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

CONTENTS

Annexes

SECTION A. General description of project activity

A.1. Title of the project activity:

>>
Tal Dman Landfill Gas Capture Project in Aleppo Ver1.0, 09/05/2008

A.2. Description of the project activity:

>>
In the project, it is planned to capture landfill gas (LFG) emitted on a Tal Dman Landfill site in Aleppo in the Syrian Arab Republic and to combust and destroy methane gas, which is a flammable greenhouse gas (GHG) contained in the LFG, in a flare stack.

The project proposes to install landfill gas (LFG) collection pipes on the landfill site, and to collect LFG to be combusted and destroyed via flare stack. Since combustion and destruction of LFG in a flare stack leads to conversion of methane gas into carbon dioxide, this will be effective in terms of reducing greenhouse gas emissions.

In the project, it is planned to commission the flaring system from January 2009.

Currently, LFG treatment from the landfill site is not properly carried out. Therefore, LFG from the site is indiscriminately discharged into the atmosphere and conditions remain poor in terms of the local environment. That is to say, the LFG emits odor when it is in low concentrations and carries risk of explosion or ignition when it is highly concentrated. Furthermore, since the main constituent of LFG is methane gas, which has a global warming potential (GWP) of 21, this has an adverse impact on the environment. Moreover, there is currently no legislation requiring the collection of LFG from landfill sites in Aleppo or indeed the Syrian Arab Republic, and the government has no plans to introduce such regulations in the future.

The project can be expected to improve the sanitary situation and general environment as well as mitigate the risk of disasters through improving storm water drainage, preventing odor, controlling outbreaks of flies and pests and controlling flocks of birds, etc. Moreover, implementation of the project will contribute to local job creation.

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)
Syrian Arab Republic (host)	Aleppo Govenorate / Public	No
Japan	Shimizu Corporation / Private	No

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

>>

A.4.1.1. Host Party(ies):

>>
Syrian Arab Republic

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

>>
Aleppo Province

A.4.1.3. City/Town/Community etc.:

>>
Aleppo City

Figure 1 shows the location of the Syrian Arab Republic and Aleppo City..

Source: http://www.lib.utexas.edu/maps/cia07/syria_sm_2007.gif

Figure 1 Location of Syrian Arab Republic and Aleppo City

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

>>

The landfill site is located approximately 50 km south of the center of Aleppo City. The overall disposal site covers approximately 45 ha, while the project target area is approximately 9 ha. Landfilling of the target waste was started in 2002 and the waste that was landfilled up to 2015 will be targeted.

The annual intake of solid waste at the site over the target period is as indicated in Annex 3 BASELINE INFORMATION. It is planned for the site to landfill a total of 3,360,000 tons over this period.

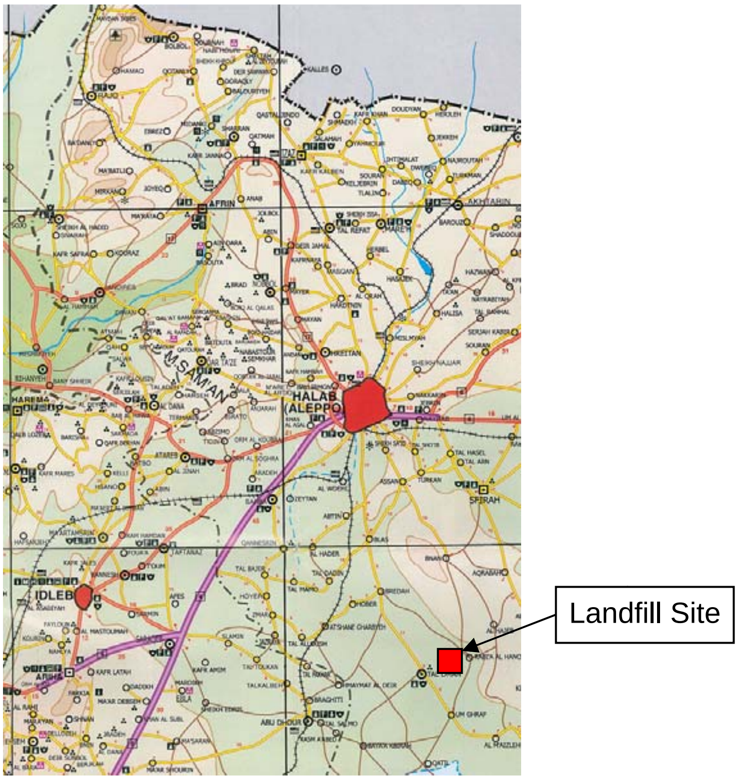

Figure 2 Location of Landfill site

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

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Sectoral Scope 13: Waste handling and disposal

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

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LFG collection system technology.

This is composed of vertical extraction wells, horizontal gas drains, measuring instruments, blowers and gas treatment equipment. In this system, highly efficient LFG collection can be anticipated.

Flaring technology.

The flare facilities combust and thereby destroy any LFG that could not be destroyed in the gas engine generator. In order to stably combust and destroy LFG, closed flare facilities are used.

Figure 3 shows a schematic view of the overall project system.

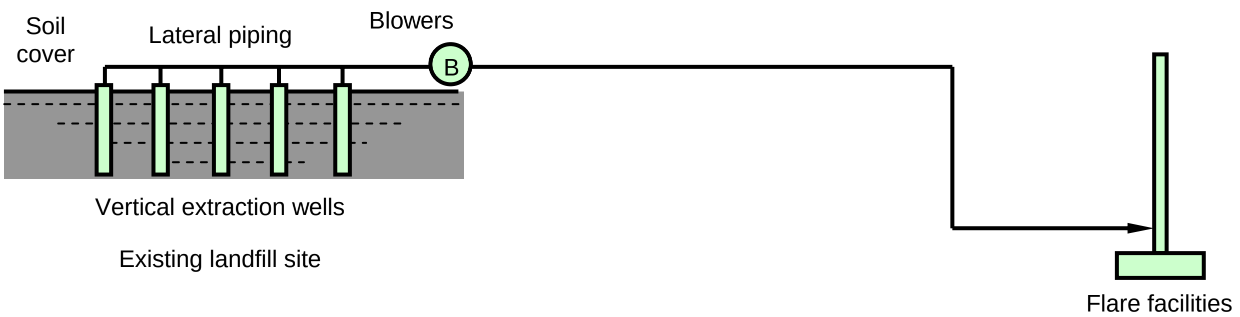

Figure 3 Project system schematic

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

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The project crediting period is 14 years and the amount of reduction is calculated as follows.

Year	Annual estimation of emission reductions in tonnes of CO_2e
2009	52,880
2010	50,067
2011	47,406
2012	44,889
2013	79,851
2014	75,622
2015	71,621
2016	67,837
2017	101,600
2018	96,235
2019	91,160
2020	86,360
2021	81,818
2022	77,521
Total estimated reductions (tCO_2e)	1,024,866
Total number of crediting years	14
Annual average over the crediting period of estimated reductions (tCO_2e)	73,205

A.4.5. Public funding of the project activity:

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The project will not utilize any official funding from Annex I countries.

