

CDM – Executive Board

**B.7.1 Data and parameters monitored:**

<b>Data / Parameter:</b>	<b>f</b>
Data unit:	-
Description:	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
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 of data:	0
Brief description of measurement methods and procedures to be applied:	Monitored annually
QA/QC procedures:	Not applied.
Any comment:	Not applied.

<b>Data / Parameter:</b>	<b>GWP<sub>CH4</sub></b>
Data unit:	tCO <sub>2</sub> e / t CH <sub>4</sub>
Description:	Global Warming Potential (GWP) of methane, valid for the relevant commitment period
Source of data:	Decisions under UNFCCC and the Kyoto Protocol
Value of data:	21(to be applied for the first commitment period of the Kyoto Protocol)
Brief description of measurement methods and procedures to be applied:	Monitored annually
QA/QC procedures:	Not applied.
Any comment:	Not applied.

<b>Data / Parameter:</b>	<b>LFG<sub>electricity, v</sub></b>
Data unit:	Nm <sup>3</sup> /y
Description:	Amount of landfill gas combusted in power plant
Source of data:	Measured by using gas flow meters
Value of data :	Not applied.
Brief description of measurement methods and procedures to be applied:	<p>Measured automatically by continuous flow meters.  The measured data is monitored in a computer and Mokpo Operation team should check the measured data continuously.</p> <ul style="list-style-type: none"> <li>- Accuracy is +/- 1.0 of F.S</li> <li>- Sensor response time is one second</li> <li>- Flow rate is 1,400 Nm<sup>3</sup>/h</li> <li>- Temperature is 50 °C</li> <li>- Pressure is 200 mmbar</li> </ul>
QA/QC procedures to be applied:	<p>The flow meters are subject to a regular maintenance and testing, to ensure accuracy.</p> <p>Calibrate the meter every three year</p>

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Any comment:	Archived data is kept during the crediting period and two years after. Daily data is documented in paper and archived in electronic file. No separate monitoring of temperature and pressure when expressing LFG volumes in normalized cubic meters
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<b>Data / Parameter:</b>	<b>W<sub>CH<sub>4</sub>,y</sub></b>
Data unit:	%
Description:	Methane fraction in LFG
Source of data:	Measured by using a methane analyzer
Value of data :	50% (IPCC default value)
Brief description of measurement methods and procedures to be applied:	Methane fraction is measured with continuous gas analysers. The measured data is monitored in a computer and Mokpo Operation team should check the measured data continuously. - Linearity is +/- 0.5% of F.S - Zero drift is +/- 1% 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
QA/QC procedures to be applied:	The gas analyzer is subject to a regular maintenance and testing regime in accordance with the manufacturer's specification at once, to ensure accuracy Calibrate the meter every three year
Any comment:	Archived data are to be kept during the crediting period and two years after. Daily data is documented in paper and archived in electronic file.

<b>Data / Parameter:</b>	<b>EL<sub>EXP, PJT, y</sub></b>
Data unit:	MWh
Description:	Total amount of electricity exported out of the project
Source of data:	Read from watt-hour meter
Value of data :	The estimation result is presented in B.6.3
Brief description of measurement methods and procedures to be applied:	The amount of exported electricity is measured automatically by certified meter. The measured data are transferred to Korea Power Exchange and are checked and achieved daily, weekly, monthly in electronic way by Mokpo Operation team. Measured by watt-hour meter

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QA/QC procedures to be applied:	The watt-hour meter is subject to a regular maintenance and testing regime to ensure accuracy. Comply with “Act for measurement”, “Regulation for operation of electricity market” of South Korea. Calibrate the meter every two year.
Any comment:	Archived data are to be kept during the crediting period and two years after. Daily data is documented in paper and archived in electronic file.

<b>Data / Parameter:</b>	<b>EL<sub>IMP, PJT, y</sub></b>
Data unit:	MWh
Description:	Total amount of electricity imported to meet project requirement
Source of data:	Measurement by watt-hour meter
Value of data :	The estimation result is presented in B.6.3
Brief description of measurement methods and procedures to be applied:	The amount of imported electricity will be measured automatically by certified 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. Measured by watt-hour meter
QA/QC procedures to be applied:	The watt-hour meter is subject to a regular maintenance and testing regime to ensure accuracy. Comply with “Act for measurement”, “Regulation for operation of electricity market” of South Korea. Calibrate the meter every two year.
Any comment:	Archived data are to be kept during the crediting period and two years after. The monthly data is archived in paper bill from KEPCO.

