



**Verification and certification report form for
CDM project activities
(Version 04.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Wonju Landfill Gas Recovery Project for Electricity Generation Reference number: 10379		
Scale of the project activity	<input type="checkbox"/> Large-scale <input checked="" type="checkbox"/> Small-scale		
Version number of the verification and certification report	1.1		
Completion date of the verification and certification report	19/11/2021		
Monitoring period number and duration of this monitoring period	Number: 4 th Period: 01/07/2020~31/12/2020 (184days)		
Version number of the monitoring report to which this report applies	2.2		
Crediting period of the project activity corresponding to this monitoring period	01/06/2017-31/05/2024		
Project participants	NEWGEN ELECTRICS Co., Ltd. ROEN consulting Co., Ltd.		
Host Party	Republic of Korea		
Applied methodologies and standardized baselines	AMS I.D: Grid connected renewable electricity generation (Version 18.0) AMS-III.G.: Landfill methane recovery (Version 09.0) No standardized baseline(s) applicable		
Mandatory sectoral scopes	1 - Energy industry 13 - Waste handling and disposal		
Conditional sectoral scopes, if applicable	No conditional sectoral scope(s) linked to the applied methodology		
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	8,131 tCO ₂ e		
Certified amount of GHG emission reductions or GHG removals for this monitoring period	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	-	6,891	-
Name and UNFCCC reference number of the DOE	Name: Korean Foundation for Quality (KFQ) Reference number: E-0025		
Name, position and signature of the approver of the verification and certification report	Yu Shim JEONG Managing Director of Energy · Climate Change		

	<p>Assessment Division</p> <p>Y S JEONG</p>
--	---

SECTION A. Executive summary

Korean Foundation for Quality (KFQ) performed the verification of emission reductions reported for the CDM project “Wonju Landfill Gas Recovery Project for Electricity Generation” (UNFCCC Registration Ref. No. 10379) in the Republic of Korea in the period from 01/07/2020 to 31/12/2020. This report contains the findings from the verification and a certification statement for the certified emission reductions.

Verification objective

Verification is the periodic, thorough and independent assessment and ex-post determination by a Designated Operational Entity (DOE) of the monitored reductions in greenhouse gas (GHG) emissions that have occurred as a result of the CDM project activity during a defined monitoring period. Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification is to verify and certify emission reductions reported for the “Wonju Landfill Gas Recovery Project for Electricity Generation” for the period from 01/07/2020 to 31/12/2020 in accordance with paragraph 62 of CDM modalities and procedures.

Verification scope

The scope of the verification is to verify that:

- The project activity has been implemented and operated in accordance with the revised project design document (PDD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- The monitoring report (MR) and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of certified emission reductions (CERs) and verifiable and in accordance with applicable CDM requirements;
- The monitoring plan complies with the monitoring methodology and the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology including applicable tools and compliance with any guidance provided by the CDM Executive Board (CDM EB) regarding deviations from the provisions of a registered plan and/or methodology;
- Data is recorded and stored as per the monitoring methodology AMS-III.G. (version 09.0) and AMS-I.D. (version 18.0), and the calculation of GHG emission reductions has been assessed to correctly support the emission reductions being claimed.

Furthermore, KFQ identified any concerns related to the conformity of the actual project activity and its operation with the registered PDD, and determined whether any deviation or proposed or actual changes in the implementation or operation of the project activity comply with the requirements of the CDM project standard for project activities (PS).

The verification ensured that reported emission reductions are complete and accurate in order to be certified and the verification assessed both quantitative and qualitative information on emission reductions.

Verification process

KFQ has made publicly available the MR received from the PPs. Only verification activities undertaken after the publication of the MR on the UNFCCC CDM website have been used as a basis for the conclusion of verification.

The verification process includes desk review of the MR published (and any updated versions, if available), emission reduction calculation spreadsheets (ER calculation spreadsheet) and other supporting documents and data. Further, onsite assessments and interviews with those involved in project management and operations are conducted. This is followed by preparation of draft verification report summarizing desk review and on-site assessment findings (i.e. CARs, CLs, and FARs). Upon successful closing of the CARs and CLs raised (if any), the draft verification report is

prepared. The draft verification report reviewed by a technical reviewer according to KFQ's internal quality assurance procedures. If no further findings are raised the final verification report is prepared and reviewed once again.

