

**MONITORING REPORT FORM (F-CDM-MR)**  
**Version 02.0****MONITORING REPORT**

<b>Title of the project activity</b>	Mokpo Landfill Gas Recovery Project for Electricity Generation
<b>Reference number of the project activity</b>	2834
<b>Version number of the monitoring report</b>	Version 5
<b>Completion date of the monitoring report</b>	20/11/2012
<b>Registration date of the project activity</b>	18/02/2010
<b>Monitoring period number and duration of this monitoring period</b>	3 <sup>rd</sup> monitoring period: 18/07/2011~18/08/2012
<b>Project participant(s)</b>	Hanwha Corporation
<b>Host Party(ies)</b>	Republic of KOREA
<b>Sectoral scope(s) and applied methodology(ies)</b>	Scope 1. Energy industry Scope 13. Waste handling and disposal Applied methodologies: - AMS I. D: Grid connected renewable electricity generation_V13 - AMS III. G: Landfill methane recovery_V06
<b>Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD</b>	27,405 tCO <sub>2</sub> -eq
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period</b>	40,670 tCO <sub>2</sub> -eq

**SECTION A. Description of project activity****A.1. Purpose and general description of project activity**

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Mokpo Landfill Gas Recovery Project for Electricity Generation is developed by Hanwha Corporation in the Republic of Korea. Mokpo Landfill which is located in Daeyang-dong Mokpo-city Jeollanam-do was constructed at the end of 1995 as a municipal solid waste (MSW) landfill. The total land area is 290,490 m<sup>2</sup> and waste disposal area is 180,000 m<sup>2</sup>.

**The purpose of the project and the measures taken to reduce greenhouse gas emission:**

The purpose of this project is to collect and utilize CH<sub>4</sub> (as a renewable energy) for electricity generation at the landfill site.

Prior to this proposed project, Mokpo Landfill was emitting landfill gas (hereinafter referred to as the LFG) into the atmosphere directly without recovery and utilization of LFG. The Project captures the landfill gas that would have been released to the atmosphere without the project activity and generates electricity with the landfill gas. The generated electricity will be transmitted to the grid of Korea Electric Power Corporation (hereinafter referred to as the KEPCO grid) which is a company in charge of exclusively managing the grid of Republic of Korea.

**The installed technology and equipments:**

The proposed project involves the installation of a highly efficient collecting, transmitting and pre-treatment system and two electricity generators. The two generators installed with total capacity of 2.123 MW (1.065 MW and 1.058 MW).

**Total emission reduction achieved in this monitoring period:**

In terms of CO<sub>2</sub> emission reductions, the reductions were 40,670 tons CO<sub>2</sub> over the 13 month (398days, 18/07/2011~18/08/2012) of crediting period.

**The relevant dates for the project activity:**

The relevant dates of the project activity are given below:

&lt;Table A-1&gt; Project Schedule

Date	Project Schedule
March 2008	Hanwha Corporation decides to invest in the proposed project (2.123 MW)
April 2008	Starting date of the project activity (the date of the start of construction work: gas collecting system)
September 2008	Date of completion for the installation of the 1.065 MW generator
	Starting date of commercial operation (electricity sales to KEPCO)
April 2009	Date of additional 1.058 MW generator installation
18, February 2010	Registered as a CDM project

**A.2. Location of project activity**

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Host Party(ies)	Republic of Korea
Region/State/Province, etc.;	Daeyang-dong
City/Town/Community, etc.;	Mokpo city

The site of the “Mokpo Landfill Gas Recovery Project for Electricity Generation” is located in Daeyang-dong, Mokpo City, Jeollanam-do, Republic of Korea. The facilities and equipment were installed inside the Mokpo landfill. The coordinates are longitude of 34:48 N and latitude of 126:22 E. The coordinates are based on the power plant.



<Figure A-1> The location of landfill site and the whole site view of the project

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

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Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of KOREA (host)	Hanwha Corporation	No
Switzerland	Hanwha Corporation	No

### A.4. Reference of applied methodology

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The approved small-scale CDM baseline methodologies;

- AMS I. D: Grid connected renewable electricity generation\_V13
- AMS III. G: Landfill methane recovery\_V06

The referred tools on the approved methodology;

- Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site\_V04
- Tool to calculate the emission factor for an electricity system\_V01.1

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

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Start date: 18/02/2010

Length of crediting period: 10years

Crediting period: 18/02/2010 ~ 17/02/2020

## SECTION B. Implementation of project activity

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

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#### The Implementation status of the project activity

Hanwha Corporation decided to invest in the proposed 2.123MW landfill gas generation project in March, 2008. Gas collecting system construction started in April, 2008.

Installation of 1.065MW generator was completed and started commercial operation in September, 2008.

A generator with capacity of 1.058MW was added in Mokpo landfill site in April, 2009. Therefore, the total installed generator capacity is 2.123MW. The CDM project monitoring activity has been started since 18/02/2010. It is registered date for CDM project.

The landfill gas collecting equipment installed on site is described in the registered PDD. The main component is the gas collecting system.

The actual implementation of the flaring system was initiated in September, 2008 and has continued through this monitoring period.

Gas analyzer's specification was corrected as below.

- Linearity is +/- 1% of F.S
- Zero drift is +/- 2% of F.S



<Figure B-1> The gas flow meter



<Figure B-2> The gas analyzer



<Figure B-3> The monitoring system



<Figure B-4> The watt-hour meter

There was no significant event affecting on the amount of reduction during the monitoring period. And also, any regulation or policy has not changed that could affect the normal operation of the project or the applicability of the methodology.

There was no monitoring equipment malfunction and the monitoring was carried out in accordance with the registered PDD. And the monitoring is compliant with the monitoring plan as described in “Operating Manual-Mokpo LFG Power Plant”.

Based on “Operating Manual-Mokpo LFG Power Plant”, if there is system error or any difficulties due to natural disasters, a daily work log have been temporarily applied during the error period. The details of errors of the monitoring system are as follows:

