CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

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SECTION A. General description of project activity

A.1 Title of the project activity:

>> Title of the project activity: Organic Waste Composting Project at Da Nang City, Viet Nam
Version number: 0
Date:

A.2. Description of the project activity:

>> The objective of the project is to establish a waste treatment facility with a mechanical segregation process and compositing plant for organic wastes on the site of the existing landfill of Kahn Son, located 14 km from the centre of Da Nang City. The project activities involves the sorting and recovering of the recyclable, reusable and recoverable resources from mixed municipal waste generated in Da Nang City, and aerobic treatment of the organic waste utilizing composting technology.

In Da Nang City, about 500 tonnes of municipal solid waste are generated daily, and most of them are disposed at the landfill site wherein landfill gasses are not extracted. Through the above-mentioned project activities, this project will realise the reduction of the amount of landfilled wastes, consequently the reduction of the GHG emission. The proposed waste treatment facility will have a daily input capacity of 500 tonnes of municipal waste disposed at Khanh Son Landfill. Considering the product quality, the compost produced through the project activities will not be sold to the end-user, but will be transported to the landfill site to be utilised as cover soil.
Based on the calculations the project will realise 460,720 tonnes CO_2 equivalents over the 7 years period from 2009 to 2015.

The project is being developed by Da Nang Urban Environmental Company (hereinafter, Da Nang URENCO), a company in charge of collection, transport, treatment and final disposal of municipal solid waste from Da Nang City, Viet Nam. The implementation of the project including operation of the waste treatment facility will be carried out by the Special Purpose Company (hereinafter, SPC), which will be formed jointly by the Da Nang URENCO and Kajima Corporation.

Besides climate change mitigation, the project will contribute to the sustainable development of Viet Nam in the following aspects:

Environmental well-being

- The project will promote sanitization of landfill site.
- The project will reduce current environmental and health impacts deriving from landfill sites in the region of the Project site as the result of reducing the load of MSW, particularly the contained organics disposed of at landfill sites

Economic and social well-being

- The project will extend operational lifetime of the landfill site.
- The project will improve local economy by providing job opportunity to local people for the operation of the facility.
- The project will contribute the development of the sustainable society in Da Nang City which is suit to the national policy of Viet Nam.

A.3. Project participants:

>>

Name of Party involved ((host) indicates a host Party)	Private and/or public entity (ies) project participants (as applicable)	Kindly indicate if the party involved wishes to be considered as project participant (Yes/No)
Viet Nam (host)	Da Nang Urban Environmental Corporation (URENCO), project sponsor	
	Special Purpose Company (SPC) formed by Da Nang URENCO and Kajima	
Japan	Kajima Corporation (Private entity), project sponsor	

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

>>

A.4.1.1. Host Party(ies):

>>Socialist Republic of Viet Nam

A.4.1.2. Region/State/Province etc.:

>>

A.4.1.3. City/Town/Community etc:

>>Da Nang City

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

>>

The treatment plant for municipal solid waste will be constructed at the part of landfill site of Khanh Son, Da Nang City. Da Nang city is along the Central coast, on the Highway 1A, 764km from Hanoi on the north, 100km from Hue city and 946km from Ho Chi Minh city on the south, 140km from Viet Nam – Laos border on the West (see maps in figures 1).

Figure 1: Map of Viet Nam and location of project site in Da Nang City

A.4.2. Category(ies) of project activity:

>> The project fits into Sectoral Scope 13: "Waste handling and disposal".

A.4.3. Technology to be employed by the project activity:

>>The principal technology to be applied in this project activity is mechanical segregation of municipal solid waste and composting of organic wastes, followed by a stabilization process. The process starts with the separation of solid waste into recyclable materials, organic wastes, and other waste. Organic wastes in this project include organic matters such as food waste, wood, and papers which cannot be recycled. Once separated, the organic fraction enters in the bio-treatment areas, and the biological degradation process starts. During the process, organic waste is decomposed aerobically under controlled temperature, humidity, and air concentration. After being stabilized with adequate humidity, it is transported to the landfill site, and disposed of, or utilised as cover soil.

A schematic diagram of the process is shown in Figure 2.

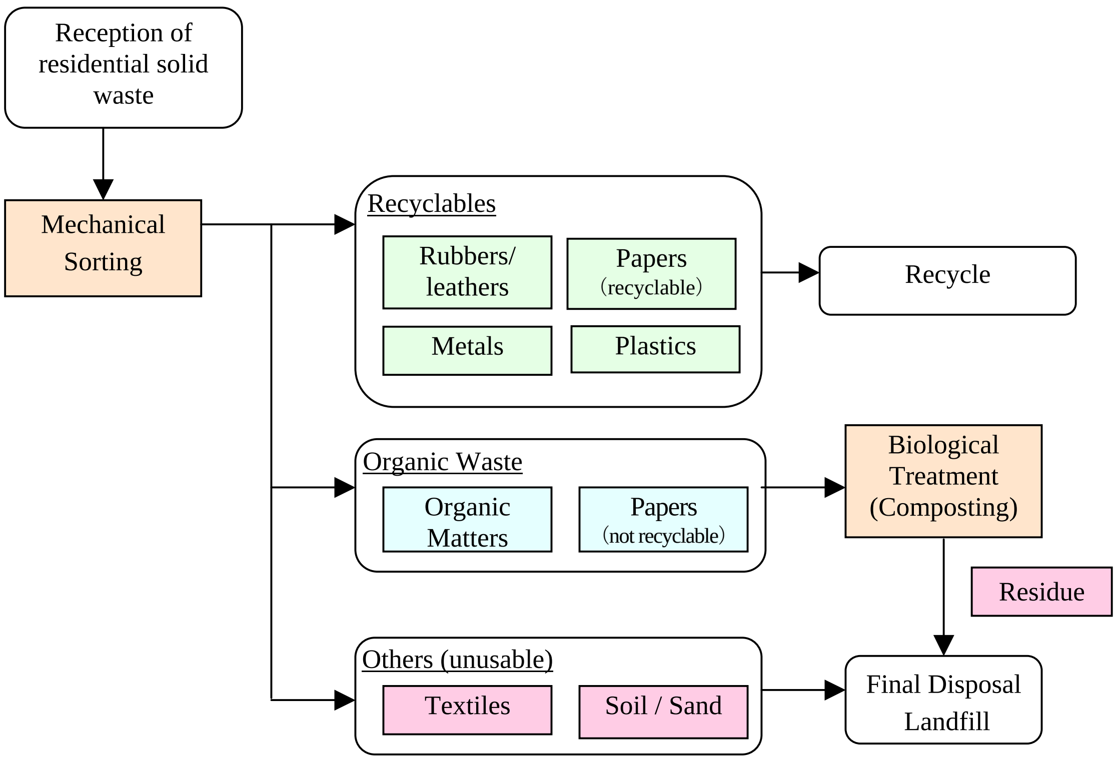

Figure 2: Schematic Diagram for the Treatment Process

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

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Table 1: Estimation of emission reductions