The data presented in the MR were assessed by review of the detailed project documentation and production records, as well as by interviews with personnel at NEWGEN ELECTRICS Co., Ltd. (NEWGEN) and ROEN consulting Co., Ltd. (ROEN) and observation of collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results, as well as to verify the correct application of the approved monitoring methodology. Furthermore, this has enabled the verification team to assess and determine that the implementation and operation of the project activity as well as the steps taken to report emission reductions in compliance with the CDM criteria and relevant guidance provided by the CDM EB.

In addition, all parameters, as required (and as applicable) by the monitoring methodology AMS-III.G. (version 09.0) and AMS-I.D. (version 18.0) as well as the monitoring plan and the management system were assessed during the site visit.

Description of the project activity

Project Parties	Republic of Korea (Host)
Title of project activity	Wonju Landfill Gas Recovery Project for Electricity Generation
UNFCCC Reference Number	10379
Project Participants	NEWGEN ELECTRICS Co., Ltd. ROEN Consulting Co., Ltd.
Baseline and monitoring methodology	AMS-III.G. version 09.0 AMS-I.D. version 18.0
Location of the project activity	San 185, Saje-ri, Heungeop-myeon, Wonju-city - North 37.327570 ° - East 127.869777 °
Registration Date	01/06/2017
Registered PDD	Version 4.0 dated 18/01/2021
Crediting Period	01/06/2017-31/05/2024
Monitoring period of this verification	01/07/2020-31/12/2020

Conclusion

KFQ has performed verification of the emission reductions reported for the project activity "Wonju Landfill Gas Recovery Project for Electricity Generation" (UNFCCC Registration Ref. No. 10379) for the period 01/07/2020 to 31/12/2020.

The verification of the emission reductions assessed all factors and issues that constitute the basis for emission reductions from the project. All relevant records of data from the monitoring system and operational record have been examined and verified for the reporting period.

KFQ confirms that the GHG emission reductions were calculated without material misstatements. Our opinion refers to the project's GHG emissions and resulting GHG emission reductions reported, both determined using the valid and revised project's baseline, its monitoring plan, and its associated documents.

The implementation of the project resulted in 6,891 tCO₂e of emission reductions during the period from 01/07/2020 to 31/12/2020. In our opinion, the GHG emission reductions reported for the project in the MR were fairly stated. The GHG emission reductions were calculated correctly on the basis of the applied monitoring methodologies AMS-III.G. (version 09.0), AMS-I.D. (version 18.0), and the monitoring plan contained in the registered PDD (version 4.0).

KFQ is able to certify that the emission reductions from the “Wonju Landfill Gas Recovery Project for Electricity Generation” during the period from 01/07/2020 to 31/12/2020 amount to 6,891 tCO_{2e}.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader (*)	IR	Jang	Pyung Hee	KFQ	√	√	√	√
2.	Verifier(*)	IR	Park	Su Hyun	KFQ	√	√	√	√
3.	Verifier	EI	Yang	Gee Hyun	-	√	-	-	√
4.	Trainee	IR	Yeom	Yu Jin	KFQ	-	√	-	-

(*) means personnel with technical expertise in technical area 1.2 and/or 13.1.

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Lee	MiJung	KFQ
2.	Approver	IR	Jeong	YuShim	KFQ

Please refer to Appendix 2 below for demonstration of how the team meets the competence required for the verification.

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Number of Monitoring parameters	M	The project activity does not involve large number of monitoring parameters.	The verification team consists of three verifiers who have the experience of verification on the same type project activities. Also, two verifiers in total conduct on-site inspection in order to check all monitoring parameters in a complete and detailed manner.
2.	Error rate in Monitoring report	L	Expert organization is involved in compilation of MR as well as calculation.	The verification team focused on systematic consistency and error check.
3.	Familiarity with Monitoring system	L	This is the 4 th monitoring period. PP (ROEN) is an	Although expert organization is involved in compilation of

			expert organization and is involved in the periodic inspection of monitoring equipment	MR as well as calculation, the verification team independently checked the existence of all measuring instruments and their validity.
4.	QA/QC	M	Stable QA/QC system has been implemented.	Focus on crosschecking between raw data and references. Review monitoring manual and relevant procedures, for example, emergency procedures.
5.	Data flow	M	Transferred to the central control system automatically.	Crosscheck raw data with spreadsheet on a random sampling basis extent to ensure the functioning of the transferring system.