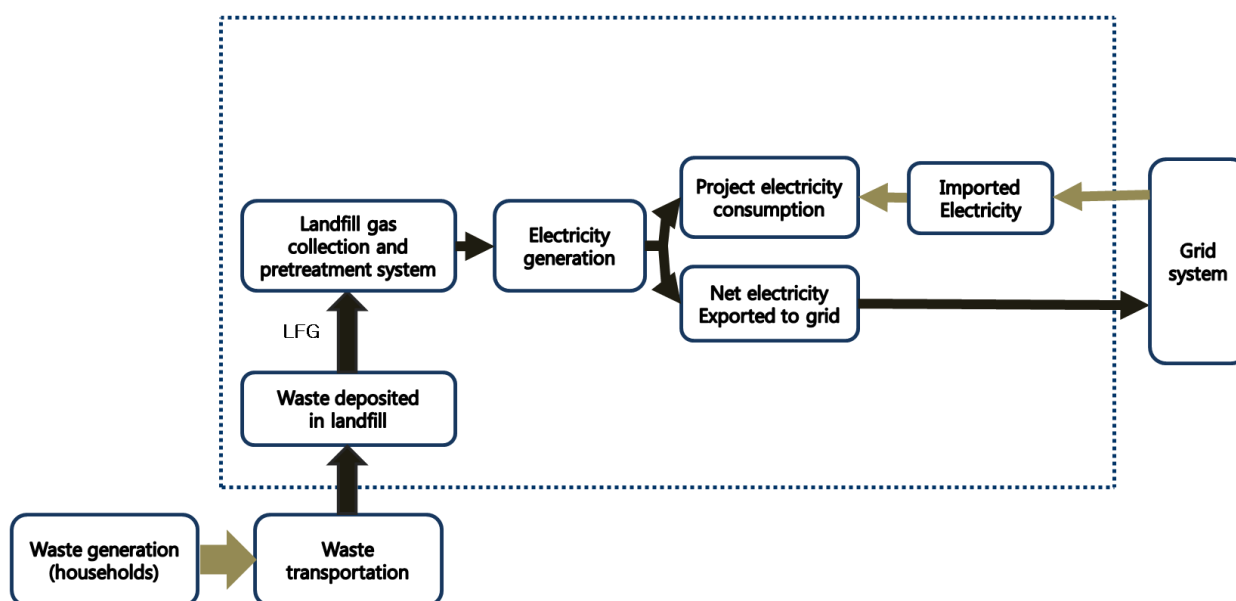
<Table B-1> Operation events history

Date	Duration	Operation events	Note
22/07/2011	0.5 hours (14:10~14:36)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
05/08/2011	0.5 hours (14:23~14:44)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
10/08/2011	11.5 hours (08:36~19:47)	Maintenance of generator.	Excluded for estimation of emission reduction.
12/08/2011	6 hours (09:42~15:39)	Maintenance of generator.	Excluded for estimation of emission reduction.
16/08/2011	6 hours (05:05~10:51)	Maintenance of generator.	Excluded for estimation of emission reduction.
07/09/2011	2 hours (15:00~16:57)	Maintenance of monitoring system.	Keep an hourly work log on the flow rate and CH <sub>4</sub> concentration.
10/09/2011	0.5 hours (18:12~18:41)	Maintenance of pressure valve.	Excluded for estimation of emission reduction.
15/09/2011	5.5 hours (16:06~21:19)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
21/10/2011	0.5 hours (16:24~16:42)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
	1.5 hours (17:22~18:32)	The Monitoring system was blacked out.	Keep an hourly work log on the flow rate and CH <sub>4</sub> concentration.
25/10/2011 ~ 26/10/2011	16 hours (21:12~11:52)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
14/12/2011	4 hours (05:35~09:24)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.

24/01/2012	1.5 hours (09:54~11:17)	Pipeline to methane analyzer was frozen.	Excluded for estimation of emission reduction.
03/02/2012	1 hours (08:00~08:53)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
13/02/2012	2 hours (10:03~12:10)	Replaced the flow meter for calibration.	Excluded for estimation of emission reduction.
24/02/2012	2.5 hours (20:58~23:29)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
15/03/2012	1 hour (13:11~14:18)	Maintenance of flow meter.	Excluded for estimation of emission reduction.
18/03/2012	1.5 hour (16:28~17:53)	Replaced the flow meter for calibration.	Excluded for estimation of emission reduction.
31/03/2012 ~ 01/04/2012	34 hours (08:09~18:00)	Maintenance of landfill site.	Excluded for estimation of emission reduction.
01/04/2012 ~ 04/04/2012	65 hours (18:00~11:02)	Calibration of two flow meters.	Excluded for estimation of avoidance methane emission reduction.
10/04/2012	1 hours (13:15~14:14)	Maintenance of generator.	Excluded for estimation of emission reduction.
18/06/2012	0.5 hours (20:59~21:24)	Errors of generator system.	Excluded for estimation of emission reduction.
22/07/2012	2.5 hours (08:48~11:04)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
03/08/2012	5.5 hours (08:01~13:34)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.
13/08/2012	0.5 hours (11:13~11:20)	The entire project boundary was blacked out. Power transmission (Import/Export) stopped.	Excluded for estimation of emission reduction.

### The description of the technology

The main process of the project is comprised of a landfill gas collecting system, a landfill gas pre-treatment system and an electricity generation system. The best available technology for each process and recycling LFG is effectively adopted into the proposed project.



<Figure B-5> The main process of the proposed project

### Landfill Gas Collecting System

The landfill gas collecting system is a gas transportation network which is consisted of gas collecting wells, lateral gas collecting sub-pipes and a main pipe to cover all the landfill. The landfill gas which is collected



from the gas collecting system is delivered into the CSV (Condensate Separation Vessel). High-density polyethylene (HDPE) collecting system is installed to convey the landfill gas from the wells to the blower. The total number of wellhead was 9. Each wellhead consisted of the 12 vertical well. 108 vertical well were being operated in the initial installation in January, 2009.

The total number of wellhead has been 11 since April 2009. Thus, 132 vertical well can be operated.

121 vertical well were being operated in the CDM-PDD. During monitoring period, 156 vertical well were being operated. Existing wellhead were relocated and new wellhead was trapped to activate methane gas capture in February, 2011.

The number of vertical well that can be operated will be varied depending on landfill gas status and other factors. J-trap and wellhead have same situation. To increase efficiency of landfill gas collection and control, ongoing maintenance has been in progress.

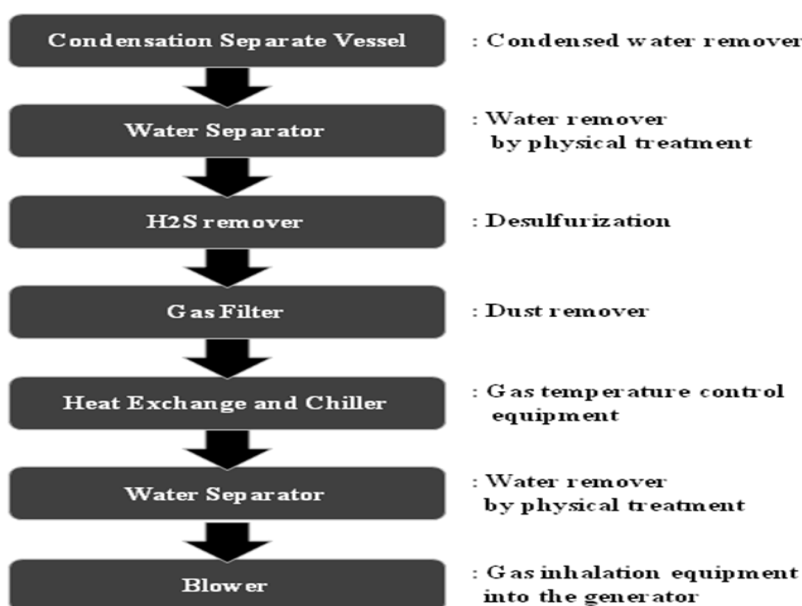
Detail history of wellhead is shown below <Table B-2>. Each of drawings was submitted to the DOE during the 2<sup>nd</sup> monitoring period.