Year	**Annual estimation of emission reductions in tonnes of CO2e**
2009	25,970
2010	45,790
2011	60,390
2012	71,330
2013	79,690
2014	86,190
2015	91,360
Total estimated reductions (tonnes of CO2e)	460,720
Total number of years in first crediting period	7
Annual average estimated reductions, first crediting period (tonnes of CO2e)	65,817

A.4.5. Public funding of the project activity:

>> The project will not receive any national or international funding for the development of the proposed project.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

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AM0025 Avoided emissions from organic waste through alternative waste treatment process, Version 10 (EB36)

B.2 Justification of the choice of the methodology and why it is applicable to the project activity:

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As stated in the methodology, the methodology is applicable to scenarios which involve one or a combination of the following waste treatment options.

a) a composting process in aerobic conditions;
b) gasification to produce syngas and its use;
c) anaerobic digestion with biogas collection and flaring and/or its use;
d) mechanical/thermal treatment process to produce refuse-derived fuel (RDF)/stabilized biomass (SB) and its use. The thermal treatment process (dehydration) occurs under controlled conditions (up to 300 degrees Celsius). In case of thermal treatment process, the process shall generate a stabilized biomass that would be used as fuel or raw material in other industrial process. The physical and chemical properties of the produced RDF/SB shall be homogenous and constant over time;
e) incineration of fresh waste for energy generation, electricity and/or heat. The thermal energy generated is either consumed on-site and/or exported to a nearby facility. Electricity generated is either consumed on-site, exported to the grid or exported to a nearby facility. The incinerator is rotating fluidized be or hearth or grate type.

The proposed project activity corresponds to a) a composting process in aerobic conditions. In addition, the proposed project satisfies the following requirements as described in the methodology.

Requirement	Project Condition
In case of composting, the produced compost is either used as soil conditioner or disposed of in landfills	The proposed project aims to dispose all of the compost produced in the landfill.
The proportions and characteristics of different types of organic waste processed in the project activity can be determined, in order to apply a multiphase landfill gas generation model to estimate the quantity of landfill gas that would have been generated in the absence of the project activity	The proportions and characteristics of different types of organic waste processed in the project activity can be determined.
Waste handling in the baseline scenario shows a continuation of current practice of disposing waste in landfill despite environmental regulation that mandates the treatment of waste, if any, using any of the project activity mentioned above.	The baseline scenario shows that the current practice of disposing waste in landfill without any treatment will be continued.

Requirement	Project Condition
The compliance rate of the environmental regulation during (part of) the crediting period is below 50%, if monitored compliance with the MSW rules exceeds 50%, the project activity shall receive no further credit, since the assumption that the policy is not enforced is no longer tenable.	There are no regulations that mandate the intermediate treatment of waste before landfill in Viet Nam. Therefore, the compliance rate does not need to be taken into account.
The project activity does not involve thermal treatment process of neither industrial or hospital waste.	The proposed project activity handles household waste and wastes from offices and markets. Therefore, neither industrial nor hospital waste is treated in the project activity.
This methodology is not applicable project activities that involve capture and flaring of methane from existing waste in the landfill. This should be treated as a separate project activity due to the difference in waste characteristics of existing and fresh waste, which may have an implication on the baseline scenario determination.	The proposed project does not involve landfill gas capture or flaring.

B.3. Description of the sources and gases included in the project boundary

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As stated in the methodology, the following are not included in the project boundary.

a) facilities for waste collection
b) facilities for waste sorting prior to transportation
c) facilities for waste transportation

The facilities included in the project boundary are the following.

d) facilities for mechanical sorting of waste after reception of waste
e) facilities for biological treatment of organic waste
f) landfill where the compost produced is disposed
g) all facilities related to the proposed project activity that uses electricity
h) all facilities related to the proposed project activity that uses fossil fuel

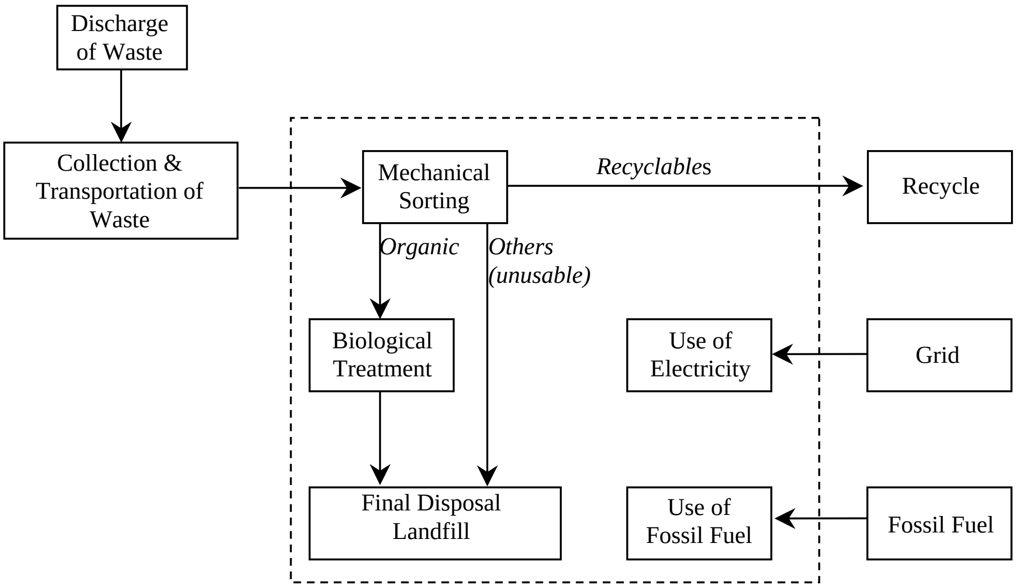

Figure 3: Project Boundary

Table B.3.1: The greenhouse gases included in or excluded from the project boundary

	Source	Gas		Justification / Explanation
Baseline	Emissions from decomposition of waste at the landfill site	CH_4	Included	The major source of emissions in the baseline from the landfill.
		N_2O	Excluded	N_2O emissions are small compared to CH_4 emissions from landfills. This is conservative.
		CO_2	Excluded	Not accounted for.
	Emissions from electricity consumption	CO_2	Included	There is no electricity consumption at the project site in the absence of the project activity.
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
	Emissions from thermal Energy generation	CO_2	Included	There is no thermal energy generation at the project site in the absence of the project activity.
		CH_4	Excluded	Excluded for simplification. This is conservative.
		N_2O	Excluded	Excluded for simplification. This is conservative.
Project Activity	On-site fossil fuel consumption due to the project activity	CO_2	Included	May be an important emission source. It includes vehicles used on-site, etc.
		CH_4	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small.
	On-site electricity use	CO_2	Included	May be an important emission source.
		CH_4	Excluded	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	Excluded	Excluded for simplification. This emission source is assumed to be very small.

	Source	Gas		Justification / Explanation
	Direct emissions from the waste treatment process	N_2O	Included	May be an important emission source for composting activities.
		CH_4	Included	The composting process may not be complete and result in anaerobic decay.

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

>>

Step 1. Identification of alternative scenarios

Sub-step 1a: Define alternatives to the project activity:
All realistic and credible alternatives to the project activity that can be (part of) the baseline scenario are defined as follows.
M1. The project activity not implemented as a CDM project;
M2. Disposal of waste at a landfill where landfill gas is captured and flared;
M3. Disposal of waste at a landfill without the capture of landfill gas.

