA.

It is only the perspective participating (temsheet signed between South Pole and Fetty Mina Jaya in November 2008) in the composting PoA that pushed PT. Fetty Mina Jaya to reevaluate the feasibility of such composting activity in December 2008.

The complete CDM-related chronological timeline is outlined below:

Table 3. Schedule of the project implementation

Description	Date
Stakeholder meeting organized by EcoSecurities	30 May 2007
Indonesian DNA approval	06 March 2008
Validation process interrupted by EcoSecurities	16 October 2008
Termsheet between Fetty Mina Jaya and South Pole	6 November 2008

[10] EB 49, Annex 22 was the most recent version of this guidance, which could be applied for CPAs falling under this category (only CPAs with project start date up to commencement of the validation of the PoA, 22, December 2009)

[11] http://www.cd4cdm.org/, CDM pipeline excel sheet, ID no. CDM 2685

Feasibility Report	15 December 2008
Signed contract with technology provider and contractor	06 March 2009
Tripartite Termination Deed by Fetty Mina Jaya, EcoSecurities and Swiss Carbon Assets (termination EcoSecurities ERPA, dated on 28 June 2006).	3 September 2009
Signed ERPA with Swiss Carbon Assets Ltd. (Carbon credit buyer)	30 October 2009
Amendment of ERPA with Swiss Carbon Assets Ltd., PT. Composting Program International and PT. Fetty Mina Jaya (agreement for PoA)	14 November 2009
Signed contract for DOE validation service	15 December 2009
On site validation of CPA DD	17 – 18 February 2010
Commissioning and commencement of operation of co-composting plant	1 September 2011 *(Projected)*

As shown above, the project implementer has worked closely with CDM consultants since 2006 to register this project as a CDM (initially it was seen as a stand alone CDM project activity) and then as a CPA of the PoA. The project implementer has always shown its best and continuous effort to secure CDM services before and after the project start-date, the proposed project activity is in-line with the requirements defined in EB 49 Annex 22 regarding prior consideration of CDM.

Pre-tax Project IRR calculation

The proposed CPA would not have occurred without CDM income due the investment barrier, which is in line with section E.5.2 of the Co-Composting PoA DD:

Pursuant to the PoA-DD, the Project IRR calculations will be based on a list of economic parameters provided by the CPA owner that were available at the date of the investment decision (see Table 4). This list of parameters includes:

Table 4. Parameters for IRR calculation

PROJECT DATA	Unit	Value	References
Investment decision date	DD/MM/YY	06/03/09	Director sole decision after consulting the feasibility study, when contracts with technology provider and contractor has been signed[12].
Technical lifetime	Year	15	Confirmation from technology provider
Annual compost production	t/year	12,000	Feasibility study
FINANCIAL PARAMETERS	**Unit**	**Value**	**References**
Price of compost	thousand IDR/t	285	Agreement with compost buyer

[12] Board decision as such doesn't exist as such investment decision is directors sole choice. The signing of the contract with the technology provider and contractor seems as appropriate date of investment decision.

Inflation rate	% per year	6.3%	Inflation in year 2008[13]
Exchange Rate	thousand IDR/USD	11,406	At investment decision[14]
COSTS AND EQUIPMENT	**Unit**	**Value**	**References**
Total investments	thousand IDR	14,823,375[15]	Feasibility Study
Operation & Maintenance cost	thousand IDR /year	2,981,240[16]	Feasibility Study
Insurance	% of Capex p.a.	-	-

Assets in a co-composting facility are considered as shredder, truck, turning machine. According to Indonesian accounting standards such assets are depreciated within 8 years. IRR analysis is performed over the period of the technical lifetime or 10 years, whichever is higher. As a consequence, the book value of any project activity assets at the end of the assessment will be considered as zero[17]. After 8 years, the lifetime of the equipment is accounting wise expected to be over. Hence, the realization of the asset is calculated by the value of the asset material (i.e. mainly steel) and the cost of transportation as it is assumed to not function anymore. Due to the remote locations of palm oil mills, transportation costs are considered as fairly high, equalizing or even exceeding the potential revenues from selling the asset (i.e. steel). If small profits or losses would be generated with the realization of the assets, such would affect the overall IRR on a minimal base as it is added in the last year of the IRR analysis period. Hence, the profit on the realization of the assets can be considered as zero.

Aerated composting requires the acquisition of specialized equipment, a large level surface of land taken away from the plantation, and the mobilization of a substantial work force for its operation (at least 15–20 additional staff). It is estimated that the investment required to build the composting plant will be IDR 14,823,375,000. Annual O&M cost of this project is estimated to be IDR 2,981,240,000 inclusive of consumption of diesel and lubricants for operation of turning machine, loader and truck. This estimate is also inclusive of equipment service and maintenance cost, labor cost, and general cost (administration, monitoring, testing and calibration cost).

The compost price of IDR 285,000 per ton is based on an agreement with the compost buyer. The expected income will come from the selling of compost product to the compost buyer. The compost production of 12,000 t/year generates an annual income of IDR 3,420,000,000.

Inserting these values yields a pre-tax project **IRR of -3.63%**.

[13] http://www.indexmundi.com/indonesia/inflation_rate_%28consumer_prices%29.html

[14] http://www.bi.go.id/web/id/Moneter/Kurs+Bank+Indonesia/Kurs+Uang+Kertas+Asing/

[15] As per Feasibility Study, without CDM related costs *(Ref doc: FMJ_Feasibility Study)*

[16] As Feasibility Study *(Ref doc: FMJ_Feasibility Study)*

[21] As per paragraph 4 of Guidance on the Assessment of Investment Analysis (Version 05).

[17] As per paragraph 4 of Guidance on the Assessment of Investment Analysis (Version 05).

Benchmark choice
A benchmark of 13.32% used to compare the return of the project has been chosen as the interest rate from commercial bank for investment loans in March 2009[18] (source: Central Bank of Indonesia).

The results of the financial analysis show that the project is not financially viable. The pre-tax Project IRR without CDM revenues is negative and below the pre-tax commercial lending rate.

Sensitivity analysis
A sensitivity analysis was undertaken by varying the most sensitive parameters by +/-10%, as summarized in the table below. The results in the table below show that the project's IRR without CDM revenue does not show any significant return to the investment for the sensitivity range tested.

Table 5. Sensitivity analysis

	IRR	Variation that hits the benchmark	Likelihood of hitting the benchmark
Total investment -10%	-2.58%	-74%	This reduction is unlikely to occur since: - Mobile equipment and machinery prices are already heavily discounted and the prices entered in the modelling are all settled and nonnegotiable. - The prices quoted are from the equipment procurement contract, and cannot be further reduced, since it is the cheapest price within the acceptable standards of quality in the area. - Moreover, between 2000 and 2009 inflation rates in Indonesia have ranged from a low of 3.8% in 2000 to a high of 13.1% in 2006[19] and there was no deflation (which can reduce investment costs). This option shall be discarded.
O&M -10%	-1.90%	-42%	A 42% fall in operating costs is unlikely to occur since: - Most components of the operation costs are not variable; it is only the salary costs that could theoretically be reduced. Reduction of salaried by this large amount would lead to a loss of staff, incurring extra recruitment and training costs. Instead it is more likely that staff cost will rise over time[20]. - Costs of fuel consumption are not variable due to the fact that

[18] For March 2009 taken from downloaded Excel sheet under I.26, lowest available loan rate for investments has been taken:
http://www.bi.go.id/web/en/Statistik/Statistik+Ekonomi+dan+Keuangan+Indonesia/Versi+HTML/Sektor+Moneter/Sektor+Moneter.htm

[19] Source: IMF World Economic Outlook Database 2009 (http://www.imf.org/external/pubs/ft/weo/2009/02/weodata/index.aspx). Accessed on 15 December 2009.

[20] Human Capital Insight – July 2009, Watson Wyatt Worldwide, http://www.watsonwyatt.com/asia-pacific/pubs/HCI/June-2009/6_2009_Salary_Increase_Drop_Sharply_in_AP.asp

			prices are set on a market-wide basis, and current oil price trends are characterised by sustained increases. As described above, average inflation rates in Indonesia (there was no deflation) are unlikely to account for reduction in O&M costs. - Other maintenance costs are based on the minimum requirements as set by the equipment supplier and cannot be varied. - in case of Fetty Mina Jaya management would consider the O&M costs in the baseline (avoided costs) as a cost saving of IDR 37,789,474 this amount represents only 1.27% of the project annual O&M costs[21]. This option shall be discarded.
Compost price increase +10%	2.58%	36%	A 36% rise in compost is unlikely to occur since - There is currently no market demand for compost, and the production tends to be consumed by adjacent plantations. - Moreover, chemical fertilizer can be used to replace compost, thus a 36% rise in compost prices would require a similar rise in fertilizer prices. This seems highly unlikely since Indonesian Government is committed to not raise the fertilizer price during the next years[22]. This option shall be discarded.
Compost production increase +10%	2.58%	36%	A 36% rise in compost production volumes cannot occur in the absence of a palm oil mill capacity increase. A capacity increase is not intended to happen. Palm oil mill's capacity is at 30 t/h, which is inline with the capacity of the co-composting facility. Transportation of EFB and POME from other sources then the palm oil mill next to the composting facility is not suitable due to transportation costs. An increase of raw material by 36% is therefore not possible. So this scenario appears highly unlikely. This option shall be discarded.

