Monitoring report form for CDM project activity
(Version 06.0)

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

MONITORING REPORT		
Title of the project activity	Gianyar Waste Recovery Project	
UNFCCC reference number of the project activity	1885	
Version number of the PDD applicable to this monitoring report	04	
Version number of this monitoring report	01	
Completion date of this monitoring report	11/01/2018	
Monitoring period number	08	
Duration of this monitoring period	01/01/2017 to 31/12/2017, first and last day included	
Monitoring report number for this monitoring report	01 of 01	
Project participants	Yayasan Pemilahan Sampah Temesi and myclimate – The Climate Protection Partnership	
Host Party	Indonesia	
Sectoral scopes	13, Waste handling and disposal	
Applied methodologies and standardized baselines	AMS-III.F. ver. 5 - Avoidance of methane production from decay of biomass through composting	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	0	9,488 t CO_2e Anthropogenic removals: NA
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	GHG emission reductions: 11,349 t CO_2e Anthropogenic removals: NA	

SECTION A. Description of project activity

A.1. General description of project activity

a) The technology used and the measures applied in this project activity are to avoid the generation 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 may be shredded prior to being composted. The windrows are 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. Depending on demand, the sieved raw compost is sold exclusively for soil top-dressing applications or further cured to finished compost. To assure an aerobic process, the windrows are aerated with blowers to guarantee an oxygen level of at least a 6 % throughout the process. Generally however, the project activity will maintain oxygen levels around 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 waste per day 2nd phase of 2400 m^2: January 2010 for processing up to 50 tons of waste
Operating Periods:	Uninterrupted since May 2008

d) Total net emission GHG reductions achieved in this monitoring period: **9,488 tons CO_2e**.

A.2. Location of project activity

a) Host Party Indonesia
b) Region of Gianyar / Province of Bali
c) Town of Temesi

Project activity location in Temesi, Gianyar: (new by GPS, in PDD from map)
Longitude: E 115º 20' 59" Latitude: S 8º 33' 58"

A.3. Parties and project participant(s)

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Party A (host Party)	Private entity A: Yayasan Pemilahan Sampah Temesi Public entity A: NA	No
Party B	Private entity B: myclimate, The Climate Protection Partnership Public entity B: NA	No
…NA	…NA	NA

The full contact information of project participants and responsible persons/entities are listed in Appendix 1

A.4. Reference of applied methodologies and standardized baselines

(a) Applied methodology:

III.F. Avoidance of methane production from decay of biomass through composting (Version 05):
https://cdm.unfccc.int/filestorage/C/D/M/CDMWF_AM_6NOS8D6BN7GD231AN3DVLG1EPPYXUK/AMS_III.F_rev_ver05.pdf?t=aGF8bmhhYnphfDBAdep_G5UPBkmbrkugprlq
The baseline methodology used is described in detail in Appendix B of the simplified modalities and procedures for small-scale project activities: "Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities".

Note: the estimation of the baseline emissions for this methodology refers to the III.G. Landfill Methane Recovery using the First Order Decay model (FOD).

(b) Additional methodologies and methodological tools used:

1. AMS-III.G.: Landfill methane recovery (all Versions):
https://cdm.unfccc.int/methodologies/DB/QPVDNPHDG8302KQ5EPGD3OC57KVA3Q

2. I.D. Grid connected renewable electricity generation (Version 13):
https://cdm.unfccc.int/filestorage/C/D/M/CDMWF_AM_PHPV5WESACMBTJ2YY54GAJYSIEI3HD/AMS_I.D_rev_ver13.pdf?t=Ymt8bmhhZDVwfDC0n334iIYaOn4zyI-JW1mV
For the purpose of estimating the project emissions from electricity, the grid emission factor of the project grid has been determined per AMS I.D. in its latest version.

3. Tool to determine methane emissions avoided from dumping waste at solid waste disposal site (Version 02):
https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-04-v2.pdf

4. Tool for the demonstration and assessment of additionality (Version 3):
https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v3.pdf
The additionality has been determined following the "Tool for demonstration and assessment of additionality", version 03, considering simplifications for small-scale projects as appropriate.

(c) Applied standardized baseline(s):

Not applicable to this project activity.

A.5. Crediting period type and duration

Fixed crediting period starting 04/11/2008 for a duration of 10 years.

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 project activity objectives were defined to:
1) become a CDM project,
2) establish a replicable model facility,
3) design 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 NGO, 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 waste per day. Construction 1st semester 2008 / commissioning May 2008.

2nd Phase: A 2400 m^2 extension to 4740 m^2 for a final capacity of up to 50 tons waste 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 Hindu or Muslim holidays and/or varying availability of waste separating personnel. While the large project activity started in May 2008, the CDM registration was received only on 04/11/2008.

Our composting technology is very low tech and known since millions of years. Only low tech equipment is used to:

- shred the raw material when indicated,
- turn the composting tables or windrows with front loaders or excavators,
- aerate the processing material with centrifugal blowers to assure aerobic conditions
- sieve to obtain the final compost.

In more detail, incoming waste is manually separated with hand tools. When deemed necessary, coarse material is shredded prior to composting to accelerate decomposition. Shredding brings little or no advantage when there is a substantial amount of slow decomposing material like palm leaves in the organic waste. During the decomposition process, air is forced into the composting material with help of centrifugal blowers to assure aerobic conditions. Also the composting material is turned in about two week intervals to loosen the material. Turning in an inside-out fashion also achieves equal decomposition conditions for all material and a hygienization by heat, which destroys pests and pathogens. After the decomposition has reached the raw compost phase, the composting material is sieved to separate the resulting compost from residue. The organic residue is returned to incoming organic waste or treated separately for continued decomposition, while the raw compost is further aerated and thus processed to finished compost. Inert residue is discharged.

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodologies or applied standard baselines

No temporary deviations from the registered monitoring plan or the applied methodology have been applied during this monitoring period. No standardized baseline is used.

B.2.2. Corrections

No corrections from project information or parameters fixed at validation have been approved during this monitoring period or are submitted with this monitoring report.

B.2.3. 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 are submitted with this monitoring report.

B.2.4. Inclusion of monitoring plan

No inclusion of a monitoring plan into the registered PDD has taken place since registration.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

No permanent changes from the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools have been approved by the Board as applicable from the period prior to this monitoring period for this monitoring period.

No changes that are being submitted with this monitoring report as part of the request for issuance as applicable from this monitoring period.

However, in 2013, a new PDD Version 4 of June 12, 2013 with changes to the project design of the registered project activity was approved on September 27, 2013 with PRC ref No. PRC-1885-001 (PRC id: prcp195686498).

The changes in this PDD Version 4 concern:

1. Section B.7.1.; "Data and parameters monitored": Here only the monitoring equipment was improved by replacing a large weighbridge by more accurate smaller weighing scales (balances). This greatly improves the monitoring precision.
2. Section B.7.2.: "Description of the monitoring plan" and Annex 4: "Monitoring information"). Here the "Technical Details" in Table 9 of Annex 5 were adapted to actual use (like the facility space or equipment used). The monitoring process is not affected by these changes.

For more details about the change in the 2013 PDD change, please refer to paragraph B.2.6. below.

B.2.6. Changes to project design

There was one change to the project design of the 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 were approved on September 27, 2013 with PRC ref No. PRC-1885-001 (PRC id: prcp195686498). The changes concern:

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

No changes that have been approved by the Board as applicable from this monitoring period and no changes are being submitted with this monitoring report as part of request for issuance as applicable from this monitoring period