Sub-step 1b: Consistency with mandatory laws and regulations:
All alternatives are in compliance with the mandatory laws and regulations that are set by the Government of Viet Nam (Decision No.1555/1999/QD-TTg, Directive No.23/2005/CT-TTG, Decree No.59/2007/ND-CP)

Step 2. Identification of fuel for the baseline

Step 3. Investment analysis

Sub-step 3a: Determine appropriate analysis method
The proposed project activity generates financial benefits other than the CDM related income from tipping fee of the waste received, and the sale of recyclable material. The financial attractiveness of the proposed project activity will be determined by using Option Ⅲ, the benchmark analysis.

Sub-step 3b: Option Ⅲ. Benchmark analysis

The economic attractiveness of scenario M1 will be examined by using the benchmark analysis method. The financial indicator is the project IRR and the benchmark is the international bond rate of the government of Viet Nam which is 7.125%. (Issued October, 2005 period of redemption: 10years)

Below are the basic conditions for the calculation of the project IRR.

Item	Description
Project Period	7 years
Waste Amount	No change during the project (500 t/d)

Amount of Loans	None
Inflation Rate	6.6%
Corporate Tax	28%
Depreciation Period	5 years
Tipping Fee	1.00 USD/ton-waste
Price of Recyclable Waste (Plastics)	40.00 USD/ton-plastic

Unit: USD

Expense	
Initial Investment	2,041,000
O&M Cost	308,000
Expense Total (7 years)	4,194,000
Income	
CER Sales	0
Tipping Fee	182,500
Plastic Sales	141,000
Income Total (7 years)	2,264,500
Project IRR	Negative Value

The project IRR is negative. Therefore, it can be stated that the project is economically unattractive, and shall be excluded from further consideration.

In scenario M2, since there are no mandatory laws or regulations that specify that the gases from the landfill must be captured and flared, there will be no public funding, money grants, or any sort of incentive for the installation of gas collection and flaring equipments. There is no income other than the CDM related income. Therefore, it can be stated clearly that scenario M2 is economically unattractive, and shall also be excluded from further consideration.

Through the assessment above, it is determined that the most plausible baseline scenario is M3 which is the disposal of waste at a landfill without the capture of landfill gas.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality): >>

Additionality of the proposed project activity will be demonstrated and assessed using the “Tool for the demonstration and assessment of additionality”. Version 04 (EB36)

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a. Define alternatives to the project activity:

Realistic and credible alternatives available are the following.
M1. The project activity not implemented as a CDM project;
M2. Disposal of waste at a landfill where landfill gas is captured and flared;

M3. Disposal of waste at a landfill without the capture of landfill gas.

Sub-step 1b: Consistency with mandatory laws and regulations:
As stated in the previous section for assessment of the baseline scenario, all alternatives are in compliance with the mandatory laws and regulations that are set by the Government of Viet Nam (Decision No.1555/1999/QD-TTg, Directive No.23/2005/CT-TTG, Decree No.59/2007/ND-CP)

Step 2. Investment Analysis

Sub-step 2a. Determine appropriate analysis method:
The proposed project activity generates financial benefits other than the CDM related income from tipping fee of the waste received, and the sale of recyclable material. The financial attractiveness of the proposed project activity will be determined by using Option Ⅲ, the benchmark analysis.

Sub-step 2b. – Option Ⅲ. Apply benchmark analysis:
The economic attractiveness of the proposed project activity (scenario M1) will be examined by using the benchmark analysis method. The financial indicator is the project IRR and the benchmark is the international bond rate of the government of Viet Nam which is 7.125%. (Issued October, 2005 period of redemption: 10years)

Sub-step 2c. Calculation and comparison of financial indicators:
The IRR is calculated according to the following basic conditions.

Item	Description
Project Period	7 years
Waste Amount	No change during the project (500 t/d)
Amount of Loans	None
Inflation Rate	6.6%
Corporate Tax	28%
Depreciation Period	5 years
Tipping Fee	1.00 USD/ton-waste
Price of Recyclable Waste (Plastics)	40.00 USD/ton-plastic

Unit: USD

Expense	
Initial Investment	2,041,000
O&M Cost	308,000
Expense Total (7 years)	4,194,000

Income	
CER Sales	0
Tipping Fee	182,500
Plastic Sales	141,000
Income Total (7 years)	2,264,500
Project IRR	Negative Value

The project IRR is negative. Therefore, it can be stated clearly that the project is economically unattractive.

In scenario M2, since there are no mandatory laws or regulations that specify that the gases from the landfill must be captured and flared, there will be no public funding, money grants, or any sort of incentive for the installation of gas collection and flaring equipments. There is no income other than the CDM related income. Therefore, it can be stated clearly that scenario M2 is economically unattractive.

In scenario M3, the landfill without the capture of landfill gas is operated by income from the tipping fee, which is a common practice in Viet Nam.

Through the assessment above, it is made clear that scenario M1, which is the project activity implemented without the income from CER sales, is economically unattractive than at least one other alternatives, identified in step 1.

Sub-step 2d. Sensitivity analysis:
The conclusion regarding the financial attractiveness will be ensured by a sensitivity analysis.
The parameters that will be considered for the analysis are the following.

Expense : Range from –5% to –15% compared to the original condition
Income : Range from +10% to +30% compared to the original condition

9 cases were considered for the sensitivity analysis.

Unit: %

		Expense		
		-15% (3.6 M USD/7 years)	-10% (3.8 M USD/7 years)	-5% (4.0 M USD/7 years)
Income	+10% (2.5 M USD/7 years)	Negative	Negative	Negative
	+20% (2.7 M USD/7 years)	Negative	Negative	Negative
	+30% (2.9 M USD/7 years)	Negative	Negative	Negative

In all cases, the IRR is negative.

Step 4. Common practice analysis

Sub-step 4a. Analyze other activities similar to the proposed activity:

Several similar projects have been implemented in Viet Nam. Composting, as well as its commercial use is under way. The similarity between the projects is the low income from compost sales compared to the initial and operational costs. The operation of the composting plant in Hanoi is made possible by subsidy from the local government. Composting facilities constructed in other areas were forced to shut down because of the high operational cost.