<Table B-2> History of the landfill gas collecting system

Date	Well			J-Trap
	Wellhead	Well	Usewell	
January 2009	9	108	97	97
April 2009	11	132	121	117
September 2009	11	132	126	117
February 2011	13	156	156	125

### Landfill Gas Pre-treatment System

Prior to electricity generation, the landfill gas must be pre-treated to remove its impurities and moisture to prevent corrosion which could cause generator shutdown. Two water separators are installed to remove H<sub>2</sub>S and to protect the generators for this project. The pre-treatment consists of 1) CSV (Condensate Separation Vessel), 2) water separator, 3) H<sub>2</sub>S remover, 4) gas filter, 5) heat exchange and chiller, 6) water separator and 7) blower.



<Figure B-6> The process of pre-treatment system

### Electricity Generation System

Two generators with capacity of 2.123 MW (1.065 MW and 1.058 MW) were installed inside the Mokpo landfill. One generator was installed in the landfill site with capacity of 1.065 MW in September, 2008 and one additional generator with capacity of 1.058 MW was added in April, 2009. The collected LFGs are sent to the generators and the electricity thereby generated is exported to the grid-connected system of the Korea Electric Power Corporation (KEPCO) supply system.

**<Table B-3> The technical data of engine and power generator based on full load**

<b>Engine</b>	Capacity of 1.065 MW	Manufacturer	GE Jenbacher
		Engine type	JGC 320 GS-L.L-C81
		Gas volume	522 Nm <sup>3</sup> /h
	Capacity of 1.058 MW	Manufacturer	GE Jenbacher
		Engine type	JGC 320 GS-L.L-B81
		Gas volume	450 Nm <sup>3</sup> /h
<b>Generator</b>	Capacity of 1.065 MW	Manufacturer	STAMFORD
		Type	PE 734 B2
		Electrical output	1065 kW el.
		Frequency	60 Hz
		Voltage	380 V
		Speed	1800 rpm
		Efficiency	97.3 %
	Capacity of 1.058 MW	Manufacturer	STAMFORD
		Type	HCI 734 E2
		Electrical output	1058 kW el.
		Frequency	60 Hz
		Voltage	380 V
		Speed	1800 rpm
		Efficiency	96.6 %

## **B.2. Post registration changes**

### **B.2.1. Temporary deviations from registered monitoring plan or applied methodology**

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N/A

### **B.2.2. Corrections**

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N/A

### **B.2.3. Permanent changes from registered monitoring plan or applied methodology**

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The revision was applied for this monitoring plan.

The revision of monitoring plan was performed on the basis of applied methodology (AMS-III.G version 06 and AMS-I.D version 13) and “Procedures for revising monitoring plans in accordance with paragraph 57 of the modalities and procedures for the CDM (version 02)” in annex 28 of EB49 meeting report.

Some parameters in the registered monitoring plan are excluded and modified in the revised monitoring plan. These parameters are as below:

- Excluded parameters: **T**, **P**, **w<sub>x</sub>**, **p<sub>n,j,x</sub>** and **z** parameters
- Modified parameter: **LFG<sub>electricity,y</sub>** parameter

The revision of monitoring plan was submitted to the DOE in September, 2010. The revision of monitoring plan was approved after the registration on January 19<sup>th</sup>, 2011.

#### **B.2.4. Changes to project design of registered project activity**

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N/A

#### **B.2.5. Changes to start date of crediting period**

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N/A

#### **B.2.6. Types of changes specific to afforestation or reforestation project activity**

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N/A

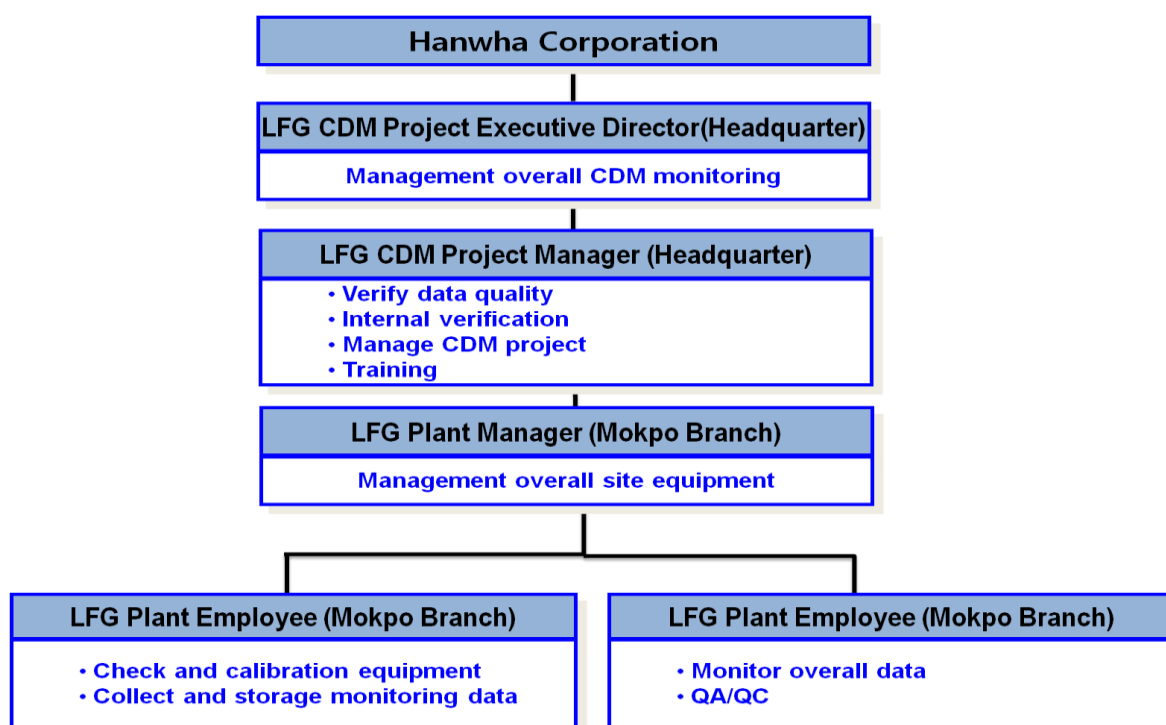
### **SECTION C. Description of monitoring system**

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Monitoring data and parameters will be monitored and their measurement method will be referred to “Operating Manual-Mokpo LFG Power Plant”. The relevant document is submitted to the DOE. Data and parameters are provided in Section D.

#### **Monitoring organization and the role of each party**

The following figure describes the operation and management structure for monitoring of the project activity. Below table shows the responsible party for each task of monitoring.



