Monitoring report form (Version 03.2)

Monitoring report

Title of the project activity	Gianyar Waste Recovery Project
Reference number of the project activity	1885 (small scale project activity)
Version number of the monitoring report	01
Completion date of the monitoring report	13/01/2014
Registration date of the project activity	04/11/2008
Monitoring period number and duration of this monitoring period	Number 4 for 01/01/2013 to 31/12/2013, including both dates
Project participant(s)	Yayasan Pemilahan Sampah Temesi myclimate – The Climate Protection Partnership
Host Party(ies)	Indonesia
Sectoral scope(s) and applied methodology(ies)	Sector 13, Waste handling and disposal. AMS-III.F. ver. 5 - Avoidance of methane production from decay of biomass through composting
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	GHG emission reductions: 8,809 CO_2e for this monitoring period including reductions allocated from prior years GHG removals by sinks: NA
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	GHG emission reductions: 5,322 CO_2e for this monitoring period including reductions allocated from prior years. GHG removals by sinks: NA
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	13,124 CO_2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	5,322 CO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

a) The technology used and the measures applied in this project activity are to avoid the production of methane from the biomass fraction of municipal waste that otherwise would have been left for anaerobic decay in a solid waste disposal site without methane capture and flaring or power production. The decay is prevented through aerobic treatment by composting the organic waste fraction and proper soil application of the compost. The proper composting process is secured by adequate compost handling procedures and measures, including active aeration.

b) Waste separation and composting are done in a covered area of 4740 m^2. Coarse organic material is shredded prior to being composted. The windrows are then turned in 2 to 3 week intervals with an excavator. When the decomposition has reached the stadium of raw compost, the material is passed through sieves with 9 or 5 mm mesh sizes. The sieved raw compost is sold directly or further cured to finished compost, depending on demand. To assure an aerobic process, the windrows are aerated with blowers to guarantee an oxygen level of at least a 6 % throughout the process. However routinely, the project can maintain oxygen levels over 12 %.

c) The project activity milestones are:

Project planning	2004 to 2008, including operation of a pilot plant
Project construction:	1st phase of 2340 m^2: 1st semester 2008 2nd phase of 2400 m^2: 2nd semester 2009
Project commissioning:	1st phase of 2340 m^2: May 2008 for processing up to 30 tons of organic waste per day 2nd phase of 2400 m^2: January 2010 for processing up to 50 tons of organic waste
Operating Periods:	Uninterrupted since May 2008

d) Total net emission reductions achieved in this monitoring period amount to **5,322 tons CO_2e**.

A.2. Location of project activity

a) Host Party Indonesia
b) Region of Gianyar / Province of Bali
c) Town of Temesi
d) Project location in Temesi, Gianyar: Longitude: E 115º 20' 59" Latitude: S 8º 33' 41" (new by Google Earth, in PDD from map)

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	**Private and/or public entity(ies) project participants (as applicable)**	**Indicate if the Party involved wishes to be considered as project participant (Yes/No)**
Republic of Indonesia	Yayasan Pemilahan Sampah Temesi (Private entity)	No
Switzerland	myclimate, The Climate Protection Partnership (Private entity)	No

A.4. Reference of applied methodology

Sector 13, Waste handling and disposal.

AMS-III.F. ver. 5 - Avoidance of methane production from decay of biomass through composting

Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site, EB 35, Annex 10 (PDD page 9)

A.5. Crediting period of project activity

10 years from 04/11/2008 to 03/11/2018, fixed

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

The Gianyar Waste Recovery Project was an environmental mission of the Rotary Club of Bali Ubud. Already in 2005 the three objectives were to become: 1) a CDM project, 2) a replicable model facility and 3) a low cost/low tech/low risk facility. The project activity was preceded by a pilot plant operation during which all relevant parameters were researched and optimized to assure later an efficient process. The pilot plant was operational from 2004 to April 2008. In December 2008 the project ownership and operation was turned over to a village based foundation, the Yayasan Pemilahan Sampah Temesi. The volume processed in the pilot plant is a "prior activity" that is deducted from the baseline emission.

The CDM project activity was implemented in two phases:

1st Phase:	A 2340 m^2 covered processing area with a capacity of maximum 30 tons per day. Construction 1st semester 2008 / commissioning May 2008
2nd Phase:	A 2400 m^2 extension to 4740 m^2 with a final capacity of up to 50 tons per day. Construction 2nd semester 2009 / commissioning January 2010
Implementation status:	Fully implemented as a small scale project activity.

In each phase the processing volume was increased progressively, although monthly variations occurred mostly due to holidays and/or varying availability of waste separating personnel. While the project activity started in May 2008, the CDM registration was received only on 04/11/ 2008. The first monitoring period started 04/11/2008 and ended 30/04/2010. The second monitoring period lasted from 01/05/2010 until 31/12/2011. The third monitoring period lasted from 01/01/2012 until 31/12/2012. This forth monitoring period lasts from 01/01/2013 until 31/12/2013.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

No temporary deviations have been applied during this monitoring period from the monitoring plan or the applied methodology.

B.2.2. Corrections

A new PDD Version 4 of June 12, 2013 with corrections was submitted for approval. The corrections were approved prior to the submission of this monitoring report on September 27, 2013 with PRC ref No. PRC-1885-001 (PRC id: prcp195686498).

B.2.3. Permanent changes from registered monitoring plan or applied methodology

A new PDD Version 4 of June 12, 2013 with permanent changes from the monitoring plan was submitted for approval. The permanent changes were approved prior to the submission of this monitoring report on September 27, 2013 with PRC ref No. PRC-1885-001 (PRC id: prcp195686498). The change to the monitoring plan concerns the use of different and more suitable weighing scales (see B.2.4.).

B.2.4. Changes to project design of registered project activity

A new PDD Version 4 of June 12, 2013 with changes to the project design of the registered project activity was submitted for approval. The changes to the PDD were approved prior to the submission of this monitoring report on September 27, 2013 with PRC ref No. PRC-1885-001 (PRC id: prcp195686498).

They concern:

1. The use of building space (“Project activity” in Section A.2. and “Layout”, Figure 2 in Annex 5.).
2. More flexibility concerning numbers of shredders used to reduce the size of organic waste (“Technical details”, Table 9 in Annex 5).
3. More flexibility concerning numbers of sieves used to size the finished compost (“Technical details”, Table 9 in Annex 5).
4. Alternative use of excavator to handle compost (“Technical details”, Table 9 in Annex 5).
5. More flexibility concerning the number of transport vehicles (“Technical details”, Table 9 in Annex 5).
6. The use of more precise weighing scales in addition to, or instead of an unsuitable weighbridge (Section B.7.1.; “Data and parameters monitored” in Section B.7.2.: ”Description of the monitoring plan” and Annex 4: “Monitoring information”).

B.2.5. Changes to start date of crediting period

No changes to the start date of the crediting period have been approved during this monitoring period or submitted with this monitoring report.

B.2.6. Types of changes specific to afforestation or reforestation project activity

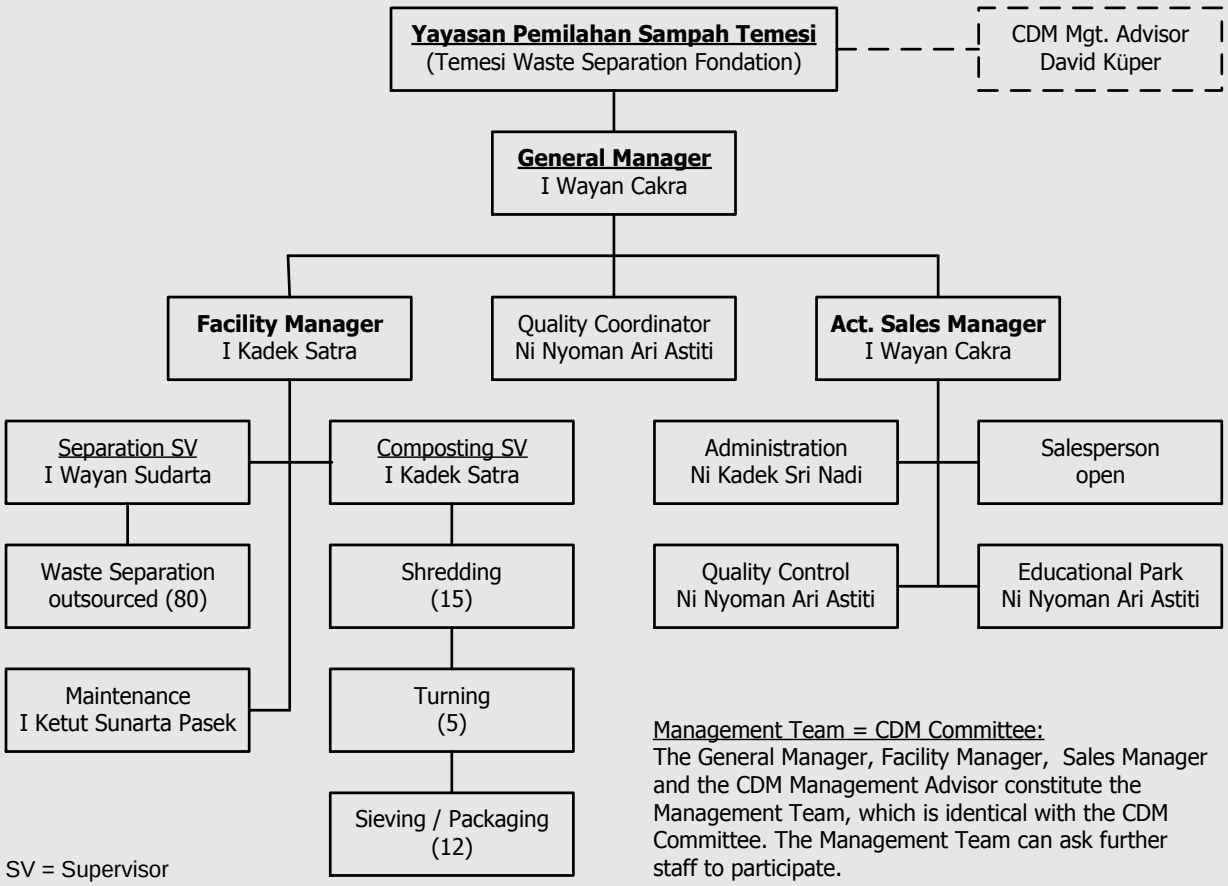
Not applicable to this project activity.