Sub-step 4b.Discuss any similar options that are occurring:

As discussed in 4a, even with the income from compost sales, implementation of a composting project is difficult due to the high operational cost.
The proposed project activity aims to dispose the compost in a landfill, clearly distinguishing the circumstance of the proposed project activity from the composting projects that have already been implemented. The proposed project activity is economically unattractive, and it will not be implemented without the incentive provided by the CDM. Therefore, the proposed project activity is additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

>>

Project Emissions

Project emissions are calculated using equation (1) provided in the methodology. $PE_{a,y}$, $PE_{g,y}$, $PE_{r,y}$, $PE_{i,y}$, $PE_{w,y}$, are excluded from the calculation since the proposed project activity involves only composting.

$$PE_y = PE_{elec,y} + PE_{fuel,on-site,y} + PE_{c,y} \quad (1)$$

Where:

PE_y	is the project emissions during the year *y* (tCO_2e/yr)
$PE_{elec,y}$	is the emissions from electricity consumption due to the project activity during the year *y* (tCO_2/yr)
$PE_{fuel,on-site,y}$	is the emissions due to fuel consumption on-site in year *y* (tCO_2/yr)
$PE_{c,y}$	is the emissions during the composting process in year *y* (tCO_2e/yr)

Emissions from electricity use ($PE_{elec,y}$)

The proposed project activity involves consumption of electricity. The emissions from electricity consumption are calculated using equation (2).

$$PE_{elec,y} = EG_{PJ,EF,y} \times CEF_{elec} \quad (2)$$

Where:

$PE_{elec,y}$	is the emissions from electricity consumption due to the project activity during the year *y* (tCO_2/yr)

$EG_{PJ,EF,y}$	is the amount of electricity generated in an on-site fossil fuel fired power plant or consumed from the grid in the project activity, measured using an electricity meter (MWh/yr)
CEF_{elec}	CO_2 emission factor for electricity generation in the project activity (tCO_2/MWh)

Since electricity will be purchased from the grid, CEF_{elec} will be calculated according to the "Tool to calculate the emission factor for an electricity system".

Emissions from fuel use on-site ($PE_{fuel,on\text{-}site,y}$)

The proposed project activity involves on-site fossil fuel consumption. The emissions from fossil fuel consumption on-site are calculated using equation (3).

$$PE_{fuel,on-site,y} = F_{cons,y} \times NCV_{fuel} \times EF_{fuel} \quad (3)$$

Where:

$PE_{fuel,on\text{-}site,y}$	is the CO_2 emissions due to on-site fuel combustion in year *y* (tCO_2/yr)
$F_{cons,y}$	is the fuel consumption on site in year *y* (l)
NCV_{fuel}	is the net calorific value of the fuel (MJ/l)
EF_{fuel}	is the CO_2 emission factor of the fuel (tCO_2/MJ)

Emissions from Composting ($PE_{c,y}$)

Project emissions from composting are calculated using equation (4).

$$PE_{c,y} = PE_{c,N2O,y} + PE_{c,CH4,y} \quad (4)$$

Where:

$PE_{c,y}$	is the emissions during the composting process in year *y* (tCO_2/yr)
$PE_{c,N2O,y}$	is the N_2O emissions during the composting process in year *y* (tCO_2e/yr)
$PE_{c,CH4,y}$	is the emissions during the composting process due to methane production through anaerobic conditions in year *y* (tCO_2e/yr)

N_2O emissions

The N_2O emissions during the composting process are calculated using equation (5).

$$PE_{c,N2O,y} = M_{compost,y} \times EF_{c,N2O} \times GWP_{N2O} \quad (5)$$

Where:

$PE_{c,N2O,y}$	is the N_2O emissions during the composting process in year *y* (tCO_2e/yr)
$M_{compost,y}$	is the total quantity of compost produced in year *y* (tonnes/yr)
$EF_{c,N2O}$	is the emission factor for N_2O from the composting process (tN_2O/t compost)
GWP_{N2O}	is the Global Warming Potential of nitrous oxide (tCO_2/tN_2O)

CH_4 emissions

The CH_4 emissions during the composting process are calculated using equation (6).

$$PE_{c,CH4,y} = M_{compost,y} \times GWP_{CH4} \times S_{a,y} \quad (6)$$

Where:

$PE_{c,CH4,y}$	is the project methane emissions due to anaerobic conditions in the composting process in year *y* (tCO_2e/yr)
$M_{compost,y}$	is the total quantity of compost produced in year *y* (tonnes/yr)
GWP_{CH4}	is the Global Warming Potential of methane, (tCO_2/tCH_4)
$S_{a,y}$	is the share of the waste that degrades under anaerobic conditions in the composting plant during year *y* (%)

$S_{a,y}$ is calculated using equation (7)

$$S_{a,y} = S_{OD,y} / S_{total,y} \quad (7)$$

Where:

$S_{a,y}$	is the share of the waste that degrades under anaerobic conditions in the composting plant during year *y* (%)
$S_{OD,y}$	is the number of samples per year with an oxygen deficiency (i.e. oxygen content below 10%)
$S_{total,y}$	is the total number of samples taken per year, where $S_{total,y}$ should be chosen in a manner that ensures the estimation of $S_{a,y}$ with 20% uncertainty at a 95% confidence level.

<u>Baseline Emissions</u>

Baseline emissions are calculated using equation (17) provided in the methodology.

$$BE_y = MB_y - MD_{reg,y} + BE_{EN,y} \quad (8)$$

Where:

BE_y	is the baseline emissions in year *y* (tCO_2e/yr)
$MB_{reg,y}$	is the methane produced in the landfill in the absence of the project activity in year *y* (tCO_2e/yr)
$MD_{reg,y}$	is the methane that would be destroyed in the absence of the project activity in year *y* (tCO_2e/yr)
$BE_{EN,y}$	Baseline emissions from generation of energy displaced by the project activity in year *y* (tCO_2/yr)

Adjustment Factor (AF)

Since regulatory or contractual requirements do not specify $MD_{reg,y}$ in the proposed project activity, Adjustment Factor (AF) will be used to determine the methane that would be destroyed in the absence of the project activity.

$$MD_{reg,y} = MB_y \times AF \quad (9)$$

Where:

AF	is Adjustment Factor for MB_y (%)

Rate of Compliance

There are no laws or regulations that mandate the use of the treatment process of the proposed project activity in Viet Nam. Therefore, method for adjusting the baseline emissions by rate of compliance does not apply.

Methane generation from the landfill in the absence of the project activity (MB_y)

The amount of methane that is generated each year (MB_y) is calculated as per the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site", considering the following equation:

$$MB_y = BE_{CH4,SWDS,y} \quad (10)$$

$$BE_{CH4,SWDS,y} = \varphi \cdot (1-f) \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^{y} \sum_{j} W_{j,x} \cdot DOC_j \cdot e^{-kj \cdot (y-x)} \cdot (1-e^{-kj}) \quad (11)$$

Where:

MB_y	is $BE_{CH4,SWDS,y}$ (tCO_2e/yr)
$BE_{CH4,SWDS,y}$	is the methane emissions avoided during the year *y* from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity to the end of the year *y* (tCO_2e/yr)
ϕ	is the model correction factor to account for model uncertainties (0.9)
f	is the fraction of methane captured at the SWDS and flared, combusted or used in another manner
GWP_{CH4}	is the Global Warming Potential (GWP) of methane, valid for the relevant commitment period
OX	is the oxidation factor (reflecting the amount of methane from SWDS that is oxidised in the soil or other material covering the waste)
F	is the fraction of methane in the SWDS gas (volume fraction) (0.5)
DOC_f	is the fraction of degradable organic carbon (DOC) that can decompose
MCF	is the methane correction factor
$W_{j,x}$	is the amount of organic waste type *j* prevented from disposal in the SWDS in the year *x* (tonnes)
DOC_j	is the fraction of degradable organic carbon (by weight) in the waste type *j*

k_j	is the decay rate for the waste type *j*
j	is the waste type category (index)
x	is the year during the crediting period: *x* runs from the first year of the first crediting period (*x*=1) to year *y* for which avoided emissions are calculated (*x*=*y*)
y	is the year for which methane emissions are calculated

$$W_{j,x} = W_x \times \frac{\sum_{n=1}^{z} P_{n,j,x}}{z} \qquad (12)$$

Where:

$W_{j,x}$	is the amount of organic waste type *j* prevented from disposal in the SWDS in the year *x* (tonnes)
W_x	is the total amount of organic waste prevented from disposal in year *x* (tonnes)
$P_{n,j,x}$	is the weight fraction of the waste type *j* in the sample *n* collected during the year *x*
z	is the number of samples collected during the year *x*

Baseline emissions from generation of electricity displaced by the project activity
This section is not applicable since the proposed project activity does not involve any electricity generation.