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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Methodology

Version08 of ACM0001

"Consolidated baseline and monitoring methodology for landfill gas project activities"

Tool

Version04 of the "Tool for the demonstration and assessment of additionality"

Version01 of the "Tool to determine project emissions from flaring gases containing methane"

Version01 of the "Tool to calculate project emissions from electricity consumption"

Version02 of the "*Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site*"

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

>>

This methodology ACM0001 states the following contents concerning applicability.

"This methodology is applicable to landfill gas capture project activities, where the baseline scenario is the partial or total atmospheric release of the gas and the project activities include situations such as:

a) The captured gas is flared; or
b) The captured gas is used to produce energy (e.g. electricity/thermal energy); or
c) The captured gas is used to supply consumers through natural gas distribution network. If emissions reductions are claimed for displacing natural gas, project activities may use approved methodologies AM0053.

In addition, the applicability conditions included in the tools referred to above apply.

Meanwhile, conditions in the Project are as follows:

① Currently, LFG collection is not carried out on the landfill site and all LFG is released into the atmosphere. (Baseline)

② The project proposes to collect LFG on the landfill site and the captured gas is flared.

Therefore, since the project falls under applicability of (a) for the approved consolidated baseline methodology ACM0001, this methodology is applied.

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

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According to ACM0001, the project boundary is the site of the project activity where the gas is captured and destroyed/used. In the project, however, sine the electricity for project activity is sourced from the grid, the project boundary shall include all the power generation sources connected to the grid to which the project activity is connected. The project boundary here is as indicated in Figure 4.

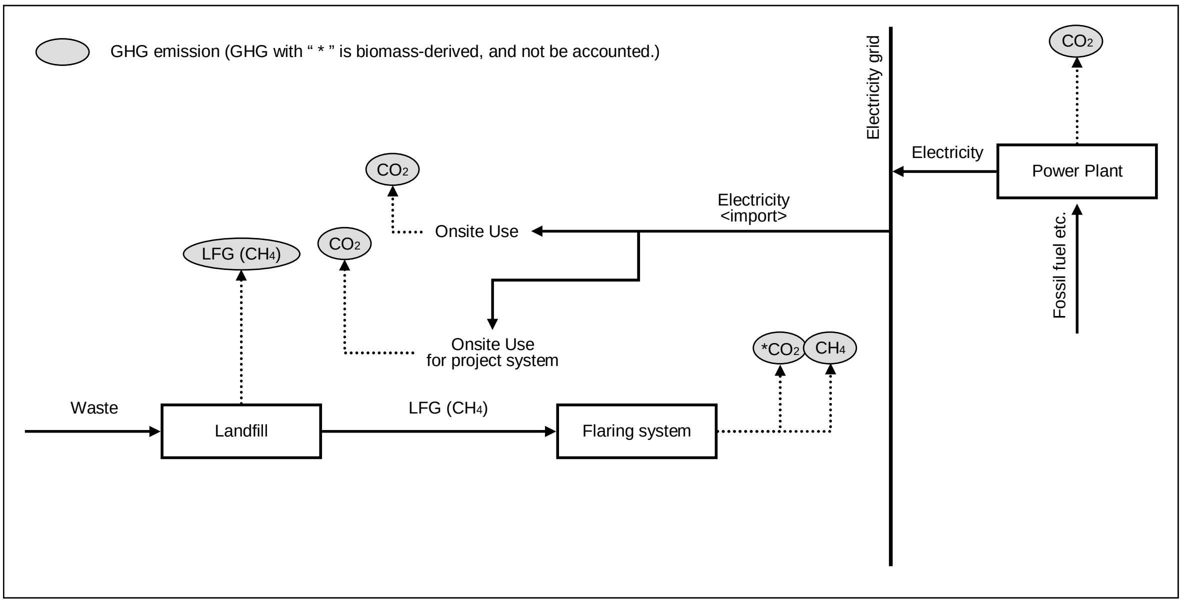

Figure 4 Project boundary

Moreover, generation sources and gases included in the project boundary are as indicated below.

	Source	Gas	Included ?	Justification/ Explanation
Baseline	Emissions from decomposition of waste at the landfill site	CH_4	Yes	The major source of emissions in the baseline
		N_2O	NO	N_2O emissions are small compared to CH_4 emissions from landfills. Exclusion of this gas is conservative.
		CO_2	NO	CO_2 emissions from the decomposition of organic waste are not accounted.
	Emissions from electricity consumption	CO_2	NO	There is no electricity generation in the project.
		CH_4	NO	Excluded for simplification. This is conservative.
		N_2O	NO	Excluded for simplification. This is conservative.
	Emissions from thermal energy generation	CO_2	NO	There is no thermal energy generation
		CH_4	NO	Excluded for simplification. This is conservative.
		N_2O	NO	Excluded for simplification. This is conservative.
Project Activity	On-site fossil fuel consumption due to the project activity other than for electricity generation	CO_2	NO	There is no consumption of fossil fuels in the project activity.
		CH_4	NO	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	NO	Excluded for simplification. This emission source is assumed to be very small.
	Emissions from on-site electricity use	CO_2	Yes	Electricity may be consumed from the grid in the project activity
		CH_4	NO	Excluded for simplification. This is conservative.
		N_2O	NO	Excluded for simplification. This is conservative.

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

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The baseline scenario is set based on *ACM0001*.

STEP 1: Identification of alternative scenarios.

According to ACM0001, Step 1 of the "Tool for the demonstration and assessment of additionality" is used to identify the baseline options.

(Step 1: Identification of alternatives to the project activity consistent with current laws and regulations)

Out of the scenarios indicated in *ACM0001,* upon considering conditions in the host country and current legislation and so on, the following are selected as the realistic and credible baseline alternatives. Incidentally, since there is no demand for heat utilization in the local area, this is not considered in the alternatives.

Scenario	Baseline			Description of situation
	LFG	electricity	Heat	
1	LFG2	-	-	Atmospheric release of LFG, no capture based on legislation, etc. (Maintenance of status quo)
2	LFG1	P6	-	In the case where the proposed project activity is undertaken without being registered as a CDM project activity, capture the LFG and combust by flaring. Power consumed in the project is obtained from the grid.
3	LFG1	P1 and P6	-	Capture of LFG, flaring and generation of power. Power generated from LFG (excluding the power consumed on site) is supplied to the grid. Power consumed in the project is obtained from the grid.

Moreover, the current laws, regulations and guidelines that apply to the above scenarios are as follows.
<Laws, regulations and guidelines (hereinafter referred to as "general items)>

- Law on Nature Protection
- Law on the Protection of Ambient Air
- Law on Water and Water Use
- Law on Environmental Assessment
- Law on Waste Management
- National Environmental Action Plan

STEP 2: Identify the fuel for the baseline choice of energy source taking into account the national and/or sectoral policies as applicable.