The analysis shows that the proposed project activity faces an investment barrier that would prevent its implementation without CDM. The overall results consistently support the conclusion that the project activity is unlikely to be financially attractive without CDM financing.

In conclusion the proposed CPA is additional.

[21] Or alternatively, this costs saving from O&M costs in the baseline would increase project IRR only by 1.35 percentage point

[22] Statement by President Susilo Bambang Yudhoyono, Dez 2006, http://www.indonesia.go.id/en/index.php?option=com_content&task=view&id=7011&Itemid=699

Statement by Ministry of Agriculture, August 2010,

http://lifestyle.kontan.co.id/v2/read/1282228059/44865/Mentan-Tak-ada-kenaikan-harga-eceran-tertinggi-pupuk

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

As referred to the stipulated project boundary for Type III activities in Appendix B for small-scale project activities, the project activity boundary encompasses the physical, geographical site of the composting plant, as well as the following sites:

(a) Where the solid waste would have been disposed and the methane emission occurs in the absence of the project activity
(b) Where the co-composting waste water 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 soil application of the produced compost takes place;

And the itineraries between (a), (b), (c) and (d), where the transportation of the waste, wastewater or compost occurs.

The project boundary is graphically summarized in the figure below. The dashed arrows express the GHG-relevant mass flow of the baseline scenario and the drawn-through arrows express the GHG-relevant mass flow of the project activity:

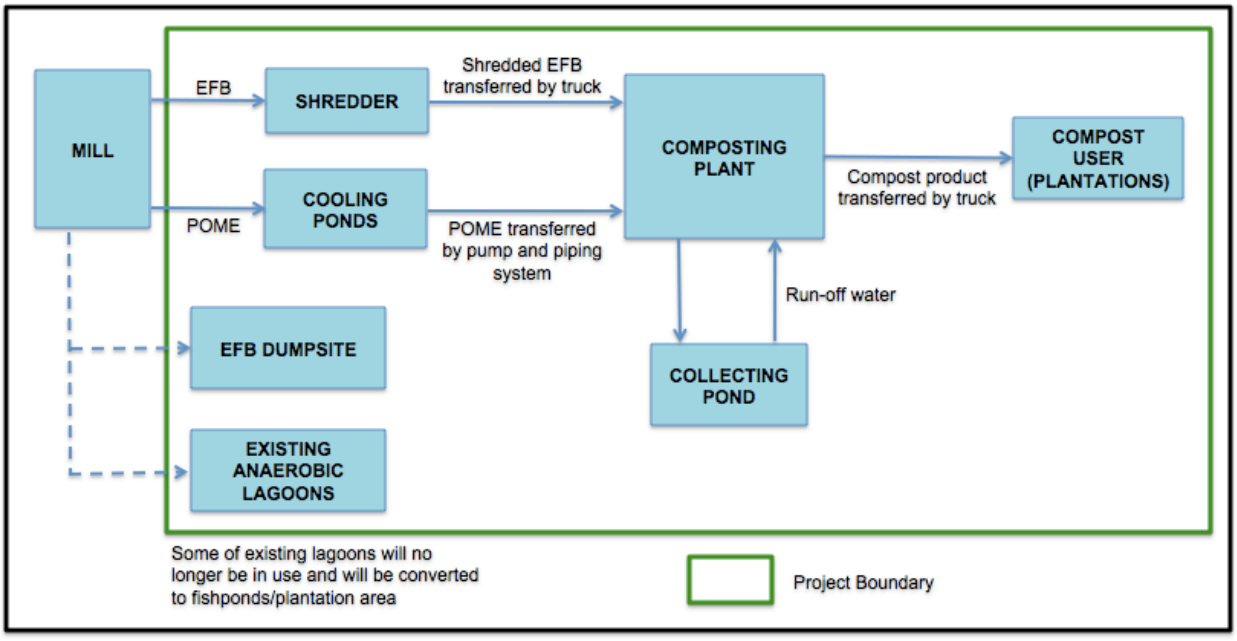

Figure 2. Project boundary

The gases and sources relevant to the Project are listed below based on the AMS III F version 8 methodology:

Table 6. Summary of Gases and Sources included in project boundary

	Source	Gas	Included?	Justification / Explanation
Baseline	Biomass disposed in unmanaged landfill/dumpsite	CO_2	No	CO_2 emissions from biomass decay in solid waste disposal sites are considered GHG neutral
		CH_4	Yes	Methane emission from biomass decay in the solid waste disposal sites
		N_2O	No	Excluded for simplification and conservativeness. Expected to be minimal
	POME treatment in Open Lagoons	CO_2	No	CO_2 emissions from anaerobic digestion are considered GHG neutral
		CH_4	Yes	Methane emission from anaerobic ponds
		N_2O	No	Excluded for simplification and conservativeness. Expected to be minimal
Project Activity	Composting process	CO_2	No	CO_2 emissions from composting process are considered GHG neutral. Excluded for simplification and conservativeness. Expected to be minimal
		CH_4	Yes	Methane emissions from anaerobic pockets during composting process. This can be set to zero, since the oxygen content of the composting process will be monitored to be above 8%.
		N_2O	No	N_2O emissions from loss of N2O-N during composting process and during application of the compost. Excluded for simplification and conservativeness. Expected to be minimal
	Run-off water	CO_2	No	Excluded for simplification and conservativeness. Expected to be minimal
		CH_4	Yes	Methane emission from run-off of the leakage water that is not re-circulated to the composting plant
		N_2O	No	Not significant, excluded for simplification. Excluded for simplification and conservativeness. Expected to be minimal
	Incremental use of fossil fuel for transportation and auxiliary equipments or machineries due to project activity	CO_2	Yes	CO_2 emissions from combustion of fossil fuel in transport vehicles and machineries
		CH_4	No	Excluded for simplification and conservativeness. Expected to be minimal
		N_2O	No	Excluded for simplification and conservativeness. Expected to be minimal
	Electricity	CO_2	Yes	Use of electricity. All the electricity generated by the biomass power plant and partly from emergency diesel genset or consumed from the electricity grid to run the auxiliary equipments e.g. pumps, lighting, shredder/grinder and mixer is considered carbon neutral

		CH_4	No	Excluded for simplification and conservativeness. Expected to be minimal
		N_2O	No	Excluded for simplification and conservativeness. Expected to be minimal

Fetty Mina Jaya is located within the boundaries of Republic of Indonesia as specified in A.4.1.2.

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

Data / Parameter:	**Bo_{ww}**
Data unit:	$tCH_4/tCOD$
Description:	The methane generation capacity of the wastewater
Source of data used:	AMS-III.F version 8
Value applied:	0.21
Justification of the choice of data or description of measurement methods and procedures actually applied:	Corrected IPCC (2006) default value.
Any comment:	-

Data / Parameter:	**$MCF_{ww,treatment}$**
Data unit:	
Description:	The methane correction factor for the anaerobic decay of untreated wastewater
Source of data used:	AMS-III.F version 8: Table III.F.1.
Value applied:	0.8
Justification of the choice of data or description of measurement methods and procedures actually applied:	The anaerobic lagoons in the baseline wastewater system are more than 2m deep, the MCF value 0f 0.8 should be used according to table III.F.1.
Any comment:	-

Data / Parameter:	**φ**
Data unit:	-
Description:	Model correction factor to account for model uncertainties
Source of data used:	-
Value applied:	0.9
Justification of the choice of data or	As per the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" version 5.01.

description of measurement methods and procedures actually applied:	
Any comment:	Oonk et al. (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**
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:	Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site, version 5.01
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied:	0 has been chosen because the landfill site has no covering material
Any comment:	As per the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" version 5.01

Data / Parameter:	**F**
Data unit:	-
Description:	Fraction of methane in the SWDS gas (volume fraction)
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories Volume 3 – Chapter 3.2.3
Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually applied:	As per the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" version 5.01
Any comment:	This factor reflects the fact that some degradable organic carbon does not degrade, or degrades very slowly, under anaerobic conditions in the SWDS. A default value of 0.5 is recommended by the IPCC.