Baseline emissions from electricity and heat cogeneration that is displaced by the project activity
This section is not applicable since the proposed project activity does not involve cogeneration by electricity or heat.

<u>Leakage</u>

The leakage emissions of the proposed project activity are estimated using the following equation:

$$L_y = L_{t,y} + L_{r,y} + L_{s,y} \qquad (13)$$

Where:

L_y	is the leakage emissions during the year *y* (tCO_2e/yr)
$L_{t,y}$	is the leakage emissions from increased transport in year *y* (tCO_2e/yr)
$L_{r,y}$	is the leakage emissions from the residual waste from the anaerobic digester, the gasifier, the processing/combustion of RDF/stabilized biomass, or compost in case it is disposed of in landfills in year *y* (tCO_2/yr)
$L_{s,y}$	is the leakage emissions from end use of stabilized biomass in year *y* (tCO_2e/yr)

There is no increase of transportation related to the proposed project activity or use of stabilized biomass. Therefore, the only leakage emission from the proposed project activity is the leakage emission from compost which will be disposed in a landfill.

Emissions from compost

Since the compost produced from the facility will be disposed in the SWDS, leakage emissions are estimated through equation (11).

Emission Reduction

The emission reductions are calculated by applying the following equation.

$$ER_y = BE_y - PE_y - L_y \qquad (14)$$

Where:

ER_y	is the emissions reductions in year y (tCO_2e)
BE_y	is the emissions in the baseline scenario in year y (tCO_2e)
PE_y	is the emissions in the project scenario in year y (tCO_2e)
L_y	is the leakage in year y (tCO_2e)

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	***CEF_{elec}***
Data unit:	tCO_2/MWh
Description:	The emission factor for electricity generation corresponding to electricity used in the project activity.
Source of data used:	
Value applied:	0.7185
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determined using the “Tool to calculate the emission factor for an electricity system”
Any comment:	
Data / Parameter:	***NCV_{fuel}***
Data unit:	MJ/l
Description:	Net calorific value of fuel
Source of data used:	IPCC
Value applied:	36.3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Adjusted by multiplying 0.844 (density of diesel) to the NCV value (43.0 TJ/Gg) provided for Gas/Diesel in the IPCC guideline.
Any comment:	

Data / Parameter:	***EF_{fuel}***
Data unit:	tCO_2/MJ
Description:	Emission factor for the fuel
Source of data used:	IPCC
Value applied:	0.000074
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	***$EF_{C,N2O}$***
Data unit:	tN_2O/t compost
Description:	Emission factor for N_2O from the composting process
Source of data used:	AM0025
Value applied:	0.000043
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value given in the approved methodology AM0025, based on Schenk et al., 1997
Any comment:	

Data / Parameter:	***GWP_{N2O}***
Data unit:	-
Description:	Global Warming Potential of nitrous oxide
Source of data used:	Kyoto Protocol
Value applied:	310
Justification of the choice of data or description of measurement methods and procedures actually applied :	Valid for the First Commitment Period
Any comment:	

Data / Parameter:	***GWP_{CH4}***
Data unit:	-
Description:	Global Warming Potential of methane
Source of data used:	Kyoto Protocol
Value applied:	21
Justification of the choice of data or	Valid for the First Commitment Period

description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	ϕ
Data unit:	-
Description:	Model correction factor to account for model uncertainties of the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site"
Source of data used:	"Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site"
Value applied:	0.9
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	***f***
Data unit:	-
Description:	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
Source of data used:	AM0025
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied :	Already accounted for as AF (Adjustment Factor)
Any comment:	

Data / Parameter:	***OX***
Data unit:	-
Description:	Oxidation Factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Source of data used:	Assessed according to site visit and the "Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site"
Value applied:	0
Justification of the choice of data or description of measurement methods	The site for the proposed project activity is an unmanaged solid waste disposal site that is not covered with soil.

and procedures actually applied :	
Any comment:	

Data / Parameter:	***F***
Data unit:	-
Description:	Fraction of methane in the SWDS gas (volume fraction)
Source of data used:	“Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site”
Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	A default value recommended by the IPCC.
Any comment:	

Data / Parameter:	DOC_f
Data unit:	-
Description:	Fraction of degradable organic carbon (DOC) that can decompose
Source of data used:	“Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site”
Value applied:	0.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	***MCF***
Data unit:	-
Description:	Methane correction factor
Source of data used:	“Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site”
Value applied:	0.8
Justification of the choice of data or description of measurement methods and procedures actually applied :	Value applied for **unmanaged solid waste disposal site – deep and/or with high water table** stated in the “Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site”. Assessed according to site visit.
Any comment:	

Data / Parameter:	DOC_j

Data unit:	-
Description:	Fraction of degradable organic carbon (by weight) in the waste type *j*
Source of data used:	"Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site"
Value applied:	Following values are applied for each waste type *j* according to the values provided in the "Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site".
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Waste Type *j*	DOC_j (% wet waste)	DOC_j (% dry waste)
Food	15	38
Garden	20	49
Wood and Straw	43	50
Paper	40	44
Textiles	24	30
Disposable nappies	24	30

Data / Parameter:	k_j
Data unit:	-
Description:	Decay rate for the waste type j
Source of data used:	"Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site"
Value applied:	Following values are applied for each waste type *j* according to the values provided in the "Tool to determine the methane emissions avoided from dumping waste at a solid waste disposal site". The conditions for the project site is tropical (MAT>20℃) and wet (MAP>1000mm), and the decomposition of waste is very fast (Rapidly degrading).
Justification of the choice of data or description of	

Waste Type *j*	Tropical (MAT>20℃) Wet (MAP>1000mm)
Food	0.4
Garden	0.17
Wood and Straw	0.035
Paper	0.07
Textiles	0.07
Disposable nappies	0.17

measurement methods and procedures actually applied :	
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

>>

<u>Project Emissions</u>

$$PE_y = PE_{elec,y} + PE_{fuel,on-site,y} + PE_{c,y} \quad (1)$$

Where:

PE_y	is the project emissions during the year y (tCO_2e/yr)
$PE_{elec,y}$	is the emissions from electricity consumption due to the project activity during the year y (tCO_2/yr)
$PE_{fuel,on-site,y}$	is the emissions on-site due to fuel consumption on-site in year y (tCO_2/yr)
$PE_{c,y}$	is the emissions during the composting process in year y (tCO_2e/yr)