SECTION C. Description of monitoring system

C.1. Introduction and Organizational Chart

The facility management has introduced a Quality System that was designed after ISO 9000. This Quality System has three hierarchical levels. The first level is the Quality Manual. The second level is Operating Procedures. The Operating Procedures (OP) describe the activities that need to be carried out to assure compliance with CDM related issues. They also serve to achieve the necessary level of quality of our products and services. Furthermore, they define how CDM and quality records are maintained to provide evidence of monitoring. Refer to Annex 8 for a list of the Operating Procedures.

The following diagram depicts the Organizational Chart as of December 31, 2013:



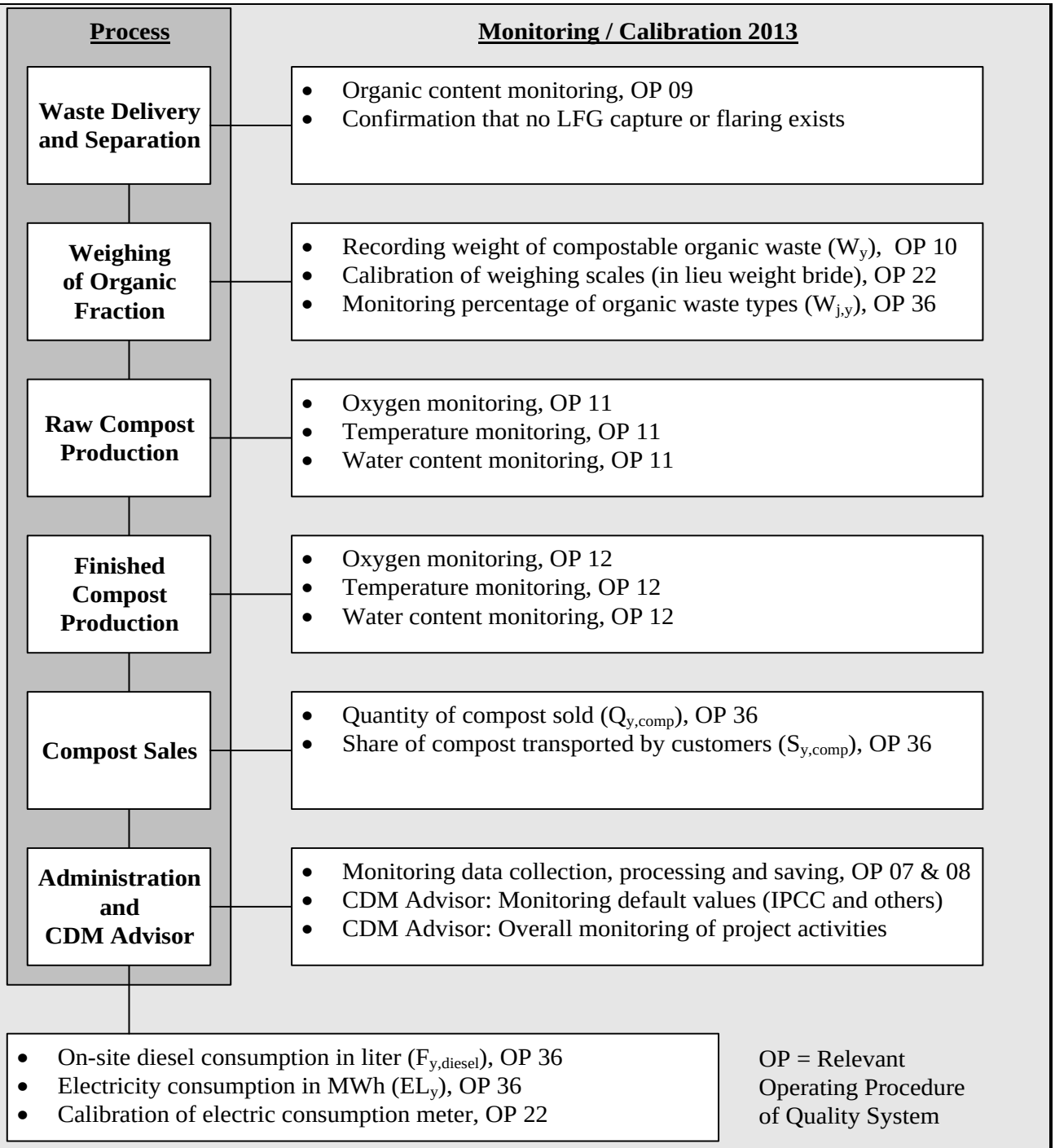
C.2. Monitoring management

All CDM related responsibilities are covered in the Quality System that is implemented under the responsibility of the Managers. The CDM Management Advisor has the overall responsibility for the project's CDM monitoring and verification. The responsibilities delegated by the Facility Manager and Sales Manager are defined in the various Operating Procedures of the Quality System.

C.3. Monitoring process

All monitoring processes are defined in their respective Operating Procedures (OP) of the Quality System, which contain the details for reliable measurement and recording of the parameters. The original versions of the Operating Procedures are available in English language, but are not necessarily updated. The Indonesian language version is the binding version and is updated if required.

The following diagram shows the monitoring points and required equipment calibrations:



C.3.1. Waste measurement and project emissions

The Operating Procedures for the measurement and recording of quantity of waste processed, waste composition, energy consumption, and transport emission are referred to in the diagram above and the related sections of section E. Emission reductions calculations.

C.3.2. Assuring aerobic conditions for decomposition

The PDD requires no specific monitoring to assure aerobic conditions. Many other composting projects do not monitor oxygen and water content, relying only on regular turning of the compost heaps.

The procedure for controlling the aerobic decomposition of organic waste are described in OP 11 Raw Compost Production, OP 12 Finished Compost Production and OP 13 Specialty Compost Production. The recording of oxygen content, temperature and water content is defined in OP 17 Compost Production Monitoring. The oxygen content and temperature are measured and recorded 2 times per

week, while the water content is measured and recorded 2 times per month. It must be noted that the temperature has no influence on aerobic conditions. However, the oxygen and water content should be kept at recommended levels to assure an aerobic decomposition.

The water content is determined by drying wet processing material and measuring the weight difference on calibrated weighing scales.

The oxygen content is measured with a self-calibrating oxygen meter. The chemical sensor of the device is subject to a miniscule but constant deterioration until it is used up and the instrument displays an error message. Therefore each time before use, it needs to be recalibrated with ambient air, which has an oxygen concentration of 20.95%. Thus, yearly calibrations are inadequate.

C.3.3. Other parameters required by the methodology

Other parameters are determined according to the following Operating Procedures:

- Analysing the compost quality is covered in OP 18 Compost Quality Control.
- Tools for market development and other customer support are covered in OP 31 Customer Support.
- The assessment of common practices at the adjacent landfill (absence of methane capture) is confirmed by written statements of the landfill operator and verifiable on site.

C.4. Data recording and archiving

Data recording is performed according to the respective Operating Procedures and data storage is performed according to OP 07 Quality Record Storage.

C.5. Quality control procedures

The Quality System includes procedures that allows all personnel to report problems or irregularities that are then addressed by the Management Team / CDM Committee.

