



**Monitoring report form  
(Version 05.1)**

MONITORING REPORT		
<b>Title of the project activity</b>	Djebel Chekir Landfill Gas Recovery and Flaring Project – Tunisia	
<b>UNFCCC reference number of the project activity</b>	0487	
<b>Version number of the monitoring report</b>	01	
<b>Completion date of the monitoring report</b>	01/04/2017	
<b>Monitoring period number and duration of this monitoring period</b>	04 01/04/2014- 31/12/2016	
<b>Project participant(s)</b>	Agence Nationale de Gestion des Déchets (ANGED) International Bank for Reconstruction and Development (IBRD) as the Trustee of the Italian Carbon Fund (ICF) Italy - Ministry for the Environment, Land and Sea Cementerie Aldo Barbetti S.p.A E.ON Produzione S.p.A. Enel Trade S.p.A. ERG S.p.A. Italcementi S.p.A. Iren Mercato S.p.A	
<b>Host Party</b>	Tunisia	
<b>Sectoral scope(s)</b>	Sectoral scope 13 – Waste handling and disposal	
<b>Selected methodology(ies)</b>	ACM0001 “Consolidated baseline and monitoring methodology for landfill gas project activities” - Version 2	
<b>Selected standardized baseline(s)</b>	N/A	
<b>Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD</b>	835,334 tonnes of CO <sub>2</sub> e	
<b>Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period</b>	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	-	171,023 t CO <sub>2</sub> e

## SECTION A. Description of project activity

### A.1. Purpose and general description of project activity

The National Waste Management Agency (ANGEd) is the government agency in charge of the waste management sector in Tunisia (project developer). ANGEd is currently implementing a CDM project at the Djebel Chekir landfill in Tunisia, which seeks to reduce greenhouse gas (GHG) emissions reductions through the capture and flaring of landfill gas (LFG).

During the considered monitoring period, LFG is extracted and collected from the landfill using gas wells on closed cells (i.e. cells 1, 2 and 3). The main equipment at the site consists of two enclosed flares that are operated alternately.

A blower creates a negative pressure in the gas collection system and extracts the LFG. The gas is fed to one of the two flares manufactured by LES, model ES 375C ICH. Each flare has a maximum capacity of 3,750 Nm<sup>3</sup>/h. GHG emission reductions are obtained through the destruction of the methane contained in the gas captured from the landfill.

The two flares were installed on 20/06/2008. The project was commissioned on 13/11/2008. The project activity has been continuously operating since then.

The total GHG emissions reductions (ERs) achieved during this monitoring period, **from 01/04/2014 to 31/12/2016, are 171,023 tCO<sub>2</sub>e.**

### A.2. Location of project activity

The project activity is located in Djebel Chekir, Greater Tunis, Tunisia.

GPS coordinates are: 36.745066, 10.067157 (or 36°44'42.236669" N 10°04'1.763928" E).

### A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
Tunisia (host)	Public entity: Agence Nationale de Gestion des Déchets (ANGED)	No
Italy	Public entity: International Bank for Reconstruction and Development (IBRD) as the Trustee of the Italian Carbon Fund (ICF) Public entity: Italy - Ministry for the Environment, Land and Sea Private entity: Cementerie Aldo Barbetti S.p.A. Private entity: E.ON Produzione S.p.A. Private entity: Enel Trade S.p.A. Private entity: ERG S.p.A. Private entity: Italcementi S.p.A. Private entity: Iren Mercato S.p.A.	Yes

### A.4. Reference of applied methodology and standardized baseline

ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities" Version 2.0.

UNFCCC CDM website reference:

[http://cdm.unfccc.int/filestorage/C/D/M/CDMWF\\_AM\\_JIVCJD2PTI9976ZOV4A8KRO8T9QUWW/E\\_B21\\_repan9\\_ACM0001\\_Revision\\_clean.pdf?t=Q298b25ndGRfDAeHvgdnY4yxPJlxyM6B0Dk](http://cdm.unfccc.int/filestorage/C/D/M/CDMWF_AM_JIVCJD2PTI9976ZOV4A8KRO8T9QUWW/E_B21_repan9_ACM0001_Revision_clean.pdf?t=Q298b25ndGRfDAeHvgdnY4yxPJlxyM6B0Dk)

“Tool for demonstration and assessment of additionality” Version 2. *Not used for monitoring.*

#### A.5. Crediting period of project activity

The crediting period is 10 years fixed, from 13/11/2008 until 12/11/2018.