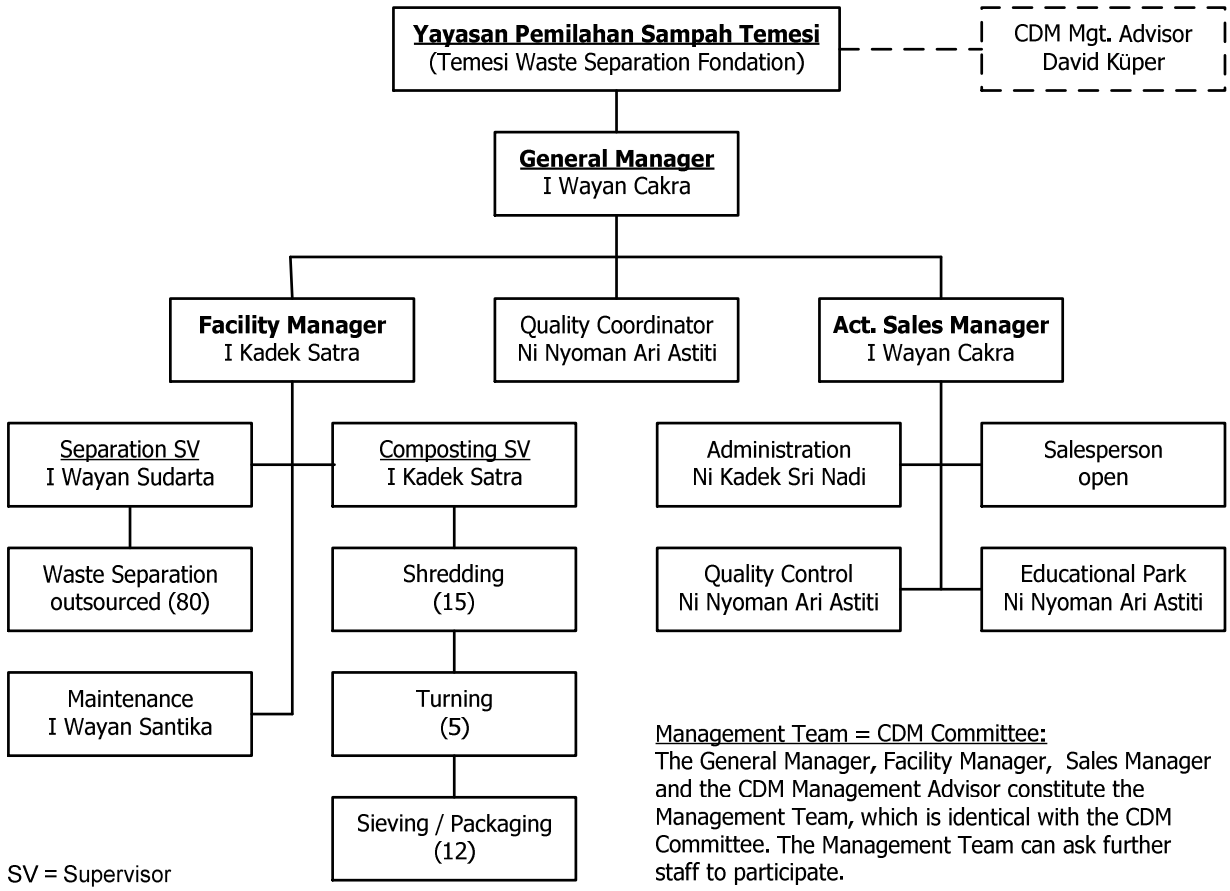
SECTION C. Description of monitoring system

C.1. Introduction and Organizational Chart

The facility management has introduced a Quality System that was designed similar to 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 desired quality level 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, 2017:



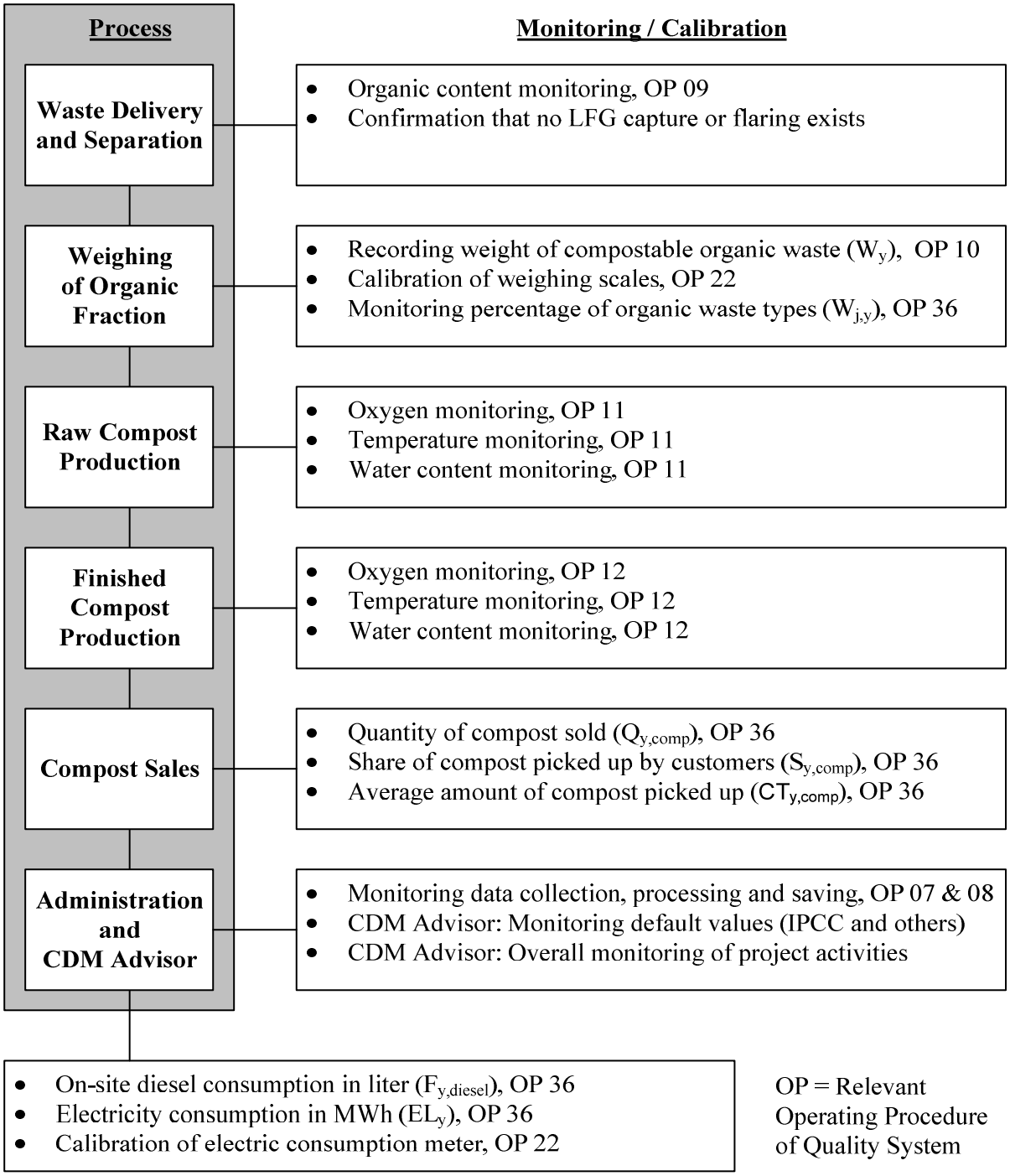
C.2. Monitoring management

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 they are not obligatorily updated. The Indonesian language versions are the binding versions and they are 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.

This project activity monitors the control of aerobic decomposition of organic waste. They 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, the oxygen meter needs to be recalibrated with ambient air, which has an oxygen concentration of 20.95%. Thus, yearly calibrations are not necessary.

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, which are made available to the DOE.

C.4. Data recording and archiving

Data recording is done 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 and the compost that is sold or used 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

Table 1

Data/Parameter	**φ**
Unit	none
Description	Model corrections factor to account for model uncertainties
Source of data	See below

Value(s) applied)	0.9
Choice of data or measurement methods and procedures	Default value selected as proposed by methodology.
Purpose of data/parameter	Baseline emission calculation
Additional comments	Oonk et el. (1994) have validated several landfill gas models based on 17 realized landfill gas projects. The mean relative error of multi-phase models was assessed to be 18%. Given the uncertainties associated with the model and in order to estimate emission reductions in a conservative manner, a discount of 10% is applied to the model results.

Table 2

Data/Parameter	**OX**
Unit:	none
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
Choice of data or measurement methods and procedures	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.
Purpose of data	Baseline emission calculation
Additional comments	none

Table 3

Data/Parameter	**F**
Unit:	none
Description	Fraction of methane in the SWDS gas (volume fraction)
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied)	0.5
Choice of data or measurement methods and procedures	IPCC default value as proposed by the methodology is applied.
Purpose of data	Baseline emission calculation
Additional comments	none

Table 4

Data/Parameter	**DOC_f**
Unit:	none
Description	Fraction of degradable organic carbon (DOC) that can decompose
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied)	0.5
Choice of data or measurement methods and procedures	IPCC default value as proposed by the methodology is applied.
Purpose of data	Baseline emission calculation
Additional comments	none

Table 5

Data/Parameter	**MCF**
Unit:	none
Description	Methane correction factor
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied)	0.8
Choice of data or measurement methods and procedures	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.
Purpose of data	Baseline emission calculation
Additional comments	none

Table 6

Data/Parameter	**DOC_j**
Unit:	none
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
Choice of data or measurement methods and procedures	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 activity: **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.
Purpose of data	Baseline emission calculation
Additional comments	none

Table 7

Data/Parameter	**k_i**
Unit:	none
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

Value(s) applied)	K_i values for tropical / wet conditions have been applied → see below
Choice of data or measurement methods and procedures	The methodology is based on the IPCC 2006 Guidelines and gives the following default values for tropical conditions:

Waste type j		**Tropical (MAT* > 20°C)**	
		Dry (MAP < 1000 mm)**	**Wet (MAP** > 1000 mm)**
Slowly degrading	Pulp. Paper, cardboard, textiles	0.045	**0.07**
	Wood, wood products, straw	0.025	**0.035**
Moderately degrading	Garden and park waste	0.065	**0.17**
Rapidly degrading	Food, food waste, beverages, tobacco	0.085	**0.4**
*MAT: mean annual temperature **MAP: mean annual precipitation			

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. Temperature and precipitation values and references for Bali are presented in Annex 3 of the PDD.

Purpose of data	Baseline emission calculation
Additional comments	none

Table 8

Data/Parameter	**EF_{diesel}**
Unit:	kg CO_2 / l
Description	Diesel CO_2 emission factor
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied)	2.664
Choice of data or measurement methods and procedures	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

43.33 GJ/t x 0.83 kg/l x 74.07 t/TJ = 2.664

Purpose of data	Project emission calculation
Additional comments	Determined ex-ante and fix over crediting period.