Personnel have two possibilities to report irregularities:

- Issue a Non-Conformity Report (NCR) according to OP 27 Non-Conformities.
- Refer to a potential problem according to OP 28 Quality Alerts.

The Facility Manager is responsible for the yearly calibration of the weighing scales (balances) used to weigh the organic waste that is composted or to determine the waste types. The calibration of the weighing scales and kW-meters is performed according to OP 22 Calibrated Equipment. According to the PDD, no other equipment requires calibration. The summary of equipment calibrations is in Annex 7.

The Facility Manager and the Sales Manager are responsible to routinely reviewing quality procedures and to request changes at the quarterly Management Team / CDM Committee meetings.

C.6. Report compilation and verification

The input for the Monitoring Report is made available by the Facility Manager and Sales Manager or their staff. The CDM Management Advisor reviews the inputs and then compiles and submits the Monitoring Report to the DOE.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Table 1

Data / Parameter:	φ
Unit:	-
Description:	Model corrections factor to account for model uncertainties
Source of data:	See below

Value(s) applied):	0.9
Purpose of data:	Default value selected as proposed by methodology.
Additional comment:	None

Table 2

Data / Parameter:	**OX**
Unit:	-
Description:	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Source of data:	See below
Value(s) applied):	0
Purpose of data:	0.1 is to be used for managed solid waste disposal sites that are covered with oxidizing material such as soil or compost. For other solid waste disposal sites a value of 0 can be used. The landfill where the waste would be disposed in the absence of the composting project activity is not covered with oxidizing material, hence a value of 0 is appropriate.
Additional comment:	None

Table 3

Data / Parameter:	**F**
Unit:	-
Description:	Fraction of methane in the SWDS gas (volume fraction)
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied):	0.5
Purpose of data:	IPCC default value as proposed by the methodology is applied.
Additional comment:	None

Table 4

Data / Parameter:	**DOC_f**
Unit:	-
Description:	Fraction of degradable organic carbon (DOC) that can decompose
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied):	0.5
Purpose of data:	IPCC default value as proposed by the methodology is applied.
Additional comment:	None

Table 5

Data / Parameter:	**MCF**
Unit:	-
Description:	Methane correction factor
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied):	0.8

Purpose of data:	MCF for the following types of solid wastes disposal sites are possible: **Disposal site type** / **MCF** Managed – anaerobic: 1.0 Managed – aerobic: 0.5 Unmanaged – deep (>5m) or high water table: 0.8 Unmanaged – shallow (<5m): 0.4 Uncategorised SWDS: 0.6 The landfill where the waste would be disposed in the absence of the composting project activity has an average depth of 6 meters and the waste is mechanically compacted. Hence, a value between 1 and 0.8 would be appropriate. For conservativeness a value of 0.8 has been applied.
Additional comment:	None

Table 6

Data / Parameter:	**DOC_j**
Unit:	-
Description:	Fraction of degradable organic carbon (by weight) in the waste type *j*
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 2.4 and 2.5)
Value(s) applied):	DOC_j values for wet waste have been applied → see below
Purpose of data:	The methodology distinguishes between five types of waste and respective DOC_j values under wet and dry waste conditions given as percentage of the total organic waste stream of the project: **Waste type j** / **% DOC wet waste** / **% DOC dry waste** Wood and wood products: **43** / 50 Pulp, paper and cardboard (other than sludge): **40** / 44 Food, food waste, beverages and tobacco (other than sludge): **15** / 38 Textiles: **24** / 30 Garden, yard and park waste: **20** / 49 Measures of the moisture content have shown values between 45-50% of the total waste amount (depending also on seasonal climatic circumstances and the waste composition). On average, the waste can be considered as wet waste and respective DOCj values as given in the second column above apply.
Additional comment:	None

Table 7

Data / Parameter:	**k_j**
Unit:	-
Description:	Decay rate for the waste type *j*
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 3.3

<table>
<tr><td>Value(s) applied):</td><td>K_j values for tropical / wet conditions have been applied → see below</td></tr>
<tr><td>Purpose of data:</td><td>The methodology is based on the IPCC 2006 Guidelines and gives the following default values for tropical conditions:
<table>
<tr><td colspan="2" rowspan="2">Waste type j</td><td colspan="2">Tropical (MAT* > 20°C)</td></tr>
<tr><td>Dry (MAP* < 1000 mm)</td><td>Wet (MAP > 1000mm)</td></tr>
<tr><td rowspan="2">Slowly degrading</td><td>Pulp. Paper, cardboard, textiles</td><td>0.045</td><td>0.07</td></tr>
<tr><td>Wood, wood products, straw</td><td>0.025</td><td>0.035</td></tr>
<tr><td>Moderately degrading</td><td>Garden and park waste</td><td>0.065</td><td>0.17</td></tr>
<tr><td>Rapidly degrading</td><td>Food, food waste, beverages, tobacco</td><td>0.085</td><td>0.4</td></tr>
<tr><td colspan="4">MAT: mean annual temperature
MAP: mean annual precipitation</td></tr>
</table>
Bali is located in tropical area with MAP of around 1700 mm per year and an average annual temperature (MAT) of 27°C. Therefore the proposed k values for wet conditions can be used.</td></tr>
<tr><td>Additional comment:</td><td>Temperature and precipitation values and references for Bali are presented in Annex 3 of the PDD.</td></tr>
</table>

Table 8

Data / Parameter:	**EF_{diesel}**
Unit:	kg/l
Description:	Diesel CO_2 emission factor
Source of data:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied):	2.664
Purpose of data:	The emission factor of diesel in kg/l has been calculated using IPCC default values for: NCV diesel: 43.33 GJ/t Density diesel: 0.83 kg/l CO_2 emission factor diesel: 74.07 t/TJ
Additional comment:	None

Table 9

Data / Parameter:	**EF_{grid}**
Unit:	t CO_2/MWh
Description:	Grid emission factor
Source of data:	Decision on the meeting on determination of CDM emission factor of JAVA-MADURA-BALI (JAMALI) Grid submitted by Chevron and agreed by the committee, Directorate General of Electricity and Energy Utilization, Jakarta, Indonesia, Friday, 11 March 2006).
Value(s) applied):	0.728

Purpose of data:	This emission factor is estimated based on ACM 0002. Reference for cross checking: Directorate general electricity and energy utilization, Renewable energy division, 2006. Since no data is directly available to the project developer and also not expected to be available in the coming years, this emission factor remains fixed over the crediting period. However, with regard to the small amount of emissions resulting from power consumption this approach is considered appropriate.
Additional comment:	Determined ex-ante and fix over crediting period.

Table 10

Data / Parameter:	**$EF_{transport}$**
Unit:	kg CO_2 / km
Description:	Average CO_2 emissions per 100 km of customer vehicles used for compost transport
Source of data:	Based on estimated average values and IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied):	0.2664 kg/km
Purpose of data:	This factor is calculated using the EF_{diesel} (2.664 kg/l) times estimated average diesel consumption of customer vehicles per 100 km (12 l)
Additional comment:	Determined ex-ante and fix over crediting period.

Table 11

Data / Parameter:	**$TWCOM_{BAU}$**
Unit:	t
Description:	Maximum amount of organic waste processed for composting per year in the BAU scenario (pilot facility)
Source of data:	Plant records
Value(s) applied):	595 t per year (source PDD)
Purpose of data:	This figure reflects a conservative approach. It was calculated based on the average processed total volume per day (2 t) times the maximum operating days of the plant (350), times the average organic fraction of the waste (= 85 % according to reality and PDD Section B.6.3.).
Additional comment:	Determined ex-ante and fix over crediting period.