Concerning the baseline energy, no energy is used in Scenario 1. Electric power is used in Scenarios 2 and 3, however, since part of the generated power is used or power is obtained from the grid, there is no restriction on the supply.

STEP 3: assess which of alternatives should be excluded from further consideration.

According to ACM0001, Step 2 and/or *Step 3of the "Tool for the demonstration and assessment of additionality are used.*

(Step 2: Investment Analysis)

(sub-step 2a Determine appropriate analysis method)

Scenario 3 includes income (from sale of electricity). Therefore, Option I (Apply simple cost analysis) cannot be adopted, so it is necessary to select from either Option II (Apply investment comparison analysis) or Option III (Apply benchmark analysis). Here Option II is adopted.

(sub-step 2b Option II: Apply investment comparison analysis)

IRR can be calculated either as project IRR or equity IRR. Here, we adopt project IRR.

(sub-step 2c Calculation and comparison of financial indicators)

First, analysis of Scenario 2 is carried out. In Scenario 2, there is investment, but since there are no returns, this cannot be the baseline scenario.
Next, the analysis of Scenario 3 is carried out. In Scenario 3, it is assumed that a 1,000 kW gas engine is introduced. Here, there is investment, but the problem is whether or not corresponding returns can be anticipated. As a result of calculating the IRR, the IRR was found to be minus and it became clear that the investment is not worthwhile. Therefore, it was demonstrated that Scenario 3 is not the baseline.

The preconditions and results of the calculation are indicated in Annex 3: BASELINE INFORMATION.

(sub-step 2d Sensitivity analysis)

In Scenario 2, since there is investment but no returns, this means that this cannot become the baseline scenario. Accordingly, sensitivity analysis is only carried out on Scenario 3.
In Scenario 3, it is assumed that a 1,000 kW gas engine is introduced. Sensitivity analysis is carried out assuming the parameters of initial cost, running cost, unit price of power sale, generated amount of LFG and inflation rate. The range of fluctuation shall be -10%~+10% for the initial cost, running cost and unit price of power sale, -20%~+20% for the generated amount of LFG, and -10%~+10% for the inflation rate. As a result of the sensitivity analysis, the IRR is minus in all scenarios, indicating that the forecast results in sub-step 2c remain the same irrespective of the surrounding conditions.

Details of the sensitivity analysis are given in Annex 3: BASELINE INFORMATION.

(Step 3 Barrier Analysis)

Since Step 2 was implemented, Step 3 can be skipped.

STEP 4: determine baseline scenarios

STEP 3 showed that Scenarios 2 and 3 cannot become the baseline. Moreover, since the host country has no legal obligation or funding regarding the collection of methane, it is projected that the status quo will continue. Accordingly, Scenario 1 (maintenance of status quo) is set as the baseline scenario.

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):

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Additionality is demonstrated according to Version04 of the *"Tool for the demonstration and assessment of additionality."*

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

sub-step 1a Define alternatives to the project activity

As was indicated in Section B.4, the alternatives to the project activity are as indicated below.

Scenario	Baseline			Description of situation
	LFG	electricity	Heat	
1	LFG2	-	-	Atmospheric release of LFG, no capture based on legislation, etc. (Maintenance of status quo)
2	LFG1	P6	-	In the case where the proposed project activity is undertaken without being registered as a CDM project activity, capture the LFG and combust by flaring. Power consumed in the project is obtained from the grid.
3	LFG1	P1 and P6	-	Capture of LFG, flaring and generation of power. Power generated from LFG (excluding the power consumed on site) is supplied to the grid. Power consumed in the project is obtained from the grid.

sub-step 1b Consistency with mandatory laws and regulations

This is the same as indicated in STEP 1 in Section B.4.

Step 2 Investment Analysis

This is the same as indicated in STEP 3 in Section B.4.

Step 3 Barrier Analysis

This is the same as indicated in STEP 3 in Section B.4.

Step 4 Common Practice Analysis

There is no evidence to suggest that a similar project has been, is being, or will be implemented in the Syrian Arab Republic (text of the additionality demonstration tool: "in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.")

As was indicated in Section B.4, the baseline scenario is Scenario 1 (maintenance of the status quo). Moreover, the project activity, which is scenario 2, cannot be the baseline, and since the cumulative reduction in emissions resulting from the project activity over 14 years is 1,024,866 ton-CO_2, the project can be described as additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

>>

Based on *ACM0001*, the baseline emissions, project emissions and emission reductions in the Project are as follows. Incidentally, the expressions have been consolidated in consideration of the fact that there will be no power generation or heat energy generation from the collected LFG, nor any supply to the natural gas pipeline.

Baseline emissions

$$BE_y = (MD_{project,y} - MD_{BL}) \times GWP_{CH4} \quad (1)$$

BE_y	Baseline emissions in year y (tCO_2e)
$MD_{project,y}$	The amount of methane that would have been destroyed/combusted during the year in project scenario (tCH_4).
MD_{BL}	The amount of methane that would have been destroyed/combusted during the year in the absence of the project due to regulatory and/or contractual requirement, in tonnes of methane (tCH_4)
GWP_{CH4}	Global Warming Potential value for methane for the first commitment period is 21 tCO_2e/tCH_4

Here, each item is defined as follows:

$$MD_{BL} = MD_{project,y} \times AF \quad (2)$$

AF	Adjustment Factor

$$MD_{project,y} = MD_{flared,y} \quad (3)$$

$MD_{flared,y}$	Quantity of methane destroyed by flaring (tCH_4)

$$MD_{flared,y} = (LFG_{flare,y} \times w_{CH4,y} \times D_{CH4}) - (PE_{flare,y} / GWP_{CH4}) \quad (4)$$

$LFG_{flare,y}$	The quantity of landfill gas fed to the flare(s) during the year (m^3)
$w_{CH4,y}$	The average methane fraction of the landfill gas as measured during the year (m^3CH_4/m^3LFG)

D_{CH4}	The methane density (tCH_4/m^3CH_4)
$PE_{flare,y}$	The project emissions from flaring of the residual gas stream in year y (tCO_2e) determined following the procedure described in the *"Tool to determine project emissions from flaring gases containing methane"*.

Here, the project emissions from flaring ($PE_{flare,y}$) are calculated by the following expression based on the *"Tool to determine project emissions from flaring gases containing methane."*

$$PE_{flare,y} = \sum_{(h=1\sim8760)} LFG_{flare,h} \times w_{CH4,h} \times D_{CH4} \times (1 - FE) \times GWP_{CH4} \quad (5)$$

$LFG_{flare,h}$	The quantity of landfill gas fed to the flare(s) in an hour (m^3)
$w_{CH4,h}$	The average methane fraction of the landfill gas in an hour (m^3CH_4/m^3LFG)
FE	Flare efficiency (-)

Project emissions

$$PE_y = PE_{EC,y} \quad (6)$$

$PE_{EC,y}$	Emissions from consumption of electricity in the project case calculated following the latest version of *"Tool to calculate project emissions from electricity consumption"*

Here, since power consumed in the project is obtained from the grid, Case A: Electricity consumption from the grid of the *"Tool to calculate project emissions from electricity consumption"* is applied. $PE_{EC,y}$ is calculated based on the following expression.

$$PE_{EC,y} = EC_{PJ,y} \times EF_{grid,y} \times (1 + TDL_y) \quad (7)$$

$EC_{PJ,y}$	The quantity of electricity consumed by the project activity during the year y (MWh)
$EF_{grid,y}$	The emissions factor for the grid in year y (tCO_2/MWh)
TDL_y	The average technical transmission and distribution losses in the grid in year y for the voltage level at which electricity is obtained from the grid at the project site

Leakage

According to ACM0001, there is no need to consider the effects of leakage.