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
Choice of data or measurement methods and procedures	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.
Purpose of data	Project emission calculation
Additional comments	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
Choice of data or measurement methods and procedures	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).
Purpose of data	Project emission calculation
Additional comments	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)
Choice of data or measurement methods and procedures	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.).
Purpose of data	Baseline emission calculation
Additional comments	Determined ex-ante and fix over crediting period.

D.2. Data and parameters monitored

Table 12

Data/Parameter	**f**
Unit	none
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	none
Measuring/reading/recording frequency	Monitoring frequency: yearly. There are no values to be measure, read or recorded, except the written confirmation from the landfill operator mentioned above.
Calculation method (if applicable)	none
QA/QC procedures	Operating Procedure 03
Purpose of data/parameter	Baseline emission calculation
Additional comments	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 was applied for the first commitment period and a value of 25 is applied for the second commitment period commencing January 1, 2013. According to EB 69 Report Annex 3 the new value can be adopted without formalities.
Monitoring equipment	none
Measuring/reading/recording frequency	There are no values to be measured read or recorded
Calculation method (if applicable)	NA
QA/QC procedures	NA
Purpose of data/parameter	Baseline emission calculation
Additional comments	The GWP was 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 weighing 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	9,795 (Source Annex 1)
Monitoring equipment	Analogue scales sentisimal, serial no. B 040704, B 070494, 110967, B 1401755, B 1102217 and digital scale AND AD 4406 serial no. P3507372, all of accuracy class III. The calibrations were performed on February 16, 2017 by UPT Meterologi, Bali. The calibrations are due yearly with the next calibration being scheduled before February 16 2018
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)	none
QA/QC procedures	Operating Procedure 03 and 10
Purpose of data/parameter	Baseline emission calculation
Additional comments	This parameter is measured directly. It is not calculated. Current and previous calibrations are listed in Annex 7

Table 15

Data/Parameter	$p_{n,j,y}$
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	2017: A=8.983% / B=2.383% / C=10.692% / D=0.067% / E=77.875% (Source Annex 2)
Monitoring equipment	Analogue scales sentisimal, serial no. B 040704, B 070494, 110967, B 1401755, B 1102217 and digital scales AND AD 4406 serial no. P3507372, Ohaus Scout, Serial No. 7129350044 and KRIS EK3550, all of accuracy class III, The calibrations were performed on February 16, 2017 by UPT Meterologi, Bali. The calibrations are due yearly with the next calibration being scheduled before February 16 2018
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/parameter	Baseline emission calculation
Additional comments	Current and previous calibration are listed in Annex 7

Table 16

Data/Parameter	$\mathbf{W_{total,y}}$
Unit	t
Description	Total waste delivered to the composting facility in period y
Measured/calculated/default	NA
Source of data	NA
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	NA
Measuring/reading/recording frequency	NA
Calculation method (if applicable)	NA
QA/QC procedures	NA
Purpose of data/parameter	NA
Additional comments	This is one of two options allowed in the PDD

Table 17

Data/Parameter	$\mathbf{W_{recycled,y}}$
Unit	t
Description	Waste fraction processed for recycling in period y
Measured/calculated/default	NA
Source of data	NA
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	NA
Measuring/reading/recording frequency	NA
Calculation method (if applicable)	NA
QA/QC procedures	NA
Purpose of data/parameter	NA
Additional comments	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	NA
Source of data	NA
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	NA
Measuring/reading/recording frequency	NA
Calculation method (if applicable)	NA
QA/QC procedures	NA
Purpose of data/parameter	NA
Additional comments	This is one of two options allowed in the PDD

Table 19

Data/Parameter	$F_{y,diesel}$
Unit	Liter (l)
Description	Total consumption of diesel composting of facility in period y
Measured/calculated/default	The volume of diesel fuel is calculated
Source of data	Plant records
Value(s) of monitored parameter	15,554.96 (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., These manual documents are then then recorded in electronic files
Calculation method (if applicable)	none
QA/QC procedures	Operating Procedure 36
Purpose of data/parameter	Project emission calculation
Additional comments	none

Table 20

Data/Parameter	EL_y
Unit	MWh
Description	Total electrical power consumption of composting facility in period y
Measured/calculated/default	The electrical power consumption is measured
Source of data	Plant records and government reading
Value(s) of monitored parameter	10,251 (Source Table 28)

Monitoring equipment	Electrical power consumption is directly measured with a kWh meter with serial number 14070367744 and an accuracy class rating of Cl.1. The last calibration was performed on December 14, 2012 by the governmental UPT Meterologi, Bali. The UPT Meterologi Bali states that calibrations are due every 5 years. The last calibration was performed in November 29, 2017, now by the governmental energy company PLN, Gianyar Bali. The next calibration is due in October 2022 (see Annex 7 for details).
Measuring/reading/recording frequency	Direct meter readings are obtained and confirmed in writing by the governmental electric company PLN on December 31 of each year. Their readings are in kWh and according to Indonesian convention, the decimal point is marked by a comma. In Table 28 a point is used for these readings.
Calculation method (if applicable)	The reading of the prior year is deducted from the reading of the current year to arrive at the power consumption for the current year.
QA/QC procedures	Operating Procedure 03 and 36
Purpose of data/parameter	Project emission calculation
Additional comments	Current and previous calibrations of the kWh meter 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. It is an unstable value because weight loss occurs due to water evaporation while the compost is stored. However, the amount of compost sold is measured and recorded. The use of compost sold is in agreement with the PDD, which on page 29 defines $Q_{y\ comp}$ also as "Quantity of compost produced / sold in year y". Therefore the more suitable "Amount of compost sold" is used, which is accurately measured at point of sale and thus renders far more accurate calculation of $PE_{y,transport}$
Source of data	Plant records
Value(s) of monitored parameter	1,119 (Source Annex 6)
Monitoring equipment	Analogue scales sentisimal, serial no. B 040704, B 070494, 110967, B 1401755, B 1102217 and digital scale AND AD 4406 serial no. P3507372, all of accuracy class III. The calibrations were performed on February 16, 2017 by UPT Meterologi, Bali. The calibrations are due yearly with the next calibration being scheduled before February 16 2018
Measuring/reading/recording frequency	Quantity of compost sold is measured and recorded continuously in the sales statistic
Calculation method (if applicable)	none
QA/QC procedures	Operating Procedure 19, 30 and 36
Purpose of data/parameter	Project emission calculation
Additional comments	Current and previous calibrations are listed in Annex 7

Table 22

Data/Parameter	**$S_{y,comp}$**
Unit	none
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	0.3969 (Source Annex 6)

Monitoring equipment	none
Measuring/reading/recording frequency	Each monitoring period
Calculation method (if applicable)	none
QA/QC procedures	Operating Procedure 30 and 36
Purpose of data/parameter	Project emission calculation
Additional comments	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	2.848 (Source Annex 6)
Monitoring equipment	none
Measuring/reading/recording frequency	Monitoring by expert estimations at the end of the crediting year
Calculation method (if applicable)	none
QA/QC procedures	Operating Procedure 36
Purpose of data/parameter	Project emission calculation
Additional comments	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 back and forth distance from the facility to the west of Denpasar. This is a conservative assumption as the majority of customers are located between the two locations.
Monitoring equipment	none
Measuring/reading/recording frequency	NA
Calculation method (if applicable)	none
QA/QC procedures	Operating Procedure 36
Purpose of data/parameter	Project emission calculation
Additional comments	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% (= precision or sampling error of +/- 10%) and a 95% confidence level. The required confidence level has been reduced to 90 % since the PDD was registered.

D.3.2. Collected data

A summary of the collected sampling data is provided in Annex 2 of the MR. The detailed calculations of the sampling procedure are shown in the separate spreadsheet "Details of waste type percentage".

D.3.3. Analysis of the collected data

D.3.3.1 Demonstration on whether the required confidence/precision has been met

The percentage of waste types has been relatively stable since the beginning of the crediting period. Nevertheless, these small yearly changes are recorded in the spreadsheets for each year (see actual and historic data in Annex 2).

Based on the sampling results listed in Annex 2, the following calculation determines the precision accomplished with the project's sampling plan. For this calculation the following standard formula is used:

Precision equals: 1.962 * sqrt(p * (1 - p) / n) (sqrt = square root)

Whereas 1.962 represents the z value for a 95% confidence level; n our daily sample size of 100 and p the response distribution. For p the value closest to 50% must be chosen. The p values for waste type E (garden, yard and park waste) are closest to 50%. For the precision calculation a conservative value of 0.7 (for 70%) was chosen, a value closer to 50% than any other ever observed percentage value for any waste type (see also argumentation for 0.7 in D.3.3.2. The value 100 for n reflects the daily sample size of 100 kg.

Thus the formula becomes: Precision equals: 1.962 * sqrt(0.7 * (1 - 0.7) / 100) = 0.0899

A precision of 8.99% is achieved at the required confidence level of 95%, a value better than the 10% required by the PPD. Even if the worst case response distribution of 50% is chosen in a scenario calculation a precision of 9.81% results, a value still below the required 10%.