Data / Parameter:	**DOC_f**
Data unit:	-
Description:	Fraction of degradable organic carbon (DOC) that can decompose
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories Volume 3 – Chapter 3.2.3

Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually applied:	As per the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" version 5.01
Any comment:	-

Data / Parameter:	**MCF**
Data unit:	-
Description:	Methane correction factor
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories Volume 3 – Table 3.1
Value applied:	0.8
Justification of the choice of data or description of measurement methods and procedures actually applied:	0.8 has been chosen because the landfill can be considered as a unmanaged landfill with depth of greater than 5 meters. It cannot be considered as an anaerobic managed solid waste disposal sites because it does not have (i) cover material; (ii) mechanical compacting; or (iii) leveling of the waste; It cannot be considered either as semi-aerobic managed solid waste disposal sites because it does not have (i) permeable cover material; (ii) leachate drainage system; (iii) regulating pondage; and (iv) gas ventilation system;
Any comment:	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**
Data unit:	-
Description:	Fraction of degradable organic carbon (by weight) in the waste type j
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories Volume 5 – Tables 2.4 and 2.5
Value applied:	20 %
Justification of the choice of data or description of measurement methods and procedures actually applied:	The figure represents the percentage of wet waste. Processed EFB falls under the category of 'garden, yard and park waste'. As per the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" version 5.01
Any comment:	See Annex 3 – Baseline Information

Data / Parameter:	**GWP_{CH4}**
Data unit:	tCO_2e/tCH_4
Description:	Global warming potential (GWP) of methane, valid for the relevant commitment period

Source of data used:	Decisions under UNFCCC and the Kyoto Protocol (a value of 21 is to be applied for the first commitment period of the Kyoto Protocol)
Value applied:	21
Justification of the choice of data or description of measurement methods and procedures actually applied:	As required by IPCC.
Any comment:	-

Data / Parameter:	k_j
Data unit:	-
Description:	Decay rate for the waste type j
Source of data used:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories Volume 5 – Tables 3.3
Value applied:	0.17
Justification of the choice of data or description of measurement methods and procedures actually applied:	As defined in the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site" version 5.01, EFB characteristics are similar to garden waste. Hence correspondent values for garden waste shall be used. Fetty Mina Jaya palm oil mill is situated within palm oil plantations. Palm oil plantations are grown within the tropical belt with MAT > 20°C and MAP > 1000 mm[23]. Indonesia is situated within the tropical belt.
Any comment:	See Annex 3 – Baseline Information

Waste type *j*		Boreal and Temperate (MAT≤20°C)		Tropical (MAT>20°C)	
		Dry (MAP/PET <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
Slowly degrading	Wood, wood products and straw	0.02	0.03	0.025	0.035
Moderately degrading	Other (non-food) 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

Data / Parameter:	EF_{fuel}

[23] Indonesia faces climatic conditions with all-year-round temperatures ranging 25C to 32C and evenly distributed rainfall of 2000 mm: Basiron Yusof, "Palm oil production through sustainable plantations" (2007), European Journal of Lipid Science Technology, 109:289

Data unit:	$t.CO_2/t.fuel$
Description:	CO_2 emission factor from diesel use
Source of data used:	IPCC 2006 value.
Value applied:	3.185
Justification of the choice of data or description of measurement methods and procedures actually applied:	Calculated by multiplying the following two values: i) Emission factor for Gas/Diesel oil: 74.10 tCO2/TJ (Source: IPCC 2006, vol2, 2006 - Table 2.2 page 2.16cited at: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf) ii) NCV for Gas/Diesel oil: 43.33 $TJ/10^3$ tonnes (Source: Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Workbook cited at http://www.ipcc- nggip.iges.or.jp/public/gl/guidelin/ch1wb1.pdf)
Any comment:	-

Data / Parameter:	**EF_{CO2}**
Data unit:	$t.CO_2/km$
Description:	CO_2 emission factor from diesel fuel use due to transportation
Source of data used:	Calculated based on the following inputs: i) Vehicle Fuel Consumption (volume): 0.175 litres/km ii) Fuel Density: 0.8425 kg/litre iii) CO_2 emission factor from fuel use due to transportation: 3.185 $t.CO_2$ / t.fuel EF_{CO2} can be calculated as: (0.175 * 0.8425) * 3.185 / 1000 = 0.00047
Value applied:	0.00047
Justification of the choice of data or description of measurement methods and procedures actually applied:	i) Vehicle Fuel Consumption (volume): 17.5 litres for 100km used. Source: www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_3_Road_Transport.pdf (table 1-31 page 70) ii) Fuel Density: 0.8425 kg/litre. Source: Pertamina National Oil Company http://www.pertamina.com/index.php?option=com_content&task=view&id=3194&Itemid=667 iii) CO_2 emission factor from fuel use due to transportation: IPCC 2006, vol2, 2006 - Table 2.2 page 2.16
Any comment:	-

Data / Parameter:	$\eta_{machine,skidloader}$
Data unit:	t.fuel / hour
Description:	Composting machine efficiency, loader / skidloader (diesel fuel consumption rate per hour)
Source of data used:	Values to be used (unit converted into tonnes using fuel density = 0.8425) : 1. Fuel consumption as defined by manufacturer; or 2. 13.6 liter/hour, defined as maximum fuel consumption of loader / skidloader in composting facilities. Option 2 is applied for this parameter: $\eta_{machine,skidloader}$ is calculated as: 13.6 x 0.8425 / 1000 = 0.01146

Value applied:	0.01146
Justification of the choice of data or description of measurement methods and procedures actually applied:	i) Highest value for loader / skidloader diesel fuel consumption rate (e.g. model GEHL 5240E = 13.6 litres / hour) Source : www.mwesales.com/Gehl-Specs/3640-4240-4640-5240.pdf ii) Fuel Density: 0.8425 kg/litre. Source: Pertamina National Oil Company http://www.pertamina.com/index.php?option=com_ content&task=view&id=3194&Itemid=667
Any comment:	-

Data / Parameter:	$\eta_{machine,turning}$
Data unit:	t.fuel / hour
Description:	Composting machine efficiency, turning machine (diesel fuel consumption rate per hour)
Source of data used:	Values to be used (unit converted into tonnes using fuel density = 0.8425) : 1. Fuel consumption as defined by manufacturer; or 2. Values from below table for different size of turning machine :

Turning machine	Fuel consumption, highest	Remarks
Small size	13 liter/hour	Compost width <=4 meter
Medium size	25 liter/hour	Compost width <4-5 meter
Large size	37 liter/hour	Compost width <5-6 meter
Very large size	45 liter/hour	Compost width >6 meter

	Option 2 is applied for this parameter: $\eta_{machine,turning}$ is calculated as: 37 x 0.8425 / 1000 = 0.03117 *(large size)*
Value applied:	0.03117
Justification of the choice of data or description of measurement methods and procedures actually applied:	i) Typical model Backhus 17.50 turning machine fuel consumption (volume): 37 litres / hour Source : http://www.organics-recycling.org.uk/uploads/article1762 /Materials%20Handling%20Equipment%20Guide.pdf ii) Fuel Density: 0.8425 kg/litre. Source: Pertamina National Oil Company http://www.pertamina.com/index.php?option=com_ content&task=view&id=3194&Itemid=667
Any comment:	-

Data / Parameter:	$\mathbf{CEF}_{gen,y}$
Data unit:	tCO2e/MWh
Description:	Carbon emissions factor of electricity supplied to the project by the palm oil mill in year 'y'
Source of data used:	Higher of the following four sources: 1. Technical specifications on fossil fuel use per energy produced multiplied by IPCC 2006 default emission factor 2. Default IPCC 2006 default emission factor on diesel fuelled stationary combustion applying a conservative generator efficiency of 30% (IPCC chapter 2, page 2.16 ff.) 3. Emission factor listed in Table I.D.1 of the methodology AMS I.D

Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied:	All electricity consumed is produced by the palm-oil mill using biomass residues and hence can be considered as zero.
Any comment:	

Data / Parameter:	**$EF_{composting}$**
Data unit:	$g.CH_4/kg.waste$
Description:	Emission factor for composting of organic waste
Source of data used:	IPCC default values
Value applied:	4 $kg.CH_4$/tonne wet waste
Justification of the choice of data or description of measurement methods and procedures actually applied:	The figure was based on wet waste, as per methodology
Any comment:	-

Data / Parameter:	**$UF_{b,baseline}$**
Data unit:	-
Description:	Model correction factor to account for model uncertainties of co-composted wastewater
Source of data used:	AMS III.F reference: FCCC/SBSTA/2003/10/Add.2, page 25
Value applied:	0.94
Justification of the choice of data or description of measurement methods and procedures actually applied:	As per methodology
Any comment:	-

Data / Parameter:	**$UF_{b,project}$**
Data unit:	-
Description:	Model correction factor to account for model uncertainties of runoff water
Source of data used:	AMS III.F reference: FCCC/SBSTA/2003/10/Add.2, page 25
Value applied:	1.06
Justification of the choice of data or description of measurement methods and procedures actually applied:	As per methodology

Any comment:	-

B.5.2. Ex-ante calculation of emission reductions:

The total emissions reduction of the CPA is calculated on the basis of the equations and parameters presented and explained in the section E.6.1 of the PoA DD and B.5.1 of this document.

Baseline Emissions

The baseline emissions are the amount of methane emitted from the decay of the degradable organic carbon in the biomass solid waste (EFB) composted in the project activity. Baseline emissions also include emissions from wastewater (POME) 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 "*Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site*" version 5.1.

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

$BE_y = BE_{CH4,SWDS,y} - (MD_{y,reg} * GWP_{CH4}) + (MEP_{y,ww} * GWP_{CH4}) + BE_{CH4,manure,y}$

Where:

$BE_{CH4,SWDS,y}$	Yearly methane generation potential of the solid waste composted by the project 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)
$MD_{y,reg}$	Amount of methane that would have to be captured and combusted in the year 'y' to comply with the prevailing regulations
$MEP_{y,ww}$	Methane emission potential in the year 'y' of the wastewater co-composted. The value of this term is zero if co-composting of wastewater is not included in the project activity
$BE_{CH4,manure,y}$	Where applicable, baseline emissions from manure composted by the project activities, as per the procedures of AMS-III.D. The value of this term is zero, since the project does not include treatment of manure.
GWP_{CH4}	GWP for CH_4 (value of 21 is used)

The above baseline emissions will be calculated as follows:

(a) The estimation of the methane emission potential of a solid waste disposal site ($BE_{CH4,SWDS,y}$, in tCO_2e) shall be undertaken using the "*Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site*" version 5.1.