Emission Reductions

Emission reductions are calculated by the following expression:

$$ER_y = BE_y - PE_y \quad (8)$$

ER_y	Emission reductions in year y (tCO_2e/yr)
BE_y	Baseline emissions in year y (tCO_2e/yr)
PE_y	Project emissions in year y (tCO_2e/yr)

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

(Copy this table for each data and parameter)

Data / Parameter:	Regulatory requirements relating to landfill gas projects
Data unit:	--
Description:	Regulatory requirements relating to landfill gas projects
Source of data used:	The DNA shall be contacted to provide information regarding host country regulation.
Value applied:	AF = 0
Justification of the choice of data or description of measurement methods and procedures actually applied:	Based on information obtained from the host country DNA, it has been confirmed that the host country has no legislation concerning capture of methane from landfill gas. Moreover, in the event where new regulations arise, calculate based on ACM0001.
Any comment:	The information though recorded annually, is used for changes to the adjustment factor (AF) or directly $MD_{BLg,y}$ at renewal of the credit period.

Data / Parameter:	GWP_{CH4}
Data unit:	tCO_2e/tCH_4
Description:	Global Warming Potential of CH_4
Source of data used:	IPCC
Value applied:	21
Justification of the choice of data or description of measurement methods and procedures actually applied:	21 for the first commitment period.
Any comment:	Confirm the latest information in monitoring.

Data / Parameter:	D_{CH4}
Data unit:	tCH_4/Nm^3CH_4
Description:	Methane density
Source of data used:	-
Value applied:	0.0007168
Justification of the choice of data or description of measurement methods and procedures actually applied :	At standard temperature and pressure (0 degree Celsius and 1,013 bar) the density of methane is 0.0007168 tCH_4/m^3CH_4
Any comment:	Confirm revision of the approval methodology during the monitoring.

B.6.3. Ex-ante calculation of emission reductions:

>>

Baseline emissions

As was indicated in Section B.6.1., expression (1) is used to make the calculation.

$$BE_y = (MD_{project,y} - MD_{BL,y}) \times GWP_{CH4} \quad (1)$$

According to *ACM0001*, $MD_{project,y}$ is calculated using the expression below in the ex-ante estimation.

$$MD_{project,y} = BE_{CH4,SWDS,y} / GWP_{CH4} \quad (9)$$

$BE_{CH4,SWDS,y}$	The methane generation from the landfill in the absence of the project activity at year y (tCO_2e)

$BE_{CH4,SWDS,y}$ is calculated using the latest version of the *"Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site."* Details of the calculation are shown in Annex 3: BASELINE INFORMATION.

Project emissions

As was indicated in Section B.6.1, project emissions are calculated from the project power consumption using expression (6).

$$PE_y = PE_{EC,y} \quad (6)$$

Leakage

As was indicated in Section B.6.1, according to *ACM0001* there is no need to consider the effects of leakage.

Emission Reductions

As was indicated in Section B.6.1, emission reductions are calculated using expression (8).

$$ER_y = BE_y - PE_y \quad (8)$$

Details on the above calculation conditions and calculation results are given in Annex 3: BASELINE INFORMATION.

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

The following table gives a summary of the ex-ante estimation of emission reductions caused by the project. It should be noted, however, that these figures are estimate values and not actual emissions. Actual emission reductions are directly measured in the monitoring.

Year	Estimation of	Estimation of	Estimation of	Estimation of

	project activity emission (tCO_2e)	baseline emission (tCO_2e)	leakage (tCO_2e)	emission reductions (tCO_2e)
2009	10,980	63,860	0	52,880
2010	21,092	71,158	0	50,067
2011	30,667	78,073	0	47,406
2012	39,735	84,624	0	44,889
2013	10,980	90,831	0	79,851
2014	21,092	96,714	0	75,622
2015	30,667	102,288	0	71,621
2016	39,735	107,572	0	67,837
2017	301	101,900	0	101,600
2018	301	96,536	0	96,235
2019	301	91,461	0	91,160
2020	301	86,660	0	86,360
2021	301	82,118	0	81,818
2022	301	77,821	0	77,521
Total	206,751	1,231,617	0	1,024,866

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

B.7.1. Data and parameters monitored:

>>

The following table shows the data and parameters in the monitoring.

Moreover, in the project, concerning the flare equipment efficiency, the default value for closed flare equipment indicated in the methodology, i.e. 0.9, has been adopted.

(Copy this table for each data and parameter)

Data / Parameter:	$LFG_{total,y}$
Data unit:	m^3
Description:	Total amount of landfill gas captured at normal temperature and pressure
Source of data to be used:	Measured on site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Measured continuously by a flow meter. Data to be aggregated monthly and yearly.
QA/QC procedures to be applied:	Flow meters should be subject to a regular maintenance and testing regime to ensure accuracy.
Any comment:	

Data / Parameter:	$LFG_{flare,y}$
Data unit:	m^3
Description:	Amount of landfill gas flared at normal temperature and pressure
Source of data to be used:	Flow meter Measured on site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Measured continuously by a flow meter. Data to be aggregated monthly and yearly.
QA/QC procedures to be applied:	Flow meters should be subject to a regular maintenance and testing regime to ensure accuracy.
Any comment:	

Data / Parameter:	$PE_{flare,y}$
Data unit:	tCO_2e
Description:	Project emissions from flaring of the residual gas stream in year y
Source of data to be used:	Calculated as per the *"Tool to determine project emissions from flaring gases containing Methane"*.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	(1) Temperature of flare exhaust gas T_{flare} Continuously measured by N-type thermocouple. (2) LFG flow supplied to the flare (hourly value) $LFG_{flare,h}$ Measured continuously by a flow meter. Values to be averaged hourly. (3) Methane ratio in LFG (hourly value) $w_{CH4,h}$ Measured continuously by gas analyzer. Values to be averaged hourly. (4) Flare efficiency FE Adopt the default value of 0.9. Check that the temperature in the exhaust gas of the flare (T_{flare}) is above 500 °C for more than 40 minutes during the hour h and the manufacturer's specifications on proper operation of the flare are met continuously during the hour h.
QA/QC procedures to be applied:	(1) Thermocouples should be replaced or calibrated every year. (2) Flow meters are to be periodically calibrated according to the manufacturer's recommendation. (3) Analysers must be periodically calibrated according to the manufacturer's recommendation. A zero check and a typical value check should be performed by comparison with a standard certified gas.
Any comment:	Adopt the monitoring method based on Version 01 of *"Tool to determine project emissions from flaring gases containing methane."* Moreover, confirm the latest methodology and tool when conducting the monitoring.