#### A.6. Contact information of responsible persons/entities

Agence Nationale de Gestion des Déchets(ANGED) (Project Participant) – See Appendix I for contact information.

International Bank for Reconstruction and Development (IBRD) as Trustee of the Italian Carbon Fund (ICF) (Project Participant) – See Appendix I for contact information.

### SECTION B. Implementation of project activity

#### B.1. Description of implemented registered project activity

Implementation status of the project:

The starting date of operation of the project activity on the Djebel Chekir landfill is 13/11/2008. Since then, the project has been continuously operating.

Description of the installed technology, technical process and equipment:

The capture and flaring of LFG requires three main components:

##### 1. LFG vertical extraction wells

- At present, LFG extraction wells were drilled on cells 1 (30 wells drilled), 2 (26 wells) and 3 (33 wells). In each well, a high-density polyethylene (HDPE) perforated pipe is installed in order to collect and transfer the LFG to the network laid on the surface.
- All wells are equipped with wellheads to allow control of the quantity and quality of the landfill gas (for cross-checking purposes only), and with valves to allow for an appropriate adjustment of the vacuum power in each well.

##### 2. Intermediary piping system to convey the LFG from the wells, to the primary collection pipes

A high-density polyethylene collection piping system is buried in trenches, and allows the transfer of LFG from the wells to the primary collection pipes.

The LFG is vacuumed by a blower into the flaring station (blower manufactured by Continental Industrie).

##### 3. Flaring equipment

A flaring station is equipped with a blower, de-condensation equipment, two enclosed flares, and instruments for measurement and monitoring. Currently the two flares are operated alternately given the low volume of gas extracted. According to initial CH<sub>4</sub> flow estimates, the maximum flaring capacity of the landfill (for cells 1 to 5) was expected to reach 7,000 Nm<sup>3</sup>/hour.

The flare technical specifications are as follow:

Manufacturer	LES
Type	Landfill gas; enclosed flare
Serial number	Flare 1: 8041 / Flare 2: 8042
Mixture	50% CH <sub>4</sub> 50% CO <sub>2</sub> , air, inert gases
Flow rate	300-3,750 Nm <sup>3</sup> /h (min-max)
Operational temperature	500°C-1200°C
Retention time	0.344 second

**B.2. Post-registration changes****B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline**

There is no deviation applied during this monitoring period. Not applicable.

**B.2.2. Corrections**

There is no correction applied during this monitoring period. Not applicable.

**B.2.3. Changes to start date of crediting period**

The starting date of the crediting period was changed from 01/01/2007 to 13/11/2008 (notification of CDM Executive Board's approval received on 07/06/2011).

**B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration**

There are no changes to project design during this monitoring period. Not applicable.

**B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline**

There is no permanent change applied during this monitoring period. Not applicable.