D.3.3.2 Demonstration on whether a sufficient sample size is applied

The determination of the sample size follows the definition of the sampling plan given in the PDD Annex 4, which determines the applicable sample size for each of the three quarterly sampling days.

In the following paragraphs the process of determining the sample size is described. Because the waste type percentages have proven to be relatively stable since the beginning of the crediting period, the daily 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. The statistical significance of the new 100 kg sample size was investigated with the result that it provides the 95% confidence level and 10% precision as required by PDD in Annex 4 (see: Sampling plan for waste types 141231).

To achieve the maximum precision of 10% at a 95% confidence level as required by the PDD, in each quarter on each of the three sampling dates, a 100 kg sample is drawn from two different trucks to determine the percentage of the different waste types ($P_{n,j,y}$). Please note that the 95% confidence level is obsolete for small scale projects for which now only 90% is required, resulting in even smaller required sample sizes. However, the project continues to use a conservatory 95% confidence level.

The following PDD formula was used to arrive at the minimum sample size in kg:

$$\frac{z^2 * p * q * N}{(z^2 * p * q) + ((N - 1) * y^2)}$$

z = value for a confidence level. This z value is always 1.962 for a 95% confidence level.
y = value for precision (= 1/2 of uncertainty range of 20%). This value is always 0.1 for a 10% precision.
p = response distribution (expected sample percentage). The value closest to 50% must be chosen to be conservative. In all years of operation the lowest level has never been below 70% or over 30% for any waste type. Therefor a value of 0.7 (for 70%) is chosen for the sample size calculation.
q = 1 – p. This value is 0.3 (30%).
N = population (PDD value = 32,000). The value stays for 32,000 kg weight processed daily. In reality N is higher, but above 32,000, the sample size hardly changes.

The above parameters were selected in accordance with Annex 4 of "Standard for sampling and surveys for CDM project activities and programmes of activities (Version 05.0) paragraph 10 / footnote 9. Above values inserted into the formula denote:

$$\frac{1.962 * 1.962 * 0.7 * 0.3 * 32000}{(1.962* 1.962 * 0.7 * 0.3) + ((32000 - 1) * 0.1 * 0.1)}$$

The calculation results in a sample size of 80.5 kg each sampling day to satisfy the requirement for a 10% precision at a 95% confidence level. In reality, the project collects a 100 kg sample every sampling day, a weight considerably above the required amount. This process follows PDD Annex 4.

SECTION E. Calculation of emission reductions or net anthropogenic removals

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

E.1.1. Introduction

As described in section B.6.1. of the PDD, the baseline emissions (BE) are calculated based on the First Order Decay (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 - BE spreadsheet, or directly from: http://cdm.unfccc.int/UserManagement/FileStorage/7OXD4P48Q7CKOWOQAU9CK89E4H4T5V

This BE 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 project activity.

E.1.2. Actual amount of organic waste processed

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 BE spreadsheet is based on processing yearly 14,875 tons of organic waste into compost Cell E4. 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 31) "Deposition trend" of the respective year. All other years remain zero. Calculating each year individually is necessary because the BE spreadsheet of the PDD cannot handle different yearly waste type percentages. See Annex 4 for more details.

Table 25: Actual amount and depositiojn trend of organic waste

Description	Unit	Value
PDD planned amount for trend calculation	tons	14,875.00
Actual amount of organic waste in tons (Annex 1)	tons	9,795.41
Deposition trend in % of PDD plan	**Percent**	**65.851%**

E.1.3. Percentage of waste types (W_j)

The methodology distinguishes between five types of waste that are eligible for emission reductions. 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.

The percentages of the different waste types are filled into column E, rows 21 to 25 of the BE spreadsheet. Column E row 26 is always 0 as glass is separated before the waste type determination.

Table 26: Percentage of organic waste types

Description waste types (j)	PDD	this year
A. Wood, wood products	3.00%	8.983%
B. Pulp, paper and cardboard	0.50%	2.383%
C. Food, food waste, beverages and tobacco	3.00%	10.692%
D. Textiles	0.50%	0.067%
E. Garden, yard and park waste	93.00%	77.875%
Total organic waste	**100.00%**	**100.000%**

Source: Annex 2, Percentage of waste types

E.1.4. Other parameters

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

E.1.5. Total baseline emission

The total baseline emission for the monitoring period is calculated by inserting the data from Table 25 and 26 into the baseline reduction spreadsheet for the monitored year (see supporting documents submitted to the DOE). The same is done with the relevant values of all past years. 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 47 of the BE spreadsheet are then entered in Table B of Annex 4.

Table 27: Total gross baseline emission

Description	Unit	Value
Total gross baseline emission (Source: Annex 4, Table B)	**t CO_2e**	**10,153.683**

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

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

- Electrical power emissions by facility — E.2.1.: Tables 28 and 29
- Diesel emissions by facility from equipment like shredders, excavator, etc. — E.2.2.: Tables 30 and 31
- Diesel emissions by facility trucks — E.2.2.: Tables 30 and 31
- Diesel emissions by customers transports — E.2.3.: Tables 32

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

E.2.1. Calculation of emissions from electricity consumption (PE_{power})

The power consumption is determined according to OP 36 CDM Monitoring Process.

The electricity consumption for this monitoring period is the difference of the meter readings of December 31st 2017 und the reading of December 31st 2016. The readings are taken and confirmed in writing by the governmental electric company PLN.

Table 28: Total of electricity consumption

Parameter	Description	Unit	Value
	Reading 31/12/2017 (according to PLN document)	kWh	102,357.19
	Reading 31/12/2016 (according to PLN document)	kWh	92,106.62
	Total electricity consumption	kWh	10,250.57
EL	**Total electricity consumption**	**MWh**	**10.251**

Source: December 31 reading obtained and confirmed by the governmental electricity company PLN
Note: The readings are in kWh and according to Indonesian convention, the decimal point is marked by a comma. In this table, following the CDM convention, the comma is replaceds by a point.

Table 29: Total electricy emission

Parameter	Description	Unit	Value
EL	Electricity consumption (Table 28)	MWh	10.251
EF_{grid}	Emission factor of Java–Madura–Bali grid (Table 9)	t CO_2/MWh	0.728
PE_{power}	**Emission from electrical power consumption**	**t CO_2e**	**7.462**

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

E.2.2. Calculation of emission from on-site diesel consumption of facility equipment and trucks (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 30 below, where they are added up.

Table 30: Facility on-site diesel consumption

Description	Unit	Value
Liter of facility equipment diesel (Annex 5)	liter	13,857.1
Liter of facility truck diesel (Annex 5)	liter	1,697.9
Total facility diesel consumption	**liter**	**15,555.0**

Table 31: Total facility on-site diesel emissions

Parameter	Description	Unit	Value
$F_{diesel, liter}$	Facility diesel consumption (Table 30)	liter	15,555.0
D_{diesel}	Density of diesel (ICPP, Table 8)	kg/l	0.83
$F_{diesel, tons}$	Facility diesel consumption	tons	12.911
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**	**41.436**

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 compost transport ($PE_{transport}$)

The raw data to calculate the emissions from customer transports (pick up) are determined according to OP 36 CDM Monitoring Process. 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.

The transport of finished compost to customers 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 30.

However, additional transport emissions are generated by customers picking up compost at the facility. They are calculated in the following Tables 32, based on precise data from Annex 6 and expert judgment for the average distance for transport.

The PDD on page 29 defines Q_{comp} as quantity compost produced / sold. The project activity uses compost sold and the known fraction of compost picked up by customers, which are both available from the sales statistic. This renders a precise result contrary to using compost produced which would require more expert estimations.

Table 32: Total compost transport diesel emissions by customers

Parameter	Description	Unit	Value
Q_{comp}	Total compost sold during monitoring period (Annex 6)	tons	1,119.2
S_{comp}	Fraction of compost picked up by customers (Annex 6)		0.3969
CT_{comp}	Average truck capacity for customer transport (Annex 6)	tons	2.848
DAF_{comp}	Average distance for compost transport (Table 24)	km/truck	62
$EF_{transport}$	CO_2 emission factor for diesel (Table 10)	kg CO_2/km	0.2664
$PE_{transport}$	**Emission from customer compost transport**	**t CO_2e**	**2.577**

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 of EF transport: Table 10
Source DAF comp: Expert estimate from Table 24

E.2.4. Total project emissions (PE_{tot})

Table 33: Total project emissions

Description	Units	Value
Total emissions from total electrical power consumption(Table 29)	t CO_2e	7.462
Total emissions from facility diesel consumption (Table 31)	t CO_2e	41.436
Total emissions from customer compost transport (Table 32)	t CO_2e	2.577
Total project emissions	**t CO_2e**	**51.475**

E.3. Calculation of leakage emissions

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

Total leakage: 0 t CO_2e

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

E.4.1. Emission reduction due to the project activity

Table 34: Emission reduction minus project emissions before adjustment

Description	Units	Value
Total gross baseline emission (Table 27)	t CO_2e	10,153.683
minus Total project emissions (Table 33)	t CO_2e	51.475
minus Total leakage (E.3.)	t CO_2e	0.000
Emissions reduction due to project activity	**t CO_2e**	**10,102.208**

Formula: Total gross baseline emission - Total project emission - Total leakage
Source of formula: PDD equation 8

E.4.2. Adjustment for volumes processed in the baseline case

No provision is made in the mandatory Monitoring Report Form 04.0 for the adjustment for volumes processed in the baseline case. The calculation of the adjustment is inserted only here as section E.4.2., because the adjustment requires the value of Table 34 “Emission reduction due to project activity”:

The emissions reduction after the deduction of the project emission and leakage must be adjusted by a factor (1 - 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. This adjustment is made according to equation 10 of the PDD which is ER = ER * (1 - r). The adjustment factor (r) is calculated by dividing the amount of organic waste that has been processed in the pilot plant during the length of the length of the monitoring period by the actual amount organic waste processed during the monitoring period.