Data / Parameter:	$w_{CH4,y}$
Data unit:	m^3CH_4/m^3LFG
Description:	Methane fraction in the landfill gas
Source of data to be used:	Measured on site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.5
Description of measurement methods and procedures to be applied:	Measured by continuous Methane fraction meter (gas quality analyser). Measured on wet basis.
QA/QC procedures to be applied:	Methane fraction meter (gas quality analyser) should be subject to a regular maintenance and testing regime to ensure accuracy.
Any comment:	

Data / Parameter:	*T*
Data unit:	K
Description:	Temperature of the landfill gas
Source of data to be used:	Measured on site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Measured continuously by thermometer.
QA/QC procedures to be applied:	Thermometer should be subject to a regular maintenance and testing regime in accordance to appropriate national/international standards.
Any comment:	No separate monitoring of temperature is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters.

Data / Parameter:	*P*
Data unit:	Pa
Description:	Pressure of the landfill gas
Source of data to be used:	Measured on site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Measured continuously by pressure gauge.
QA/QC procedures to be applied:	Pressure gauge should be subject to a regular maintenance and testing regime in accordance to appropriate national/international standards.
Any comment:	No separate monitoring of temperature is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters.

Data / Parameter:	**$PE_{EC,y}$**
Data unit:	tCO_2
Description:	Project emissions from electricity consumption by the project activity during the year y
Source of data to be used:	Calculated as per the "*Tool to calculate project emissions from electricity consumption*".
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Indicated in Annex 3: BASELINE INFORMATION.
Description of measurement methods and procedures to be applied:	(1) Electricity consumption by the project activity during the year y ($EC_{PJ,P,y}$) Measured continuously by electricity meter. Data to be aggregated at least annually. (2) Emission factor for the grid in year y ($EF_{grid,y}$) Receive data calculated based on the "Tool to calculate project emissions from electricity consumption" from the host DNA. If the grid emission factor cannot be obtained, receive the data required for calculation and calculate based on the said tool. If data cannot be acquired, use the default value of 1.3. (3) Average technical transmission and distribution losses in the grid in year y for the voltage level at which electricity is obtained from the grid at the project site (TDL_y) Data received from DNA of host country If data cannot be acquired, use the default value of 0.2.
QA/QC procedures to be applied:	(1) Cross check measurement results with invoices for purchased electricity. (2) Follow procedures as described in ACM0002 (3) In the absence of data from the relevant year, most recent figures should be used, but not older than 5 years.
Any comment:	

Data / Parameter:	$MG_{pr,y}$
Data unit:	tCH_4
Description:	Amount of methane generated during year y of the project activity
Source of data to be used:	Measured on site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Once per year
QA/QC procedures to be applied:	As per the latest version of the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site".
Any comment:	Only implement if AF disappears to 0 in future. Estimated using the actual amount of waste disposed in the landfill as per the latest version of the "Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site".

B.7.2. Description of the monitoring plan:

>>

Figure 5 shows the monitoring plan in the project.

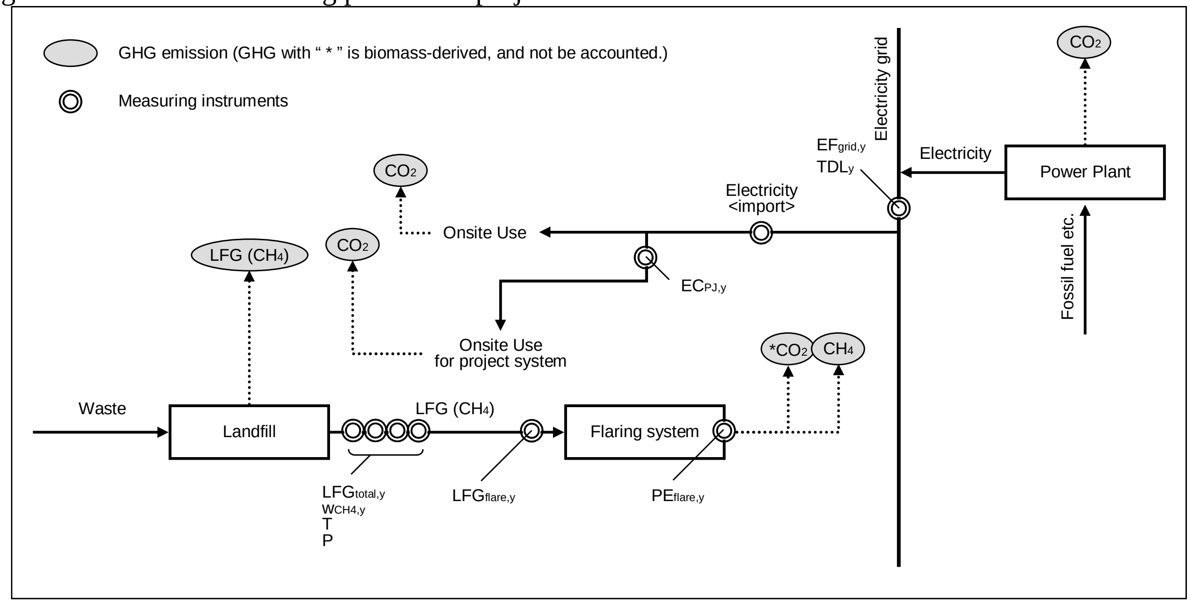

Figure 5 Flow chart of monitoring plan

Note: The power consumed in the project $EC_{PJ,y}$ is the electric power consumed in the facilities that are newly installed in the project.

The Municipality of Homs City will bear full responsibility for project operation and management (monitoring, facilities operation and maintenance, accounting, subcontracting, personnel affairs, reporting, etc.). In the project, quality control and quality assurance will be carried out by the following methods.

- ○ The project implementing organization will consist of operating personnel and management.
- ○ Management will prepare written procedures for operating facilities.
- ○ Written procedures, containing daily work contents, periodic maintenance methods and judgment criteria, etc., will be compiled according to appropriate formats.
- ○ Management will check reports from operating personnel and determine there are no problems according to the procedures. If problems are found in such checks, management will implement the appropriate countermeasures with appropriate timing.
- ○ Management will everyday file and store reports from operating personnel according to the procedures.
- ○ In the event of accidents (including the unforeseen release of GHG), management will ascertain the causes, implement and instruct countermeasures to the operating personnel.
- ○ In cases of emergency (including the unforeseen release of GHG), operating personnel will take stopgap measures and implement countermeasures according to instructions from management.
- ○ Measuring instruments will be periodically and appropriately calibrated according to the procedures. Calibration timing and methods will be in accordance with "the monitoring plan".
- ○ Measured data will be disclosed and open to public comment. Received comments and the steps taken in response to them will also be disclosed.
- ○ Measured data will also be subject to audit by government agencies in the host country.