D.2. Data and parameters monitored

Table 12

Data / Parameter:	**f**
Unit:	-
Description:	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
Measured/ Calculated / Default:	There are no LFG capture and flaring installations at the landfill. However, the landfill operator will issue yearly a confirmation that no such equipment is installed and operated.
Source of data:	On-site inspection and written confirmation by landfill operator

Value(s) of monitored parameter:	0
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Monitoring frequency: yearly. There are no values to be measure, read or recorded, except the confirmation from the landfill operator mentioned above.
Calculation method (if applicable):	-
QA/QC procedures:	Operating Procedure 03
Purpose of data:	Baseline emission calculation
Additional comment:	None

Table 13

Data / Parameter:	**GWP_{CH4}**
Unit:	t CO_2e / t CH_4
Description:	Global warming potential (GWP) of methane, valid for the relevant commitment period
Measured/ Calculated / Default:	Default
Source of data:	UNFCCC
Value(s) of monitored parameter:	A value of 21 is to be applied for the first commitment period
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	There are no values to be measured read or recorded
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Baseline emission calculation
Additional comment:	After each commitment period GWP is adjusted according UNFCCC decisions

Table 14

Data / Parameter:	**$W_y = TWCOM_y$**
Unit:	t
Description:	Total organic waste prevented from disposal in period y

Measured/ Calculated / Default:	Total weight of organic waste composted is determined directly on scales instead of calculated by deducting recycled and landfilled waste from total delivered waste. This alternative is more accurate and allowed according to PDD Section B.7.2. (paragraph on waste measurement)
Source of data:	Plant records
Value(s) of monitored parameter:	01/01/2013 to 31/12/2013: 8,358.592 t (Source Annex 1)
Monitoring equipment:	Analogue scales sentisimal, Serial No. B 040704, B 070494, 110967, B 910007, and B 1102217. Calibrated yearly by UPT Meterologi, Bali
Measuring/ Reading/ Recording frequency:	The weight is measured continuously on calibrated scales. The readings are first recorded as raw data and then transferred to electronic files
Calculation method (if applicable):	-
QA/QC procedures:	Operating Procedure 03 and 10
Purpose of data:	Baseline emission calculation
Additional comment:	This parameter is measured directly. It is not calculated. Current and previous calibrations are listed in Annex 7

Table 15

Data / Parameter:	$\mathbf{p_{n,j,y}}$
Unit:	t
Description:	Weight fraction of waste type j in the sample n collected during period y
Measured/ Calculated / Default:	The weight of each fraction is determined on scales
Source of data:	Plant records
Value(s) of monitored parameter:	2013: A=5.667% / B=4.014% / C=8.042% / D=0.611% / E=81.667% (Source Annex 2)
Monitoring equipment:	Digital scale AND AD 4406 1000kg/0.2kg, Serial No. P3507372, KRIS EK3550 5000g/1g and Ohaus Scout 200g/10mg, Serial No. 7129350044. Calibrated yearly by UPT Meterologi, Bali
Measuring/ Reading/ Recording frequency:	Sampling is undertaken quarterly (4 times a year at 3 different days. Sample size 100 kg each day) on calibrated scales. The average of these samplings is recorded in electronic files as weight fraction of waste type
Calculation method (if applicable):	A detailed written sampling procedure is applied to ensure a consistent approach over the crediting period. (see Operating Procedure 36, PDD Section B.7.2 and Annex 4 of the PDD)
QA/QC procedures:	Operating Procedures 03 and 36
Purpose of data:	Baseline emission calculation
Additional comment:	Current and previous calibration are listed in Annex 7

Table 16

Data / Parameter:	**$W_{total,y}$**
Unit:	t
Description:	Total waste delivered to the composting facility in period y
Measured/ Calculated / Default:	-
Source of data:	-
Value(s) of monitored parameter:	This value is not needed and thus not monitored, because the weight of organic waste composted is determined directly (see Table 14)
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	-
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	-
Additional comment:	This is one of two options allowed in the PDD

Table 17

Data / Parameter:	**$W_{recycled,y}$**
Unit:	t
Description:	Waste fraction processed for recycling in period y
Measured/ Calculated / Default:	-
Source of data:	-
Value(s) of monitored parameter:	This value is not needed and thus not monitored, because the weight of organic waste composted is determined directly (see Table 14)
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	-
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	
Additional comment:	This is one of two options allowed in the PDD

Table 18

Data / Parameter:	$W_{landfill,y}$
Unit:	t
Description:	Waste fraction diverted to landfill in period y
Measured/ Calculated / Default:	-
Source of data:	-
Value(s) of monitored parameter:	This value is not needed and thus not monitored, because the weight of organic waste composted is determined directly (see Table 14)
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	-
Additional comment:	This is one of two options allowed in the PDD

Table 19

Data / Parameter:	$F_{y,diesel}$
Unit:	Liter
Description:	Total consumption of diesel composting facility in period y
Measured/ Calculated / Default:	The volume of diesel fuel is measured
Source of data:	Plant records
Value(s) of monitored parameter:	15,757.27 (Source Annex 5)
Monitoring equipment:	The diesel fuel is purchased at various government owned fuel stations.
Measuring/ Reading/ Recording frequency:	Monitoring frequency: continuously. Purchase records and invoices are used to determine the diesel consumption, which is then recorded in electronic files
Calculation method (if applicable):	-
QA/QC procedures:	Operating Procedure 36
Purpose of data:	Project emission calculation
Additional comment:	None

Table 20

Data / Parameter:	EL_y

Unit:	MWh
Description:	Total power consumption of composting facility in period y
Measured/ Calculated / Default:	The power consumption is measured
Source of data:	Plant records
Value(s) of monitored parameter:	26,813.0 (Source Annex 5)
Monitoring equipment:	Power consumption is directly measured with meters. Meters are subject to regular calibration by the governmental UPT Metrologi, Bali
Measuring/ Reading/ Recording frequency:	Meter readings are taken each time new pulses are bought. The kWh purchased with the pulse system are printed on the purchase receipt and then transferred to electronic files.
Calculation method (if applicable):	-
QA/QC procedures:	Operating Procedure 03 and 36
Purpose of data:	Project emission calculation
Additional comment:	Current and previous calibrations are listed in Annex 7

Table 21

Data / Parameter:	**$Q_{y,comp}$**
Unit:	t
Description:	Amount of compost sold in period y
Measured/ Calculated / Default:	The weight of compost produced is not measured. However, the amount of compost sold is measured and recorded as sales of bulk and sales of 5 and 20 kg bags as well as 1 liter bottles
Source of data:	Plant records
Value(s) of monitored parameter:	1,264.2 t based on calculation in Annex 6
Monitoring equipment:	Analogue scales sentisimal, Serial No. B 040704, B 070494, 110967, B 910007, and B 1102217. Calibrated yearly by UPT Meterologi, Bali
Measuring/ Reading/ Recording frequency:	Quantity of compost sold is measured and recorded continuously in the sales statistic
Calculation method (if applicable):	-
QA/QC procedures:	Operating Procedure 19, 30 and 36
Purpose of data:	Project emission calculation
Additional comment:	Current and previous calibrations are listed in Annex 7

Table 22

Data / Parameter:	**$S_{y,comp}$**

Unit:	
Description:	Share of compost bought and transported by customers in period y
Measured/ Calculated / Default:	The share of compost picked up by customers at the facility is calculated with data taken from the sales statistic
Source of data:	Plant records
Value(s) of monitored parameter:	0.1057 based on calculation in Annex 6
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Each monitoring period
Calculation method (if applicable):	-
QA/QC procedures:	Operating Procedure 30 and 36
Purpose of data:	Project emission calculation
Additional comment:	None

Table 23

Data / Parameter:	**$CT_{y,comp}$**
Unit:	t
Description:	Average capacity of vehicles used by customers
Measured/ Calculated / Default:	The average weight of compost picked up by customers at the facility is calculated with data taken from the sales statistic
Source of data:	Plant records
Value(s) of monitored parameter:	0.773 t based on calculation in Annex 6
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	Monitoring by expert estimations at the end of the crediting period
Calculation method (if applicable):	-
QA/QC procedures:	Operating Procedure 36
Purpose of data:	Project emission calculation
Additional comment:	None

Table 24

Data / Parameter:	**DAF_{comp}**
Unit:	Km / vehicle

Description:	Average return distance for compost transportation
Measured/ Calculated / Default:	The distance driven by customers to pick-up compost at the facility is estimated using sales data and expert judgement.
Source of data:	Expert estimation
Value(s) of monitored parameter:	62 km / vehicle which corresponds to the distance from the facility to Denpasar, a conservative assumption
Monitoring equipment:	-
Measuring/ Reading/ Recording frequency:	-
Calculation method (if applicable):	-
QA/QC procedures:	Operating Procedure 36
Purpose of data:	Project emission calculation
Additional comment:	None

D.3. Implementation of sampling plan

D.3.1. Description of implemented sampling design

A detailed written sampling procedure is applied to ensure a consistent approach over the crediting period (see Operating Procedure 36 as well as PDD Section B.7.2. and Annex 4). The size and frequency of sampling required in the sampling plan provides statistically significant data with a maximum uncertainty range of 20% (= sampling error of +/- 10%) and a 95% confidence level.

D.3.2. Collected data

A summary of the collected data is provided in Annex 2 of the MR. The detailed results of the sampling procedure are shown in the separate spreadsheet “Details of Waste type percentage”.

D.3.3. Analysis of collected data

The percentage of waste types has been relatively stable since the beginning of the crediting period. Nevertheless, these small yearly changes are listed in the spreadsheet for each year (see ER spreadsheets 2008 to 2013). A sensitivity study on the impact of changes in the percentage of waste types revealed that an unrealistic large 10% change in each waste type has virtually no impact on the resulting CO_2e (see “Sensitivity analysis for variations in waste type percentage 130127”).