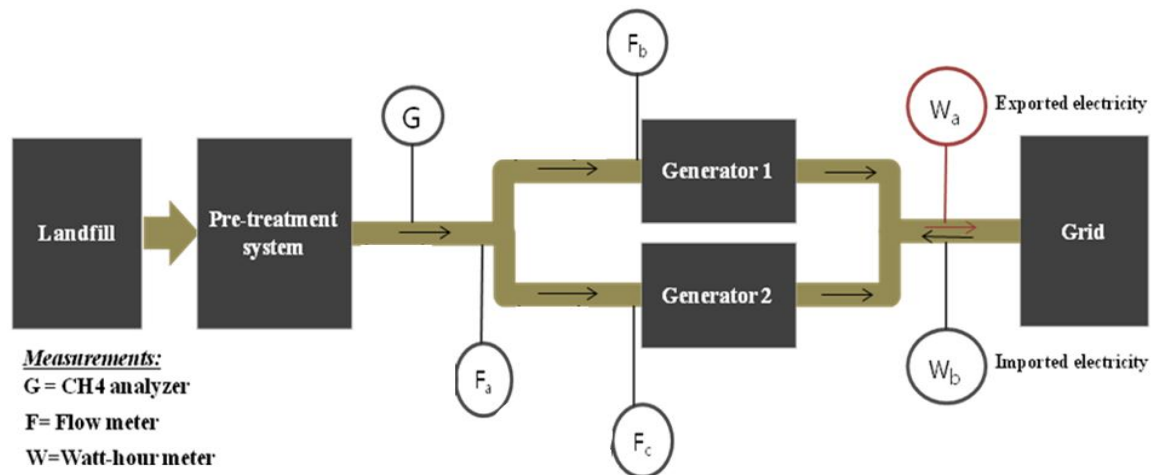
<Figure C-1> The structure of monitoring system

<Table C-1> The responsible party for each task of monitoring

Item	Sub-item	Responsible person
Measure & Archive	LFG <sub>electricity, y</sub>	Responsible person/department for the project : <ul style="list-style-type: none"><li>LFG plant manager / Mokpo operating Team of HWC Mokpo branch</li></ul>
	W <sub>CH4, y</sub>	
	EL <sub>EXP, PJT, y</sub>	
	EL <sub>IMP, PJT, y</sub>	
Measuring instrument check & Calibration	Centralized monitoring system	Responsible person/department for the project : <ul style="list-style-type: none"><li>LFG plant employee / Mokpo operating team of HWC Mokpo branch</li></ul>
	Flow meter	
	Gas analyzer	
	Watt-hour meter	Responsible person/department for the project: <ul style="list-style-type: none"><li>Korea Power Exchange (According to “Law regarding measurement” and : act on operation of electricity market”)</li></ul>
Establish monitoring plan		Responsible person/department for the project : <ul style="list-style-type: none"><li>LFG CDM project executive director / Environment /Renewable team of HWC Headquarter</li><li>LFG plant manage / Mokpo operating team of HWC Mokpo branch</li><li>LFG CDM project manager / Environment / Green &amp; Renewable energy business team of HWC Headquarter</li></ul>
Task coordination		
Monitoring report		Responsible person/department for the project : <ul style="list-style-type: none"><li>LFG plant manager / Mokpo operating team of HWC Mokpo branch</li><li>LFG CDM project manager / Environment / Green &amp; Renewable energy business team of HWC Headquarter</li></ul>

### The monitoring equipments to measure the amount of methane and electricity

- Gas flow meters are installed between the blower and generating facility to measure LFG flow rate. LFG volumes are expressed in normalized cubic meters.
- A methane analyzer is located in front of the flow meter to measure the concentration of methane in LFG which flows into the gas engine.
- The watt-hour meters are to be set-up transparently in accordance with “Law regarding measurement” and “Act on operation of electricity market”. Thereafter, the electricity measuring meter will be calibrated when it is installed behind the generator and sealed up after affirmation of Korea Power Exchange. The certified sheet of measurement registration is submitted to the DOE.



<Figure C-2> The Location of the Monitoring facilities

### Quality control (QC) and quality assurance (QA) procedures

LFG plant manager is the responsible person for quality management, which ensures the quality and accuracy of the measured data. For quality management, the following items are included: data records and storage, equipment calibration and maintenance, corrective action and emergency procedures for unintended emissions.

- Three gas flow meters were installed to ensure that if one of the meters has a problem to measure LFG flow rate, the two remaining meters are measured to calculate the amount of landfill gas.

The manufacturer provides the official document for the unique error between two flow meters and it says the maximum error range is 1,728 Nm<sup>3</sup>/day from theoretical calculation with each flow meter's accuracy. To be conservative, if the measured value between two flow meters is out of the range, the smaller value was applied. In this monitoring period, no out of the range of meters unique error has taken place.

When the flow rate data was transferred to the server, data lag was occurred occasionally. In this case there is no record spot for the data but it is possible to measure total flow rate during the time because measuring figure is accumulated data. When data lag is occurred, data correction applied as a conservative manner.

- Gas analyzer records the density of methane gas in the landfill gas.

Regular maintenance and testing for gas analyzer was done once a month in two ways, zero calibration and span calibration. Zero calibration is to set zero for analyzer and N<sub>2</sub> gas is used. Span calibration is for span point adjustment. For this calibration, the standard gas (CH<sub>4</sub>, CO<sub>2</sub>, and O<sub>2</sub>) was used with a concentration of each specification in accordance with manufacturer's specification.

When data lag is occurred, the lower CH<sub>4</sub> concentration value was selected between before and after of this lagging time and the CH<sub>4</sub> quantity was calculated with this CH<sub>4</sub> concentration as a conservative manner.

- The amount of electricity exported ( $W_a$ ) to the grid-connected system is measured by watt-hour meter. The measured data is simultaneously transferred to Korea Power Exchange and the amount of imported electricity ( $W_b$ ) is measured by a meter as well. They are collected daily, weekly and monthly.

**Data records and storage:**

The measured data is monitored by a computer and Mokpo operation team should check it continuously.

**Equipment calibration and maintenance:**

- LFG plant Manager should check monitoring plan and/or schedules, and also calibrate generators periodically in line with procedure calibration manual from related manufacturer. If necessary, LFG plant manager could calibrate the CDM project related equipment.

- The watt-hour meter is subject to a regular maintenance and testing regime to ensure accuracy. This is in compliance with the “Act for measurement” and “Regulation for operation in electricity market” of South Korea. Under this regulation, the calibration period is every two years.

**Corrective action**

LFG plant manager will report all issues and data related to plant operation to LFG CDM project manager (Environment/renewable team).

Operation review, internal audit and corrective action are carried out by Environment/renewable team according to the “Mokpo LFG Power Plant Operation Manual”.

**Emergency procedure:**

In case of emergency situation, proper action is carried out to minimize damage in accordance with “Mokpo LFG Power Plant Operation Manual”.

**Training**

All employees involved in this project should be trained for the knowledge of operating equipment and monitoring by skilled technician from the generator manufacturer. The employees should attain a comprehensive knowledge with regard to the general and technical aspects of the CDM project.

Employees involved in the monitoring were trained externally and internally on the overall CDM project activity.

External training for electric system operation was done by experts (from KPX) from October 26, 2011 to October 28, 2011.

External training for electrical safety manages education was done by experts (from Korea Electric Engineers Association) from May 22, 2012 to May 24, 2012.

Internal training for the monitoring was done by LFG CDM project manager of headquarter on July 20<sup>th</sup>, 2012.

## SECTION D. Data and parameters

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

Data/Parameter	Operation Margin Emission Factor ( $EF_{OM}$ )
Unit	ton CO <sub>2</sub> e/MWh
Description	The generation-weighted average of CO <sub>2</sub> emission per electricity unit generated by the existing grid-connected power plants
Source of data	“Statistics of Electric Power in Korea”
Value(s) applied	0.6817
Purpose of data	Calculation of Baseline/ Project emission
Additional comment	This data is available at time of this PDD submission, and fixed for the crediting period.