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: 09/05/2008
General Manager : Kurita Hiroyuki,
Manager: Kazuhide Maruyama, and
Manager: Akira Yashio
Shimizu Corporation
GHG Project Department
SEAVANS SOUTH, 1-2-3
Shibaura, Minato-ku, Tokyo 105-8007
03-5441-0137 (in Japan)
+81-3-5441-0137 (from overseas)
(Japanese HP) http://www.shimz.co.jp/
(English HP) http://www.shimz.co.jp/english/index.html

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:

>>
01/09/2008

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

>>
14 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:

>>
01/01/2009

C.2.1.2. Length of the first crediting period:

>>
7 years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>
N/A

C.2.2.2. Length:

>>
N/A

SECTION D. Environmental impacts

>>

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

>>

The following paragraphs describe the results of environmental impact analysis.

The project can be expected to improve the sanitary situation and general environment as well as mitigate the risk of disasters through improving storm water drainage, preventing odor, controlling outbreaks of flies and pests and controlling flocks of birds, etc.

Having said that, concern also exists over the following impacts, so the measures described will need to be taken in order to minimize their impact.

<u>Noise and vibration:</u>

Installation of the blowers for LFG collection will create noise and vibration. However, since these facilities will be located sufficiently apart from houses around the landfill site, there shouldn't be any problems. Rather, the only problem will be that concerning the working environment (impact on hearing, etc.) for operators on the site. This can be resolved by installing appropriate soundproof covers and vibration-proof frames.

<u>Risk of fire from installation of flaring equipment:</u>

Installation of flaring equipment and the artificial collection of methane gas may increase the risk of fires occurring along pipe routes and around the flaring equipment. This can be resolved by measuring and monitoring oxygen concentration inside LFG collection pipes, stopping the system when the oxygen concentration becomes too high, and stabilizing flame by means of burner combustion control of the flare equipment.

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:

>>Upon referring to the Syrian Ministry of Local Administration and Environment, it was confirmed that because the Project will improve the environment, there is no need to implement environmental impact assessment

SECTION E. Stakeholders' comments

>> Describe in below

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

>> General Commission for Environmental Affairs (which is under the Ministry of Local Administration and Environment) is the DNA (Designated National Authority) in Syria that has oversight over approval of CDM projects and adjustments in undertaking CDM projects, and the decision on what parties are stakeholders in the project will be made by this General Commission for Environmental Affairs.

Ministry of Local Administration and Environment set up two committees for CDM, which are Technical committee and Consultant committee. And the Ministry decided that the Technical committee shall be the stakeholders.

On 8th of April, 2008, Technical committee convened to receive the stakeholders comments, based on the PDD which DNA submitted in advance

E.2. Summary of the comments received:

>> The member from the following Ministry attended at the Technical committee on 8th of April 2008

-Ministy of transportation
-Ministy of petroleum and mineral resources
-Ministy of industry
-Ministy of electricity
-Ministy of local administration and environment
-Ministy of state planning commission

Each member gives high praise to this project as this project provides both environmental improvement and sustainable development

The conclusion of the Technical committee is that there is no negative comment on this project.

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

>> According to the comments that have been provided, all stakeholders are positive about this project and it is believed that no particular measures are necessary with respect to the comments that have been received.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Project Participant 1

Organization:	Aleppo Govenorate
Street/P.O.Box:	-
Building:	-
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State/Region:	Aleppo
Postcode/ZIP:	-
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FAX:	00963-21-2288318
E-Mail:	-
URL:	www.aleppo-sy.com
Represented by:	
Title:	Director of Technical Services in Aleppo
Salutation:	Mr.
Last name:	Monla
Middle name:	-
First name:	Mohammed
Department:	Directorate of Technical Services in Aleppo
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Direct FAX:	00963-21-2639345
Direct tel:	00963-21-2639330
Personal e-mail:	Technical-services@trassul.sy

Project Participant 2

Organization:	Shimizu Corporation
Street/P.O.Box:	1-2-3, Shibaura
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Country:	Japan
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FAX:	-
E-Mail:	-
URL:	http://www.shimz.co.jp/english/index.html http://www.shimz.co.jp/
Represented by:	-
Title:	General Manager
Salutation:	Mr.
Last name:	Kurita
Middle name:	-
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project will not utilize any official funding from Annex I countries.

Annex 3

BASELINE INFORMATION

Methane emission potential

According to the *"Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site,"* $BE_{CH4,SWDS,y}$ can be calculated using the following expression.

$$BE_{CH4,SWDS,y} = 0.9 * (1 - f) * GWP_{CH4} * (1 - OX) * 16 / 12 * F * DOC_f * MCF * \sum_{(x=1\sim y)}\sum_j W_{j,x} * DOC_j * e^{-k\,(y-x)} * (1 - e^{-kj})$$

$BE_{CH4,SWDS,y}$	tCO_2e	Methane emissions potential of landfill site (SWDS)
f	-	Fraction of methane captured at the landfill site (SWDS)
OX	-	Oxidation factor
F	-	Fraction of methane in the LFG (SWDS gas)
DOC_f	-	Fraction of DOC that can decompose
MCF	-	Methane correction factor
$W_{j,x}$	t	Mass of waste type *j* deposited in the year x
DOC_j	-	Fraction of DOC in the waste type *j*
k_j	-	Decay rate for the waste type *j*
j	-	Waste type category

f: Fraction of methane captured at SWDS

Apart from the project, since collection of landfill gas on the project site is not currently implemented and will not be implemented in the future, $f = 0$ is adopted.

OX: Oxidation factor

Since the project site is a managed site, $OX = 0.1$ is adopted upon referring to the *"IPCC 2006 Guidelines."*

F: Fraction of methane in the SWDS gas

F = 0.5 as recommended in the *"IPCC 2006 Guidelines"* is adopted.

DOC_f: Fraction of DOC that can decompose

$DOC_f = 0.5$ as recommended in the *"IPCC 2006 Guidelines"* is adopted.

MCF: Methane correction factor

Since the project site was only used as a post-landfill disposal site prior to the start of the project, it is regarded as a managed disposal site when setting the MCF. Accordingly, MCF = 0.1 is adopted.

$W_{j,x}$: Mass of waste type j deposited in the year x

The landfill quantity and composition of solid waste on the project site are as indicated below. The quantity of solid waste type j can be calculated from the product of a) solid waste landfill quantity and b) solid waste composition.

a) Solid waste landfill quantity
The amount of waste carried onto the project landfill site from 2002 to 2007 is as indicated in Table A3.1.