D.3.4. Complying with the required confidence/precision level

As the waste types have proven to be relatively stable since the beginning of the crediting period, the sample size has been reduced in 2013 to the 100 kg proposed in the PDD, Annex 4. This decision has been taken after a sensitivity analysis was performed (see D.3.3.). The statistical significance of the new 100 kg sample size was investigated and has been proven to assure the statistical significance of the 95% confidence level and 10% sampling error (precision) required in PDD Section, Annex 4 (see “Details of the waste type sampling plan 140112”).

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

E.1.1. Introduction

As described in section B.6.1. of the PDD, the baseline emissions are calculated based on the FOD-Model. The detailed calculations are available to the DOE from the UNFCCC project website: http://cdm.unfccc.int/Projects/DB/SGS-UKL1214472977.27/view as Annex 1 - ER spreadsheet, or directly from: http://cdm.unfccc.int/UserManagement/FileStorage/7OXD4P48Q7CKOWOQAU9CK89E4H4T5V

This ER spreadsheet allows scenario calculations by changing the input of the various parameters to

represent the actual project activity during the monitoring period, like tons processed and waste types. No GHG removals by sinks apply for this PA.

E.1.2. Actual amount of organic waste processed per monitoring period

Of the two methods possible according to the PDD, the project has chosen to determine the actual weight of compostable organic waste directly after the waste separation on calibrated weighing scales according to Operating Procedure (OP) 10 Weight Control.

The ER spreadsheet is fixed on processing yearly 14,875 tons of organic waste into compost (Cell D3). Any yearly deviation from this amount is adjusted in the spreadsheet by inserting the percentage of actual tons processed in percent of the 14,875 tons into row 30 "Deposition trend" of the respective year. All other years remain zero. Calculating each year individually is necessary because the ER spreadsheet cannot handle different yearly waste type percentages. See Annex 4 for more details.

Table 25: Actual amount and Deposition Trend of organic waste

Actual amount and percentage of organic waste	**tons / %**
Actual amount of organic waste in tons (Annex 1)	8,358.592
Deposition trend in % of PDD plan (14,875 tons/year=100%)	**56.192%**

E.1.3. Percentage of waste types per monitoring period (W_j)

The methodology distinguishes between five types of waste. Table 26 below shows the sampled amounts of organic waste type for each monitoring year in percent of total organic waste as measured according to OP 36 CDM Monitoring Process, which complies with the details provided in Annex 4 of the PDD.

Table 26: Percentage of organic waste types

Waste types (j_y)	PDD	2013
A. Wood, wood products	3.00%	5.667%
B. Pulp, paper and cardboard	0.50%	4.014%
C. Food, food waste, beverages and tobacco	3.00%	8.042%
D. Textiles	0.50%	0.611%
E. Garden, yard and park waste	93.00%	81.667%
Total organic waste	100.00%	100.000%

Source: Annex 2, Percentage of waste types

The percentages of the different waste types are filled into column D, rows 20 to 24 of the ER spreadsheet. Column D row 25 is always 0 as glass is separated before the waste type determination.

E.1.4. Other parameters

All default parameters are used as indicated in section D.1.

E.1.5. Total baseline emission for the monitoring period

The total baseline emission for the monitoring period is calculated by inserting the data from Table 25 and 26 into the ER spreadsheet baseline for the monitored year (see attachments). A sample spreadsheet was submitted with the PDD and an excerpt of the spreadsheet for the monitored year is in Annex 3. The values obtained in row 46 of the ER spreadsheet are then entered in Table B of Annex 4.

Table 27: Total gross baseline emissions

Total gross baseline emissions	**t CO_2e**
Total monitoring period (Source: Annex 4, Table C)	**5,800.374**

E.1.6. Calculation of adjustment factor (r) for prior activities

No provision is made in the template of this form to account for prior project activities. It was decided to insert this calculation below and then adjust the baseline calculation accordingly.

The baseline emissions must be reduced by a factor r for organic waste volumes already processed in the baseline case, i.e. the volume processed prior to the project activity in the pilot plant. The pilot plant

processed 700 tons of waste with an organic content of 85 % which results in 595 tons of organic waste per year. The value of 595 tons is taken from Table 11 which is based on the PDD.

The adjustment factor (r) is calculated by dividing the amount of organic waste that would have been processed in the pilot plant during the length of the monitoring period by the actual amount organic waste composted during the monitoring period.

Table 28: Calculation of average adjustment factor r

Organic waste processed in tons	**Tons**
Project activity (Table 25)	8,358.592
Prior activity in tons (Table 11)	595.000
Adjustment factor r	**0.07118**

Formula: Adjustments factor r = Prior activity (pilot plant) / Project activity
Source Project activity: Annex 1 / Source Prior activity: Table 11

Table 29: Total net baseline emissions

Total net baseline emissions	**t CO_2e**
Gross base line reduction	5,800.374
minus Adjustment for prior activity (Table 28)	412.895
Total monitoring period	**5,387.478**

Formula: Adjustment for prior activity = Adjustment factor r * Gross emission reduction

E.2. Calculation of project emissions or actual net GHG removals by sinks

In this Monitoring Report the project emissions are accumulated as follow:

- Electrical power emissions by facility — E.2.1.: Tables 30 and 31
- Diesel emissions by facility from equipment like shredders, excavator, etc. — E.2.2.: Tables 32 and 33
- Diesel emissions by facility trucks — E.2.2.: Tables 32 and 33
- Diesel emissions by customers transports — E.2.3.: Tables 34 and 35

To calculate the project emissions during the monitoring period, first the energy consumption of each energy type is listed separately in the respective tables. The same applies for the quantity of compost sold used to calculate customer transport emission.

E.2.1. Calculation of emissions from power consumption (PE_{power})
The power consumption is determined monthly according to OP 36 CDM Monitoring Process.

Table 30: Total of power consumption

Total power consumption	**kWh**
kWh (Annex 5)	**26,813.0**

Table 31: Total power emission

Parameter	**Total power emission**	**Unit**	**Value**
EL	Power consumption	kWh	26,813.0
	in MWh:	MWh	26.8130
EF_{grid}	Emission factor of Java–Madura–Bali grid (Table 9)	t CO_2/MWh	0.728
PE_{power}	**Emission from power consumption**	**t CO_2e**	**19.520**

Formula: PE_{power} = EL * EF (source of formula: PDD equation 6)

E.2.2. Calculation of emission from facility equipment and truck diesel consumption (PE_{diesel})
The facility equipment and truck diesel consumption is determined monthly according to OP 36 CDM Monitoring Process. The truck diesel consumption includes diesel for transports that are not related to the project activity. However, as this diesel consumption is difficult to separate and to be conservative, it is included the truck diesel consumption. The facility equipment and truck fuel consumptions are summarized in Annex 5 then entered into Table 32, where they are added up.

Table 32: Total facility diesel consumption

Facility diesel consumption	**Liter**
Liter of facility equipment diesel (Annex 5)	13,707.2
Liter of facility truck diesel (Annex 5)	2,050.0
Total facility fuel consumption	**15,757.3**

Table 33. Total facility diesel emissions

Parameter	**Total facility diesel emissions**	**Unit**	**Value**
$F_{diesel, liter}$	Facility diesel consumption	liter	15,757.3
D_{diesel}	Density of diesel (ICPP, Table 8)	kg/l	0.83
$F_{diesel, tons}$	Facility diesel consumption	tons	13.079
NCV_{diesel}	Net caloric value of diesel fuel (IPCC, Table 8)	GJ/t	43.33
EF_{diesel}	CO_2 emissions factor for diesel (IPCC, Table 8)	t CO_2/TJ	74.07
PE_{diesel}	**Emission from facility diesel consumption**	**t CO_2e**	**41.975**

Formula: $F_{diesel, tons} = F_{diesel, liter} * D_{diesel} / 1000$
Formula: $PE_{diesel} = F_{diesel, tons} * NCV / 1000 * EF$
Sources: PE: equation 7 and Table 6 in PDD / IPCC values: PDD

E.2.3. Calculation of emissions from customer transport ($PE_{transport}$)

Transport emissions for waste delivery to the facility are not included, because the project site is on the former landfill site that already received all waste before the project activity begun.

