First Monitoring Report

of

Guangzhou Xingfeng Landfill Gas Recovery and Electricity Generation CDM Project

UNFCCC CDM Ref. No. 1075

Monitoring Period: Dec. 30, 2008 to Mar. 31, 2009

Version: 01

Date: May 21, 2009

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1. Executive Summary

The purpose of this monitoring report is to calculate the greenhouse gas emission reduction achieved by Xingfeng[1] CDM project for periodic verification.

The relevant details of the project activity are given below:

No.	Project Year	Activity	Dates
1.		Start of crediting period	Dec. 30, 2008
2.	**1**	**First monitoring period (this report)**	**Dec. 30, 2008 to Mar. 31, 2009**

The total emission reduction being claimed in this monitoring period (Dec. 30, 2008 to Mar. 31, 2009) is **32106** tCO_2e (see Section 7 for detailed calculation).

2. Reference

The project is categorized in sector scope 13: Waste handling and disposal

Approved baseline methodology: ACM0001/Version 05 – Consolidated methodology for landfill gas project activities

Approved baseline methodology: ACM0002/Version 06 – Consolidated methodology for grid connected electricity generation from renewable sources

Tool to determine project emissions from flaring gases containing methane
Project Design Document: Guangzhou Xingfeng Landfill Gas Recovery and Electricity Generation CDM Project Version 4.4 dated Sep. 16, 2007.

3. Definitions in the report

CDM: Clean Development Mechanism

PDD: Project Design Document

GHG: Greenhouse Gases

IPCC: Intergovernmental Panel on Climate Change

4. General description of the project

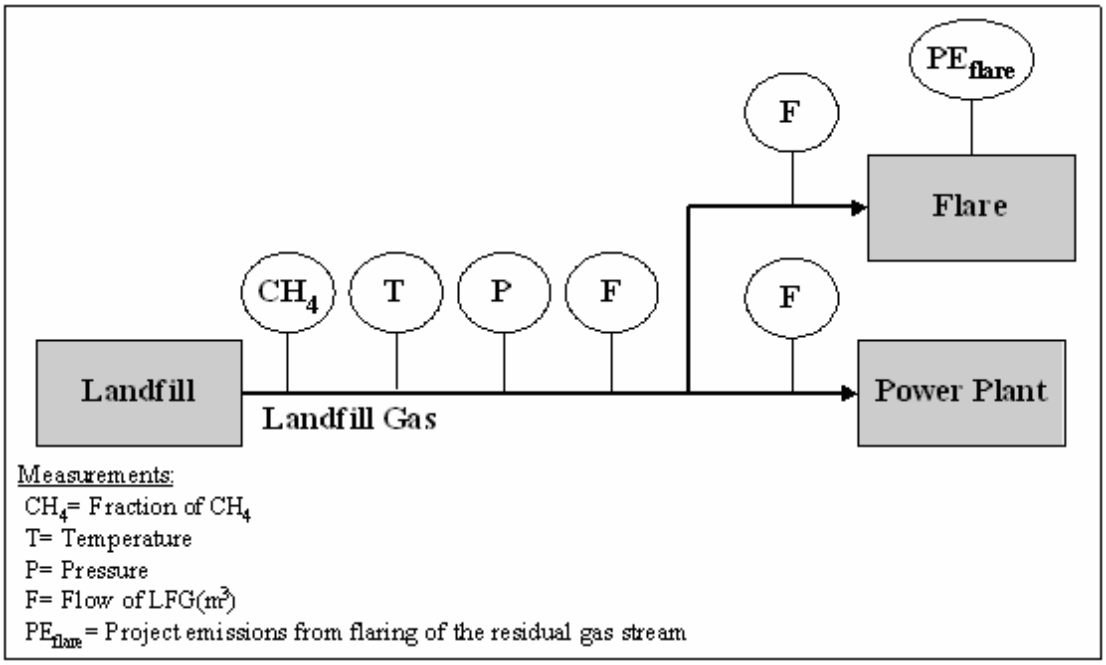
The proposed project is consisted of landfill gas collecting system, pre-treatment system,

[1] Xingfeng: Guangzhou Xingfeng landfill site

electricity generation system and grid connection system. Firstly, the landfill gas is collected, then through a transportation pipes, the landfill gas reaches pre-treatment system, in which the moisture and impurity of landfill gas is removed. After increasing pressure of the landfill gas, it is fed into electricity generation system. The electricity generated is connected to local grid (South China Power Grid) through transformer substation system. In order to prevent environment damage, the surplus landfill gas is flared by two combustion devices as per registered PDD. During this monitoring period, only one combustion device is operating.

5. Monitoring methodology and plan

Approved monitoring methodology ACM0001/Version 05 and ACM0002/Version 06 are applied to this project. The monitoring points are shown as below:



Data being collected in order to monitor the GHG reduction is shown in the table below:

ID number	Data variable	Data unit	Recording frequency	Comment
1. $LFG_{total,y}$	Total amount of landfill gas captured	Nm^3	Continuously	Measured by flow meter.
2.$LFG_{flare,y}$	Amount of landfill gas flared	Nm^3	Continuously	Measured by flow meter.
3. $LFG_{electricity,y}$	Amount of landfill gas combusted in power plant	Nm^3	Continuously	Measured by flow meter.
4. $w_{CH4,y}$	Methane fraction in the	%	Continuously	Measured by gas quality analyzer.

	landfill gas			
5. T_{flare}	Temperature in exhaust gas of the flare	℃	Continuously	Measured by thermometer.
6. EL_y	Net quantity of electricity exported to South China Power Grid	KWh	Continuously	Measured by bidirectional electricity meter.