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

where:

$BE_{CH4,SWDS,y}$	Methane emissions avoided during the year *y* from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity to the end of the year y (tCO2e)
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, valid for the relevant commitment period (21)
OX	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering 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 (0.8)
$W_{j,x}$	Amount of organic waste type *j* prevented from disposal in the SWDS in the year *x* (tons)
DOC_j	Fraction of degradable organic carbon (by weight) in the waste type *j* (20%)
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 emissions are calculated (x = y)
y	Year for which methane emissions are calculated

The following table shows the amount of organic waste composted from the palm-oil mill operation that would have been dumped in an unmanaged site for each waste type for the project activity:

Waste type	**Amount composted per year**	**Proportion of total**
Wood and wood products	0	0
Pulp, paper and cardboard (other than sludge)	0	0
Food, food waste, beverages and tobacco (other than sludge)	0	0
Textiles	0	0
Garden, yard and park waste	23,491 tonnes	100%
Glass, plastic, metal, other inert waste	0	0
TOTAL	23,491 tonnes	100 %

Baseline Emissions for EFB

Year	EFB (tonnes)	$BE_{CH4,SWDS}$ (tCO_2e)
2012	23,491	3,702
2013	23,491	6,825
2014	23,491	9,460
2015	23,491	11,683
2016	23,491	13,558

2017	23,491	15,140
2018	23,491	16,475

(b) Methane emission potential of co-composted wastewater is estimated as follows:

$MEP_{y,ww} = Q_{y,ww,in} * COD_{y,ww,untreated} * B_{o,ww} * MCF_{ww,treatment} * UF_{b,baseline}$

Where:

$Q_{y,ww,in}$	Volume of wastewater entering the co-composting facility in the year "y" (m^3)
$COD_{y,ww,untreated}$	Chemical oxygen demand of the wastewater entering the co-composting facility in the year "y" (tonnes/m^3) (0.05176)
$B_{o,ww}$	Methane producing capacity for the wastewater (IPCC default value of 0.21 kg CH_4 / kg COD)
$MCF_{ww,treatment}$	Methane correction factor for the wastewater treatment system in the baseline scenario (MCF value as per table III.F.1) (0.8)
$UF_{b,baseline}$	Model correction factor to account for model uncertainties of co-composted wastewater (0.94)

Baseline Emissions for POME

YEAR	Qww (m3/year)	COD_{ww} (kg COD/m^3)	$B_{O,ww}$ (default)	$MCF_{ww,untreated}$	GWP_{CH4}	UF_b (default)	$BE_{CH4,WW}$ (tCO_2e)
2012	69,404	0.05176	0.21	0.80	21	0.94	11,913
2013	69,404	0.05176	0.21	0.80	21	0.94	11,913
2014	69,404	0.05176	0.21	0.80	21	0.94	11,913
2015	69,404	0.05176	0.21	0.80	21	0.94	11,913
2016	69,404	0.05176	0.21	0.80	21	0.94	11,913
2017	69,404	0.05176	0.21	0.80	21	0.94	11,913
2018	69,404	0.05176	0.21	0.80	21	0.94	11,913

(c) There are no regulations in Indonesia requiring the capture and utilisation or destruction of methane from EFB disposal sites. There are no regulations in Indonesia that prohibits the current EFB disposal in unmanaged solid waste disposal site/landfilling. In addition, there is no regulation to require the recovery of methane from anaerobic lagoons treating POME.

Therefore, $\mathbf{MD_{y,reg}} = 0$

Project Activity Emissions

Project activity emissions consist of:

(a) CO_2 emissions due to incremental transport distances;
(b) CO2 emissions from electricity and/or fossil fuel consumption by the project activity facilities;

(c) In case of anaerobic digestion: methane emissions from physical leakages of the anaerobic digester;
(d) In case of composting: methane emissions during composting process;
(e) In case of composting (including co-composting of wastewater): methane emissions from runoff water;
(f) In case the residual waste from the biological treatment (slurry, compost or products from those treatments) are stored under anaerobic conditions and/or delivered to a landfill: the methane emissions from the disposal/storage of these residual waste/products.

$PE = PE_{y,transp} + PE_{y,power} + PE_{y,\ phy\ leakage} + PE_{y,comp} + PE_{y,runoff} + PE_{y,res\ waste}$

Where:

PE_y	Project activity emissions in the year
$PE_{y,transp}$	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)
$PE_{y,\ phy\ leakage}$	In case of anaerobic digestion: methane emissions from physical leakages of the anaerobic digester in the year y (tCO_2e)
$PE_{y,comp}$	In case of composting: methane emissions during composting process in the year y (tCO_2e)
$PE_{y,runoff}$	In case of composting (including co-composting of wastewater): methane emissions from runoff water in the year y (tCO_2e)
$PE_{y,res\ waste}$	In case the residual waste/slurry/products are subjected to anaerobic storage or disposed in a landfill: methane emissions from the anaerobic decay of the residual waste/products (tCO_2e)

(a) CO_2 emissions due to incremental transport distances between:

(i) The collection points of biomass and the composting site as compared to the baseline solid waste disposal site,
The composting plant is within the palm oil mill compound and there is no significant increment in distance and emissions compared to the baseline.

(ii) The collection points of wastewater and composting site as compared to the baseline wastewater treatment site,
The POME is transported using a piping system both in the baseline and project activity, which is within the palm oil mill compound or close to it. The pumps for the piping system are powered by biomass boiler and steam turbine which is carbon neutral. Thus, there will be no increased emissions due to transportation or pumping of POME in the project activity.

(iii) The composting site and the soil application sites.
The compost will be used in the plantation and replace in-organic fertilizers. The compost will be transported by trucks to the plantation, which incur emissions from combustion of diesel. A maximum distance of a radius of 200 km from the mills is used for the estimations in the PDD.

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

Where:

Q_y	Quantity of waste composted and/or wastewater in the year "y" (t)
CT_y	Average truck capacity for waste transportation (t/truck)
DAF_w	Average incremental distance for waste transportation (km/truck)
EF_{CO2}	CO_2 emission factor from fuel use due to transportation (t.CO_2/km, IPCC default values or local values can be used) (0.00047)
$Q_{y,comp}$	Quantity of final compost product produced in the year "y" (t)
$CT_{y,comp}$	Average truck capacity for final compost product transportation (t/truck)
DAF_{comp}	Average distance for final compost product transportation (km/truck)

DAF_w = 0; as the composting facilities are within the boundaries of the composting mills, therefore project emissions due to transportation of EFB to the composting sites is considered as '0'. Therefore the average truck capacity for EFB transportation CT_y is not needed to be monitored.

Hence:

$PE_{y,transp} = (Q_{y,comp}/ CT_{y,comp}) * DAF_{comp} * EF_{CO2}$

Project Emissions from transportation

YEAR	$Q_{y,comp}$ (tonnes)	$CT_{y,comp}$ (tonnes/truck)	DAF_{comp} (km/truck)	EF_{CO2} (tCO_2e/km)	$PE_{y,trans}$ (tCO_2e)
2012	11,745	8	100	0.0005	69
2013	11,745	8	100	0.0005	69
2014	11,745	8	100	0.0005	69
2015	11,745	8	100	0.0005	69
2016	11,745	8	100	0.0005	69
2017	11,745	8	100	0.0005	69
2018	11,745	8	100	0.0005	69

(b) CO_2 emissions on account of fossil fuel based energy used by the project activity facilities, which includes energy used for aeration and turning of the compost windrows and shredding of EFB.

The EFB needs to be shredded into small pieces before it can be used for composting using an electrical powered shredding machine. The palm oil mill is not connected to the grid. The power used in shredding of the EFB is supplied from the palm oil mill's existing biomass boilers and steam turbines. The composting plants will stop operating in case of failure of the biomass boilers. The power from the biomass boilers is considered carbon neutral and is not leading to any increase in emissions.

Mechanical aeration of compost is done by turning the compost periodically with compost shuffling machines (compost turner) and front loaders powered by diesel fuel. Thus the emissions from compost aeration must be considered in the project activity.

Energy used for screening and drying of the final compost product is not relevant since these components are not taking place in the proposed project.