**B.2.6. Changes to project design of registered project activity**

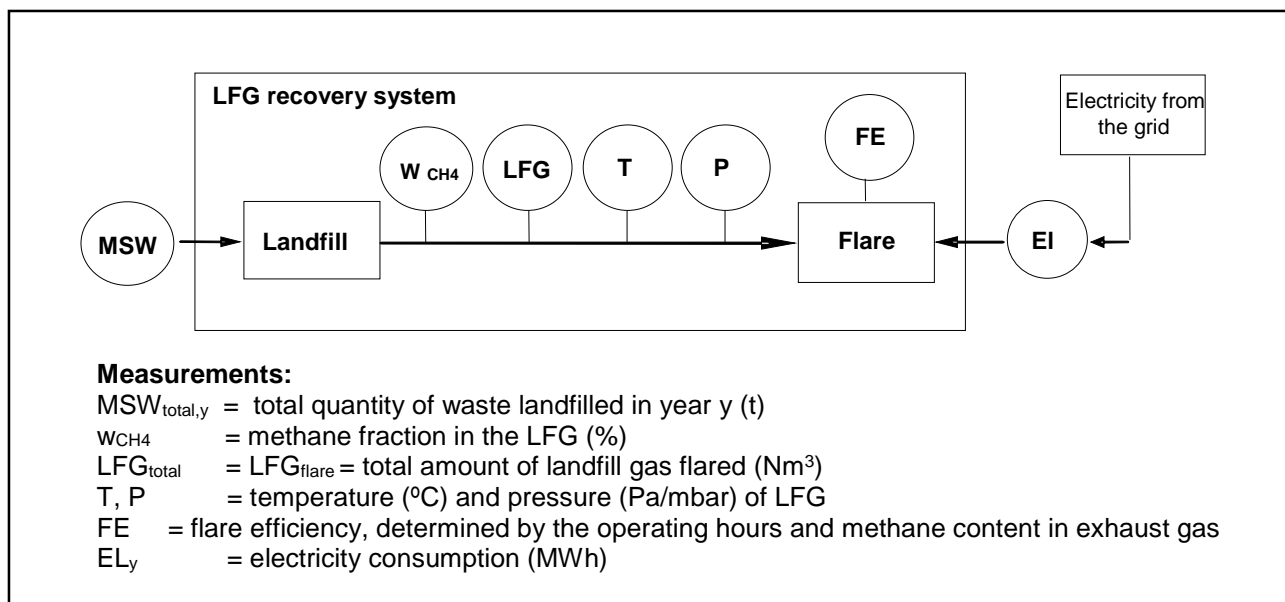
There is no permanent change applied during this monitoring period. Not applicable.

**B.2.7. Types of changes specific to afforestation or reforestation project activity**

Not applicable.

**SECTION C. Description of monitoring system**

The monitoring system for the project was developed according to version 2.0 of methodology ACM0001. It is based on direct measurement of the amount of landfill gas captured and destroyed at the flare and the electricity consumed for the project as shown in the figure below.



## SECTION D. Data and parameters

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

<b>Data/parameter:</b>	$GWP_{CH_4}$
Unit	$tCO_2/tCH_4$
Description	Global warming potential of $CH_4$
Source of data	IPCC
Value(s) applied)	25
Choice of data or measurement methods and procedures	
Purpose of data	Baseline emissions calculations
Additional comments	Value shall be updated according to any future COP/MOP decisions.

<b>Data/parameter:</b>	$D_{CH_4}$
Unit	$tCH_4/m^3CH_4$
Description	Methane density
Source of data	IPCC
Value(s) applied)	0.0007168
Choice of data or measurement methods and procedures	
Purpose of data	Baseline emissions calculations
Additional comments	At standard T and P ( $0^{\circ}C$ and 1.013 bar), the density of methane is $0.0007168 tCH_4/m^3CH_4$

<b>Data/parameter:</b>	$EF_{grid}$
Unit	$tCO_2e/MWh$
Description	Grid emission factor for Tunisia

Source of data	PDD
Value(s) applied)	0.627
Choice of data or measurement methods and procedures	
Purpose of data	Project emission calculation
Additional comments	Fixed ex ante for the crediting period

## D.2. Data and parameters monitored

<b>Data / Parameter:</b>	<b>MSW<sub>total,y</sub></b>
Unit:	Metric tonnes
Description:	Total quantity of waste disposed in year y
Measured/ Calculated / Default:	Measured
Source of data:	Measured at weight bridge
Value(s) of monitored parameter:	Not applicable: Waste disposed in the landfill during the monitoring period was not deposited in the area covered by the project activity, since the project is implemented on closed cells (i.e. cells 1, 2 and 3)
Monitoring equipment:	Weighing scale
Measuring/ Reading/ Recording frequency:	Measured continuously; recorded continuously (i.e., each truck entering the site)
Calculation method (if applicable):	Aggregated monthly and annually
QA/QC procedures:	Calibration is performed by a third-party entity according to a schedule established as per the manufacturer specifications.
Purpose of data:	Baseline emission calculations for ex ante estimation in PDD. Not used for monitoring.
Additional comment:	-