Table A3-1 Solid Waste Landfill Quantity

year *x*	W_x	*Accumulated Amount*
	ton/year	ton
2002	240,000	240,000
2003	240,000	480,000
2004	240,000	720,000
2005	240,000	960,000
2006	240,000	1,200,000
2007	240,000	1,440,000
2008	240,000	1,680,000
2009	240,000	1,920,000
2010	240,000	2,160,000
2011	240,000	2,400,000
2012	240,000	2,640,000
2013	240,000	2,880,000
2014	240,000	3,120,000
2015	240,000	3,360,000

b) Composition of solid waste
Concerning the composition of solid waste, the results of the waste composition survey conducted on the sites were classified according to the *"IPCC 2006 Guidelines"* (Table A3-2).

Table A3-2 Composition of Solid Waste

Waste type *j*	Mass portion %
Wood and wood products	0.2
Pulp, paper and cardboard	8.7
Food, food waste, beverages and tobacco	68.4
Textiles	6.8
Garden, yard and park waste	3.0

Glass, plastic, metal, other inert waste	12.9
Total	100.0

DOC_j: Fraction of DOC in the waste type j

In accordance with the state of waste on the project sites, the "wet waste" values as given in the *"IPCC 2006 Guidelines"* were adopted (Table A3-3).

Table A3-3 Fraction of DOC in the waste type j

Waste type *j*	DOC_i (wet waste)
Wood and wood products	0.43
Pulp, paper and cardboard	0.40
Food, food waste, beverages and tobacco	0.15
Textiles	0.24
Garden, yard and park waste	0.20
Glass, plastic, metal, other inert waste	0.00

k_j: Decay rate for the waste type j

In accordance with the climate in the Syrian Arab Republic, the "Boreal and Temperate and Dry" values as given in the *"IPCC 2006 Guidelines"* were adopted (Table A3-4).

Table A3-4 Decay rate for the waste type j

Waste type *j*	k_j (Boreal and Temperate ,and Dry)
Pulp, paper, cardboard, textiles	0.040
Wood, wood products and straw	0.020
Other (non-food) organic putrescible garden and park waste	0.050
Food, food waste, beverages and tobacco	0.060

Emission Reductions

Emission reductions were calculated based on the methodology indicated in B.6.1.

Table A3-5 Emission Reductions

	Item	Unit	2009	2010	2011	2012	2013	2014	2015	2016
ex-ante	$BE_{CH4,SWDS,y}$	tCO_2e	63,860	71,158	78,073	84,624	90,831	96,714	102,288	107,572
	BE_y	tCO_2e	63,860	71,158	78,073	84,624	90,831	96,714	102,288	107,572
	$MD_{project,y}$	tCH_4	3,041	3,388	3,718	4,030	4,325	4,605	4,871	5,122
	$MD_{reg,y}$	tCH_4	0	0	0	0	0	0	0	0
	AF	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PE_y	tCO_2e	10,980	21,092	30,667	39,735	10,980	21,092	30,667	39,735
	$PE_{EC,y}$	tCO_2e	301	301	301	301	301	301	301	301
	$EC_{PJ,y}$	MWh	193	193	193	193	193	193	193	193
	$EF_{grid,y}$	tCO_2e/MWh	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
	TDL_y	-	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
	not collected LFG	tCO_2e	10,679	20,791	30,366	39,434	10,679	20,791	30,366	39,434
	ER_y	tCO_2e	52,880	50,067	47,406	44,889	79,851	75,622	71,621	67,837

	Item	Unit	2017	2018	2019	2020	2021	2022		TOTAL
ex-ante	$BE_{CH4,SWDS,y}$	tCO_2e	101,900	96,536	91,461	86,660	82,118	77,821		1,231,617
	BE_y	tCO_2e	101,900	96,536	91,461	86,660	82,118	77,821		1,231,617
	$MD_{project,y}$	tCH_4	4,852	4,597	4,355	4,127	3,910	3,706		58,648
	$MD_{reg,y}$	tCH_4	0	0	0	0	0	0		0
	AF	-	0.0	0.0	0.0	0.0	0.0	0.0		
	PE_y	tCO_2e	301	301	301	301	301	301		206,751
	$PE_{EC,y}$	tCO_2e	301	301	301	301	301	301		4,209
	$EC_{PJ,y}$	MWh	193	193	193	193	193	193		2,698
	$EF_{grid,y}$	tCO_2e/MWh	1.3	1.3	1.3	1.3	1.3	1.3		
	TDL_y	-	0.200	0.200	0.200	0.200	0.200	0.200		
	not collected LFG	tCO_2e	0	0	0	0	0	0		202,542
	ER_y	tCO_2e	101,600	96,235	91,160	86,360	81,818	77,521		1,024,866

Financial Indicators

Details of the sensitivity analysis conducted for the baseline scenarios in Section B.4 are given.
In Scenario 2, which is the Project case, since there is investment but no returns, this clearly cannot become the baseline scenario. Accordingly, sensitivity analysis is only carried out on Scenario 3.
In Scenario 3, it is assumed that a 1,000 kW gas engine is introduced. Table A3-6 shows the costs and parameters used in calculating the project IRR in Scenario 3. Moreover, Table A3-7 shows the results of Project IRR sensitivity analysis in the case where CERs are not taken into account.

Incidentally, the project implementation period will be 15 years from 2008 to 2022 (the credit period will be 14 years from January 2009 to December 2022).

Table A3.6 Cost and Financial Parameters

Item		Unit	Value
Initial cost		US$	4,744,739
Running cost		US$/y	22,800
DOE cost		US$/y	20,000
United Nations cost		US$/$tCO_2$	0.20
Inflation rate		%	0
Tax	Corporate profit tax	%	15
	Asset tax	%	0.1
Depreciation rate		%	90
Power tariff		US$/kWh	0.030
Exchange rate	Yen⇔US$	Yen/US$	116.0

Table A3-7 Results of Sensitivity Analysis

			Reference		
Construction cost	-10%	-5%	±0%	+5%	+10%
IRR	Minus	Minus	Minus	Minus	Minus

			Reference		
Running cost	-10%	-5%	±0%	+5%	+10%
IRR	Minus	Minus	Minus	Minus	Minus

			Reference		
Electricity salse tariff	-10%	-5%	±0%	+5%	+10%
IRR	Minus	Minus	Minus	Minus	Minus

			Reference		
Generated LFG	-20%	-10%	±0%	+10%	+20%
IRR	Minus	Minus	Minus	Minus	Minus

			Reference		
Inflation rate	-10%	-5%	±0%	+5%	+10%
IRR	Minus	Minus	Minus	Minus	Minus

Annex 4

MONITORING INFORMATION

Below is indicated the monitoring plan for each item based on the monitoring methodology.

○**$LFG_{total,y}$** **Collected amount of LFG**
○**$LFG_{flare,,y}$** **Flared amount of LFG**
○**$LFG_{flare,h}$** **Flared amount of LFG (hour)**

There are various types of flow meters; meanwhile, the target measurements here are the instantaneous flow rate and integrated flow rate for volumetric flow rate of a gas. The instantaneous volumetric flow rate of a gas can be measured by a differential pressure type flow meter (orifice, etc.), an area type flow meter (float, etc.), an ultrasonic type flow meter, a vortex type flow meter or a turbine flow meter. The performance requirements for the flow meter here are relatively low price (i.e. a widely available type), accuracy, no major loss in precision even if the flow rate varies somewhat, durability and easy maintenance. The turbine type and the vortex type flow meters fulfil these requirements. As is explained below, the flow meter must be capable of outputting to a computing unit.