$PE_{y,power} = PE_{gen,y} + \sum PE_{fuel,i,y}$

$PE_{gen,y} = P_{gen,y} \times OT_{gen,comp,y} \times 110\% \times CEF_{gen,y}$

$PE_{fuel,i,y} = OT_{machine,i,y} \times \eta_{machine,i} \times EF_{fuel}$

Where:

$PE_{y,power}$	Project emissions from electricity and/or fossil fuel consumption by the project activity facilities ($t.CO_2$/year)
$PE_{gen,y}$	Project emissions from electricity consumption by the project activity facilities ($t.CO_2$/year)
$PE_{fuel,y}$	Project emissions from fossil fuel consumption by the project activity facilities ($t.CO_2$/year)
$P_{gen,y}$	Total capacity of auxiliary equipment installed in the project activity (MW).
$CEF_{gen,y}$	Carbon emissions factor of electricity supplied to the project by the palm-oil mill in year 'y' ($t.CO_2e$/MWh). In this project, this is zero, since all electricity is generated using biomass residues ($CEF_{gen,y} = 0$).
$PE_{fuel,i,y}$	Project emissions from fossil fuel consumption by the project activity facilities ($t.CO_2$/year)
$OT_{machine,i,y}$	Operating hours of composting machine type 'i' in year 'y' (hour/year) (*see values below*)
EF_{fuel}	Emissions factor for the diesel fuel used ($t.CO_2e$/t.fuel) (IPCC 2006) (3.185)
$\eta_{machine,i}$	Efficiency factor of composting machine type 'i' (t.fuel / hour) (*see values below*)
i	type of composting machines with diesel fuel consumption (loader / skidloader or turning machine)
$OT_{gen,comp,y}$	Operating hours of composting plant when biomass power plant is out of operation (hour/year)

Composting machine efficiency is taken from machine specification datasheet. There are two types of composting machine, the loader / skidloader and the turning machine, with each diesel fuel consumption rate per hour as follows :

$OT_{machine,loader,y}$	Operating hours of composting machine, loader, in year 'y' (hour/year) (2000)
$OT_{machine,turning,y}$	Operating hours of composting machine, turning, in year 'y' (hour/year) (2000)
$\eta_{machine,skidloader}$	Efficiency factor of the loader / skidloader machine (t.fuel / hour) (0.01146)
$\eta_{machine,turning}$	Efficiency factor of the turning machine used (t.fuel / hour) (0.03117)

Therefore:

$PE_{gen,y} = 0 \quad (OT_{gen,comp,y} = 0)$

$PE_{y,power} = \sum PE_{fuel,i,y}$

Project Emissions from power, skidloader

YEAR	$OT_{machine,skiloader,y}$ (hours)	$\eta_{machine,skidloader}$ (t.fuel / hours)	EF_{fuel} ($t.CO_2e/t.fuel$)	$PE_{fuel,skidloader,y}$ ($t.CO_2e$)
2012	2000	0.01146	3.185	73
2013	2000	0.01146	3.185	73
2014	2000	0.01146	3.185	73
2015	2000	0.01146	3.185	73
2016	2000	0.01146	3.185	73
2017	2000	0.01146	3.185	73
2018	2000	0.01146	3.185	73

Project Emissions from power, turning machine

YEAR	$OT_{machine,turning,y}$ (hours)	$\eta_{machine,turning}$ (t.fuel / hours)	EF_{fuel} ($t.CO_2e/t.fuel$)	$PE_{fuel,turning,y}$ ($t.CO_2e$)
2012	2000	0.03117	3.185	199
2013	2000	0.03117	3.185	199
2014	2000	0.03117	3.185	199
2015	2000	0.03117	3.185	199
2016	2000	0.03117	3.185	199
2017	2000	0.03117	3.185	199
2018	2000	0.03117	3.185	199

(c) CH_4 emissions from physical leakages of the anaerobic digester.

$PE_{y,phy\ leakage} = Q_y * EF_{anaerobic} * GWP_{CH4}$

Where:

$EF_{anaerobic}$ Emission factor for anaerobic digestion of organic waste (t CH_4/ton waste treated)
Emission factor can be based on facility/site-specific measurements, country specific values (table 4.1, chapter 4, Volume 5, 2006 IPCC Guidelines for National Greenhouse Gases Inventories). IPCC default values are 2 g CH_4/kg waste treated on a dry weight basis and 1 g CH_4/kg waste treated on a wet weight basis

Methane emission from physical leakages in the project emission is negligible, since the project activity is composting and no digester involved in the project activity.

Hence this project emission calculation is zero.

(d) CH_4 emissions during composting.

$PE_{y,comp} = Q_y * EF_{composting} * GWP_{CH4}$

Where:

$EF_{composting}$ Emission factor for composting of organic waste (t CH_4/ton waste treated)
Emission factor can be based on facility/site-specific measurements, country specific

values (table 4.1, chapter 4, Volume 5, 2006 IPCC Guidelines for National Greenhouse Gases Inventories). IPCC default values are 10 g CH_4/kg waste treated on a dry weight basis and 4 g CH_4/kg waste treated on a wet weight basis. In this case, the waste treated (EFB) is categorized as wet weight basis[24].

In case oxygen content of the composting process is monitored and above 8%, value of $EF_{composting}$ can be set to zero. This will be done via sampling with maximum margin of error of 10% at a 95% confidence level. For this purpose a portable oxygen meter can be used with lancets of at least 1 m length.

Hence the value for $EF_{composting}$ is set to zero for this CPA-DD project emission calculation, therefore $PE_{y,comp}$ is zero.

(e) CH_4 emissions from run-off water from the composting facilities.

The composting site will have a perimeter drain to collect leachate and rain water. The water from the perimeter drain is defined as run-off water. During normal daily operation, all run-off water will be collected in this perimeter drain and be re-circulated onto the composting piles. No excess water will flow into the collecting pond (due to higher intake perimeter drain to collecting pond). The project is located in a high rainfall area. Thus during operation in times of heavy rain, the run-off water consists of mainly rainwater and is very much diluted.

If at any time excess runoff water in the collecting pond cannot all be re-circulated, it will be diverted to the well-managed aerobic lagoons installed with aerators before discharged into the waterways according to the local discharge standards. The quantity of runoff water that is not re-circulated will be measured using a flow meter. Project emissions from runoff water will take into account any runoff that is sent to the aerobic lagoons.

Project emissions from runoff water will be taken into account.

$$PE_{y,runoff} = Q_{y,ww,runoff} * COD_{y,ww,runoff} * B_{o,ww} * MCF_{ww,treatment} * UF_{b,project} * GWP\_CH_4$$

Where:

$Q_{y,ww,runoff}$	Volume of run-off water in the year "y" (m^3)
$COD_{y,ww,runoff}$	Chemical oxygen demand of the runoff water leaving the composting facility in the year "y" (t/m^3) (0.05176)
$B_{o,ww}$	Methane producing capacity of the wastewater (IPCC default value for domestic wastewater of 0.21 kg CH_4/kg. COD)
$MCF_{ww,\ treatment}$	Methane correction factor for the wastewater treatment system where the runoff water is treated (MCF value as per table III.F.1) (0.8)
GWP_{CH4}	Global Warming Potential (GWP) of methane, valid for the relevant commitment period (21)
$UF_{b,\ project}$	Model correction factor to account for model uncertainties of project (1.06)

[24] Astimar Abdul Aziz, Mohamad Deraman, Ropandi Mamat, Anis Mokhtar, Wan Hasamudin Wan Hasan, Ridzuan Ramli and Ismadi Ismail; High Porosity Carbon Powder from Oil Palm Empty Fruit Bunches for Adsorbent Products, Jurnal MPOB TT No. 332

Project Emissions from runoff water

YEAR	$Q_{y,runoff}$ (m3/year)	$COD_{y,runoff}$ (kg COD/m^3)	$B_{O,ww}$ (default)	$MCF_{ww,treatment}$	GWP_{CH4}	$UF_{b,project}$ (default)	$PE_{y,runoff}$ (tCO_2e)
2012	694	0.05176	0.21	0.80	21	1.06	134
2013	694	0.05176	0.21	0.80	21	1.06	134
2014	694	0.05176	0.21	0.80	21	1.06	134
2015	694	0.05176	0.21	0.80	21	1.06	134
2016	694	0.05176	0.21	0.80	21	1.06	134
2017	694	0.05176	0.21	0.80	21	1.06	134
2018	694	0.05176	0.21	0.80	21	1.06	134

(f) CH_4 emissions from anaerobic storage and/or disposal in a landfill of the compost
Methane emission from anaerobic storage and/or disposal in a landfill of the compost is negligible, since the compost product is not stored and/or dispose in a landfill. All compost will be used directly to the plantation or be sold to the market.

Hence this project emission calculation is zero.

Leakage

The technology and machinery for the project activity is not transferred from or to another activity and thus no leakage is considered to take place.

Therefore, $\mathbf{Leakage_y = 0}$.

B.5.3. Summary of the ex-ante estimation of emission reductions:

Table 7. Summary of the ex-ante estimation of emission reductions

Years	Estimation of baseline emissions (tonnes of CO_2 e)	Estimation of project activity emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of emission reductions (tonnes of CO_2 e)
2012	15,615	475	0	15,140
2013	18,738	475	0	18,263
2014	21,373	475	0	20,898
2015	23,596	475	0	23,121
2016	25,471	475	0	24,996
2017	27,053	475	0	26,578
2018	28,388	475	0	27,913
Total (tonnes of CO_2)	160,235	3,325	0	156,910
Total number of crediting years				7
Annual average over the crediting period of estimated reductions				22,416

(tonnes of CO2e)	

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

The monitoring plan details the actions necessary to record all the data parameters required by the methodology AMS III.F, version 8, as detailed in section E.7.1 of the PoA-DD. Details of the monitoring procedures and frequency of monitoring are described for each parameter in this section. All data will be recorded at the specified frequency.