<b>Data / Parameter:</b>	<b>LFG<sub>total,y</sub> = LFG<sub>flare,y</sub></b>					
Unit:	Nm <sup>3</sup>					
Description:	Total amount of landfill gas captured and flared					
Measured/ Calculated / Default:	Measured by flow meter (m <sup>3</sup> ) that compute readings using measured temperature and pressure of LFG to provide normalized flow (Nm <sup>3</sup> )					
Source of data:	Flow meter					
Value(s) of monitored parameter:	Refer to electronic spreadsheets for exhaustive hourly measures during the entire monitoring period.					
Monitoring equipment:	Monitoring equipment	Manufacturer Type Accuracy	Serial number	Calibration frequency	Date of last calibration	Validity
	Differential pressure flow meter	Fuji Electric/ Platon Torbar QRT/FKCP11V4 AKDYYCA Accuracy: +/- 1%	A8C8656F/ 0QC6236	3 years as per the manufacturer specifications	21/03/2014	calibration valid during the entire monitoring period
Measuring/ Reading/ Recording frequency:	Measured continuously; recorded on hourly basis.					
Calculation method (if applicable):	Not calculated. Flow meter records LFG volumes in normalized cubic meters.					

QA/QC procedures:	Calibration is performed according to a schedule established as per the manufacturer specifications. The validity of the calibration of the monitoring equipment covered the whole monitoring period.
Purpose of data:	Baseline emission calculations.
Additional comment:	-

<b>Data / Parameter:</b>	<b>W<sub>CH<sub>4</sub>,y</sub></b>					
Unit:	% (m <sup>3</sup> CH <sub>4</sub> /m <sup>3</sup> LFG)					
Description:	Methane fraction in the landfill gas					
Measured/ Calculated / Default:	Measured					
Source of data:	Gas analyzer					
Value(s) of monitored parameter:	Refer to electronic spreadsheets for exhaustive hourly measures during the entire monitoring period.					
Monitoring equipment:	Monitoring equipment	Manufacturer Type Accuracy	Serial number	Calibration frequency	Date of last calibrations	Validity
	Gas analyzer	FUJI electric ZRJF4D25-BURYR-YYYYYAY-A Accuracy +/- 2%	A8C7246T	6 months (as per the manufacturer)	02/01/2014 07/07/2014 31/12/2014 24/02/2016 14/10/2016	Not valid from 02/07/2014 to 07/07/2014 and from 24/08/2016 to 14/10/2016
Measuring/ Reading/ Recording frequency:	Measured continuously; recorded on hourly basis.					
Calculation method (if applicable):	Not calculated.					
QA/QC procedures:	Calibration is performed by a third-party entity according to a schedule established as per the manufacturer specifications.					
Purpose of data:	Baseline emission calculations					
Additional comment:	The delays have been addressed by deviating the measured values of w <sub>CH<sub>4</sub>,y</sub> by the maximum permissible error of the gas analyzer (2%) since the results of the delayed calibrations were lower than the accuracy of the instrument.					

<b>Data / Parameter:</b>	<b>FE</b>
Unit:	%
Description:	Flare combustion efficiency
Measured/ Calculated / Default:	Measured/Calculated
Source of data:	Measured by a gas quality analyzer (methane content in exhaust gas) taking into account the operating hours of the flare
Value(s) of monitored parameter:	Refer to electronic spreadsheets for exhaustive monthly measures during the entire monitoring period.

Monitoring equipment:	Monitoring equipment	Manufacturer Type Accuracy	Serial number	Calibration frequency	Date of last calibration	Validity
	Gas analyzer	Geotech Biogas Check $\pm 0.5\%$	BM11071	1 year As per the manufacturer's recommendation	02/01/2014 31/12/2014 30/12/2015	Calibrations valid during the entire monitoring period
			BM11259		02/01/2014	
			G504112		06/09/2016	
Measuring/ Reading/ Recording frequency:	Combustion efficiency: measured monthly Operating hours: measured continuously; recorded on hourly basis.					
Calculation method (if applicable):	Flare/combustion efficiency is determined by the operation hours and the methane content in the exhaust gas. The operating hours of the flare are taken into consideration in the ER calculations only for the hours when the flare combustion temperature is above 500°C and below 1200°C. The flare combustion temperature is measured continuously by a thermocouple type K and automatically recorded.					
QA/QC procedures:	Calibration is performed by a third-party entity according to a schedule established as per the manufacturer specifications.					
Purpose of data:	Baseline emission calculations					
Additional comment:	During the entire monitoring period, the measured value of methane in the exhaust gas analysis was 0%. Though a flare efficiency of 100% could be claimed, to be conservative it has been considered that the minimum value to be taken into account should be based on the detection limit of the instrument, i.e. 0.5%, for the value of CH <sub>4</sub> in the exhaust gas. Then, the flare efficiency is calculated as $1 - (\%CH_4 \text{ in the exhaust gas} / \%CH_4 \text{ in the LFG})$ . The resulting flare efficiency has been calculated every month and applied to final values of MD <sub>flare</sub> on a monthly basis.					