The turbine type and the vortex type flow meters measure instantaneous flow rate, however, this is the flow rate at that pressure and temperature and not the rate in the normal state (standard condition). Here, it is necessary to measure pressure and temperature at the same time with flow rate, in order to correct the measurement to the normal state value, and thereby assess volumetric flow using the same scale. Accordingly, a pressure gage and thermometer are required as well as a computing unit for correcting values into the normal state.

The turbine flow meter is characterized by having a moving part, i.e. a turbine, in the flow meter unit. Accordingly, it is necessary to attach a filter to the upstream part of the flow meter to ensure that no foreign objects get caught in the turbine. The vortex type flow meter has no movable parts, however, it does have a vortex generator. Therefore, as with the turbine flow meter, it is essential to attach a filter to the upstream part of the flow meter to ensure that no foreign objects get caught in the vortex generator. Accordingly, it is very important to manage the filter and keep it clean. If the filter is managed and cleaned adequately, there is no need to perform regular calibration of the flow meter unit.

Measurement of flow is made possible by connecting the above flow meter, pressure gage, thermometer and computing unit by wiring. The computing unit shall be capable of displaying the instantaneous flow rate as well as the integrated flow rate.

The flow rate is continuously measured and automatically integrated by the computing unit. Since the accumulated integrated flow and not the instantaneous flow rate needs to be known, there is no need to make frequent visual checks and record value. As a rule, checking for abnormalities in the display shall be conducted at least once per week and records shall be taken once per month.

○T_{flare} Temperature of flare exhaust gas
○T Temperature of LFG

Concerning thermometers, there are again various types, for example, thermocouple, resistance type, thermistor type, radiation type, glass pipe type, filled type, bimetal type, crystal oscillating type, fluorescent type, optical fibre distribution type and magnetic type. The performance requirements for the thermometer here are relatively low price (i.e. a widely available type), accuracy, no major loss in precision even if temperature varies somewhat, durability, easy maintenance and ability to output to a computing unit, etc. (i.e. fitting with a terminal). The resistance type thermometer fulfils these requirements if measuring relatively low temperature (80°C~50°C) objects such as LFG, whereas the thermocouple is more appropriate for measuring relatively hot (500°C~1500°C) objects such as flare exhaust gas.

The resistance type thermometer has a platinum temperature sensor with extremely high durability. However, since the thermocouple is used under extremely high temperatures, there is a risk that resistive element degradation will diminish the accuracy of temperature measurements. Therefore, it is necessary to regularly change the thermocouple.

The temperature of LFG is continuously measured. As a rule, the display is checked for no abnormalities once per week, while the temperature is recorded once per month.

The temperature of flare exhaust gas is recorded in a recorder (pen recorder or data logger). In other words, automatic recording is performed continuously. As a rule, recording shall be performed to coincide with recording of the LFG flow rate, and checking for abnormalities in records shall be conducted at least once per week and records shall be taken once per month.

○P Pressure of LFG

Different types of pressure gage are the liquid column type, the plumb bob type and the elasticity type. The performance requirements for the pressure gage here are relatively low price (i.e. a widely available type), accuracy, no major loss in precision even if the pressure varies somewhat, durability, easy maintenance and ability to output to a computing unit (fitted with a transmitter). The elasticity type pressure gage fulfils these requirements.

As for the pressure gage, a pressure transmitter that utilizes a diaphragm is used, however, since this has excellent durability, there is no need especially to carry out calibration on site.

The pressure of LFG is continuously measured. As a rule, the display is checked for no abnormalities once per week, while the pressure is recorded once per month.

○$w_{CH4,y}$ **Methane concentration in LFG**
○$w_{CH4,h}$ **Methane concentration in LFG (hour)**

Methods for measuring the volumetric concentration of methane in gas include gas chromatograph analysis, solid sensor gas analyser, optical sensor gas analyser, hydrogen flame ionisation detector, and so on. The performance requirements for the gas analyser here are relatively low price (i.e. a widely available type), accuracy, no major loss in precision even if the concentration level varies somewhat, durability and easy maintenance. Measured concentration here is in the order of 0~70% and are not measured in ppm. Easy measurement and easy calibration are also desired. The optical sensor gas analyser fulfils these requirements, and in particular the infrared type is appropriate.

The infrared methane gas analyser can be easily calibrated. It is possible to calibrate an infrared methane gas analyser by preparing a cylinder of reference methane gas of known concentration and a cylinder of zero methane concentration for zero calibration purposes. In other words, the infrared methane gas analyser can be calibrated in any place that is accessible to gas cylinders.

It is desirable that the infrared methane gas analyser can also measure the oxygen concentration. This is because, although not directly linked to the monitoring, since there is risk of explosion if the oxygen concentration of LFG rises to abnormal levels, it is necessary to stop the system.

The methane concentration shall as a rule be checked once a week for abnormal readings and recorded once every month to coincide with recording of the LFG flow.

○$EC_{PJ,y}$ **Amount of electricity consumed in the project**

The watt-hour meter shall be installed in order to monitor the amount of electricity consumed in the facilities newly installed in the Project. Incidentally, the site already has power consumption and watt-hour meter to measure the amount of purchased electricity, however, it will be necessary to install a separate watt-hour meter for measuring just the project power. The new watt-hour meter shall be the same type as the existing one. Accordingly, the meter demanded by the grid owner shall be installed, and the calibrations that are required by the grid owner shall be carried out.

Electric energy is continuously measured and automatically integrated. Since the integrated electricity and not the instantaneous electricity needs to be known, there is no need to make frequent visual checks and record values. As a rule, recording shall be performed to coincide with recording of the LFG flow rate, and checking for abnormalities in the display shall be conducted at least once per week and records shall be taken once per month.

○**$EF_{grid,y}$** **Grid emission coefficient**
○**TDL_y** **Grid transmission/distribution loss factor**
The necessary data shall be received from the DNA of the Government of Syria once per year. If the data cannot be acquired, default values shall be used. Moreover, if $EF_{grid,y}$ cannot be acquired, use the default value of 1.3.

○**AF** **Adjustment factor**
○**MG**pr,y **Total amount of methane gas generated from the landfill**

The necessary data shall be received from the Government of Syria once per year.
In the event where legislation and regulations are changed, calculate the AF based on ACM0001. Moreover, in this case, add $MG_{PR,Y}$ to the list of monitoring items.

○ In the absence of any international calibration standards for the above calibration items, calibration shall be conducted based on standards of the instrument makers.

○ Monitoring data shall be totalled as annual data based on the methodology. Where data is collected every month, the monthly amounts shall be summated to give annual totals.