Table 35: Calculation of adjustment factor r and (1 - r)

Parameter	Description	Units	Value
$WCOM_{BAU}$	Prior project activity in pilot plant (Table 11)	tons	595.000
$TWCOM_y$	Project activity (Table 25 and Annex 1)	tons	9,795.409
	Adjustment factor r		0.06074
	Adjustment (1 - r)		**0.93926**

Formula: Adjustments factor r = Prior activity ($WCOM_{BAU}$) / Project activity ($TWCOM_y$)
Source of formula: PDD equation 10

Table 36: Adjustment to gross baseline emission due to prior project activity in pilot plant

Description	Units	Value
Gross emissions reduction due to project activity (Table 34)	t CO_2e	10,102.208
Adjustment factor (1 - r) (Table 35)		0.93926
Net emissions reduction due to project activity (Formula 1)	t CO_2e	9,488.572
Adjustments to gross baseline emission (Formula 2)	**t CO_2e**	**613.636**

Formula 1: Adjustment factor (1 - r) * Gross emissions reduction due to project activity (Table 35)
Formula 2: Difference between gross and net
Source of formula: PDD equation 9

Table 36 above corresponds to PDD equation 9. However while rendering a correct emission reduction (ER) result, it cannot be used in the mandatory Monitoring Report Form Version 05.1, which makes no provision for the sequence of calculations proposed in the PDD. As a consequence, the required net baseline emission is calculated by the project in Table 37 and its value is inserted as baseline emission in summary table of Section E.4.

Table 37: Adjustment to baseline emission for the prior project activity in the pilot plant

Description	Unit	Value
Gross baseline emission (Table 27)	t CO_2e	10,153.683
Adjustment due to prior activity in pilot plant (Table 36)	t CO_2e	613.636
Net baseline emission for Summary Table of section E.4.	**t CO_2e**	**9,540.047**

Formula: Total gross baseline reduction - Emissions from priort activity

The Table 38 below summarizes the calculation of the net GHG reduction the project achieves. It also does the up and down rounding of values as specified for the Monitoring Report.

Table 38: Calculation of net emission reduction with required roundings

Description	Unit	Value
Gross baseline emission (Table 27)	t CO_2e	10,153.683
Adjustment due to prior activity in pilot plant (Table 36)	t CO_2e	613.636
Baseline emission (Table 37)	t CO2e	9,540.047
Rounded down value	**t CO2e**	**9,540**
Total project emissions (Table 33)	t CO2e	51.475
Rounded up value	**t CO2e**	**52**
Total leakage (E.3.)	**t CO2e**	**0**
GHG emission reduction	**t CO_2e**	**9,488**

Formula: Gross baseline emission - Adjustment due to prior activity = Baseline emission
Baseline emission (rounded down) - Total project emission (rounded up) = GHG emission reductions

The rounded bold values of above summary table are inserted in the Summary Table of Section E.4. below.

	Baseline GHG emissions or	Project GHG emissions or actual net	Leakage GHG emissions	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)

				Before 01/01/2013	From 01/01/2013	Total amount
Total	**9,540**	**52**			**9,488**	**9,488**

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

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante (t CO_2e)
9,488	**11,349**

E.6. Remarks on increase of achieved emission reductions

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 received too little organic material to process into compost.

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Document information

Version	*Date*	*Description*
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
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 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
Document Type: Form
Business Function: Issuance
Keywords: monitoring report

Appendix 1. Contact information of project participants and responsible persons/entities

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Annexes to Monitoring Report

1 Organic waste processed 2017 (detailed Excel workbook is made available to the DOE), version 1
2 Percentage of waste types 2017, Version 1 (detailed Excel workbook is made available to the DOE), version 1
3. Excerpt of baseline emission workbook 2017 (whole Excel workbook is made available for to DOE), version 1
4. Calculation of total baseline emission 2008 to 2017 (all Excel workbooks are made available to the DOE), version 1
5. Project on-site energy consumption 2017 (detailed Excel workbook is made available to the DOE), version 1
6. Compost transport emission 2017 (detailed Excel workbook is made available to the DOE), version 1
7. Calibration of weighing scales and kW-meter 2017, version 1 (all calibration certificates are made available to the DOE)
8. Index of the Operating Procedures of the Quality System, version 1
9 Summary of BE, PE and ER 2017, version 1
10 Details of linked BE, PE and ER calculations 2017, version 1

Above annexes are integral parts 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)

$GWPCH_4$ = 21:
Details of 2008 baseline emission for 2008 to 2012 for Annex 4
Details of 2009 baseline emission for 2009 to 2012 for Annex 4
Details of 2010 baseline emission for 2010 to 2012 for Annex 4
Details of 2011 baseline emission for 2011 to 2012 for Annex 4
Details of 2012 baseline emission for 2012 for Annex 4

$GWPCH_4$ = 25:
Details of 2008 baseline emission for 2013 to 2018 for Annex 4
Details of 2009 baseline emission for 2013 to 2018 for Annex 4
Details of 2010 baseline emission for 2013 to 2018 for Annex 4
Details of 2011 baseline emission for 2013 to 2018 for Annex 4
Details of 2012 baseline emission for 2013 to 2018 for Annex 4
Details of 2013 baseline emission for 2013 to 2018 for Annex 4
Details of 2014 baseline emission for 2013 to 2018 for Annex 4
Details of 2015 baseline emission for 2013 to 2018 for Annex 4
Details of 2016 baseline emission for 2013 to 2018 for Annex 4
Details of 2017 baseline emission for 2017 to 2018 for Annex 3 and 4, version 1

Details of BE and PE calculation 2017 (linked Excel tables 25 to 37), version 1
Details of total organic waste 2017 with summary for Annex 1, version 1
Details of waste type percentage 2017 with summary for Annex 2, version 1
Details of total baseline emission calculation 2008 to 2017 for Annex 4, version 1
Details of diesel consumption 2017 with summary for Annex 5, version 1
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Sampling plan for waste types, 141231
Sensitivity analysis for waste type percentages, 130127

Annex 1: Organic waste processed 2017, version 1

Copied from Excel workbook: Details of total organic waste 2017 with summary for Annex 1