PE_y	$PE_{elec,y}$	$PE_{fuel,on-site,y}$	$PE_{c,y}$
tCO_2e/yr	tCO_2/yr	tCO_2/yr	tCO_2e/yr
1,387	59	389	368

Emissions from electricity use ($PE_{elec,y}$)

$$PE_{elec,y} = EG_{PJ,EF,y} \times CEF_{elec} \quad (2)$$

Where:

$PE_{elec,y}$	is the emissions from electricity consumption due to the project activity during the year y (tCO_2/yr)
$EG_{PJ,EF,y}$	is the amount of electricity generated in an on-site fossil fuel fired power plant or consumed from the grid in the project activity, measured using an electricity meter (MWh)
CEF_{elec}	CO_2 emission factor for electricity generation in the project activity (tCO_2/MWh)

$PE_{elec,y}$	$EG_{PJ,EF,y}$	CEF_{elec}
tCO_2/yr	MWh	tCO_2/MWh
118	164	0.719

Emissions from fuel use on-site ($PE_{fuel,on-site,y}$)

$$PE_{fuel,on-site,y} = F_{cons,y} \times NCV_{fuel} \times EF_{fuel} \quad (3)$$

Where:

$PE_{fuel,on-site,y}$	is the CO_2 emissions due to on-site fuel combustion in year *y* (tCO_2/yr)
$F_{cons,y}$	is the fuel consumption on site in year *y* (l)
NCV_{fuel}	is the net calorific value of the fuel (MJ/l)
EF_{fuel}	is the CO_2 emission factor of the fuel (tCO_2/MJ)

$PE_{fuel,on-site,y}$	$F_{cons,y}$	NCV_{fuel}	EF_{fuel}
tCO_2/yr	l	MJ/l	tCO_2/MJ
593	220,758	36.3	0.000074

Emissions from Composting ($PE_{c,y}$)

$$PE_{c,y} = PE_{c,N2O,y} + PE_{c,CH4,y} \quad (4)$$

Where:

$PE_{c,y}$	is the emissions during the composting process in year *y* (tCO_2e/yr)
$PE_{c,N2O,y}$	is the N_2O emissions during the composting process in year *y* (tCO_2e/yr)
$PE_{c,CH4,y}$	is the emissions during the composting process due to methane production through anaerobic conditions in year *y* (tCO_2e/yr)

$PE_{c,y}$	$PE_{c,N2O,y}$	$PE_{c,CH4,y}$
tCO_2e/yr	tCO_2e/yr	tCO_2e/yr
677	677	0

N_2O emissions

$$PE_{c,N2O,y} = M_{compost,y} \times EF_{c,N2O} \times GWP_{N2O} \quad (5)$$

Where:

$PE_{c,N2O,y}$	is the N_2O emissions during the composting process in year *y* (tCO_2e/yr)
$M_{compost,y}$	is the total quantity of compost produced in year y (tonnes/yr)
$EF_{c,N2O}$	is the emission factor for N_2O from the composting process (tN_2O/t compost)
GWP_{N2O}	is the Global Warming Potential of nitrous oxide, (tCO_2/tN_2O)

$PE_{c,N2O,y}$	$M_{compost,y}$	$EF_{c,N2O}$	GWP_{N2O}
tCO_2e/yr	tonnes/yr	tN_2O/t compost	tCO_2/tN_2O
677	50,808	0.000043	310

CH_4 emissions

$$PE_{c,CH4,y} = M_{compost,y} \times GWP_{N2O} \times S_{a,y} \quad (6)$$

Where:

$PE_{c,CH4,y}$	is the project methane emissions due to anaerobic conditions in the composting process in year *y* (tCO_2e)
$M_{compost,y}$	is the total quantity of compost produced in year y (tonnes/yr)
GWP_{CH4}	is the Global Warming Potential of methane, (tCO_2/tCH_4)
$S_{a,y}$	is the share of the waste that degrades under anaerobic conditions in the composting plant during year *y* (%)

$PE_{c,CH4,y}$	$M_{compost,y}$	GWP_{CH4}	$S_{a,y}$
tCO_2e/yr	tonnes/yr	tCO_2/tCH_4	%
0	50,808	21	0

$$S_{a,y} = S_{OD,y} / S_{total,y} \quad (7)$$

Where:

$S_{a,y}$	is the share of the waste that degrades under anaerobic conditions in the composting plant during year *y* (%)
$S_{OD,y}$	is the number of samples per year with an oxygen deficiency (i.e. oxygen content below 10%)
$S_{total,y}$	is the total number of samples taken per year, where $S_{total,y}$ should be chosen in a manner that ensures the estimation of $S_{a,y}$ with 20% uncertainty at a 95% confidence level.

$S_{a,y}$	$S_{OD,y}$	$S_{total,y}$
%	-	-
0	0	5,000

Baseline Emissions

$$BE_y = MB_y - MD_{reg,y} + BE_{EN,y} \quad (8)$$

Where:

BE_y	is the baseline emissions in year *y* (tCO_2/yr)
$MB_{reg,y}$	is the methane produced in the landfill in the absence of the project activity in year *y* (tCO_2e/yr)
$MD_{reg,y}$	is the methane that would be destroyed in the absence of the project activity in year *y* (tCO_2e/yr)
$BE_{EN,y}$	Baseline emissions from generation of energy displaced by the project activity in year *y* (tCO_2/yr)

Year *y*	BE_y	MB_y	$MD_{reg,y}$	$BE_{EN,y}$
	tCO_2/yr	tCO_2e/yr	tCO_2e/yr	tCO_2/yr
2009	27,355	27,355	0	0

2010	47,181	47,181		
2011	61,780	61,780		
2012	72,720	72,720		
2013	81,075	81,075		
2014	87,581	87,581		
2015	92,748	92,748		

Adjustment Factor (AF)

$$MD_{reg,y} = MB_y \times AF \tag{9}$$

Where:

AF is the Adjustment Factor for MB_y (%)

$MD_{reg,y}$	MB_y	AF
tCO_2e/yr	tCO_2e/yr	%
0	See table above	0

Methane generation from the landfill in the absence of the project activity (MB_y)

$$MB_y = BE_{CH4,SWDS,y} \tag{10}$$

$$BE_{CH4,SWDS,y} = \varphi \cdot (1-f)\cdot(1-OX)\cdot\frac{16}{12}\cdot F\cdot DOC_f\cdot MCF\cdot\sum_{x=1}^{y}\sum_{j}W_{j,x}\cdot DOC_j\cdot e^{-kj\cdot(y-x)}\cdot\left(1-e^{-kj}\right) \tag{11}$$

Where:

MB_y	is $BE_{CH4,SWDS,y}$ (tCO_2e/yr)
$BE_{CH4,SWDS,y}$	is the methane emissions avoided during the year *y* from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity to the end of the year *y* (tCO_2e/yr)
ϕ	is the model correction factor to account for model uncertainties (0.9)
f	is the fraction of methane captured at the SWDS and flared, combusted or used in another manner
GWP_{CH4}	is the Global Warming Potential (GWP) of methane, valid for the relevant commitment period
OX	is the oxidation factor (reflecting the amount of methane from SWDS that is oxidised in the soil or other material covering the waste)
F	is the fraction of methane in the SWDS gas (volume fraction) (0.5)
DOC_f	is the fraction of degradable organic carbon (DOC) that can decompose
MCF	is the methane correction factor