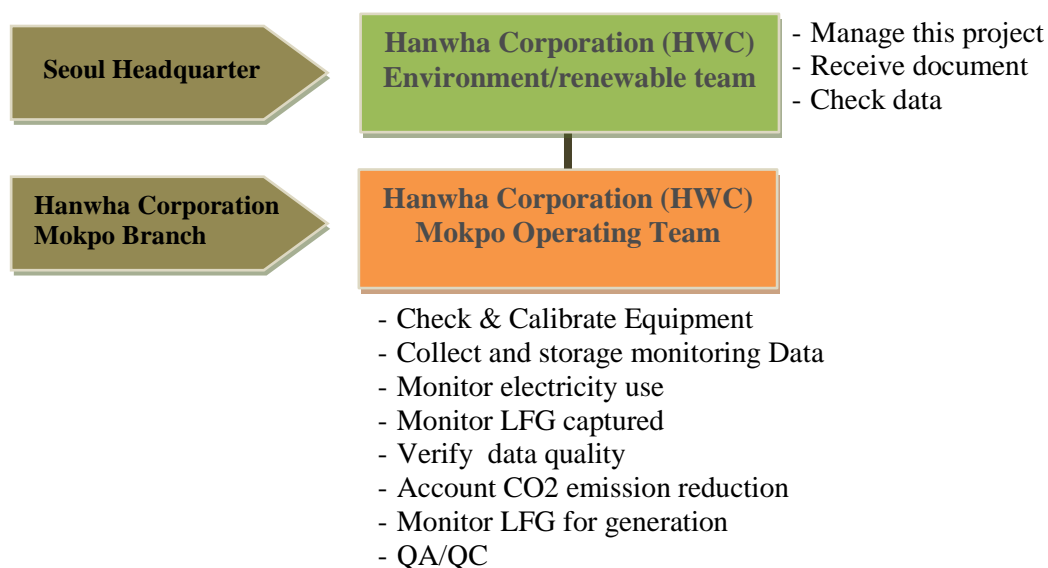
**B.7.2 Description of the monitoring plan:**

Data and parameters provided in Section B.7.1 will be monitored and their measurement method will be referred to Section B.7.11. “Operating Manure-Mokpo LFG Power Plant” is submitted to DOE.

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

The following figure describes the operational and management structure that monitor the project activity and the table below shows the responsible party for each task of monitoring.

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&lt;Figure B-3&gt;The structure of monitoring system

&lt;Table B-18&gt; The responsible party for each task of monitoring.

Table 2-10: 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 : Kunhong, Lee (LFG Plant Manager) / Mokpo Operating Team of HWC Mokpo branch
	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 : Kunhong, Lee (LFG Plant Manager) / Mokpo Operating Team of HWC Mokpo branch
	Flow meter	
	Gas analyzer	
	Watt-hour meter	Responsible person/department for the project: Korea Power Exchange (According to “Law regarding measurement” and : act on operation of electricity market”)
Establish monitoring plan		Responsible person/department for the project : Kunhong, Lee (LFG Plant Manager) / Mokpo Operating Team of HWC Mokpo branch Jihyun, Park (LFG CDM Project Manager) / Environment /Renewable Team of HWC Headquarter
Task coordination		