In kilograms

Date	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	276,394.0	20,523.0	22,266.0	23,766.0	26,218.0	24,010.0	24,540.0	18,350.0	37,082.0	15,884.0	35,534.0	0.0	28,221.0
2	321,421.0	22,801.0	21,901.0	22,969.0	25,362.0	22,760.0	23,561.0	18,737.0	36,648.0	26,174.0	37,526.0	30,009.0	32,973.0
3	322,356.0	23,012.0	22,027.0	27,506.0	27,630.0	20,684.0	25,289.0	18,187.0	34,417.0	26,255.0	36,021.0	29,749.0	31,579.0
4	326,933.0	21,254.0	23,214.0	24,711.0	28,406.0	23,818.0	24,366.0	18,336.0	35,954.0	23,049.0	36,729.0	33,464.0	33,632.0
5	290,601.0	22,825.0	22,824.0	24,645.0	0.0	22,055.0	24,723.0	18,001.0	36,995.0	25,269.0	34,848.0	30,996.0	27,420.0
6	325,543.0	20,577.0	23,346.0	25,155.0	30,613.0	21,952.0	24,237.0	18,333.0	36,173.0	24,718.0	36,015.0	33,741.0	30,683.0
7	323,849.0	22,117.0	20,283.0	26,066.0	26,826.0	19,262.0	24,038.0	18,336.0	37,917.0	29,661.0	35,881.0	30,661.0	32,801.0
8	321,839.0	22,084.0	22,020.0	25,796.0	25,795.0	21,219.0	20,595.0	23,284.0	36,389.0	26,896.0	35,000.0	30,137.0	32,624.0
9	329,703.0	21,431.0	21,989.0	25,379.0	25,931.0	22,724.0	22,834.0	23,385.0	34,799.0	27,898.0	37,724.0	33,748.0	31,861.0
10	330,871.0	21,002.0	24,909.0	25,931.0	27,423.0	21,009.0	24,689.0	23,670.0	36,293.0	26,697.0	35,396.0	32,628.0	31,224.0
11	298,937.0	22,405.0	22,683.0	24,788.0	27,811.0	22,415.0	23,492.0	24,615.0	34,345.0	27,389.0	38,166.0	0.0	30,828.0
12	333,181.0	21,193.0	23,495.0	25,094.0	25,921.0	20,601.0	23,440.0	24,927.0	35,984.0	27,521.0	36,767.0	36,417.0	31,821.0
13	329,811.0	21,236.0	27,609.0	26,440.0	25,227.0	22,312.0	20,767.0	25,942.0	33,730.0	27,320.0	36,918.0	30,110.0	32,200.0
14	333,253.0	21,301.0	26,614.0	27,320.0	26,199.0	21,768.0	17,275.0	26,871.0	31,483.0	28,216.0	36,969.0	35,061.0	34,176.0
15	301,728.0	20,691.0	24,563.0	26,405.0	0.0	23,593.0	16,103.0	28,564.0	31,729.0	28,840.0	35,561.0	31,368.0	34,311.0
16	342,461.0	22,751.0	26,186.0	27,877.0	29,932.0	23,898.0	16,801.0	28,327.0	30,901.0	31,055.0	36,060.0	34,728.0	33,945.0
17	326,822.0	17,391.0	26,051.0	27,347.0	21,655.0	25,013.0	16,866.0	30,274.0	32,548.0	30,432.0	35,716.0	31,900.0	31,629.0
18	338,240.0	19,468.0	25,911.0	27,163.0	21,151.0	24,228.0	15,876.0	31,168.0	32,757.0	33,115.0	37,219.0	34,708.0	35,476.0
19	344,497.0	19,892.0	26,299.0	28,216.0	22,391.0	24,995.0	16,478.0	33,637.0	30,490.0	33,912.0	36,454.0	33,798.0	37,935.0
20	333,303.0	19,788.0	26,897.0	28,088.0	22,427.0	24,278.0	15,963.0	32,144.0	26,814.0	31,539.0	36,497.0	33,446.0	35,422.0
21	325,312.0	20,133.0	25,255.0	30,515.0	21,507.0	24,774.0	5,385.0	31,200.0	31,752.0	32,948.0	34,589.0	30,863.0	36,391.0
22	326,967.0	20,860.0	25,955.0	28,891.0	21,506.0	24,629.0	5,470.0	31,644.0	35,069.0	34,947.0	32,945.0	31,083.0	33,968.0
23	326,889.0	19,900.0	26,886.0	28,952.0	21,713.0	24,047.0	5,253.0	31,637.0	35,560.0	35,245.0	35,026.0	26,561.0	36,109.0
24	319,597.0	21,708.0	21,971.0	27,440.0	24,129.0	23,989.0	5,591.0	32,032.0	33,081.0	35,406.0	33,355.0	26,225.0	34,670.0
25	320,587.0	22,023.0	28,179.0	28,594.0	23,334.0	24,022.0	5,253.0	30,789.0	30,740.0	33,883.0	29,823.0	30,579.0	33,368.0
26	316,786.0	19,274.0	26,189.0	27,292.0	23,754.0	22,340.0	5,460.0	32,447.0	29,266.0	36,528.0	30,257.0	29,830.0	34,149.0
27	325,164.0	21,195.0	28,921.0	30,184.0	23,871.0	23,511.0	5,183.0	35,131.0	26,788.0	36,129.0	27,810.0	31,847.0	34,594.0
28	287,442.0	18,476.0	25,092.0	0.0	21,619.0	23,976.0	5,052.0	35,750.0	26,905.0	36,208.0	31,554.0	29,570.0	33,240.0
29	292,834.0	14,897.0	0.0	28,953.0	23,736.0	25,980.0	5,018.0	37,216.0	26,242.0	34,122.0	30,355.0	30,160.0	36,155.0
30	299,516.0	18,573.0	0.0	27,233.0	24,109.0	26,549.0	5,075.0	36,996.0	27,993.0	36,387.0	32,319.0	29,412.0	34,870.0
31	202,572.0	18,979.0	0.0	29,045.0	0.0	24,946.0	0.0	37,151.0	28,195.0	0.0	28,204.0	0.0	36,052.0
TOTAL	9,795,409	639,760	689,535	807,761	696,196	721,357	474,673	857,081	1,015,039	903,643	1,073,238	882,799	1,034,327

Annex 2: Percentage of waste types 2017, version 1

Copied from Excel workbook: Details of waste type percentage 2017 with summary for Annex 2, Version 1

Legend:

A. Wood and wood products
B. Pulp, paper and cardboard
C. Food, food waste, beverages and tobacco
D. Textiles
E. Garden, yard and park waste
F. Glas is not present in the project's organic waste

Truck 1 and 2 are randomly selected on each sampling day.

Three digitals after the points are statistically not significant, but are used to avoid confusion with rounding errors.

Quarterly sampling	Date of sampling	Sampling source		Waste type					
		Truck 1 kg	Truck 2 kg	A kg	B kg	C kg	D kg	E kg	Total kg
January 2017	9	50.0	50.0	18.00	0.20	19.60	0.10	62.10	100.0
	20	50.0	50.0	5.60	0.50	14.50	0.00	79.40	100.0
	31	50.0	50.0	8.20	1.40	10.60	0.00	79.80	100.0
Total kg		150.0	150.0	31.80	2.10	44.70	0.10	221.30	300.0
Total percent				10.600%	0.700%	14.900%	0.033%	73.767%	100.000%
April 2017	4	50.0	50.0	14.40	2.20	10.80	0.10	72.50	100.0
	12	50.0	50.0	12.00	1.60	15.10	0.10	71.20	100.0
	24	50.0	50.0	12.50	2.00	9.50	0.00	76.00	100.0
Total kg		150.0	150.0	38.9	5.8	35.4	0.2	219.7	300.0
Total percent				12.967%	1.933%	11.800%	0.067%	73.233%	100.000%
July 2017	11	50.0	50.0	6.00	4.60	10.50	0.00	78.90	100.00
	19	50.0	50.0	5.40	1.00	8.90	0.20	84.50	100.00
	24	50.0	50.0	9.20	1.90	6.40	0.00	82.50	100.00
Total kg		150.0	150.0	20.6	7.5	25.8	0.2	245.9	300.0
Total percent				6.867%	2.500%	8.600%	0.067%	81.967%	100.000%
October 2017	3	50.0	50.0	8.5	4.7	10.5	0.1	76.2	100.0
	11	50.0	50.0	2.6	4.5	6.4	0.0	86.5	100.0
	25	50.0	50.0	5.4	4.0	5.5	0.2	84.9	100.0
Total kg		150.0	150.0	16.5	13.2	22.4	0.3	247.6	300.0
Total percent				5.500%	4.400%	7.467%	0.100%	82.533%	100.000%

Total year 2017	Total kg	107.80	28.60	128.30	0.80	934.50	1200.0
	Total percent	**8.983%**	**2.383%**	**10.692%**	**0.067%**	**77.875%**	**100.000%**

Historic data

2009	5.051%	5.756%	7.416%	0.000%	81.777%	100.000%
2010	4.613%	4.238%	8.225%	0.125%	82.800%	100.000%
2011	4.675%	3.988%	9.119%	0.313%	81.906%	100.000%
2012	4.400%	3.500%	12.100%	0.213%	79.788%	100.000%
2013	5.667%	4.014%	8.042%	0.611%	81.667%	100.000%
2014	5.667%	4.014%	8.042%	0.611%	81.667%	100.000%
2015	8.025%	5.442%	10.475%	0.075%	75.983%	100.000%
2016	7.308%	7.175%	13.458%	0.075%	71.908%	100.000%
2017	8.983%	2.383%	10.692%	0.067%	77.875%	100.000%

Annex 3: Excerpt of baseline emission workbook 2017, version 1

Copied from workable Excel workbook: Details of 2017 baseline emission for 2017 to 2018 for Annex 3 and 4, Version 1

	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		25									
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	%	8.983%		0.43	0.50	0.020	0.030	0.025	0.035	0.43	0.035
21	Pulp, paper and cardboard	B	%	2.383%		0.40	0.44	0.040	0.060	0.045	0.070	0.40	0.070
22	Food, food waste, beverages and tobacco	C	%	10.692%		0.15	0.38	0.060	0.185	0.085	0.400	0.15	0.400
23	Textiles	D	%	0.067%		0.24	0.30	0.040	0.060	0.045	0.070	0.24	0.070
24	Garden, yard and park waste	E	%	77.875%		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%	0%	0%	0%	0%	65.851%	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	0.00	0.00	0.00	0.00	879.95	0.00
34	Pulp, paper and cardboard	t / year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	233.46	0.00
35	Food, food waste, beverages and tobacco	t / year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,047.29	0.00
36	Textiles	t / year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.53	0.00
37	Garden, yard and park waste	t / year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7,628.17	0.00
38	Waste deposition total	t / year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9,795.41	0.00
39	Waste deposition (cumulative)	t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9,795.41	9,795.41
40	**Methane emissions**												
41	Wood and wood products	t CO2e/yr	0	0	0	0	0	0	0	0	0	78	75
42	Pulp, paper and cardboard	t CO2e/yr	0	0	0	0	0	0	0	0	0	38	35
43	Food, food waste, beverages and tobacco	t CO2e/yr	0	0	0	0	0	0	0	0	0	311	208
44	Textiles	t CO2e/yr	0	0	0	0	0	0	0	0	0	1	1
45	Garden, yard and park waste	t CO2e/yr	0	0	0	0	0	0	0	0	0	1,431	1,207
46	Methane emissions total	t CO2e/yr	0	0	0	0	0	0	0	0	0	1,858	1,527