Besides the data shown in the above table, temperature and pressure of the landfill gas are measured continuously by a thermometer and a manometer separately. They are measured to correct the flow of LFG in normalized cubic meters.

6. Quality Control (QC) and Quality Assurance (QA)

6.1 Quality Management System

The organizational structure is established in the monitoring management and operational system in order to ensure a successful operation of the project and the credibility and verifiability of the Emission Reductions achieved. The position, roles and responsibilities of each person in such organization structure are well defined. Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees in the document.

The competencies, capabilities, and qualifications needed for each aspect of the GHG emission reduction determination process are analyzed and relevant training was provided to ensure the required data quality.

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6.2 Quality control (QC) and quality assurance (QA) procedures that are being undertaken for data monitored

The QA & QC procedures include applicable national standards. They are established and implemented in order to:

1. Secure a good consistency through planning to implementation of this CDM project and,
2. Stipulate who has responsibility for what and,
3. Avoid any misunderstanding between people and organization involved.

Date	**Uncertainty level of data**	**QA/QC procedures undertaken for these data**
1. $LFG_{total,y}$	Low	Measured by flow meter. The meter will be

		calibrated each year by accredited institute.
2.$LFG_{flare,y}$	Low	Measured by flow meter. The meter will be calibrated each year by accredited institute.
3. $LFG_{electricity,y}$	Low	Measured by flow meter. The meter will be calibrated each year by accredited institute.
4. $w_{CH4,y}$	Low	Measured by continuous gas quality analyzer. The gas quality analyzer will be calibrated each year by accredited institute.
5. T_{flare}	Low	Measured by thermometer. The thermometer will be calibrated each year by accredited institute.

7. GHG Calculations

Statement of GHG emission reduction in 1st monitoring period

According to the approved methodology (ACM0001/Version 05 and ACM0002/Version 06)), the GHG emission reduction (ER_y), achieved by the project activity for this monitoring period is calculated as follows:

$$\mathbf{ER_y = (MD_{project,y} - MD_{reg,y}) * GWP_{CH4} + EL_y * CEF_{electricity,y}}$$

7.1 Calculation of $MD_{project,y}$

The methane destroyed by the project activity ($MD_{project,y}$) during this monitoring period is determined by the quantity of methane actually flared and gas used to generate electricity and the total quantity of methane captured.

The sum of the quantities fed to the flare ($LFG_{flare,y}$), to the power plant ($LFG_{electricity,y}$) have been compared with the total gas generated ($LFG_{total,y}$). The lower value must be adopted as $MD_{project,y}$. It is calculated as follows:

$$\mathbf{MD_{project,y} = MDf_{lare,y} + MD_{electricity,y}}$$

$$\mathbf{MDf_{lare,y} = LFG_{flare,y} * w_{CH4,y} * D_{CH4} - (PE_{flare,y} / GWP_{CH4})}$$

$$\mathbf{MD_{electricity,y} = LFG_{electricity,y} * w_{CH4,y} * D_{CH4}}$$

Date	$LFG_{total,y}$	$LFG_{flare,y}$	$LFG_{electricity,y}$
	Nm^3	Nm^3	Nm^3
Dec.30,2008– Dec.31, 2008	66007.613	419.901	55620.810
Jan. 1, 2009 – Jan. 31, 2009	1277401.536	274788.450	959327.391
Feb.1, 2009 – Feb. 28, 2009	1292342.217	215271.066	998819.563
Mar.1,2009 – Mar. 31, 2009	1281785.925	155279.855	1057639.518
Total	**3917537.291**	**645759.272**	**3071407.282**

The sum of the quantities fed to the flare ($LFG_{flare,y}$) and to the power plant ($LFG_{electricity,y}$) is 3717166.540 Nm^3, which is lower than the total gas generated ($LFG_{total,y}$). $LFG_{flare,y}$ and $LFG_{electricity,y}$ are used for $MD_{project,y}$ calculation.

The average methane fraction of the landfill gas during this monitoring period is as follows:

Date	$w_{CH4,y}$
	%
Dec.30,2008– Dec.31, 2008	51.025
Jan. 1, 2009 – Jan. 31, 2009	57.696
Feb.1, 2009 – Feb. 28, 2009	54.354
Mar.1,2009 – Mar. 31, 2009	54.359
Average	**54.358**

$PE_{flare,y}$ is the project emissions from flaring of the residual gas stream determined following the procedure described in the "Tool to determine project emissions from flaring gases containing Methane".