Data/Parameter	Build Margin Emission Factor ( $EF_{BM}$ )
Unit	ton CO <sub>2</sub> e/MWh
Description	The generation-weighted average of CO <sub>2</sub> emission per electricity unit generated by additionally constructed power plants.
Source of data	“Statistics of Electric Power in Korea”
Value(s) applied	0.3933
Purpose of data	Calculation of Baseline/ Project emission
Additional comment	This data is available at time of this PDD submission, and fixed for the crediting period.

Data/Parameter	CO <sub>2</sub> Emission Intensity of the Electricity displaced ( $CEF_{electricity}$ )
Unit	ton CO <sub>2</sub> e/MWh
Description	The weighted average of $EF_{OM}$ and $EF_{BM}$
Source of data	“Statistics of Electric Power in Korea”
Value(s) applied	0.5375
Purpose of data	Calculation of Baseline/ Project emission
Additional comment	This data is available at time of this PDD submission, and fixed for the crediting period

### D.2. Data and parameters monitored

Data/Parameter	F
Unit	Not applied.
Description	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
Measured/Calculated /Default	Not applied.
Source of data	Written information from the operator of the solid waste disposal site and/or site visits at the solid waste disposal site
Value(s) of monitored parameter	0
Monitoring equipment	Not applied.
Measuring/Reading/	Monitored annually



<b>Recording frequency</b>	
<b>Calculation method (if applicable)</b>	Not applied.
<b>QA/QC procedures</b>	Not applied.
<b>Purpose of data</b>	Calculation of Baseline emission
<b>Additional comment</b>	Not applied.

<b>Data/Parameter</b>	<b>GWP<sub>CH4</sub></b>
<b>Unit</b>	tCO <sub>2</sub> e/tCH <sub>4</sub>
<b>Description</b>	Global Warming Potential (GWP) of methane, valid for the relevant commitment period
<b>Measured/Calculated /Default</b>	Not applied.
<b>Source of data</b>	Decisions under UNFCCC and the Kyoto Protocol
<b>Value(s) of monitored parameter</b>	21(to be applied for the first commitment period of the Kyoto Protocol)
<b>Monitoring equipment</b>	Not applied.
<b>Measuring/Reading/ Recording frequency</b>	Monitored annually
<b>Calculation method (if applicable)</b>	Not applied.
<b>QA/QC procedures</b>	Not applied.
<b>Purpose of data</b>	Calculation of Baseline/ Project emission
<b>Additional comment</b>	Not applied.

<b>Data/Parameter</b>	<b>LFG<sub>electricity, y</sub></b>			
<b>Unit</b>	Nm <sup>3</sup> /y			
<b>Description</b>	Amount of landfill gas combusted in power plant			
<b>Measured/Calculated /Default</b>	Measured			
<b>Source of data</b>	Gas flow meters			
<b>Value(s) of monitored parameter</b>	<b>Data</b>	<b>Measured LFG<sub>electricity, y</sub> (Nm<sup>3</sup>)</b>		
		<b>F<sub>b</sub></b>	<b>F<sub>c</sub></b>	<b>F<sub>b</sub> + F<sub>c</sub></b>
	18/07/2011	12,420.300	0.000	12,420.300
	19/07/2011 ~ 18/08/2011	284,633.000	65,886.300	350,519.300
	19/08/2011 ~ 18/09/2011	281,708.800	69,528.500	351,237.300
	19/09/2011 ~ 18/10/2011	328,462.000	18,273.600	346,735.600
	19/10/2011 ~ 18/11/2011	319,753.900	33,468.500	353,222.400
	19/11/2011 ~ 18/12/2011	340,694.400	34,212.500	374,906.900
	19/12/2011 ~ 18/01/2012	348,156.100	32,611.600	380,767.700

	19/01/2012 ~ 18/02/2012	273,587.300	98,883.200	372,470.500
	19/02/2012 ~ 18/03/2012	0.000	346,027.300	346,027.300
	19/03/2011 ~ 18/04/2012	178,273.300	151,453.900	329,727.200
	19/04/2012 ~ 18/05/2012	338,625.500	19,230.000	357,855.500
	19/05/2012 ~ 18/06/2012	331,201.400	45,730.300	376,931.700
	19/06/2012 ~ 18/07/2012	333,859.500	34,522.800	368,382.300
	19/07/2012 ~ 18/08/2012	367,517.000	30,904.000	398,421.000
	2011/07/18 ~ 18/08/2012	3,738,892.500	980,732.500	4,719,625.000
<p>Measured LFG data by the flow meter is accumulated data showing integrating meter. Measured real time data have calculated from automatically recorded data by continuous integrating flow meters. ‘Measured LFG<sub>electricity, y</sub>’ in above table is calculated by difference between current measuring data and previous measuring data in every recording time</p> <p>All measured data for the crediting period was submitted to the DOE as a spread sheet named “Mokpo_3rd MR_R2834_Emission Reduction_ver3”.</p>				
<b>Monitoring equipment</b>	Tag	F <sub>a</sub> (main)	F <sub>b</sub> (1 <sup>st</sup> generator)	F <sub>c</sub> (2 <sup>nd</sup> generator)
	Type	Thermal Mass Flow Meter		
	Serial No	906044B	812003	906044A
	Accuracy level	1%	1%	1%
	<ul style="list-style-type: none"> <li>Measured automatically and continuously by integrating flow meters.</li> <li>The measured data is monitored by a computer and Mokpo operation team should check it continuously. <ul style="list-style-type: none"> <li>Accuracy is +/- 1.0 of F.S</li> <li>Sensor response time is one second</li> </ul> </li> <li>To ensure accuracy, the flow meters are subject to regular maintenance and testing. The flow meter is calibrated every three years.</li> <li>The archived data is kept during the crediting period as well as two years after that.</li> <li>Daily data is documented in paper and archived in electronic file.</li> <li>The temperature and pressure in Landfill gas are not monitored separately.</li> </ul>			
<b>Measuring/Reading/Recording frequency</b>	Measured automatically.			
<b>Calculation method (if applicable)</b>	Not applied.			
<b>QA/QC procedures</b>	<p>To ensure accuracy, the flow meters are subject to regular maintenance and testing.</p> <p>The flow meter is calibrated every three years.</p>			





	Tag		F <sub>a</sub> (main)	F <sub>b</sub> (1 <sup>st</sup> generator)	F <sub>c</sub> (2 <sup>nd</sup> generator)
	Type		Thermal Mass Flow Meter		
	Serial No		906044B	812003	906044A
	Accuracy level		1%	1%	1%
	Installation Date		27-07-2009	27-07-2009	20-05-2009
	Initial Testing	Testing Report No.	24-07-2009 (2009-06-31)	18-03-2009 (2008-12-03)	24-07-2009 (2009-06-31)
		Validity	23-07-2012	17-03-2012	23-07-2012
		Calibration Entity	Flow Technology Co., Ltd.		
	Second Testing	Data of Calibration	02-04-2012 ~ 03-04-2012	02-04-2012 ~ 03-04-2012	02-04-2012 ~ 03-04-2012
		Validity	01-04-2015	01-04-2015	01-04-2015
		Calibration Entity	Flow Technology Co., Ltd.		
	This project involves the installation of two electricity generators. One of the generators is operating normally, and the other one is used as a standby unit. During the normal operation period, Either one or the other generator has been operated.				
	For periodic calibration, the location of the flow meter (F <sub>b</sub> ) for measuring the 1 <sup>st</sup> generator was replaced with the flow meter (F <sub>c</sub> ) for measuring the 2 <sup>nd</sup> generator on 13/02/2012. And, the flow meter (F <sub>c</sub> ) was returned to its original location on 15/03/12 for the 2 <sup>nd</sup> generator operation. In the meanwhile, the measured integrating flow data of the 1st generator was monitored by the flow meter (F <sub>c</sub> ).				
	From 15/03/2012 to 31/03/2012, only 2 <sup>nd</sup> generator was operated.				
The evidence for the adequacy of replacement was submitted to the DOE. It is identified from the confirmation letter by the manufacturer.					
Purpose of data		Calculation of Baseline emission			
Additional comment		Not applied.			