Data / Parameter:	T					
Unit:	°C					
Description:	Temperature of the landfill gas					
Measured/ Calculated / Default:	Measured					
Source of data:	Temperature sensor					
Value(s) of monitored parameter:	Refer to electronic spreadsheets for exhaustive hourly measures during the entire monitoring period.					
Monitoring equipment:	Monitoring equipment	Manufacturer Type Accuracy	Serial number	Calibration frequency	Date of last calibration	Validity
	Temperature transmitter	Jumo Pt100 0.10°C	918197/ 134177	3 years as per the manufacturer	21/03/2014 10/04/2015	calibrations valid during the entire monitoring period
Measuring/ Reading/ Recording frequency:	Measured continuously; recorded on hourly basis.					
Calculation method (if applicable):	This parameter is measured to calculate the LFG volumes in normalized cubic meters.					
QA/QC procedures:	As per the manufacturer specifications the transmitter should be calibrated every 3 years					
Purpose of data:	Baseline emissions calculations					
Additional comment:	-					



<b>Data / Parameter:</b>	<b>P</b>												
Unit:	mbar												
Description:	Pressure of the landfill gas												
Measured/ Calculated / Default:	Measured												
Source of data:	Pressure sensor												
Value(s) of monitored parameter:	Refer to electronic spreadsheets for exhaustive hourly measures during the entire monitoring period.												
Monitoring equipment:	<table border="1"> <thead> <tr> <th>Monitoring equipment</th><th>Manufacturer Type Accuracy</th><th>Serial number</th><th>Calibration frequency</th><th>Date of last calibration</th><th>Validity</th></tr> </thead> <tbody> <tr> <td>Pressure transmitter</td><td>FUJI ELECTRIC FCX-AII ±0.07%</td><td>A8C8697F/ FK97907</td><td>3 years as per the manufacturer</td><td>21/03/2014</td><td>calibration valid during the entire monitoring period</td></tr> </tbody> </table>	Monitoring equipment	Manufacturer Type Accuracy	Serial number	Calibration frequency	Date of last calibration	Validity	Pressure transmitter	FUJI ELECTRIC FCX-AII ±0.07%	A8C8697F/ FK97907	3 years as per the manufacturer	21/03/2014	calibration valid during the entire monitoring period
Monitoring equipment	Manufacturer Type Accuracy	Serial number	Calibration frequency	Date of last calibration	Validity								
Pressure transmitter	FUJI ELECTRIC FCX-AII ±0.07%	A8C8697F/ FK97907	3 years as per the manufacturer	21/03/2014	calibration valid during the entire monitoring period								
Measuring/ Reading/ Recording frequency:	Continuous measurement and at least hourly recording.												
Calculation method (if applicable):	This parameter is measured to calculate the LFG volumes in normalized cubic meters.												
QA/QC procedures:	Calibration is performed by a third party entity at a frequency recommended by the manufacturer.												
Purpose of data:	Baseline emissions calculations												
Additional comment:	-												