The operator of the CPA will be responsible for collecting the monitoring data and will provide the coordinating entity with full data records and if applicable calibration certificates. The data will be archived electronically, backed up regularly, and be stored by the coordinating entity for 2 years after the end of the crediting period of each CPA or the last issuance of CERs of this project, whichever occurs last.

The installation of the monitoring equipment is detailed below for each parameter. The CPA operator will implement QA&QC measures to calibrate and guarantee the accuracy of metering and safety of the project operation. The metering devices will be calibrated and inspected properly and periodically as per standard industry norms and requirements.

Procedures to discount conservatively the emission reductions from the projects will be defined, in the event either the project owner or the coordinating entity detects any distortion or mal-function of the monitoring equipment. The readings from monitoring equipment will be readily accessible for the Designated Operational Entity (DOE) carrying out the verification of monitoring data.

The CPA operator has an operational and management structure in place to monitor emission reductions from the project activity. Specific personnel will be assigned to be responsible for project management as well as for all the different parameters to be monitored and reported.

The parameters to be monitored are:

Data / Parameter:	**Q_y**
Data unit:	t/year
Description:	Total amount of organic EFB prevented from disposal in year ‘y’
Source of data to be used:	Host facility: weighbridge
Value of data	23,491
Description of measurement methods and procedures to be applied:	EFB weighing by calibrated weighbridge. Recording frequency: each time a truck passes the weighbridge. The data will be measured and recorded daily in a log sheet and aggregated monthly for calculations.
QA/QC procedures to be applied:	Calibration and maintenance are subject to procedures established by instrument manufacturer.

	The weighbridge will be calibrated annually..
Any comment:	Data monitored and required for verification and issuance will be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this programme activity, whichever occurs later.

Data / Parameter:	$\mathbf{Q_{y,ww,in}}$
Data unit:	m^3/year
Description:	Flow rate of organic wastewater into the composting facility
Source of data to be used:	Host facility: flow meter (cumulative measurement)
Value of data	69,404
Description of measurement methods and procedures to be applied:	Recording frequency: Data will be recorded daily in a log sheet and aggregated weekly and monthly. Measurement will be taken from an installed flow meter that will be placed at the inlet of the pond where POME will be pumped to the composting site. When the meter is removed for repairing/maintenance or off-site calibration, which will take up to several days, the POME will be channelled through bypass piping. The volume during these few days will be calculated based on the average daily flow of the previous 3 months record. It should be confirmed that the FFB entering the palm oil mill during those days is within the range of the previously 3 months.
QA/QC procedures to be applied:	Calibration and maintenance are subject to procedures established by instrument manufacturer. The flowmeter will be calibrated annually.
Any comment:	Data monitored and required for verification and issuance will be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this programme activity, whichever occurs later.

Data / Parameter:	$\mathbf{COD_{y,ww,untreated}}$
Data unit:	t/m^3
Description:	Concentration of organic material in wastewater into the composting facility
Source of data to be used:	COD sampling
Value of data	0.05176
Description of measurement methods and procedures to be applied:	Measurement will be taken from the pond where the POME will be pumped to the composting site. COD samples will be measured monthly by an accredited third party laboratory
QA/QC procedures to be applied:	Test equipment will be calibrated according to manufacturer's recommendations.
Any comment:	Data monitored and required for verification and issuance will be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this programme activity, whichever occurs later. COD values of the wastewater in a mill won't vary over the year as palm oil production process doesn't change. Hence, one COD test a month by an independent third party laboratory is considered as representative and further in line with the government regulation of effluent COD measurement frequency Ex-ante value is based on a 10 day COD measurement campaign by an accredited

	third party laboratory as per methodological requirements.

Data / Parameter:	**$Q_{y,ww,runoff}$**
Data unit:	m^3
Description:	Volume of run-off water from the co-composting plant
Source of data to be used:	Host facility: flow meter (cumulative measurement)
Value of data:	1% of POME volume
Description of measurement methods and procedures to be applied:	Recording frequency: Data will be recorded daily in a log sheet and aggregated weekly and monthly. Measurement will be taken from an installed flow meter that will be placed at the inlet point to the environmental pond (existing aerobic pond). When the meter is removed for repairing/maintenance or off-site calibration, which will take up to several days, the run-off water will be channelled through bypass piping. The volume during these few days will be calculated based on the average daily flow of the previous 3 months record.
QA/QC procedures to be applied:	Calibration and maintenance are subject to procedures established by instrument manufacturer. The flowmeter will be calibrated annually.
Any comment:	It is assumed that the volume of run-off water will be mainly constitutes of rainwater. Actual run-off water volume will be measured during the crediting period. Data monitored and required for verification and issuance will be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this programme activity, whichever occurs later.

Data / Parameter:	**$COD_{y,ww,runoff}$**
Data unit:	t / m^3
Description:	Concentration of organic material in runoff water from the composting facility
Source of data to be used:	COD sampling
Value of data:	0.05176
Description of measurement methods and procedures to be applied:	Measurement will be taken from the pond where the runoff water is discharged to. One COD sample will be taken monthly and sent for testing at an independent third party laboratory.
QA/QC procedures to be applied:	Test equipment will be calibrated according to manufacturer's recommendations.
Any comment:	It is assumed that ex-ante $COD_{y,ww,runoff} = COD_{y,ww,untreated}$ for a conservative approach. Ex-ante value is based on a 10 day COD measurement campaign by an accredited third party laboratory as per methodological requirements. Actual COD run-off water will be measured during the crediting period. Data monitored and required for verification and issuance will be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this programme activity, whichever occurs later. COD values of the wastewater in a mill won't vary over the year as palm oil production process doesn't change. Hence, one COD test a month by an independent third party laboratory is considered as representative and further in

	line with the government regulation of effluent COD measurement frequency

Data / Parameter:	**$Q_{y,comp}$**
Data unit:	t/year
Description:	Quantity of final compost produced in year 'y'
Source of data to be used:	Host facility: Weighbridge
Value of data	11,745
Description of measurement methods and procedures to be applied:	The produced compost weighing by calibrated weighbridge. Recording frequency: each time a truck passes the weighbridge. The data will be measured and recorded daily in a log sheet but aggregated monthly for calculations
QA/QC procedures to be applied:	The sale/delivery of compost will be documented by providing a copy of the invoices. Calibration and maintenance are subject to procedures established by instrument manufacturer. The weighbridge will be calibrated annually.
Any comment:	Data monitored and required for verification and issuance will be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this programme activity, whichever occurs later.

Data / Parameter:	**$P_{gen,y}$**
Data unit:	MW
Description:	Total capacity of auxiliary equipment installed in the project activity
Source of data to be used:	Project owner
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:	-
QA/QC procedures to be applied:	-
Any comment:	The exact capacity of auxiliary equipment is not yet know but expected to be very low. Further, the operating hours of composting plant when biomass power plant is out of operation is expected to be zero as well resulting in zero project emissions by auxiliary equipment. Hence, total capacity of auxiliary equipment is considered as zero for the ex-ante emission reduction calculation.

Data / Parameter:	**$OT_{gen\ comp,y}$**
Data unit:	hour/year
Description:	Operating hours of composting plant when biomass power plant is out of operation

Source of data to be used:	Project owner
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:	Data can be obtained from the palm oil mills and composting facilities logbooks. Any time when composting plant is operating during failure of biomass power plant shall be monitored.
QA/QC procedures to be applied:	Each failure or maintenance shut down of either the biomass power plant or composting facility is recorded in company's logbooks.
Any comment:	-

Data / Parameter:	**$OT_{machine,skidloader,y}$**
Data unit:	hour/year
Description:	Annual operating hours of loader / skidloader machine
Source of data to be used:	Project owner
Value of data applied for the purpose of calculating expected emission reductions in section B.5	2000
Description of measurement methods and procedures to be applied:	Data can be obtained from the palm oil mills and composting facilities logbooks.
QA/QC procedures to be applied:	Confirmation by supervisor, attendance logbook of machine operator.
Any comment:	For determination of the ex-ante value, it is assumed that skidloader operates during 3 hours in the morning and 3 hours in the evening, 300 days a year, rounded up to 2000 h/year.

Data / Parameter:	**$OT_{machine,turning,y}$**
Data unit:	hour/year
Description:	Annual operating hours of turning machine
Source of data to be used:	Project owner
Value of data applied for the purpose of calculating expected emission reductions in section B.5	2000
Description of measurement methods	Data can be obtained from the palm oil mills and composting facilities logbooks.

and procedures to be applied:	
QA/QC procedures to be applied:	Confirmation by supervisor, attendance logbook of machine operator.
Any comment:	For determination of the ex-ante value, it is assumed that turning machine operates during 3 hours in the morning and 3 hours in the evening, 300 days a year, rounded up to 2000 h/year.