<b>Data/Parameter</b>	<b>W<sub>CH<sub>4</sub>,y</sub></b>
<b>Unit</b>	%
<b>Description</b>	Methane fraction in LFG
<b>Measured/Calculated/Default</b>	Measured
<b>Source of data</b>	Methane analyzer



Value(s) of monitored parameter	- Weighted average CH <sub>4</sub> concentration during the monitoring period The measured methane fraction data is monitored automatically and continuously by gas analyser.		
	Date		Measured CH <sub>4</sub> (%) (Weighted average CH <sub>4</sub> concentration)
	18/07/2011 ~ 18/08/2012		52.13
	All measured data for the crediting period submitted to the DOE as a spread sheet.		
Monitoring equipment	Tag		G
	Serial No		A8M7282T
	Accuracy level		Linearity 1%, Repeatability 0.5%
	• Methane fraction is measured with continuous gas analysers.		
	• The measured data is monitored by a computer and Mokpo operation team should check it continuously. - Linearity is +/- 1% of F.S - Zero drift is +/- 2% of F.S - Span Drift is +/- 2% of F.S - Response time is 15~30 seconds - Operating condition's temperature is – 5 °C to 45 °C		
	• To ensure accuracy, the gas analyzer is subject to regular maintenance and testing regime in accordance with the manufacturer's specification.		
	• The methane analyzer is calibrated every three years.		
	• The archived data is kept during the crediting period as well as two years after that.		
	• Daily data is documented in paper and archived in electronic file.		
	Measuring/Reading/Recording frequency	Measured automatically.	
Calculation method (if applicable)	Not applied.		
QA/QC procedures	To ensure accuracy, the gas analyzer is subject to regular maintenance and testing regime in accordance with the manufacturer's specification. The methane analyzer is calibrated every three years.		
	Tag		G
	Serial No		A8M7282T
	Accuracy level		Linearity 1%, Repeatability 0.5%
	Installation Date		02-06-2009
	Initial Testing	Testing Report No.	09-04-2009 (K02505)
		Validity	08-04-2012
		Calibration Entity	Fuji Electric Instrumentation Co., Ltd. (Initial)
	Second Testing	Testing Report No.	02-04-2012 (1201-00302-001)
		Validity	01-04-2015



	Calibration Entity	National Metrology Institute
<b>Purpose of data</b>	Calculation of Baseline emission	
<b>Additional comment</b>	Not applied.	

<b>Data/Parameter</b>	$EL_{EXP, PJT, y}$	
<b>Unit</b>	MWh	
<b>Description</b>	Total amount of exported electricity out of the project	
<b>Measured/Calculated/Default</b>	Measured	
<b>Source of data</b>	Watt-hour meter	
<b>Value(s) of monitored parameter</b>	Date	Measured $EL_{EXP}$ (MWh)
	18/07/2011	18.355
	19/07/2011 ~ 18/08/2011	516.455
	19/08/2011 ~ 18/09/2011	539.142
	19/09/2011 ~ 18/10/2011	546.713
	19/10/2011 ~ 18/11/2011	547.385
	19/11/2011 ~ 18/12/2011	536.788
	19/12/2011 ~ 18/01/2012	535.639
	19/01/2012 ~ 18/02/2012	523.916
	19/02/2012 ~ 18/03/2012	489.525
	19/03/2011 ~ 18/04/2012	500.182
	19/04/2012 ~ 18/05/2012	491.151
	19/05/2012 ~ 18/06/2012	505.683
	19/06/2012 ~ 18/07/2012	491.310
	19/07/2012 ~ 18/08/2012	517.374
	2011-07-18 ~ 18/08/2012	6,759.616
	The exported electricity data is automatically monitored by a certified meter. All measured data for the crediting period submitted to the DOE as a spread sheet.	
<b>Monitoring equipment</b>	Tag	$W_a$
	Serial No	95246742
	Accuracy level	0.5s
	<ul style="list-style-type: none"> <li>The amount of exported electricity is measured automatically by a certified meter. The measured data is transferred to Korea Power Exchange. It is checked and achieved daily, weekly, monthly in electronic way by the Mokpo operation team.</li> <li>To ensure accuracy, the watt-hour meter is subject to regular maintenance and testing regime complying with the “Act for measurement” and “Regulation for operation of electricity market” in South Korea.</li> <li>The watt-hour meter is calibrated every two years.</li> </ul>	



	<ul style="list-style-type: none"><li>• The archived data is kept during the crediting period as well as two years after that.</li><li>• Daily data is documented in paper and archived in electronic file.</li></ul>																											
Measuring/Reading/Recording frequency	Measured automatically.																											
Calculation method (if applicable)	Not applied.																											
QA/QC procedures	To ensure accuracy, the watt-hour meter is subject to regular maintenance and testing regime complying with the “Act for measurement” and “Regulation for operation of electricity market” in South Korea. The watt-hour meter is calibrated every two years.																											
	<table><tr><td colspan="2">Tag</td><td>W<sub>a</sub></td></tr><tr><td colspan="2">Serial No</td><td>95246742</td></tr><tr><td colspan="2">Accuracy level</td><td>0.5s</td></tr><tr><td colspan="2">Installation Date</td><td>06-09-2008</td></tr><tr><td rowspan="3">Initial Testing</td><td>Testing Report No.</td><td>28-08-2008 (2008-074-6)</td></tr><tr><td>Validity</td><td>27-08-2010</td></tr><tr><td>Calibration Entity</td><td>Meter and Petrochemical testing and research Institute.</td></tr><tr><td rowspan="3">Second Testing</td><td>Testing Report No.</td><td>25-08-2010 (DC2010-318)</td></tr><tr><td>Validity</td><td>24-08-2012</td></tr><tr><td>Calibration Entity</td><td>Korea Testing Certification.</td></tr></table>		Tag		W <sub>a</sub>	Serial No		95246742	Accuracy level		0.5s	Installation Date		06-09-2008	Initial Testing	Testing Report No.	28-08-2008 (2008-074-6)	Validity	27-08-2010	Calibration Entity	Meter and Petrochemical testing and research Institute.	Second Testing	Testing Report No.	25-08-2010 (DC2010-318)	Validity	24-08-2012	Calibration Entity	Korea Testing Certification.
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		Validity	27-08-2010																									
		Calibration Entity	Meter and Petrochemical testing and research Institute.																									
	Second Testing	Testing Report No.	25-08-2010 (DC2010-318)																									
		Validity	24-08-2012																									
		Calibration Entity	Korea Testing Certification.																									
Purpose of data	Calculation of Baseline emission																											
Additional comment	Not applied.																											