$W_{j,x}$	is the amount of organic waste type *j* prevented from disposal in the SWDS in the year *x* (tonnes)
DOC_j	is the fraction of degradable organic carbon (by weight) in the waste type *j*
k_j	is the decay rate for the waste type *j*
j	is the waste type category (index)
x	is the year during the crediting period: *x* runs from the first year of the first crediting period (*x*=1) to year *y* for which avoided emissions are calculated (*x*=*y*)
y	is the year for which methane emissions are calculated

$$W_{j,x} = W_x \times \frac{\sum_{n=1}^{z} P_{n,j,x}}{z} \qquad (12)$$

Where:

$W_{j,x}$	is the amount of organic waste type *j* prevented from disposal in the SWDS in the year *x* (tonnes)
W_x	is the total amount of organic waste prevented from disposal in year *x* (tonnes)
$P_{n,j,x}$	is the weight fraction of the waste type *j* in the sample *n* collected during the year *x*
z	is the number of samples collected during the year *x*

Year *y*	MB_y	$BE_{CH4,SWDS,y}$
	tCO_2e/yr	tCO_2e/yr
2009	27,355	27,355
2010	47,181	47,181
2011	61,780	61,780
2012	72,720	72,720
2013	81,075	81,075
2014	87,581	87,581
2015	92,748	92,748

ϕ	f	GWP_{CH4}	OX	F	DOC_f	MCF
-	-	-	-	-	-	-
0.9	0	21	0	0.5	0.5	0.8

Waste type *j*	$W_{j,x}$	DOC_j	k_j
	tons/yr	%	1/yr
Food	79,745	0.15	0.4
Garden	34,933	0.20	0.17
Wood and Straw	10,838	0.43	0.035
Paper	6,878	0.40	0.07
Textiles	5,669	0.24	0.07
Disposable nappies	0	0.24	0.17

Year	W_x
	tons/yr
2009	182,500
2010	182,500
2011	182,500
2012	182,500
2013	182,500
2014	182,500
2015	182,500

Waste Type	$P_{n,j,x}$
	%
Food	43.7
Garden	19.1
Paper	5.9
Wood	3.8
Textile	3.1
Nappies	0.0
Plastics, other inert	24.3

Baseline emissions from generation of electricity displaced by the project activity

This section is not applicable since the proposed project activity does not involve any electricity generation.

Baseline emissions from electricity and heat cogeneration that is displaced by the project activity

This section is not applicable since the proposed project activity does not involve electricity or heat cogeneration.

<u>Leakage</u>

$$L_y = L_{t,y} + L_{r,y} + L_{s,y} \quad (13)$$

Where:

L_y is the leakage emissions during the year y (tCO_2e/yr)

$L_{t,y}$ is the leakage emissions from increased transport in year y (tCO_2e/yr)

$L_{r,y}$ is the leakage emissions from the residual waste from the anaerobic digester, the gasifier, the processing/combustion of RDF/stabilized biomass, or compost in case it is disposed of in landfills in year y (tCO_2e/yr)

$L_{s,y}$ is the leakage emissions from end use of compost in year y (tCO_2e/yr)

L_y	$L_{t,y}$	$L_{r,y}$	$L_{s,y}$
tCO_2e/yr	tCO_2e/yr	tCO_2e/yr	tCO_2/yr
0	0	N/A	0

Since the degradable organic carbon and the decay rate of the compost disposed in the landfill is very small, the leakage emissions from compost is assumed to be negligible. The DOC and k value will be monitored in the project activity.

<u>Emission Reduction</u>

$$ER_y = BE_y - PE_y - L_y \quad (14)$$

Where:

ER_y	is the emissions reductions in year y (tCO_2e)
BE_y	is the emissions in the baseline scenario in year y (tCO_2e)
PE_y	is the emissions in the project scenario in year y (tCO_2e)
L_y	is the leakage in year y (tCO_2e)

B.6.4 Summary of the ex-ante estimation of emission reductions:

>>

The ex-ante emission reductions throughout the crediting period are estimated as below:

Year y	ER_y	BE_y	PE_y	L_y
	tCO_2e/yr	tCO_2e/yr	tCO_2e/yr	tCO_2e/yr
2009	25,967	27,355	1,388	0
2010	45,793	47,181	1,388	0
2011	60,392	61,780	1,388	0
2012	71,332	72,720	1,388	0
2013	79,687	81,075	1,388	0
2014	86,193	87,581	1,388	0
2015	91,360	92,748	1,388	0

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

B.7.1 Data and parameters monitored:

Data / Parameter:	$EG_{PJ,EF,y}$
Data unit:	MWh/year
Description:	The amount of electricity consumed from the grid in the project activity.
Source of data to be used:	Measurements at the composting facility and metering data from the electric company.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	164 MWh
Description of measurement methods and procedures to be applied:	Electricity consumption will be measure by an electric meter of the composting facility.
QA/QC procedures to be applied:	The electric meter will be checked periodically to test the accuracy of its measurement. The data will be double checked with the electric company.
Any comment:	

Data / Parameter:	$F_{cons,y}$
Data unit:	l/year

Description:	The diesel fuel consumption by vehicles.
Source of data to be used:	Fuel purchase invoice and/or metering
Value of data applied for the purpose of calculating expected emission reductions in section B.5	220,758 l
Description of measurement methods and procedures to be applied:	Original invoices for fuel purchases would be kept by paper as well as electronic data by the SPC.
QA/QC procedures to be applied:	Consistency between the original invoice and the accumulated electronic data will be checked periodically.
Any comment:	

Data / Parameter:	$M_{compost,y}$
Data unit:	tonnes / yr
Description:	Quantity of compost produced.
Source of data to be used:	Record of compost facility
Value of data applied for the purpose of calculating expected emission reductions in section B.5	(see table below)
Description of measurement methods and procedures to be applied:	Measured by truck scale. Data will be stored by paper as well as electronic data.
QA/QC procedures to be applied:	Periodical calibration of the truck scale.
Any comment:	

Year	$M_{compost,y}$ tonnes/yr
2009	50,808
2010	50,808
2011	50,808
2012	50,808
2013	50,808
2014	50,808
2015	50,808

Data / Parameter:	$S_{OD,y}$
Data unit:	Dimensionless
Description:	The number of samples taken per year with an oxygen deficiency (i.e. oxygen content below 10%)
Source of data to be used:	On-site measurement

Value of data applied for the purpose of calculating expected emission reductions in section B.5	0 (For ex-ante estimation, it is assumed that no samples will have oxygen deficiency in the composting process.)
Description of measurement methods and procedures to be applied:	Oxygen concentration will be measured using a portable oxygen analyzer.
QA/QC procedures to be applied:	Calibration of oxygen analyzer will be done periodically.
Any comment:	

Data / Parameter:	$S_{total,y}$
Data unit:	Dimensionless
Description:	The total number of samples taken per year.
Source of data to be used:	On-site measurement
Value of data applied for the purpose of calculating expected emission reductions in section B.5	5,000 (number of samples taken will be decided after commencement of the project taking into account the result of the first measurement)
Description of measurement methods and procedures to be applied:	
QA/QC procedures to be applied:	Frequency of measurement and the number of samples taken will be decided so as to comply with the statistical requirements.
Any comment:	