In this project, the temperature of the exhaust gas of the flare is measured continuously. For each minute, if the temperature of the flare's exhaust gas is above 500 ºC, it indicates that the flare is operating and the gas flowing into the flare has been burnt effectively during the minute. The effective amount of LFG flared during this minute is statistic as $*LFG_{flare,y}$ automatically and 90% is adopted as default value for the flare efficiency as per the registered PDD. If the temperature of the flare's exhaust gas is lower than 500 ºC, it indicates that the gas flowing into the flare has not been burnt effectively during the minute and the flare efficiency is 0. Hence, the project emissions from flaring of the residual gas stream $PE_{flare,y}$ is calculated as:

$$PE_{flare,y} = \sum_{h=1}^{n} (*LFG_{flare,y} \times w_{CH4,y} \times D_{CH4} \times (1-90\%) \times GWP_{CH4} + (LFG_{flare,y} - *LFG_{flare,y}) \times w_{CH4,y} \times D_{CH4} \times (1-0) \times GWP_{CH4})$$

In determine the project emissions from flaring of the residual gas stream $PE_{flare,y}$, some factors are used as follow:

Parameter	Value	Unit	Reference
D_{CH4}	0.0007168	tCH_4/ m^3CH_4	Methodology ACM0001
GWP_{CH4}	21	$tCO2e/tCH_4$	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories

The project emissions from flaring of the residual gas stream $PE_{flare,y}$ during this monitoring period is as follows:

Date	$PE_{flare,y}$
	tCO2e

Dec.30,2008– Dec.31, 2008	3.289
Jan. 1, 2009 – Jan. 31, 2009	406.247
Feb.1, 2009 – Feb. 28, 2009	263.683
Mar.1,2009 – Mar. 31, 2009	188.046
Total	**861.264**

$MDf_{lare,y} = LFG_{flare,y} * w_{CH4,y} * D_{CH4} - (PE_{flare,y} / GWP_{CH4})$

$= 645759.272 * 54.358\% * 0.0007168 - 861.264/ 21$

$= 210.601\ tCH_4$

$MD_{electricity,y} = LFG_{electricity,y} * w_{CH4,y} * D_{CH4}$

$= 3071407.282 * 54.358\% * 0.0007168$

$= 1196.743\ tCH_4$

$MD_{project,y} = MDf_{lare,y} + MD_{electricity,y}$

$= 210.601 + 1196.743$

$= 1407.344\ tCH_4$

7.2 Calculation of $MD_{reg,y}$

$MD_{reg,y} = MD_{project,y} * AF$

As per the registered PDD, the Xingfeng Landfill was built in 2001. At that time, Chinese government did not enact any law or compulsory regulation to require the landfills to destruct a certain amount of methane. Although in 2004, China Construction Ministry enacted the Technical Code of Municipal Waste Sanitation Landfill, which requires the installation of landfill gas capture systems and flares during the construction of landfills, the criterion is only addressing new landfill sites, and there are still no compulsory requirements on reconstruction of landfill site in operation. In addition, taking into account the large investment demand of the reconstruction, it is highly possible that Chinese government will not enact laws or regulations to require reconstruction of landfill site in operation. Therefore, the adjustment factor AF is 0 for the proposed project activity. Hence, the amount of regulatory requirements of methane destruction $MD_{reg,y}$ is :

$MD_{reg,y} = 1407.344 * 0 = 0\ tCH_4$

7.3 Calculation of ERs

$ER_y = (MD_{project,y} - MD_{reg,y}) * GWP_{CH4} + EL_y * CEF_{electricity,y}$

The net quantity of electricity exported to South China Grid during this monitoring period is as follows:

Date	EL_y
	KWh
Dec.30,2008– Dec.31, 2008	73200
Jan. 1, 2009 – Jan. 31, 2009	1161240
Feb.1, 2009 – Feb. 28, 2009	1092480
Mar.1,2009 – Mar. 31, 2009	951870
Total:	**3278790**

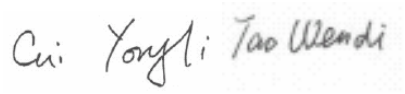
In determine the emission reduction ER_y, some factors are used as follow:

Parameter	Value	Unit	Reference
$\mathbf{GWP_{CH4}}$	21	$tCO2e/tCH_4$	Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories
$\mathbf{CEF_{electricity,y}}$	0.77835	tCO2e/MWh	PDD and the latest Baseline Emission Factors of China Grid was issued on Jul. 18, 2008 and updated on Dec. 30, 2008 by Chinese DNA. For South China Power Grid, where the project activity occurs, the $CEF_{electriccity}$ is 0. $8712tCO_2e/KWh$. However, the value of $CEF_{electriccity}$ in the registered PDD (0.77835 tCO_2e/MWh) is smaller than the above-mentioned $CEF_{electriccity}$. To be conservative, the lower value as $0.77835tCO_2e/MWh$ is adopted as $CEF_{electricity,y}$ in this monitoring period.

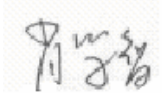
ER_y = (1407.344 – 0) * 21 + 3278790 / 1000 * 0.77835

= **32106 tCO2e**

The monitoring report is prepared by: ***Cui Yongli, Tao Wendi***



The monitoring report is approved by: ***Xiao Xuezhi***



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