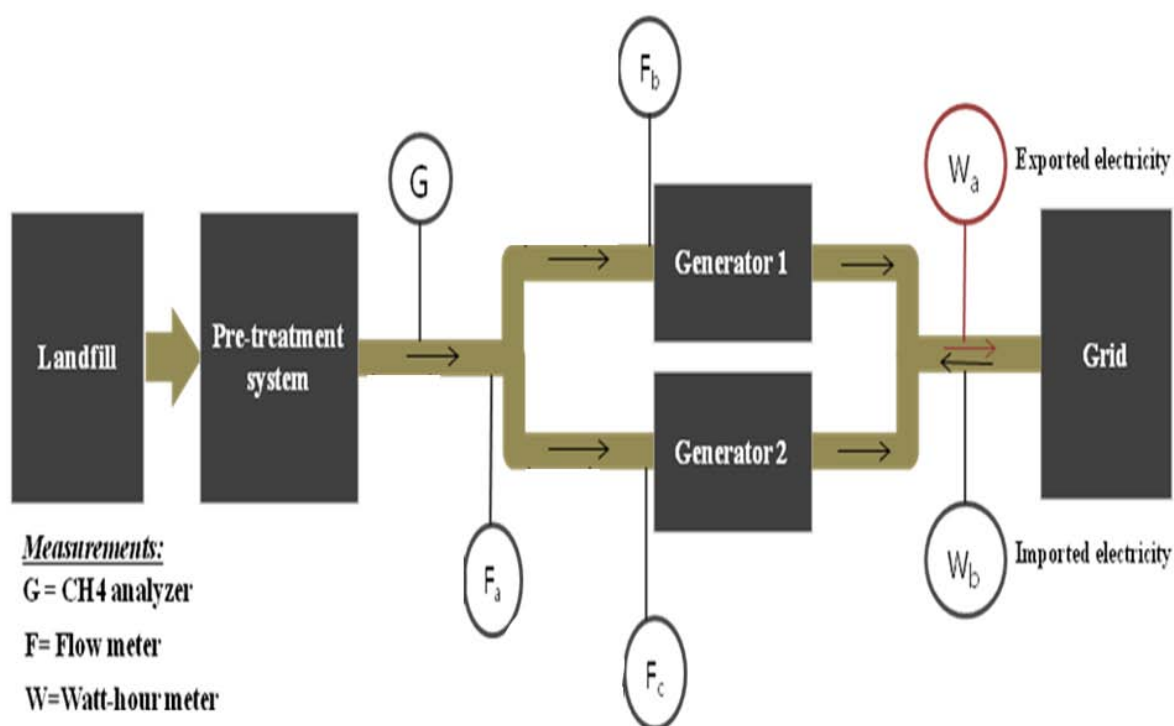
Monitoring report	Responsible person/department for the project : Kunhong, Lee (LFG Plant Manager) / Mokpo Operating Team of HWC Mokpo branch Jihyun, Park (LFG CDM Project Manager) / Environment /Renewable Team of HWC Headquarter
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***The monitoring equipments to measure amount of methane and electricity***

- Gas flow meters are installed between the blower and generating facility to measure LFG flow rate, LFG volumes expressing in normalized cubic meters.

-A methane analyzer is located before the above flow meter to measure the fraction of methane in LFG volume fed into the gas engine.

-Electricity measuring meters are to be set-up transparently in accordance with “Law regarding measurement” and “Act on operation of electricity market”. Thereafter, the meter is calibrated when installed behind the generator and sealed up after affirmation of Korea Power Exchange. The certified sheet of measurement registration is submitted to DOE.



<Fig. B-4> 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 data storage, equipment calibration and maintenance, corrective action, and Emergency procedures for unintended emissions.

- Three gas flow meters will be installed to ensure that if one of the meters has a problem to measure LFG flow rate, the two remainings are measured to calculate the amount of landfill gas. Otherwise, the IPCC default factor will be used for methane content in the LFG, if a methane analyzer has a problem.

- The amount of electricity exported (Wa) 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 (Wb) is measured by a meter, as well. They are collected daily, weekly and monthly. If the landfill site data were to differ from that of the Korea Power Exchange, each data should be inspected. The collected data should be kept during the crediting period and 2 years after.

***Data records and storage:***

All the daily data related to CDM project are documented on paper and archived in electronic files and kept during the crediting period and two years after. The measured data is monitored on a computer and Mokpo Operation team should check them 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. The equipment, related to CDM project could be calibrated by LFG Plant Manager if necessary.

- 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 of 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 is 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 in knowledge/information of operating equipment and monitoring by skilled technician from the Generator manufacturer, and/or participate in training programs. The employees should attain a comprehensive knowledge with regard to the general and technical aspects of CDM project.