KFQ's verification plan draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate them. KFQ planned the verification by obtaining evidence and other information and explanations that KFQ considers necessary to give reasonable assurance on the reported GHG emission reductions on the basis of risk level identified and materiality concept in accordance with "Guideline on the application of materiality in verifications (version 02.0)".

C.2. Consideration of materiality in conducting the verification

There were some findings that has an impact on the amount of emission reductions, but it is immaterial. As the finding could be considered as simple error, not systematic reoccurring error, the verification team decided that no additional audit procedures need to be conducted in order to reach a reasonable level of assurance, and that the claimed emission reductions in the MR are free from material error, omission or misstatement. Accordingly, verification and sampling plan were not revised.

SECTION D. Means of verification

D.1. Desk/document review

The MR (version 1.0 dated 27/05/2021, published on 15/06/2021) and additional background documents related to the project performance were reviewed by the verification team. Furthermore, the registered PDD and validation report were reviewed as well as previous verification reports, the applied baseline and monitoring methodology and any other information and references relevant to the project activity's emission reductions. A complete list of all documents reviewed is shown in appendix 3 of this report.

KFQ's verification process takes into consideration all the CDM rules and guidance applicable to the project activity, e.g. CDM validation and verification standard for project activities (VVS), CDM project standard for project activities (PS), CDM project cycle procedure for project activities (PCP), checklist for requests for issuance for project activities, and relevant decisions, clarifications and guidance from the CMP and the CDM EB.

The aim of the assessment in the desk review was to:

- Verify the compliance of the MR with the guidance for completing the monitoring report form;
- Verify the completeness of the data and the information presented in the MR;
- Check the compliance of the monitoring plan with the applied monitoring methodologies;

- Check the compliance of the MR with respect to the monitoring plan and verify that the applied methodologies were carried out. Particular attention was paid to coverage of all monitoring parameters, the frequency of measurements, the quality of the metering equipment including calibration requirements and the quality assurance and quality control procedures;
- Review the calculations and assumptions used to obtain the GHG data and ER;
- Evaluate the data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

D.2. On-site inspection

Detailed verification of all data contained in the MR was performed during the site visit at Wonju landfill on 29/09/2021. During the site visit, the personnel were interviewed or assisted the verification team. KFQ has applied standard auditing techniques to assess the quality of information provided. The following aspects of the CDM project activity have been confirmed:

- The implementation and operation of the CDM project activity;
- The information flow for generating, aggregating, recording, calculation and reporting of the monitoring parameters;
- The operational and data collection procedures and their implementation in accordance with the monitoring plan.

Further, the following activities were performed:

- A cross-check between information provided in the MR and data from other sources such as electricity bills or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD, the monitoring plan and the applied methodological regulatory documents;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification that quality control and quality assurance procedures are in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

Duration of on-site inspection: 29/09/2021				
No.	Activity performed on-site	Site location	Date	Team member
1.	Confirm the implementation and operation of the project	Wonju City	29/09/2021	Pyung Hee JANG Su Hyun PARK YuJin YEOM
2.	Review the data flow for generating, aggregating and reporting the monitoring parameters	Same as above	Same as above	Same as above
3.	Confirm the correct implementation of procedures for operations and data collection	Same as above	Same as above	Same as above
4.	Cross-check the information provided in the MR documentation with other sources	Same as above	Same as above	Same as above
5.	Check the monitoring equipment against the requirements of the registered PDD & registered PDD, and the approved methodology including calibration & maintenance, etc.	Same as above	Same as above	Same as above
6.	Identify if the quality control and quality assurance procedures are in place to prevent or correct error or omissions in the reported parameters	Same as above	Same as above	Same as above

D.3. Interviews

A list of the persons interviewed during this verification activity is included in table below

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Han	Sun Woong	NEWGEN ELECTRICS Co., Ltd	29/09/2011	Operation, Facility Management	Pyung Hee JANG Su Hyun PARK YuJin YEOM
2.	Lee	Yu Jeong	ROEN Consulting Co., Ltd.	Same as above	QA/QC, Calculation, Reporting	Same as above
3	Back	Jong Min	Same as above	Same as above	QA/QC, Calculation, Reporting	Same as above

D.4. Sampling approach

As no sampling approach was applied by the PPs, the verification team has applied random sampling according to the requirements set out in the CDM VVS. Since automatic transferred system to the spreadsheet is in place, crosscheck for data in spreadsheet against raw data were done based on random sampling after confirming safeguard measure for raw data in DCS and server and transferring system. Sampling plan which the verification team planned was not revised as no omission in data and information related to emission reductions were found.