<b>Data / Parameter:</b>	<b>El<sub>y</sub></b>												
Unit:	kWh												
Description:	Electricity consumption												
Measured/ Calculated / Default:	Measured												
Source of data:	Electricity meter												
Value(s) of monitored parameter:	48.4 MWh for the entire monitoring period												
Monitoring equipment:	<table border="1"> <thead> <tr> <th>Monitoring equipment</th><th>Manufacturer Type Accuracy</th><th>Serial number</th><th>Calibration frequency</th><th>Date of last calibration</th><th>Validity</th></tr> </thead> <tbody> <tr> <td>Electricity meter</td><td>SIAME T34B Triphase Class 2</td><td>0110041</td><td>5 years as per the manufacturer</td><td>18/08/2011 17/08/2016</td><td>calibrations valid during the entire monitoring period</td></tr> </tbody> </table>	Monitoring equipment	Manufacturer Type Accuracy	Serial number	Calibration frequency	Date of last calibration	Validity	Electricity meter	SIAME T34B Triphase Class 2	0110041	5 years as per the manufacturer	18/08/2011 17/08/2016	calibrations valid during the entire monitoring period
Monitoring equipment	Manufacturer Type Accuracy	Serial number	Calibration frequency	Date of last calibration	Validity								
Electricity meter	SIAME T34B Triphase Class 2	0110041	5 years as per the manufacturer	18/08/2011 17/08/2016	calibrations valid during the entire monitoring period								
Measuring/ Reading/ Recording frequency:	Measured continuously, recorded manually daily.												
Calculation method (if applicable):	Aggregated monthly and annually.												
QA/QC procedures:	According to the manufacturer's technical specifications, electricity meters are tested and calibrated and then sealed. Their use in optimal conditions does not alter the uncertainty rate.												
Purpose of data:	Project emissions calculations												
Additional comment:	-												

<b>Data / Parameter:</b>	Regulatory requirements related to landfill gas projects
Unit:	n/a

Description:	Required for any changes to the adjustment Factor (AF) or directly MD <sub>reg,y</sub>
Measured/ Calculated / Default:	N/A
Source of data:	National regulations
Value(s) of monitored parameter:	N/A
Monitoring equipment:	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	Annually
QA/QC procedures:	n/a. Regulation has not changed during monitoring period.
Purpose of data:	Baseline emissions calculations
Additional comment:	-

### D.3. Implementation of sampling plan

Not applicable.

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

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

According to the baseline methodology ACM0001 - Version 2, emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

$$BE_y = (MD_{project,y} - MD_{reg,y}) * GWP_{CH4}$$

$$PE_y = EI_y * 0.627$$

Where

MD<sub>project,y</sub> = amount of methane actually destroyed/combusted during the period  
MD<sub>reg,y</sub> = amount of methane that would have been destroyed/combusted during the period in the absence of the project activity (MD<sub>reg,y</sub> = 0 in absence of regulation)  
GWP<sub>CH4</sub> = global warming potential of methane  
EI<sub>y</sub> = net quantity of electricity consumed during year y, in megawatt hours (MWh)

$$MD_{project,y} = MD_{flare,y}$$

Where

MD<sub>flare,y</sub> = the quantity of methane destroyed by flaring,  
MD<sub>flare,y</sub> = LFG<sub>flare,y</sub> \* W<sub>CH4,y</sub> \* D<sub>CH4</sub> \* FE

Where

LFG<sub>flare,y</sub> = Total amount of landfill gas flared  
W<sub>CH4</sub> = Methane fraction in the landfill gas  
D<sub>CH4</sub> = Density of methane derived from measurement of LFG (0.0007168 tCH<sub>4</sub>/m<sup>3</sup>CH<sub>4</sub>)  
FE = Flare/combustion efficiency (values provided in spreadsheets)

Thus, baseline emissions are calculated as follows:

$$BE_y = LFG_{flare,y} * W_{CH4,y} * D_{CH4} * FE$$

Baseline emissions for the period are calculated as BE<sub>y</sub> = 171,053 tCO<sub>2e</sub>.