Data / Parameter:	**DAF_{comp}**
Data unit:	km/truck
Description:	Average incremental distance for composting transportation
Source of data to be used:	Project owner/compost buyer
Value of data:	100
Description of measurement methods and procedures to be applied:	Records of all dispatches of compost from the composting site and the destination for the delivery of compost will be maintained at the plant. For each load/trip of compost taken out of the plant, the operator shall record the distance to destination by speaking to the carrier The total distance will be divided by the total number of trips to calculate the average distance.
QA/QC procedures to be applied:	Confirmation by supervisor & bills/invoices for compost delivery.
Any comment:	Data monitored and required for verification and issuance will be kept for a minimum of two years after the end of the crediting period or the last issuance of CERs for this programme activity, whichever occurs later. This will be calculated annually. The ex-ante value is determined by assuming a compost application in the nearby plantations. Palm-oil mills are situated within plantations with demand on fertilizer and therefore compost. Hence, 100 km can be considered as rather high ex-ante value.

Data / Parameter:	**$CT_{y,comp}$**
Data unit:	t/truck
Description:	Average truck capacity for compost transportation
Source of data to be used:	Capacity specification of the truck fleet
Value of data:	8
Description of measurement methods and procedures to be applied:	Analysis of the composition of the truck fleet and respective load capacity of each truck. Keeping records (log sheets) of the trucks transporting compost that depart from the composting sites.
QA/QC procedures to be applied:	Data from weighbridge measurement will be used to cross check the recorded data
Any comment:	Ex-ante value is applied as per typical truck size for FFB transportation. It is assumed that compost is transported with similar trucks

Data / Parameter:	**Oxygen Level in the compost**

Data unit:	% of dissolvent oxygen content
Description:	Percentage of dissolvent oxygen content in the compost
Source of data to be used:	On-site measurements
Value of data:	10%
Description of measurement methods and procedures to be applied:	The oxygen level during thermophilic stage will be recorded daily using a handheld oxygen meter with lancets of at least 1 m length and sampling with maximum margin of error of 10% at a 95% confidence level will be taken by compost technician. The compost pile will be turned if the oxygen level drops to below 10% to ensure the compost pile is in aerobic condition at all times.
QA/QC procedures to be applied:	The records will be verified by the compost plant manager. The oxygen meter will record data from at least 2 different points in the windrow to ensure homogeneity of reading taken. Average value of these data will be used to determine the oxygen level of the windrow. The handheld oxygen meter will be calibrated annually as per manufacturers specification. All monitoring data will be electronically archived for a period of 2 years after crediting period.
Any comment:	In case oxygen content of the composting process is monitored and above 8%, the parameter $EF_{composting}$ can be set to zero for the portions of Q_y for which the monitored oxygen content of the composting process.

Data / Parameter:	**Soil application of the compost in the plantation**
Data unit:	N/A
Description:	Proper soil application of the compost to ensure aerobic conditions for further decay
Source of data to be used:	Project owner / plantation
Value of data:	N/A
Description of measurement methods and procedures to be applied:	Soil application of the compost in the plantation will be monitored by documenting the delivery of the compost produced by the project activity to the plantation.
QA/QC procedures to be applied:	1) Verification of the annual record of compost application plan including information regarding the amount, date and specific areas for compost application and; 2) An in situ verification of the proper soil application of the compost in order to ensure the aerobic conditions of the decay process or; 3) Photographic evidences will be provided to demonstrate that the compost is properly applied
Any comment:	To be monitored annually

Data / Parameter:	**Quality Control Program to the Composting work**
Data unit:	N/A
Description:	monitoring the conditions and procedures that ensure the aerobic condition of the waste during the composting process
Source of data to be used:	Project owner (composting plant team work and Technical Advisor)

Value of data:	N/A
Description of measurement methods and procedures to be applied:	– Turning of the material every 2 days - Regular check of the compost quality leaving the composting facility (i.e. brown color and homogenous shows low C/N ratio: good quality; dark color and heterogeneous shows high C/N ratio: bad quality)
QA/QC procedures to be applied:	- Check of the operating hours of turning machine which equals a defined amount of compost during the period as turning machine operates at fixed speed. - Pictures will be taken of the final compost product on frequent basis. Quality is assured by regular turning anyhow.
Any comment:	-

Data / Parameter:	**$MD_{y,reg}$**
Data unit:	tonnes of CH_4 / year
Description:	Quantity of methane that would have to be captured and combusted to comply with the prevailing regulations
Source of data to be used:	Current regulations in the Host Country
Value of data:	0
Description of measurement methods and procedures to be applied:	Current regulations in the host country do not require the capture and combustion Of methane. Changes in the legislation requirements will be monitored.
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	**f**
Data unit:	%
Description:	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
Source of data to be used:	Data available from palm oil mill site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0
Justification of the choice of data or description of measurement methods and procedures actually applied:	No methane is captured and flared at the palm oil mill's facilities. The continuance of no capturing/flaring will be checked on-site during every verification site visit.
QA/QC procedures to be applied:	-
Any comment:	To be carried out on an annual basis.

Parameters to be **calculated** (not measured):

Data / Parameter:	**$BE_{CH4,SWDS,y}$**
Data unit:	tCO2/year
Description:	Yearly methane generation potential of the solid waste composted by the project during the years "x" from the beginning of the project activity (x=1) up to the year 'y'
Source of data to be used:	Calculated from other monitored parameters (as explained in section B.5.2, baseline a))
Value of data	3,702 (calculation provided in the spreadsheet, this value is for the first year)
Description of measurement methods and procedures to be applied:	Calculated
QA/QC procedures to be applied:	N/A
Any comment:	This parameter is not measured directly.

Data / Parameter:	**$MEP_{y,ww}$**
Data unit:	tCO2/year
Description:	Methane emission potential in the year 'y' of the wastewater co-composted.
Source of data to be used:	Calculated from other monitored parameters (equation baseline "b").
Value of data	11,913 (calculation provided in the spreadsheet, this value is for the first year)
Description of measurement methods and procedures to be applied:	Calculated
QA/QC procedures to be applied:	N/A
Any comment:	This parameter is not measured directly.

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:

☐ Please tick if this information is provided at the PoA level. In this case sections C.2. and C.3. need not be completed in this form.

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

The implementation of this project activity will not have any significant negative environmental impacts. On the contrary, the implementation of this project activity will improve local environmental conditions, since with this composting activity emission of methane gas will be reduced. Since all POME will be used in the composting plant, no wastewater will be discharged to the surrounding environment. To avoid infiltration of the wastewater into the ground water, this composting plant will have a concrete floor, complete with a drainage system, as to re-circulate excess wastewater back into the composting process.

The only negative environmental impact due to the project activity is the possible slight increase in local air pollution due to the combustion of diesel fuel to operate the turning machine, loader and dump truck. However, this fuel consumption is minimal as equipment will be new, and therefore clean-burning. To reduce the exhaust emissions, proper maintenance will be implemented on this machinery. Since the project is located within a large mill site and, therefore, there are no people living close to the site, this local air pollution will not have any impact on people. The minimal noise nuisance also will not affect residents due to the same reason.

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

According to Government Regulation of PP No. 11/2006, the construction and operation of the composting plant will not require an Environmental Impact Assessment (EIA), since the project is a continuous improvement of the existing environmental management. No other license will be required to operate the project activity.

SECTION D. Stakeholders' comments

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

☐ Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

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

A local stakeholder consultation was carried out on May 30, 2007 in the hall's meeting room of the Fettty Mina Jaya mill close to the palm-oil mill PT. Fettty Mina Jaya. The local stakeholders were invited via invitation letter at least a week before to provide reasonable time for the related stakeholders to attend the meeting. The meeting was attended by 23 local stakeholders from the local authorities, organisations and palm-oil plantation farmers.

The stakeholder consultation was opened with a welcoming speech from Mr. Bintang Siahaan as the General Manager of PT Fettty Mina Jaya. Mr. Siahaan also introduced the participants from the sub-district government, head of village, local leaders, and partners from Fettty Mina Jaya. After the brief introduction, he explained shortly the proposed composting project for PT. Fettty Mina Jaya. Mr. Prasetio Utomo of Indonesian Designed National Authority (DNA) presented an overview of the Clean

Development Mechanism, the Kyoto Protocol, and its connection with the Ministry of Environment. Afterwards, Mr. Henricus Hutabarat of EcoSecurities Indonesia presented the Kyoto Protocol, the Clean Development Mechanism (CDM) concept, and the objective of the project. The discussion took place when the presentation ended.

D.3. Summary of the comments received:

The following are the main issues raised by the participants during the consultation:

1. The concern about the compost quality compared to chemical fertilizer and it's potential impact on the plantation, included it's mitigation if negative impact of compost utilization occured;
2. Demand of the palm oil grower on the access to the compost at a comparable selling price with chemical fertilizer;
3. Working opportunities in the project;
4. Suggestion to conduct open discussion related to the progress of the composting activities

Below are the minutes of meeting of the Stakeholder Consultation:

The Stakeholder Consultation meeting commenced with the brief introduction of PT. Fetty Mina Jaya, EcoSecurities Indonesia, and Indonesian Designed National Authority (DNA) by Mr. Bintang Siahaan of PT. Fetty Mina Jaya. Mr. Bintang also introduced the participants from representative of Siak District, Minas Sub-District and other stakeholders. After the brief introduction, he explained the proposed composting project for PT. Fetty Mina Jaya. Mr. Prasetio Utomo of Indonesian Designed National Authority (DNA) presented an overview of the Clean Development Mechanism, the Kyoto Protocol, and its connection with the Ministry of Environment. Afterwards, Mr. Henricus Hutabarat of EcoSecurities Indonesia presented the Kyoto Protocol, the Clean Development Mechanism (CDM) concept, and the objective of the project. After the presentation, an open forum was carried out to elicit comments and issues from the various stakeholders.