Annex 4: Calculation of total baseline emission 2008 to 2017, version 1

Values copied from workbooks: Details of baseline emissions for 2008 to 2018 (for with GWPCH4 21 and GWPCH4 25), for Annex 4

Table A: Inputs for the BE spreadsheets (white cells row 21 to 26 and 31)

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	11,787.523	79.244%	6.183	4.067	9.225	0.183	80.342	100.000
2015	13,055.889	87.771%	8.025	5.442	10.475	0.075	75.983	100.000
2016	11,921.949	80.148%	7.308	7.175	13.458	0.150	71.908	100.000
2017	9,795.409	65.851%	8.983	2.383	10.692	0.067	77.875	100.000
2018		0.000%						0.000

Table B: Results from the BE spreadsheets in tons of CO_2e (from yellow cells in row 47)

	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
2008	236.859	196.777	164.441	138.127	116.552	117.554	99.961	85.289	73.004	62.680	53.978
2009		1,142.465	949.133	793.165	666.244	669.258	567.011	482.152	411.385	352.127	302.330
2010			1,653.026	1,367.656	1,138.469	1,134.199	953.567	804.997	682.076	579.864	494.509
2011				2,231.371	1,840.807	1,819.798	1,519.868	1,275.744	1,075.567	910.376	773.312
2012					1,627.627	1,582.909	1,303.461	1,080.857	901.740	756.325	637.346
2013						1,581.489	1,310.071	1,091.951	915.068	770.485	651.491
2014							2,243.852	1,852.105	1,539.290	1,287.030	1,081.823
2015								2,476.057	2,040.272	1,694.718	1,417.704
2016									2,302.214	1,881.670	1,552.911
2017										1,858.407	1,526.946
2018											
Total:	**236.859**	**1,339.242**	**2,766.600**	**4,530.320**	**5,389.699**	**6,905.207**	**7,997.791**	**9,149.151**	**9,940.615**	**10,153.683**	**8,492.350**
From Table 13:	$GWPCH_4$ for 2008 to 2012: 21					$GWPCH_4$ for 2013 to 2018: 25					

Note to Table A:

The highlighted values above must be inserted for each year separately (other years = 0) into the respective BE spreadsheet.

The CO2e values resulting from the BE spreadsheets (highlighted cells in row 47) are then entered into Table B.

The BE spreadsheet is available from the PA's CDM website: http://cdm.unfccc.int/UserManagement/FileStorage/7OXD4P48Q7CKOWOQAU9CK89E4H4T5V

The BE workbook (excerpt for 2017 in Annex 3 and workable workbook 2008 to 2017 available to the DOE) is based on processing yearly 14,875 tons of organic waste into compost Cell E4). 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 31"Deposition trend" of the respective year. All other years must remain zero, because the BE spreadsheet cannot handle different yearly waste type percentages. This requires a BE baseline spreadsheet for each year. Also separate BE spreadsheets are necessary for the commitment period up to 2012 and after 2012, because the Global Warming Potential for methane ($GWPCH_4$) has been increased from 21 to 25. The yearly CO_2e values in row 47 from actual year onwards to the right are then copied into the spreadsheet of above Table B.

Because each year requires its individual BE spreadsheets, no values are shown for other year. As a consequence, " #Div/0! " appear in the workable spreadsheets in cells from row 48 on downwards.

Annex 5: Project on-site diesel consumption 2017, version 1

Copied from workbook: Details of on-site energy consumption 2017 with summary for Annex 5, Version 2

Total Year 2017	**Transport Diesel Consumption** in liters		**On-site Diesel Consumption** in liters
January	58.21		38.80
February	1,739.56		116.40
March	1,459.90		116.40
April	155.26		135.80
May	232.80		194.00
June	1,592.00		145.50
July	1,172.60		126.10
August	947.20		135.80
September	2,609.30		223.10
October	349.23		116.40
November	1,669.40		116.80
December	1,871.60		232.80
Total	**13,857.06**		**1,697.90**
		15,554.96	

Annex 6: Compost transport emissions 2017, version 1

Copied from workbook: Details of compost sales and transport 2017 with summary for Annex 6, Version 1

	Unit	Value
1. Compost Delivery by Facility		
Compost sold and delivered by facility	kg	356,640.0
	tons	356.640
Deliveries by facility	transports	65
2. Compost Pick-up by Customers		
Compost sold and pickedup by customer	kg	444,220.4
	tons	444.220
Pick ups by customer	pick ups	156
3. Compost sold to PT.Songolangit Persada in Temesi	kg	318,300.0
	tons	318.300
Used on site (see note below)	transactions	4
4. Data used in Tables 21, 22, 23 and 32		
Total compost sold = Q_{comp}	kg	1,119,160.4
	tons	**1,119.160**
(for use in Table 21 and 32)		
Share of compost picked up = S_{comp}	**ratio**	**0.3969**
(for use in Table 22 and 32)		(= 318,300 / 1,119,160.4
Average weight in tons per pick-up = CT_{comp}	**tons**	**2.848**
(for use in Table 23 and 32)		(= 444,220.4 : 156)

Note: PT.Songolangit Persada in Temesi (PT SP Temesi) is a company that is located on the same premises as the project activity. It processes our compost with other material to organic fertilizer. Our compost makes up about 30% in its formula. As it is located on-site, no compost transport ensues.

Annex 7: Calibration of weighing scales and kWh-meter 2017, version 1

Weighing scales are calibrated according to Operating Procedure OP 22.
Calibration frequency: annually for weighing scales, 5 years for kW-Meter.
All balances were calibrated by the governmental UPT Metrologi, Denpasar Bali.
The kWh-Meter was calibrated by the governmental energy company PLN, Gianyar Bali

Equipment	Brand and model		Specification		Serial No.	
Digital balance	**AND-AD 4406**		**1000 kg / 0.2 kg**		**P3507372**	
Calibration dates:	27-Mar-2008	10-Jun-2008	18-Feb-2009	17-Feb-2010	10-Feb-2011	9-Feb-2012
	9-Feb-2013	7-Feb-2014	6-Feb-2015	18-Feb-2016	16-Feb-2017	
Analog balance	**Pertis CB 300**		**300 kg / 0.1 kg**		**B 040704**	
Calibration dates:			21-Jul-2009	17-Feb-2010	10-Feb-2011	9-Feb-2012
	9-Feb-2013	7-Feb-2014	6-Feb-2015	18-Feb-2016	16-Feb-2017	
Analog balance	**Pertis CB 300**		**300 kg / 0.1 kg**		**B 070494**	
Calibration dates:			21-Jul-2009	17-Feb-2010	10-Feb-2011	9-Feb-2012
	9-Feb-2013	7-Feb-2014	6-Feb-2015	18-Feb-2016	16-Feb-2017	
Digital balance	**Ohaus Scout Pro**		**200 g / 10 mg**		**7129350044**	
				3-Sep-2010	not used	9-Feb-2012
	9-Feb-2013	7-Feb-2014	6-Feb-2015	18-Feb-2016	16-Feb-2017	
Analog balance	**Radjin CB 300**		**300 kg / 0.1 kg**		**110967**	
Calibration dates:						9-Feb-2012
	9-Feb-2013	7-Feb-2014	6-Feb-2015	18-Feb-2016	16-Feb-2017	
Analog balance	**Pertis CB 300**		**300 kg / 0.1 kg**		**B 1102217**	
Calibration dates:						24-Sep-2012
	9-Feb-2013	7-Feb-2014	6-Feb-2015	18-Feb-2016	16-Feb-2017	
Digital balance	**KRIS EK3550-31P**		**5000 g / 1 g**		**C0903150828**	
Calibration dates:						20-Mar-2012
	20-Mar-2013	7-Feb-2014	6-Feb-2015	18-Feb-2016	16-Feb-2017	
Analog balance	**Pertis CB 300**		**300 kg / 0.1 kg**		**B 1401755**	
Calibration dates:						
			6-Feb-2015	18-Feb-2016	16-Feb-2017	
kWh-Meter	**Hexing SGC:901129**		**3 Phase 33 kW**		**14070367744**	
	Commissioned:		**12/14/2012**			
Calibration dates:	14-Dec-2012	29-Nov-2017				

Note: * See calibration report of kWh-meter of 2012 about recommended calibration frequency.

Accuracy class:	All weighing scales:	Class III				
	kWh meter:	Class Cl 1				
Calibration frequency:	All weighing scales:	project frequency:	yearly	applied law:	10 years	
	kWh meter:	project frequency:	5 years	applied law:	15 years	

The calibration frequency for weighing scales and energy meters is fixed in laws of the Ministry of Trade:
- All weighing scales: Law No. 2 of 1981 about Legal Metrology (measurement science)
- kWh meter: Law No. 96 of 2015 about Legal Marks (seals etc.)