Therefore, emission reductions are calculated as follows:

$$ER_y = LFG_{flare,y} * W_{CH4,y} * D_{CH4} * FE * GWP_{CH4} - (EI_y * 0.627)$$

This equation is equivalent to the one presented in the registered PDD:

$$ER_y = (ER_{CH4_y} * CF * GWP_{CH4}) - (El_y * 0.627)$$

$$ER_{CH4_y} = CH4_{project,y} - CH4_{baseline,y}$$

Where:

- $ER_{CH4_y}$  is the methane emission reduction in  $m^3$ ; **equivalent to  $LFG_{flare,y} * W_{CH4,y} * FE$**
- CF is the conversion factors from  $m^3$   $CH_4$  to t  $CH_4$  (0.0007168) at standard temperature and pressure; **equivalent to  $D_{CH4}$**
- $GWP_{CH4}$  is the global warming potential for  $CH_4$ ; **equivalent  $GWP_{CH4}$**
- $El_y$  is the annual electricity consumption of the LFG system
- 0.627 is the emission indicator for electricity from the grid in Tunisia expressed in  $tCO_2e/MWh$

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

Project emissions are calculated as follows:

$$PE_y = El_y * 0.627$$

Where

$El_y$  = net quantity of electricity consumed during year y, in megawatt hours (MWh).

$El_y$  is measured as 34.5 MWh for the entire monitoring period.

Project emissions for the period are calculated as  $PE_y = 30 tCO_2e$

## E.3. Calculation of leakage

No leakage will be considered for the project activity

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

Item	Baseline emissions or baseline net GHG removals by sinks (t CO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	GHG emission reductions or net GHG removals by sinks (t CO <sub>2</sub> e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	171,053	30	-	-	171,023	171,023

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

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	835,334 <sup>1</sup> tCO <sub>2</sub> e	171,023 tCO <sub>2</sub> e

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

There is no increase in the actual GHG emission reductions achieved during this monitoring period as compared to values estimated ex-ante in the registered PDD.

<sup>1</sup> The value is calculated as the sum of the ERs reported in the registered PDD for 9 months of 2014 (337,765 / 12 x 9 = 253,324 tCO<sub>2</sub>), the year 2015 (305,571 tCO<sub>2</sub>) and the year 2016 (276,439 tCO<sub>2</sub>).

The low amount of reductions achieved is due to following reasons:

- High leachate level in the landfill.
- Landfill gas has been captured from 3 cells only, whereas the PDD foresees the extraction from 5 cells. Gas extraction system in cell 4 has not started due to procurement issues and the waste disposal is still ongoing in cell 5.
- The PDD had an overestimation in the average methane concentration used for calculations (50%) and an optimistic biogas recovery rate of 70%.

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

<b>Project participant and/or responsible person/ entity</b>	<input checked="" type="checkbox"/> Project participant <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
<b>Organization name</b>	Agence Nationale de Gestion des Déchets-ANGED
<b>Street/P.O. Box</b>	12, rue du Cameroun, BP52, 1002 Tunis Belvedere
<b>Building</b>	
<b>City</b>	Tunis
<b>State/region</b>	Tunis
<b>Postcode</b>	1002
<b>Country</b>	Tunisia
<b>Telephone</b>	+216 71 847 493
<b>Fax</b>	+216 71 848 069
<b>E-mail</b>	<a href="mailto:dds@anpe.nat.tn">dds@anpe.nat.tn</a>
<b>Website</b>	
<b>Contact person</b>	Mounir Ferchichi
<b>Title</b>	General Director
<b>Salutation</b>	Mr
<b>Last name</b>	Ferchichi
<b>Middle name</b>	
<b>First name</b>	Mounir
<b>Department</b>	
<b>Mobile</b>	
<b>Direct fax</b>	+216 71 848 069
<b>Direct tel.</b>	+216 71 847 493
<b>Personal e-mail</b>	

<b>Project participant and/or responsible person/ entity</b>	<input checked="" type="checkbox"/> Project participant <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
<b>Organization name</b>	International Bank for Reconstruction and Development (IBRD) as Trustee of the Italian Carbon Fund (ICF)
<b>Street/P.O. Box</b>	1818 H Street NW
<b>Building</b>	MC
<b>City</b>	Washington
<b>State/region</b>	DC
<b>Postcode</b>	20433
<b>Country</b>	United States of America
<b>Telephone</b>	+1 202 458 5051
<b>Fax</b>	+1 202 522 7432
<b>E-mail</b>	<a href="mailto:IBRD-carbonfinance@worldbank.org">IBRD-carbonfinance@worldbank.org</a>
<b>Website</b>	<a href="http://www.worldbank.org/climate">www.worldbank.org/climate</a>
<b>Contact person</b>	Jose Andreu
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<b>Salutation</b>	Mr

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