However, the transport of finished compost consumes diesel fuel and adds to project emissions. The diesel used by facility trucks to deliver compost is already included in the total facility truck diesel consumption in Table 32. On the other hand, additional transport emissions are generated by customers picking up compost at the facility. They are calculated in the following Tables 34 and 35, based on data from Annex 6 and expert judgment

Table 34: Total compost sold

Total compost sold	**Tons**
Q y, comp (Annex 6)	**1,264.2**

Table 35: Total transport diesel emissions by customers

Parameter	**Description**	**Unit**	**Value**
Q_{comp}	Total compost sold during monitoring period	t	1,264.2
S_{comp}	Fraction of compost picked up by customers		0.1057
CT_{comp}	Average truck capacity for customer transport	t	0.773
DAF_{comp}	Average distance for compost transport	km/truck	62
$EF_{transport}$	CO_2 emission factor for diesel	kg/km	0.2664
$PE_{transport}$	**Emission from customer compost transport**	**t CO_2e**	**2.857**

Formula: PE = Q * S / CT * DAF * EF / 1000 (source of formula: PDD equation 5)
Source of Q comp, S comp and CT comp: Annex 6
Source DAF comp: Expert estimate from Table 24 / Source of EF transport: Table 10

E.2.4. Total project emissions for the 3rd monitoring period

Table 36: Calculation of total project emissions

Total emissions from total power (Table 31)	19.520
Total emissions from facility equipment & truck diesel (Table 33)	41.975
Total emissions from transport diesel (Table 35)	2.857
Total project emissions	**64.352**

E.3.1. Calculation of leakage

No leakage needs to be considered, since no composting technology equipment is transferred from or to another activity (L_V=0)

Total leakage: 0 t CO_2e

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Item	Baseline emissions ~~or~~ baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO_2e)
Total	**5,387**	**65**	**0**	**5,322**

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO_2e)	**8,809**	**5,322**

E.6. Remarks on difference from estimated value in registered PDD

The actual emission reductions achieved during this monitoring period are smaller than the PDD estimate. The reason is that it is difficult to recruit a sufficient number of waste separators on the island of Bali, which offers more attractive occupations. Little waste was processed during Ramadan (the vast majority of waste separators are Muslim migrant workers from Java). After Ramadan many waste separators did not return and could only slowly be replaced. Thus we could not process the planned amount of waste and consequently receive too little organic material to process into compost.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO_2e)	**13,124**	**5,322**

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Document information

Version	*Date*	*Description*
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

Decision Class: Regulatory
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Annexes to Monitoring Report

1 Organic waste processed 2013 (detailed workable Excel spreadsheet is available to the DOE), Version 1
2 Percentage of waste types 2013, Version 1
3. Excerpt of ER baseline spreadsheet 2013 (complete workable Excel spreadsheet is available for to DOE), Version 1
4. Calculation of baseline emission 2008 to 2013 (workable Excel spreadsheet is available to the DOE), Version 1
5. Summary of total of project energy consumption 2013, Version 1
6. Summary calculation of transport emissions 2013 (workable Excel spreadsheet is available to the DOE), Version 1
7. Calibration of weighing scales and kW-meters 2013, Version 1
8. Index of the Operating Procedures of the Quality System
9. Yearly Summary of BE, PE and ER 2013, Version 1

Above annexes are an integral part of the Monitoring Report. The Supporting Documents below contain details that are made available to the DOE for the verification.

Supporting documents for the DOE (not exhaustive)

Details of BE and PE calculation 2013 (linked tables), Version 1
Details of ER baseline spreadsheet 2008
Details of ER baseline spreadsheet 2009
Details of ER baseline spreadsheet 2010
Details of ER baseline spreadsheet 2011
Details of ER baseline spreadsheet 2012
Details of ER baseline spreadsheet 2013, Version 1
Details of total baseline calculation 2008 to 2013, Version 1
Details of sales – transport emission 2013, Version 1
Details of total energy consumption 2013, Version 1
Details of total organic waste, Version 1
Details of yearly summary of BE PE and ER 2013, Version 1
Details of waste type percentage 2013, Version 1
Sampling plan for waste types 140112
Sensitivity analysis for waste type percentages 130127

Annex 1: Organic Waste Processed 2013, Version 1

(Copied from file “Details of total organic waste 2013”)

In kilograms

Date	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	196,822.0	12,135.0	15,846.0	10,755.0	26,363.0	14,445.0	11,604.0	13,842.0	3,035.0	18,370.0	25,393.0	17,456.0	27,578.0
2	229,688.0	21,102.0	20,635.0	25,271.0	20,163.0	21,835.0	26,017.0	16,712.0	5,414.0	14,801.0	24,621.0	1,657.0	31,460.0
3	258,043.0	27,620.0	18,206.0	17,762.0	28,948.0	25,174.0	20,186.0	12,709.0	3,111.0	16,320.0	23,995.0	30,962.0	33,050.0
4	270,453.0	19,810.0	19,722.0	19,592.0	35,127.0	26,567.0	26,949.0	17,197.0	1,676.0	16,483.0	24,781.0	34,917.0	27,632.0
5	253,714.0	23,949.0	17,774.0	21,501.0	29,049.0	23,972.0	22,219.0	17,332.0	3,255.0	18,857.0	25,851.0	29,362.0	20,593.0
6	236,656.0	21,687.0	16,835.0	23,972.0	0.0	25,068.0	19,925.0	16,091.0	3,600.0	18,966.0	25,364.0	31,453.0	33,695.0
7	283,618.0	20,742.0	16,143.0	26,931.0	42,639.0	25,077.0	18,774.0	20,158.0	4,800.0	21,534.0	27,612.0	25,888.0	33,320.0
8	269,318.0	24,586.0	19,203.0	28,703.0	29,362.0	29,398.0	18,150.0	16,719.0	1,982.0	22,456.0	25,428.0	23,591.0	29,740.0
9	288,753.0	26,516.0	20,795.0	19,437.0	37,258.0	30,343.0	21,764.0	20,084.0	5,675.0	20,407.0	25,315.0	28,823.0	32,336.0
10	286,235.0	24,383.0	20,732.0	26,225.0	39,879.0	25,766.0	19,252.0	15,127.0	2,619.0	20,831.0	27,345.0	29,131.0	34,945.0
11	278,004.0	23,062.0	18,308.0	25,046.0	34,057.0	29,662.0	20,994.0	21,670.0	1,894.0	16,471.0	24,688.0	30,298.0	31,854.0
12	252,672.0	21,008.0	17,355.0	0.0	35,750.0	25,595.0	20,765.0	18,524.0	2,609.0	24,050.0	25,639.0	25,334.0	36,043.0
13	252,683.0	22,341.0	17,968.0	2,812.0	36,253.0	19,591.0	19,601.0	26,622.0	2,673.0	19,534.0	25,945.0	25,978.0	33,365.0
14	266,831.0	21,267.0	16,069.0	21,220.0	30,367.0	26,820.0	20,407.0	20,038.0	2,251.0	22,402.0	23,932.0	29,811.0	32,247.0
15	239,779.0	15,503.0	16,501.0	25,124.0	27,936.0	25,065.0	21,947.0	19,578.0	2,418.0	22,793.0	1,627.0	25,617.0	35,670.0
16	277,722.0	23,961.0	14,510.0	21,948.0	17,907.0	32,300.0	22,291.0	22,072.0	4,589.0	19,719.0	29,685.0	29,520.0	39,220.0
17	287,327.0	28,380.0	14,494.0	22,241.0	37,697.0	20,582.0	20,320.0	19,404.0	2,724.0	27,786.0	27,524.0	28,848.0	37,327.0
18	278,469.0	28,990.0	15,445.0	29,053.0	30,999.0	18,206.0	22,377.0	19,888.0	1,845.0	22,121.0	21,907.0	28,722.0	38,916.0
19	307,436.0	27,524.0	20,258.0	27,776.0	36,190.0	32,143.0	19,791.0	18,540.0	3,037.0	23,335.0	28,374.0	31,656.0	38,812.0
20	278,407.0	15,457.0	20,828.0	24,733.0	27,606.0	28,304.0	26,385.0	16,797.0	3,168.0	24,512.0	23,389.0	34,168.0	33,060.0
21	308,102.0	27,284.0	24,055.0	28,609.0	31,549.0	28,364.0	23,345.0	16,989.0	2,463.0	28,843.0	30,975.0	30,682.0	34,944.0
22	314,722.0	27,797.0	26,509.0	27,533.0	32,573.0	29,992.0	21,850.0	16,389.0	3,284.0	29,877.0	33,814.0	28,997.0	36,107.0
23	289,833.0	24,575.0	25,565.0	25,283.0	34,030.0	24,804.0	25,634.0	20,860.0	4,676.0	30,919.0	1,393.0	33,533.0	38,561.0
24	292,313.0	13,728.0	22,311.0	23,637.0	28,746.0	32,439.0	13,781.0	18,353.0	1,517.0	26,853.0	39,592.0	31,699.0	39,657.0
25	318,618.0	24,226.0	22,320.0	27,039.0	31,396.0	31,666.0	25,853.0	20,525.0	1,715.0	21,419.0	32,724.0	37,051.0	42,684.0
26	295,092.0	0.0	28,267.0	23,588.0	33,664.0	32,897.0	23,045.0	17,684.0	1,623.0	29,472.0	33,158.0	34,255.0	37,439.0
27	281,004.0	33,790.0	25,408.0	0.0	31,065.0	25,158.0	22,772.0	15,207.0	1,577.0	29,680.0	29,374.0	35,085.0	31,888.0
28	303,894.0	25,880.0	21,530.0	33,384.0	30,996.0	30,393.0	21,208.0	11,904.0	1,888.0	26,609.0	32,873.0	36,986.0	30,243.0
29	271,261.0	24,787.0	0.0	27,056.0	24,434.0	34,348.0	21,114.0	8,970.0	2,279.0	26,929.0	33,249.0	35,147.0	32,948.0
30	252,147.0	25,038.0	0.0	28,246.0	26,126.0	21,736.0	16,025.0	7,285.0	10,727.0	21,505.0	30,176.0	35,304.0	29,979.0
31	138,976.0	21,479.0	0.0	31,588.0	0.0	29,353.0	0.0	1,539.0	9,235.0	0.0	32,158.0	0.0	13,624.0
TOTAL	8,358,592	698,607	553,592	696,065	908,129	827,063	634,345	524,809	103,359	683,854	817,901	881,931	1,028,937