Annex 8: Index of the Operating Procedures of the Quality System, version 1

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
OP 40	Compiling the CDM Monitoring Report (Draft)
OP 41	Modalities of Communication (MoC) with CDM Authorities

Annex 9: Summary of BE, PE and ER 2017, version 1

Copied from workbook: Summary of BE, PE and ER 2017 for Annex 9, version 1

	Source	Units	Total CO_2e 2017	For MR 2017
1. Details on emission reductions				
ER from processing and subsequent year	Table 27	t CO2e	10,153.683	
Adjustment for prior activities	Table 35/36	t CO2e	613.636	
Total		t CO2e	**9,540.047**	
2. Details on project emissions				
Facility electricity (PE power)	Table 28/29	t CO2e	7.462	
Facility diesel (PE diesel, gasoline)	Table 30/31	t CO2e	41.436	
Transport diesel (PE transport)	Table 32	t CO2e	2.577	
Total PE Project	**Table 34**	t CO2e	**51.475**	**52**
3. Total leakage				
Leakage (L)	E.3.	t CO2e	0	**0**
4. Emission reductions in year y (before adjustment for volumes processed in the baseline case)				
Equation 8 of PDD: ERy = BEy – PEy – Ly				
Gross baseline emission	Table 27	t CO2e	10,153.68	
Total project emission	**Table 33**	t CO2e	**51.48**	**52**
Leakage	E.3.	t CO2e	0	
Emission reduction due to project activity	Table 34	t CO2e	10,102.21	
5. Adjustment of baseline emission due to prior pilot plant activity				
5.1. Adjustment factor r				
Equation 10 of PDD: $r = WCOM_{BAU} / TWCO_{My}$				
Prior activity WCOMBAU	Table 35	tons	595.000	
Project activity WCOMMY	Table 35	tons	9,795.409	
Adjustment factor r	Table 35		0.06074	
Adjustment factor (1 - r)	Table 35		0.93926	
5.2. Adjustment for gross baseline emission due to prior project activity in pilot plant				
Equation 9 of PDD: ERy = ERy * (1 - r)				
Gross emission reduction due to project activity	Table 34	t CO2e	10,102.208	
Adjustment factor (1 - r)	Table 35		0.93926	
Net emissions reduction due to project activity	Table 36	t CO2e	9,488.572	
Adjustments to gross baseline emission	Table 36	t CO2e	613.636	
5.3. Adjustment to gross baseline emission for the prior project activity in the pilot plant				
Gross baseline emission	Table 27	t CO2e	10,153.683	
Adjustment due to prior activity in pilot plant	Table 36	t CO2e	613.636	
Net baseline emission	**Table 37**	t CO2e	**9,540.047**	**9,540**
Calculation basis for project emissions per year:				
Facility power	Table 28	MWh	10.251	
Facility equipment and truck diesel	Table 30	liter	15,555.0	
Compost sold	Table 32	tons	1,119.2	
Organics processed	Table 25	tons	9,795.409	

Annex 10: Details of BE, PE and ER calculation 2017 (linked tables 25 to 38), version 1

For MR and Annex 9. These details are too large to be copied directly. To read the workbook below, it has to be copied in to an empty Excel workbook and then double clicked to see it as Excel workbook.

1. Baseline emission

Table 25: Actual amount and depositiojn trend of organic waste

Description	Unit	Value
PDD planned amount for trend calculation	tons	14,875.00
Actual amount of organic waste in tons (Annex 1)	tons	9,795.41
Deposition trend in % of PDD plan	**Percent**	**65.851%**

Table 26: Percentage of organic waste types

Description waste types (j)	PDD	this year
A. Wood, wood products	3.00%	8.983%
B. Pulp, paper and cardboard	0.50%	2.383%
C. Food, food waste, beverages and tobacco	3.00%	10.692%
D. Textiles	0.50%	0.067%
E. Garden, yard and park waste	93.00%	77.875%
Total organic waste	**100.00%**	**100.000%**

Source: Annex 2, Percentage of waste types

Table 27: Total gross baseline emission

Description	Unit	Value
Total gross baseline emission (Source: Annex 4, Table B)	**t CO_2e**	**10,153.683**

2. Project emission

Table 28: Total of electricity consumption

Parameter	Description	Unit	Value
	Reading 31/12/2017 (according to PLN document)	kWh	102,357.19
	Reading 31/12/2016 (according to PLN document)	kWh	92,106.62
	Total electricity consumption	kWh	10,250.57
EL	**Total electricity consumption**	**MWh**	**10.251**

Source: December 31 reading obtained and confirmed by the governmental electricity company PLN
Note: The readings are in kWh and according to Indonesian convention, the decimal point is marked by a comma. In this table, following the CDM convention, the comma is replaceds by a point.

Table 29: Total electricy emission

Parameter	Description	Unit	Value
EL	Electricity consumption (Table 28)	MWh	10.251
EF_{grid}	Emission factor of Java–Madura–Bali grid (Table 9)	t CO_2/MWh	0.728
PE_{power}	**Emission from electrical power consumption**	**t CO_2e**	**7.462**

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

Table 30: Facility on-site diesel consumption

Description	Unit	Value
Liter of facility equipment diesel (Annex 5)	liter	13,857.1
Liter of facility truck diesel (Annex 5)	liter	1,697.9
Total facility diesel consumption	**liter**	**15,555.0**

Table 31: Total facility on-site diesel emissions

Parameter	Description	Unit	Value
$F_{diesel, liter}$	Facility diesel consumption (Table 30)	liter	15,555.0
D_{diesel}	Density of diesel (ICPP, Table 8)	kg/l	0.83
$F_{diesel, tons}$	Facility diesel consumption	tons	12.911
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**	**41.436**

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

Table 32: Total compost transport diesel emissions by customers

Parameter	Description	Unit	Value
Q_{comp}	Total compost sold during monitoring period (Annex 6)	tons	1,119.2
S_{comp}	Fraction of compost picked up by customers (Annex 6)		0.3969
CT_{comp}	Average truck capacity for customer transport (Annex 6)	tons	2.848
DAF_{comp}	Average distance for compost transport (Table 24)	km/truck	62
$EF_{transport}$	CO_2 emission factor for diesel (Table 10)	kg CO_2/km	0.2664
$PE_{transport}$	**Emission from customer compost transport**	**t CO_2e**	**2.577**

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 of EF transport: Table 10
Source DAF comp: Expert estimate from Table 24

Table 33: Total project emissions

Description	Units	Value
Total emissions from total electrical power consumption(Table 29)	t CO_2e	7.462
Total emissions from facility diesel consumption (Table 31)	t CO_2e	41.436
Total emissions from customer compost transport (Table 32)	t CO_2e	2.577
Total project emissions	**t CO_2e**	**51.475**

Table 34: Emission reduction minus project emissions before adjustment

Description	Units	Value
Total gross baseline emission (Table 27)	t CO_2e	10,153.683
minus Total project emissions (Table 33)	t CO_2e	51.475
minus Total leakage (E.3.)	t CO_2e	0.000
Emissions reduction due to project activity	**t CO_2e**	**10,102.208**

Formula: Total gross baseline emission - Total project emission - Total leakage
Source of formula: PDD equation 8

3. Adjustment of baseline emission due to prior pilot plant activity

Table 35: Calculation of adjustment factor r and (1 - r)

Parameter	Description	Units	Value
$WCOM_{BAU}$	Prior project activity in pilot plant (Table 11)	tons	595.000
$TWCOM_y$	Project activity (Table 25 and Annex 1)	tons	9,795.409
	Adjustment factor r		0.06074
	Adjustment (1 - r)		**0.93926**

Formula: Adjustments factor r = Prior activity ($WCOM_{BAU}$) / Project activity ($TWCOM_y$)
Source of formula: PDD equation 10

Table 36: Adjustment to gross baseline emission due to prior project activity in pilot plant

Description	Units	Value
Gross emissions reduction due to project activity (Table 34)	t CO_2e	10,102.208
Adjustment factor (1 - r) (Table 35)		0.93926
Net emissions reduction due to project activity (Formula 1)	t CO_2e	9,488.572
Adjustments to gross baseline emission (Formula 2)	**t CO_2e**	**613.636**

Formula 1: Adjustment factor (1 - r) * Gross emissions reduction due to project activity (Table 35)
Formula 2: Difference between gross and net
Source of formula: PDD equation 9

Table 37: Adjustment to baseline emission for the prior project activity in the pilot plant

Description	Unit	Value
Gross baseline emission (Table 27)	t CO_2e	10,153.683
Adjustment due to prior activity in pilot plant (Table 36)	t CO_2e	613.636
Net baseline emission for Summary Table of section E.4.	**t CO_2e**	**9,540.047**

Formula: Total gross baseline reduction - Emissions from priort activity

Table 38: Calculation of net emission reduction with required roundings

Description	Unit	Value
Gross baseline emission (Table 27)	t CO_2e	10,153.683
Adjustment due to prior activity in pilot plant (Table 36)	t CO_2e	613.636
Baseline emission (Table 37)	t CO2e	9,540.047
Rounded down value	**t CO2e**	**9,540**
Total project emissions (Table 33)	t CO2e	51.475
Rounded up value	**t CO2e**	**52**
Total leakage (E.3.)	**t CO2e**	**0**
GHG emission reduction	**t CO_2e**	**9,488**

Formula: Gross baseline emission - Adjustment due to prior activity = Baseline emission
Baseline emission (rounded down) - Total project emission (rounded up) = GHG emission reductions