Data / Parameter:	W_x
Data unit:	Tonnes/year
Description:	Total amount of organic waste prevented from disposal during the year *x*
Source of data to be used:	On-site measurements

Value of data applied for the purpose of calculating expected emission reductions in section B.5	<table><tr><td rowspan="2">Year</td><td>W_x</td></tr><tr><td>tons/yr</td></tr><tr><td>2009</td><td>182,500</td></tr><tr><td>2010</td><td>182,500</td></tr><tr><td>2011</td><td>182,500</td></tr><tr><td>2012</td><td>182,500</td></tr><tr><td>2013</td><td>182,500</td></tr><tr><td>2014</td><td>182,500</td></tr><tr><td>2015</td><td>182,500</td></tr></table>
Description of measurement methods and procedures to be applied:	The amount of organic waste prevented from disposal is the amount of organic waste processed at the composting facility. This amount will be measured at the truck scale which will be located at the entrance of the facility.
QA/QC procedures to be applied:	Periodical calibration of the truck scale.
Any comment:	

Data / Parameter:	$\boldsymbol{P_{n,j,x}}$
Data unit:	% by weight of waste
Description:	Weight fraction of the waste type *j* in the sample *n* collected during the year *x*
Source of data to be used:	Sample on-site measurements
Value of data applied for the purpose of calculating expected emission reductions in section B.5	<table><tr><td rowspan="2">Waste Type</td><td>$P_{n,j,x}$</td></tr><tr><td>%</td></tr><tr><td>Food</td><td>43.7</td></tr><tr><td>Garden</td><td>19.1</td></tr><tr><td>Paper</td><td>5.9</td></tr><tr><td>Wood</td><td>3.8</td></tr><tr><td>Textile</td><td>3.1</td></tr><tr><td>Nappies</td><td>0.0</td></tr><tr><td>Plastics, other inert</td><td>24.3</td></tr></table>
Description of measurement methods and procedures to be applied:	Sampling of waste will be conducted at least four times a year. Volume of waste to be sampled, and the frequency of sampling will be adjusted in the project activity to meet the statistical requirements.
QA/QC procedures to be applied:	
Any comment:	

Data / Parameter:	***z***
Data unit:	Dimensionless
Description:	Number of samples taken per year, for determination of waste composition, $\boldsymbol{P_{n,j,x}}$

Source of data to be used:	On-site measurement
Value of data applied for the purpose of calculating expected emission reductions in section B.5	N/A
Description of measurement methods and procedures to be applied:	Number of samples taken for analysis will be recorded on paper and electronic format.
QA/QC procedures to be applied:	
Any comment:	

>>
All data will be converted and stored by electronic format and cross checked with the original data. The data and calculation result will be managed by the SPC that will be established for project implementation. The various data and calculation results will be verified by a DOE yearly for the issuance of CER's.

	Items	Responsible Organization	Description
1	Monitoring Planning	SPC	Training will be done for the O/M team for the good understanding of the monitoring plan and the actual monitoring methods.
2	Monitoring	SPC or outsourced	All data will be stored by paper and electronic files.
3	Monitoring of Regulation	SPC or outsourced	Periodical reports will be made
4	Calibration of Monitoring Equipments	Authorized entity	Calibration record will be kept by the SPC

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

>>
Date of completion of the application of the methodology to the project activity: 01/10/2008

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SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>
The project is expected to start from July 2009 (1/7/2009)

C.1.2. Expected operational lifetime of the project activity:

>>
7 years.

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

>>
01/07/2009

C.2.1.2. Length of the first crediting period:

>>
7 years.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
Not selected.

C.2.2.2. Length:

>>
Not selected.

SECTION D. Environmental impacts

>>
The project might have some environmental impacts such as air pollution, noise and odour emissions, etc. which may occur along with construction and operation of the facility. However, the project's overall impact on environment will be small, and be reduced to minimum by implementation of project.

Negative impacts that may occur on environment during construction and operation include as follows;
<Construction>

- Air pollution, through the use of fossil fuel on vehicles required for transportation of construction materials, and machinery required for construction.
- Generation of noise to some extent, due to material transportation, number of worker increase, installing of facilities, etc.
- Generation of the waste due to the construction work

<Operation>

- Generation of noise due to facility operation
- Generation of unpleasant smells, due to the storage and treatment of organic wastes.
- Generation of wastes (or residue) through the sorting and treatment process

These negative impacts shall be reduced by taking the appropriate mitigation measures. In addition, all the potential negative impacts were taken into account in the environmental management plan which was developed in accordance with the Environmental Impact Assessment System defined by the Law on Environmental Protection.

Positive environmental impacts of the project activity are as follows;

- Significant decrease of methane generation due to organic waste degradation in the landfill, which contributes to avoiding the GHG emissions
- Decrease of leachate generation and of its contaminant load
- Extension of the landfill life time due to smaller amount of disposed waste.
- Improvement of landfill's stability.
- Decrease of fire and explosions risk in the landfill
- Recovery of recycling materials and decrease of impacts generated by the extraction of new raw materials.

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>>
The Environmental Impact Assessment report of the project will be completed by the project participants, in line with the new Environmental Protection Law of 2006.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>
Project participants expect no significant negative environmental impact from the project activity.

SECTION E. Stakeholders' comments

>>

E.1. Brief description how comments by local stakeholders have been invited and compiled:

>>

This project is to establish the waste treatment facilities within on the area of the existing landfill site. Thus, the local stakeholders in the project area include;

- Ministry of natural Resources and Environment (MONRE) - as they have jurisdiction over the waste management, and MONRE is the DNA in Viet Nam
- Da Nang People's Committee (Da Nang PC) – as they are a local authority that govern Da Nang City
- Local Communities – They comprise of the local people around the project area. The role of the local people is as beneficiary of the project because a large number of jobs will be created for them. On the other hand they might experience some odour emissions from the compost plant.

The project participants have conducted two meetings to have comments from MONRE, and Da Nang PC. In these meetings, the general plans on project activities including applied methodologies, project scale, implementation structures, schedule, etc were presented, followed by the discussion about the feasibility of the study and feedback comments from the participants.

The meeting with the local community has not been completed. It will be arranged and carried out before the project implementation.

E.2. Summary of the comments received:

>>

Since this project will contribute to improving the waste management in Da Nang City, as well as reducing the GHG emission through the organic waste composting, all parties joined the meetings welcomed the project activities and expressed their support for the implementation of project in Da Nang City.

Major comments from stakeholders are as follows;

MONRE: Fully understand the methodologies for this project activity and, it can be considered to be suitable to Da Nang City, and correspond to the national policies of Viet Nam, as well.

Da Nang PC: Welcome the project implementation, and agree to use the part of Khahn Son landfill site for the waste treatment plant.

E.3. Report on how due account was taken of any comments received:

>>

At present project has not received any claims from local stakeholders to obstruct project implementation.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

Annex 3

BASELINE INFORMATION

Annex 4

MONITORING INFORMATION

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