Total = 8358592 kg

or 8,358.592 tons

Annex 2: Percentage of waste types, Version 1

Organic waste for composting:

Sampling Year	Sampling Month	Sample Size	Unit	A. Wood, wood products	B. Pulp, paper cardboard	C. Food, food waste, tobaco, beverages	D. Textiles	E. Garden, yard park waste	Total organic waste

1. Percentage of waste types of prior years

2009	4x / yr	800	kg	5.051%	5.756%	7.416%	0.000%	81.777%	100.000%
2010	4x / yr	800	kg	4.613%	4.238%	8.225%	0.125%	82.800%	100.000%
2011	4x / yr	800	kg	4.675%	3.988%	9.119%	0.313%	81.906%	100.000%
2012	4x / yr	800	kg	4.400%	3.500%	12.100%	0.213%	79.788%	100.000%

2. Percentage of waste types 2013

2013	January	600	kg	26.5	16.5	38.0	3.5	515.5	600.0
2013	April	600	kg	49.5	33.0	38.0	2.5	477.0	600.0
2013	July	300	kg	16.0	9.8	28.8	3.0	242.5	300.0
2013	October	300	kg	10.0	13.0	40.0	2.0	235.0	300.0
			kg	102.0	72.3	144.8	11.0	1,470.0	1,800.0
Total	**2013**		**%**	**5.667%**	**4.014%**	**8.042%**	**0.611%**	**81.667%**	**100.000%**

Annex 3: Excerpt of ER worksheet for 2013, Version 1

(Copied from file “Details of ER baseline spreadsheet 2013”)

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Parameter**	**Variable**	**Unit**	**Value**									
2	Project commissioning year		y	2008									
3	Waste deposition per year		t / y	14,875									
4	Waste deposition days per year		d	350									
5	Deposition trend			0%									
6	Midpoint year			1									
7	Landfill closure (in years)			30									
8	Waste conditions			wet									
9	Regional climatic conditions			tropical									
10	Regional precipitation conditions			wet									
11	Model correction parameter for uncertainties	Phi		0.9									
12	Fraction of methane captured in the baseline	f		0.0									
13	Global warming Potential CH4	GWPCH4		21									
14	Oxidation factor	OX		0.0									
15	Fraction of methane in LFG	F		0.5									
16	Fraction of degradable organic carbon	DOCf		0.5		Determination of DOCj and kj depending on input parameters. Do not edit this table!							
17	Mass ratio CH4:C	16/12		1.33		Degradable organic carbon DOCj (fraction)		Decay rate kj				Applied Parameters	
18	Methane correction factor	MCF		0.8				boreal / temperate climate		tropical climate			
19	Waste stream					wet waste	dry waste	dry	wet	dry	wet	DOCj	kj
20	Wood and wood products	A	%	5.667%		0.43	0.50	0.020	0.030	0.025	0.035	0.43	0.035
21	Pulp, paper and cardboard	B	%	4.014%		0.40	0.44	0.040	0.060	0.045	0.070	0.40	0.070
22	Food, food waste, beverages and tobacco	C	%	8.042%		0.15	0.38	0.060	0.185	0.085	0.400	0.15	0.400
23	Textiles	D	%	0.611%		0.24	0.30	0.040	0.060	0.045	0.070	0.24	0.070
24	Garden, yard and park waste	E	%	81.667%		0.20	0.49	0.050	0.100	0.065	0.170	0.20	0.170
25	Glass, plastic, metal other inert	F	%	0.000%		0.00	0.00	0.000	0.000	0.000	0.000	0.00	0.000
26	Total		%	100.000%									
27													
28	**Calculations**												
29			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
30	Deposition trend:		0%	0%	0%	0%	0%	56.192%	0%	0%	0%	0%	0%
31	**Year**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
32	**Waste deposition**												
33	Wood and wood products	t / year	0.00	0.00	0.00	0.00	0.00	473.65	0.00	0.00	0.00	0.00	0.00
34	Pulp, paper and cardboard	t / year	0.00	0.00	0.00	0.00	0.00	335.50	0.00	0.00	0.00	0.00	0.00
35	Food, food waste, beverages and tobacco	t / year	0.00	0.00	0.00	0.00	0.00	672.17	0.00	0.00	0.00	0.00	0.00
36	Textiles	t / year	0.00	0.00	0.00	0.00	0.00	51.08	0.00	0.00	0.00	0.00	0.00
37	Garden, yard and park waste	t / year	0.00	0.00	0.00	0.00	0.00	6,826.18	0.00	0.00	0.00	0.00	0.00
38	Waste deposition total	t / year	0.00	0.00	0.00	0.00	0.00	8,358.59	0.00	0.00	0.00	0.00	0.00
39	Waste deposition (cumulative)	t	0.00	0.00	0.00	0.00	0.00	8,358.59	8,358.59	8,358.59	8,358.59	8,358.59	8,358.59
40	**Methane emissions**												
41	Wood and wood products	t CO2e/yr	0	0	0	0	0	35	34	33	32	31	30
42	Pulp, paper and cardboard	t CO2e/yr	0	0	0	0	0	46	43	40	37	35	32
43	Food, food waste, beverages and tobacco	t CO2e/yr	0	0	0	0	0	168	112	75	50	34	23
44	Textiles	t CO2e/yr	0	0	0	0	0	4	4	4	3	3	3
45	Garden, yard and park waste	t CO2e/yr	0	0	0	0	0	1,076	908	766	646	545	460
46	Methane emissions total	t CO2e/yr	0	0	0	0	0	1,328	1,100	917	769	647	547

Annex 4: Calculation of total baseline emission 2008 to 2013, Version 1

Values copied from workable "Details of ER baseline spreadsheet 2008" to "Details of ER baseline spreadsheet 2013"

Table A: Inputs for the ER worksheets (white cells row 20 to 25 and 30)

Year	Processed (Annex 1)	Percent of 14,875	Percent Waste Type (Annex 2) A	B	C	D	E	A to E
2008	1,490.000	10.017%	5.051	5.756	7.416	0.000	81.777	100.000
2009	7,187.000	48.316%	5.051	5.756	7.416	0.000	81.777	100.000
2010	10,312.308	69.326%	4.613	4.237	8.225	0.125	82.800	100.000
2011	13,861.651	93.188%	4.675	3.987	9.119	0.313	81.906	100.000
2012	9,917.502	66.672%	4.400	3.500	12.100	0.213	79.788	100.001
2013	8,358.592	56.192%	5.667	4.014	8.042	0.611	81.667	100.000
2014		0.000%						0.000
2015		0.000%						0.000
2016		0.000%						0.000
2017		0.000%						0.000
2018		0.000%						0.000

Table B: Results from the ER worksheets in tons of CO_2e (white cells row 46)

2008 CO_2e	2009 CO_2e	2010 CO_2e	2011 CO_2e	2012 CO_2e	2013 CO_2e	2014 CO_2e	2015 CO_2e	2016 CO_2e	2017 CO_2e	2018 CO_2e
236.859	196.777	164.441	138.127	116.552	98.746	83.967	71.643	61.323	52.651	45.341
	1,142.465	949.133	793.165	666.244	562.177	476.289	405.007	345.563	295.787	253.958
		1,653.026	1,367.656	1,138.469	952.727	800.997	676.197	572.944	487.086	415.388
			2,231.371	1,840.807	1,528.630	1,276.689	1,071.625	903.476	764.716	649.582
				1,627.627	1,329.643	1,094.907	907.919	757.462	635.313	535.370
					1,328.451	1,100.460	917.239	768.657	647.207	547.252

Note to Table A: The highlighted values above must be inserted for each year separately (other years = 0) into the ER worksheet that is downloadable from the project's CDM website: http://cdm.unfccc.int/UserManagement/FileStorage/7OXD4P48I (See sheet FOD Model Input & Output)
Inserting these values into the ER worksheets does results in the grey and yellow highlighted values in above tables

Table C: Summary of Table B in tons of CO_2e

Total CO_2e from the processing year	236.859	1,142.465	1,653.026	2,231.371	1,627.627	1,328.451	0.000	0.000	0.000	0.000	0.000
Total CO_2e from the years following processing		196.777	1,113.574	2,298.949	3,762.072	4,471.923	4,833.309	4,049.631	3,409.425	2,882.761	2,446.892
Total CO_2e per year	**236.859**	**1,339.242**	**2,766.600**	**4,530.320**	**5,389.699**	**5,800.374**	**4,833.309**	**4,049.631**	**3,409.425**	**2,882.761**	**2,446.892**

= Values from ER worksheets for each processing year.