OPEN FORUM

Sumaryono, Oil Palm Grower :
Any kinds of negative impact would arise by applying this compost to the plantation?

Henricus Hutabarat (EcoSecurities):
Compost is a material rich in organic matter. The addition of compost to soil can enrich the water retention and enhance soil structure as well. This compost is also very good if applied to other plantations. For instance, if it applied to the tomato plantation hence the productivity will increase. There is no chemical substances will be added during the process. Both EFB and POME are utilized and will be turned every three days using Backhus turning machine.

Prasetyo (Kementerian Lingkungan Hidup):
It could be happen. I suggest the project developer analyze the compost for its content to know any dangerous matter harming the plant before distributed to the society. It can be done by coordinating with local agriculture department.

Ir. Yuzak Siahaan (Manajer Perkebunan):

I do not think there will be any negative impact arisen from applying this compost to the plant.This compost have element of K with value of 3.45%. In general, when oil palm is lacking of K, the palm will be easy to break. With addition of compost about 4-5 tons per hectare, oil palm will be better.

Chaerul, Chairman of Community organization:
Could the community use this compost for their plantation? Will this compost be cheaper than other chemical fertilizer such as Urea? Is this compost better than other anorganic fertilizer?

Henricus Hutabarat (EcoSecurities):
It will be cheaper than other anorganic fertilizer. This compost have elements differing from other anorganic fertilizer, in consequence we cannot replacing 100% of usage of anorganic fertilizer such as Urea.

Ir. Yuzak Siahaan (Plantation Manajer):
Compost has ability to improve properties of the soils. Besides that compost provides nutrients to fertilize the palm.

Bintang Siahaan (General Manager PT. Fetty Mina Jaya):
We will distribute part of this compost to the community. Prior to that, we will ask laboratory to analyze whether the compost is containing any dangerous matter harming the plant growth. Of course, we expect that this compost will be cheaper than other chemical fertilizer.

Palm Grower:
We will support this project anyway as long as it gives benefits for us. Is there any possibility for us working on this project? Could we use this product?

Henricus Hutabarat (EcoSecurities):
It was explained that this project will give benefits to the community such as; elimination or reduction of odors and job opportunities for the community. Additionally, part of the products will be distributed to the community at a cheaper price than chemical fertilizer.

Siman, Society Leader:
Can this company hire workers from our community to work in the factory?
When you built this plant, you promised that you would hire 80% of local people to work in this plant, but it turns out that you only hire 20%. We ask for a written promise and not just oral agreement. We also expect that the company can cooperate well with the community and hopefully the community can be helped with this project.

Bintang Siahaan (General Manager PT. Fettymina Jaya):
We hold some admission tests when selecting people working for the project. We will only accept a person who passes the test. Honestly, we prefer hiring local people to work on this project, because for example we do not need to build housing for them, since it is costly.

Jumari, Palm Grower :
Will there be any feasibility study of this composting project? if the use of this compost is harming the plantation, to whom should we report it? Please provide us information in advance.

Prasetyo (Kementerian Lingkungan Hidup):

All participants expect company to give more information relating to project activities.
Every project has its risk. If something happen, communities could ask related department to analyze the problem. Which means company and community as users will be sure and do not have to worry on the utilization of compost in their plantation.

Bintang Siahaan (General Manager PT. Fettymina Jaya):
It is not about research for the availability of project to be built but more to analyze the contents of the compost, if there is any hazardous matter that could harming the plant

Henricus Hutabarat (EcoSecurities):
In fact, this composting project is a simple one. Currently, all the EFB will be dumped and left to decay in unmanaged site or sprayed to the plantation as a fertilizer. POME is disposed of via a series of anaerobic lagoons and discharged to the river or sprayed as land application. In composting technology, both EFB and POME are utilized and will be turned every three days using turning machine. There is no other chemical matter will be added during the process.

Rasman Simanjuntak, Palm Plantation Supplier:
For Mr. Prasetyo, it was explained that emission can damage the environment. If the EFB is spread and piled in the open field, will it create emission and pollute the environment?
For Mr. Henricus, has a factory like this been built before and has it operated now?
For Mr. Bintang, when the composting project is operated, please prevent it from polluting the environment. If that happens, what can the society do? If the compost will be distributed to the community, please do not supply it through the head office in Pekanbaru since it is too far.

Prasetyo (DNA):
The current practice of piling the EFB in open field will create a CH4 emission which will pollute the environment. But when it is processed into compost, if the methane still exist, then the composting process has failed.
During the composting process, there should be no methane emission since the process will be an aerobic process which involves oxygen. When anaerobic processes occur, it will release methane, which means the process is failed.

When this project was proposed to our office, it is guaranteed that the project will not cause any negative impact to the community or the environment. In Indonesia, there is Amdal or UKL/UPL (EIA), where it is a kind of SOP (Standard Operating Procedure) that has to be legalized by the Environmental Office. Before it is legalized, we can not approve the project to be a CDM project. So the filter for this project to be realized is quite heavy. If there is any negative impact later on, it can be reported to our office on the Amdal department. Since in the Amdal document is stated what has to be done then if it is not done according to the Amdal, the project can be sued.

Henricus Hutabarat (EcoSecurities):
The technology we will use is from Germany. They have experiences in this composting technology for more than 20 years. In Indonesia, the composting project has been applied at PTPN III and the project has been operated.

Bintang Siahaan (General Manager PT. Fettymina Jaya):

For the environment impact, we are using Amdal. So we still refer to that, such as in the amount of waste (ppm), COD, and BOD. Later when we are building a good building, closed. We will follow the rules from the government.

Slamet Rahardjo, RT. 01, Palm Plantation Farmer:
We really hope that there will not be negative impacts from this composting project. Therefore it is necessary for the company to hold this kind of event in a routine every 3 or 6 months to give information to the community.

Bintang Siahaan (General Manager PT. Fettymina Jaya):
We will try to prevent any negative impact from this project, such as bad odour, etc.

Prasetyo (DNA):
I hope that the community can support this project and also gain the advantages. This is a revision from the previous waste treatment. The company is suggested to hold this kind of event every 3 or 6 months. This event, however simple, gives extraordinary inputs.

The meeting is closed with comments and remarks from Bintang Siahaan as General Manager PT. Fettymina Jaya.

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

The project developer promise to do the following to respond to the concern of stakeholders:

1. The project developer ensure that compost does not have negative impacts on plantation since is is based on organic matter. However, the project developer promise to conduct a periodical testing on the quality of compost;
2. The project developer ensures that palm oil grower will have access to the compost at a price lower than chemical fertilizer. The project developer will provide a guidance how to get access to the compost;
3. The project developer promise to provide working opportunities during construction and operation of the project. However, that person to be hired has to pass the test. Prior to start the construction project developer promises to announce the recruitment process;
4. Project developer promise to hold similar event every year.

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-SCALE CPA

Organization:	PT Fetty Mina Jaya
Street/P.O.Box:	Jalan Hang Tuah I No. 6
Building:	
City:	Pekanbaru
State/Region:	Riau Province
Postfix/ZIP:	
Country:	Indonesia
Telephone:	
FAX:	+62 761 858592
E-Mail:	
URL:	
Represented by:	
Title:	President Director
Salutation:	
Last Name:	Siahaan
Middle Name:	
First Name:	Pardamean
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	benyamin_sudiro@yahoo.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project does not receive any public funding.

Annex 3

BASELINE INFORMATION

Baseline emission calculation is shown in section B.5.2

FFB Process

Total FFB Production (ton/year)					
Year	**2006**	**2007**	**2008**	**2009**	**Average**
Total	-	125,194	106,775	74,132	102,034

Dimension of Lagoons

No	Pond	Length (M)	Width (M)	Depth (M)	Volume (M3)
1	Cooling Pond	60.00	31.00	6.00	11,160.00
2	Acidification Pond 1	60.00	41.00	6.00	14,760.00
3	Acidification Pond 2	55.00	30.00	6.00	9,900.00
4	Primary Anaerobic 1	137.00	40.00	6.00	32,880.00
5	Primary Anaerobic 2	137.00	40.00	6.00	32,880.00
6	Secondary Anaerobic 1	50.00	31.00	6.00	9,300.00
7	Secondary Anaerobic 2	49.00	31.00	6.00	9,114.00
8	Secondary Anaerobic 3	39.00	21.00	6.00	4,914.00
9	Secondary Anaerobic 4	49.00	21.00	6.00	6,174.00
10	Aerobic Pond 1	60.00	52.00	8.00	24,960.00
11	Aerobic Pond 2	61.00	25.00	8.00	12,200.00
12	Sedimentation Pond 1	70.00	40.00	8.00	22,400.00
13	Sedimentation Pond 2	56.00	21.00	8.00	9408.00
TOTAL					**200,050.00**

Annex 4

MONITORING INFORMATION

The monitoring parameters and description of monitoring is shown in section B.6.1