Data/Parameter	EL <sub>IMP</sub> , PJT, y		
Unit	MWh		
Description	Total amount of imported electricity to meet project requirement		
Measured/Calculated /Default	Measured		
Source of data	Watt-hour meter		
Value(s) of monitored parameter	Date	Measured EL <sub>IMP</sub> (MWh)	Corrected EL <sub>IMP</sub> (MWh)
	18/07/2011	0.312	0.317
	19/07/2011 ~ 18/08/2011	0.648	0.658
	19/08/2011 ~ 18/09/2011	0.096	0.097
	19/09/2011 ~ 18/10/2011	0.022	0.022
	19/10/2011 ~ 18/11/2011	0.096	0.096
	19/11/2011 ~ 18/12/2011	0.048	0.048
	19/12/2011 ~ 18/01/2012	0.048	0.048



	19/01/2012 ~ 18/02/2012	0.096	0.096
	19/02/2012 ~ 18/03/2012	0.096	0.096
	19/03/2011 ~ 18/04/2012	0.864	0.864
	19/04/2012 ~ 18/05/2012	0.024	0.024
	19/05/2012 ~ 18/06/2012	0.072	0.072
	19/06/2012 ~ 18/07/2012	0.024	0.024
	19/07/2012 ~ 18/08/2012	0.120	0.120
	18/07/2011 ~ 18/08/2012	2.566	2.582
	*As the calibration of watt-meter for electricity imported has been delayed, data correction implemented. (18/07/2011~18/09/2011)		
	The imported electricity data is automatically monitored by a certified meter. All measured data for the crediting period submitted to the DOE as a spread sheet.		
Monitoring equipment	Tag	W <sub>b</sub>	
	Serial No	0190662	
	Accuracy level	1s	
	<ul style="list-style-type: none"><li>• The amount of imported electricity will be measured automatically by certified watt-hour meter. The project participant will check the amount of the imported electricity at the web site (<a href="http://cyber.kepco.co.kr">http://cyber.kepco.co.kr</a>) and get the paper bill from KEPCO monthly.</li><li>• To ensure accuracy, the watt-hour meter is subject to regular maintenance and testing regime complying with the “Act for measurement” and “Regulation for operation of electricity market” in South Korea.</li><li>• The watt-hour meter is calibrated every two years.</li><li>• The archived data is kept during the crediting period as well as two years after that.</li><li>• The monthly data is archived in paper bill from KEPCO.</li></ul>		
Measuring/Reading/Recording frequency	Measured automatically.		
Calculation method (if applicable)	Not applied.		
QA/QC procedures	To ensure accuracy, the watt-hour meter is subject to regular maintenance and testing regime complying with the “Act for measurement” and “Regulation for operation of electricity market” in South Korea.		
	The watt-hour meter is calibrated every two years.		
	Tag		W <sub>b</sub>
	Serial No		0190662
	Accuracy level		1s
	Installation Date		01-06-2009
	Initial Testing	Testing Report No.	22-08-2008
		Validity	21-08-2010

		Calibration Entity	LS industrial systems Co., Ltd
	Second Testing	Testing Report No.	27-09-2011 (DC2011-398)
		Validity	26-09-2013
		Calibration Entity	Korea Testing Certification (KTC)
Purpose of data	Calculation of Project emission		
Additional comment	Not applied.		

### D.3. Implementation of sampling plan

&gt;&gt;

N/A

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

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

&gt;&gt;

$$BE_y = (MD_y - MD_{reg,y}) + EL_{EXP, PJT, y} * CEF$$

Parameter	Unit	Description
$MD_y$	tCO <sub>2</sub> e	CO <sub>2</sub> equivalent of the methane captured and destroyed/ gainfully used by the project activity in year y;
$MD_{reg,y}$	tCO <sub>2</sub> e	Methane emissions that would be captured and destroyed to comply with national or local safety requirements or legal regulations in the year 'y'
$EL_{EXP, PJT, y}$	MWh	The quantity of electricity exported to the grid-connected system by this project activity during the year, y
CEF	tCO <sub>2</sub> e/MWh	Combined emission factor in electricity generation by grid-connected system; weighted average of EF <sub>OM</sub> and EF <sub>BM</sub> .

CEF is 0.5375 tCO<sub>2</sub>e/MWh and this is fixed factor during the crediting period.

$$MD_y = LFG_{electricity,y} * wCH_{4,y} * DCH_{4,y} * GWP_{CH4}$$

Parameter	Unit	Description
$LFG_{electricity,y}$	Nm <sup>3</sup>	Landfill gas flared or used as fuel in the year 'y'
$wCH_{4,y}$	%	Methane content in landfill gas in the year 'y' (mass fraction)
$DCH_{4,y}$	kg/ Nm <sup>3</sup>	Density of methane at normal conditions in the year 'y' (Source: ACM0001 ver.11)
$GWP_{CH4}$	tCO <sub>2</sub> /tCH <sub>4</sub>	Global warming potential of methane

Density of methane in landfill gas is determined at the temperature and pressure of the landfill gas as described in AMS-III.G. However,  $LFG_{electricity,y}$  is automatically measured at normal condition by a flow meter, and the temperature and pressure are not monitored separately. Thus, density of methane at normal conditions in the year 'y' is measured in  $kg/Nm^3$ .

Methane content is measured by gas analyzer.

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

>>

$$PE_y = EL_{IMP, PJT, y} * CEF$$

Parameter	Unit	Description
$EL_{IMP, PJT, y}$	MWh	The quantity of imported electricity from grid-connected system to project activity during the year, y

CEF is 0.5375  $tCO_2e/MWh$  and this is fixed factor during the crediting period.

## E.3. Calculation of leakage

>>

Mokpo landfill gas has not been destructed by flaring and/or taken for any utilisation before developing the proposed project. For this project, there is no leakage effect.