The ER spreadsheet (excerpt for 2013 in Annex 3 and workable spreadsheets 2008 to 2013 available to the DOE) is fixed on processing yearly 14,875 tons of organic waste into compost (Cell D3). Any yearly deviation from this amount is adjusted in the spreadsheet by inserting the percentage of actual tons processed in percent of 14,875 tons into row 30 "Deposition trend" of the respective year. All other years must remain zero, because the ER spreadsheet cannot handle different yearly waste type percentages. This requires an ER baseline spreadsheet for each year. The yearly CO_2e values in row 48 from actual year onwards to the right are then copied into the spreadsheet of above Table B. The CO_2e for the crediting and successive years are then calculated in Table C.

Because each year requires its individual ER spreadsheets, no values are shown for other year. As a consequence, " #Div/0! " appear in the workable spreadsheets in cells from row 49 on downwards.

Annex 5: Summary of total project energy consumption 2013, Version 1

(Copied from file "Details of total energy consumption 2013")

Total Year 2013	**Electric Consumption** in kWh	**Transport Diesel Consumption** in liters	**On-site Diesel Consumption** in liters
January	2,228.60	177.60	1,200.00
February	2,805.00	155.40	1,301.10
March	2,293.50	177.60	1,320.00
April	3,293.80	299.70	1,440.00
May	2,195.60	244.20	1,780.00
June	2,196.00	248.58	1,192.40
July	3,148.60	201.98	719.80
August	522.10	127.22	195.30
September	2,099.20	108.68	520.60
October	2,010.20	109.08	1,300.40
November	2,010.20	109.08	1,302.00
December	2,010.20	90.91	1,435.64
Total	**26,813.00**	**2,050.03**	**13,707.24**

Total diesel **15,757.27**

There was no gasoline in 2013

Annex 6: Summary of calculation of transport emissions 2013, Version 1

(Copied from file "Details of sales –transport emission 2013")

1. Compost Delivery by Facility

Compost sold and delivered by facility	kg	232,080.0
	tons	232.080
Deliveries by facility	transports	74

2. Compost Pickup by Customers

Compost sold and pickedup by customer	kg	133,645.0
	tons	133.645
Pick ups by customer	pick ups	173

3. Compost sold to BioTek

	kg	898,450.0
	tons	898.450
Used on site (see note below)	transactions	24

4. Data used in Tables 32 and 33

Total compost sold = Q_{comp}	in kg	1,264,175.0
	in tons	1,264.2
(for use in Table 21 and 34)		
Share of compost picked up = S_{comp}	**ratio**	**0.1057**
(for use in Table 22 and 35)		(= 133.645 : 1,264.175)
Average weight in tons per pickup = CT_{comp}	**tons**	**0.773**
(for use in Table 23 and 35)		(= 133.645 : 173)

Note: BioTek is a company that is located on the same premises as the project activity. They process our compost with other material to fertilizer pellets. Our compost makes up about 30% in their formula. As they are located on-site, no compost transport ensues.

Annex 7: Calibration of weighing scales and kW-meters, Version 1

Weighing scales, calibrated according to Operating Procedure OP 22
Calibration frequency: annually for weighing scales, 10 years for kW-Meter
If no recalibration date is mentioned, calibration must be made yearly.
All weighing scales were calibrated by the UPT Metrologi, Bali

Equipment	Brand and model	Specification	Serial No.	Calibration dates
Digital balance	AND AD 4406	1000 kg / 0.2 kg	P3507372	27-Mar-08 10-Jun-08 17-Feb-09 17-Feb-10 10-Feb-11 9-Feb-12 9-Feb-13
Analog balance	Pertis sentisimal	300 kg / 0.1 kg	B 040704	21-Jul-09 17-Feb-10 10-Feb-11 9-Feb-12 9-Feb-13
Analog balance	Pertis sentisimal	300 kg / 0.1 kg	B 070494	21-Jul-09 17-Feb-10 10-Feb-11 9-Feb-12 9-Feb-13
Analog balance	Pertis sentisimal	300 kg / 0.1 kg	B 1102217	24-Sep-12 9-Feb-13
Analog balance	KM sentisimal	300 kg / 0.1 kg	B 910007	9-Feb-12 9-Feb-13
Analog balance	Radjin sentisimal	300 kg / 0.1 kg	110967	9-Feb-12 9-Feb-13
Digital balance	KRIS EK3550	5000 g / 1 g	none available	20-Mar-12 20-Mar-13
Digital balance	Ohaus Scout	200 g / 10 mg	7129350044	3-Sep-10 9-Feb-12 9-Feb-13
kW-Meter	Metbelosa OQ93L	3 Phase 40 kW	4523019	2008
Used till 5. Apr 2012		Recalibration 2018 (no day/month available from UPT Metrologi)		
kW-Meter	Atlas MK 10	3 Phase 23 kW	211379861	23-Jul-12
Used from 5 Apr 2012 till 14 Dec 2012				Recalibration July 23, 2022
kW-Meter	Hexing SGC:901129	3 Phase 33 kW	14070367744	14-Dec-12
Used after 14 Dec 2012		Recalibration November 2017 (no day available from UPT Metrologi)		

The project activity uses only one kW-Meter, which was twice replaced in 2012

Annex 8: Index of the Operating Procedures of the Quality System

Section	Topic
Quality System Related Operating Procedures	
OP 01	Index
OP 02	empty
OP 03	Document Control
OP 04	Procedure Writing
OP 05	Management Review
OP 06	Internal Quality Audits
OP 07	Quality Record Storage
OP 08	Computer Security
Production Related Operating Procedures	
OP 09	Waste Separation
OP 10	Weight Control
OP 11	Raw Compost Production
OP 12	Finished Compost Production
OP 13	Speciality Compost Production
OP 14	Sieving of Compost
OP 15	Product Identification
OP 16	Compost Storage
OP 17	Compost Production Monitoring
OP 18	Compost Quality Control
OP 19	Packaging and Delivery
OP 20	empty
OP 21	Maintenance
OP 22	Calibrated Equipment
OP 23	Staff Training
OP 24	Staff Safety
OP 25	Staff Health
OP 26	Environmental Control
OP 27	Non-Conformities
OP 28	Quality Alerts
OP 29	empty
Sales Related Operating Procedures	
OP 30	Sales Control
OP 31	Customer Support
OP 32	Customer Complaints
OP 33	Administration and Accounting
OP 34	empty
CDM Related Operating Procedures	
OP 35	CDM Monitoring Management
OP 36	CDM Monitoring Process
OP 37	CDM Data Recording and Storage
OP 38	CDM Quality Control Procedures
OP 39	CDM Report Compilation and Verification

Annex 9: Yearly summary of BE, PE and ER 2013, Version 1

(Copied from file "Details of BE, PE calculation 2013")

	Source	Total CO_2e 2013	
1. Details on emission reductions			
ER from processing year	Annex 4	1,328.451	
ER resulting from previous years	Annex 4	4,471.923	
Adjustment for prior activities	Table 28/29	412.895	
Total	Table 29	**5,387.478**	
2. Details on project emissions			
Facility power (PE power)	Table 30/31	19.520	
Facility diesel (PE diesel, gasoline)	Table 32/33	41.975	
Transport diesel (PE transport)	Table 34/35	2.857	
Total PE Project	Table 34	**64.352**	
3. Total leakage			
Leakage (L)	E.3.	0	
4. Overall emission reduction			In MR:
Total baseline emission	Table 29	5,387.478	5387
Total Project emission	Table 36	64.352	65
Correction for leakage	E.3.	0	
Overall emission reduction	**Table 37**	**5,323.126**	**5322**

Calculation basis for project emissions per year:		
Facility power (kWh)	Table 30	26,813.0
Facility equipment and truck diesel (liter)	Table 32	15,757.3
Compost sold (tons)	Table 34	1,264.2
Organics processed (tons)	Table 25	8,358.592