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

Date	$ER_y$	$LFG_{electricity, y}$	$wCH_4, y$	$DCH_4, y$	$GWP_{CH_4}$	$MD_{reg, y}$	$EL_{EXP, PJT, y}$	$EL_{IMP, PJT, y}$	CEF	Leakage
18/07/2011	111.303	12,420.300	54.347	0.0007168	21	0	18.355	0.317	0.5375	
19/07/2011 ~ 18/08/2011	3,115.257	350,519.300	53.79	0.0007168	21	0	516.455	0.658	0.5375	
19/08/2011 ~ 18/09/2011	3,298.503	351,237.300	56.91	0.0007168	21	0	539.142	0.097	0.5375	
19/09/2011 ~ 18/10/2011	3,129.778	346,735.600	54.34	0.0007168	21	0	546.713	0.022	0.5375	
19/10/2011 ~ 18/11/2011	3,137.879	353,222.400	53.48	0.0007168	21	0	547.385	0.096	0.5375	
19/11/2011 ~ 18/12/2011	3,355.947	374,906.900	54.35	0.0007168	21	0	536.788	0.048	0.5375	
19/12/2011 ~ 18/01/2012	3,242.784	380,767.700	51.55	0.0007168	21	0	535.639	0.048	0.5375	
19/01/2012 ~ 18/02/2012	3,078.739	372,470.500	49.89	0.0007168	21	0	523.916	0.096	0.5375	
19/02/2012 ~ 18/03/2012	2,840.088	346,027.300	49.48	0.0007168	21	0	489.525	0.096	0.5375	
19/03/2012 ~ 18/04/2012	2,724.137	329,727.200	49.48	0.0007168	21	0	500.182	0.864	0.5375	
19/04/2012 ~ 18/05/2012	2,930.271	357,855.500	49.50	0.0007168	21	0	491.151	0.024	0.5375	
19/05/2012 ~ 18/06/2012	3,078.552	376,931.700	49.47	0.0007168	21	0	505.683	0.072	0.5375	
19/06/2012 ~ 18/07/2012	3,085.500	368,382.300	50.88	0.0007168	21	0	491.310	0.024	0.5375	
19/07/2012 ~ 18/08/2012	3,541.615	398,421.000	54.42	0.0007168	21	0	517.374	0.120	0.5375	
18/07/2011~ 18/08/2012	40,670.340	4,719,625.000	52.13	0.0007168	21	0	6,759.616	2.582	0.5375	

In this project, the billing cycle of electricity consumption is for the period from 19<sup>th</sup> of last month to 18<sup>th</sup> of current month. And the starting date of the crediting period is 18<sup>th</sup> Feb.



For a conservative calculation, the total amount of electricity consumption from January 19<sup>th</sup> to February 18<sup>th</sup> in 2010 was included in the 1<sup>st</sup> monitoring period. And the total amount of electricity consumption from July 19<sup>th</sup> to August 18<sup>th</sup> in 2010 was included in the 2<sup>nd</sup> monitoring period. Also, the total amount of electricity consumption from June 19<sup>th</sup> to July 18<sup>th</sup> in 2011 was included in the 3<sup>rd</sup> monitoring period. Thus, this method results in conservative ER calculation.

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (tCO <sub>2</sub> e)	Leakage (tCO <sub>2</sub> e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO <sub>2</sub> e)
<b>Total</b>	40,671.728	1.388	0	40,670.340

#### E.5. Comparison of actual emission reductions or net anthropogenic 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
<b>Emission reductions or GHG removals by sinks (tCO<sub>2</sub>e)</b>	<b>27,405 tCO<sub>2</sub>e</b>	<b>40,670 tCO<sub>2</sub>e</b>

Detail Values estimated in ex-ante calculation of registered PDD (only 3<sup>rd</sup> Monitoring period) are shown as below.

Year	ER <sub>y,estimated</sub> , PDD	=	ER <sub>y,CH4</sub> , PDD	+	ER <sub>y,electricity</sub> , PDD
2009	13,712	=	11,911	+	1,801
2010	24,220	=	21,038	+	3,182
2011	24,831	=	21,569	+	3,262
2012	25,350	=	22,020	+	3,331
2013	25,783	=	22,396	+	3,387
2014	26,137	=	22,703	+	3,434
2015	26,417	=	22,946	+	3,471
2016	26,630	=	23,131	+	3,499
2017	26,780	=	23,262	+	3,519
2018	26,874	=	23,343	+	3,531
2019	11,214	=	9,741	+	1,473

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

>>

**Actual values reached during the monitoring period: 40,670 tCO<sub>2</sub>e**

**Values applied in ex-ante calculation of the registered CDM-PDD (2011~2012): 27,405 tCO<sub>2</sub>e**

The emission reductions increased to 48% during the monitoring period compared to the expected emission reductions which is on the registered CDM-PDD.

The main causes of the increased emission reductions are as follows.

#### Expected data in registered PDD calculated using conservative data.

In PDD,  $BE_y = BE_{CH_4,SWDS,y} - MD_{reg,y}$ . The methane emission potential of a solid waste disposal site,  $BE_{CH_4,SWDS,y}$  in tCO<sub>2</sub>e, is undertaken using the equation in the “Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site.”

Therefore, the expected LFG by waste composition analysis is differs from actual LFG generation on monitoring system.

The LFG flow was estimated to be 6.05 m<sup>3</sup>/min (on the registered CDM-PDD: 167 days in 2011, 231days in 2012) but the actual average flow was 8.24 m<sup>3</sup>/min during the monitoring period. In other words, there was 36% of the difference between the theoretical and the actual values.

#### **Quantity of waste for LFG**

The starting year of Mokpo landfill is in 1996, and the ending year is expected in 2022.

Compared table between the actual quantity and the expected quantity waste are shown below.

Year	Expected waste estimation(ton)	The actual quantity waste(ton)
2007	66,627	91,099
2008	66,134	68,720
2009	65,644	70,032
2010	65,158	70,737
2011	64,676	66,686
2012 (1.1~ 8.18, 231days)	40,629	37,899
Total	368,868	405,173

The amount of waste quantity (91,099ton, up 37%) was a lot more than the expected quantity (66,627 ton) in 2007 due to the waste brought from other landfill. The actual quantity of waste was increased compared to the expected quantity of waste which is on the registered CDM-PDD until 2011. Thus quantity of waste was increased methane content in landfill gas by its 1<sup>st</sup> order decay model.

The emission reduction was calculated using actual amount of landfill considering the registered PDD.

The difference between the emission reduction in the monitoring period and on the registered PDD can be explained by the difference of quantity of waste in landfill. This factor can serve as a main cause. The increase in quantity of waste causes the increase in actual LFG generation. So, conservative assumption for the expected amount of waste in landfill is the reason for the difference.

#### **CH<sub>4</sub> concentration**

The PDD estimate was based on 50% CH<sub>4</sub> concentration but the actual concentration exceeds 52.13%.

#### **Maintenance of Landfill gas collecting system**

Another reason for increase in emission reduction is the overall optimization of landfill operation. Emission reduction can be increased depending on the amount of LFG. In addition, the conservative assumptions for the landfill operating conditions including operating hour and the optimization of the LFG power generation can also be the reasons for the difference. The overall and comprehensive environment was optimized for the landfill, although the theoretical model considered less methane fraction in the landfill gas.

Therefore, the emission reduction is not increased proportionally in accordance with only one factor. And the biggest cause is the difference of the prediction of landfill gas.

#### **Amount of exported electricity**

The amount of exported electricity was estimated to be 6,908 MWh (on the registered CDM-PDD: 167 days in 2011, 231days in 2012) but the actual amount of exported electricity was 6,760 MWh during the monitoring period. In other words, there was 2% of the difference between the theoretical and the actual values. For this project activity, amount of exported electricity is the only factor for revenue. In a point of additionality of this project activity, increasing of treated methane gas is not directly related to income of this project activity. Thus regarding to this change, this change was not occurred intentionally as it does not have influence on revenue and this increasing also does not effect to the additionality of this project activity.



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**History of the document**

<b>Version</b>	<b>Date</b>	<b>Nature of revision</b>
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	EB 54, Annex 34 28 May 2010	Initial adoption.
<b>Decision Class:</b> Regulatory <b>Document Type:</b> Form <b>Business Function:</b> Issuance		