Whereas all events, the locations, calibrations of all measurement instruments and intervals (measuring frequency, reading frequency, recording frequency) were assessed.

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	0	0	0
Compliance of the project implementation and operation with the registered PDD	2	0	0
Post-registration changes	0	0	0
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	0	0	0
Compliance of monitoring activities with the registered monitoring plan	0	1	0
Compliance with the calibration frequency requirements for measuring instruments	0	1	0
Assessment of data and calculation of emission reductions or net removals	0	0	0
Assessment of reported sustainable development co-benefits	0	0	0
Global stakeholder consultation	0	0	0
Others (Remarks on scale of small-scale project activity)	0	0	0
Total	2	2	0

The objective of this phase of the verification was to resolve any issues which were needed to be clarified prior to KFQ's conclusion that:

- The project activity has been implemented and operated in accordance with the registered PDD;
- The monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan including any guidance provided by the CDM EB regarding deviations from the provisions of a registered/revised plan and/or methodology;
- The data and calculation of GHG emission reductions are correct.

A corrective action request (CAR) is issued, where:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impact the quantity of emission reductions;
- Issues identified in a FAR during validation or previous verification(s) to be verified during next verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable CDM rules and requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

2 CLs and 2 CARs were raised for this monitoring period, which were closed after the PP satisfactorily addressed them in the final MR (Version 2.2).

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	KFQ has checked the MR provided by the PP against the latest monitoring report form (version 09.0) in order to determine whether the MR is in compliance with it.
Findings	The PPs submitted the MR to DOE applying the Monitoring Report Form Version 09.0. It was found that there are no deviations between the MR and the latest monitoring report form. It is identified during document review that the MR has no blank section.
Conclusion	The verification team concluded that the final MR (Version 2.2) is in compliance with the latest monitoring report form (Version 9.0) and instructions therein.

E.2. Remaining forward action requests from validation and/or previous verifications

There was no FAR raised from the validation or previous verification.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	<p>Physical project implementation</p> <p>During the on-site visit, the verification team visually inspected the installations of the project activity as well as all instrumentations necessary for the monitoring of emission reductions and checked whether all physical features of the project activity, including the data collection and storage systems, correspond with the registered PDD.</p> <p>Project operation</p> <p>The verification team checked raw data of landfill gas (LFG) flow rate and methane fraction recorded in every hour, records of monthly electricity export, monthly bills of electricity import, maintenance & calibration history, and event log files. In addition to this, the verification team interviewed relevant staff to check out actual operation especially events occurred such as maintenance and error in monitoring system to understand operational status during this monitoring period.</p> <p>Management system and quality control and quality assurance (QA/QC)</p> <p>The operation procedures, QA/QC procedures, and respective reports have been reviewed and crosschecked by the verification team. Furthermore, the latest organizational arrangements were checked by means of interviews with relevant staff.</p>
------------------------------	---

	<p>Consecutive monitoring period The verification team checked monitoring period of previous verification through interviews with staff from NEWGEN and ROEN as well as history of requests for issuance provided by UNFCCC website to confirm consecutive monitoring periods of this project activity.</p>																																				
Findings	<p>Physical project implementation The project activity is LFG energy project located in Wonju city. LFG from Wonju landfill site is collected by LFG recovery system and used to generate electricity. Generated electricity is sold to Korea Electric Power Corporation (KEPCO) after consumed by the project facility. The project was registered on 01/06/2017 and commercial operation of electricity generation system started from 17/10/2016.</p> <p>By means of on-site inspection, the verification team confirmed that all physical features (technology, project equipment and monitoring/metering equipment) of the project and their technical data gathered during on-site inspection are in consistent with the registered PDD(version 4.0).</p> <table border="1" data-bbox="464 674 1463 1238"> <thead> <tr> <th></th><th colspan="2">Registered PDD (version 4.0) and MR (version 1.0 and 2.2)</th><th>Installed equipment</th></tr> </thead> <tbody> <tr> <td rowspan="3">Engine</td><td>Engine manufacture</td><td>Baudouin</td><td>Baudouin</td></tr> <tr> <td>Model</td><td>12M26D660E301NG</td><td>12M26D660E301NG</td></tr> <tr> <td>Engine Type</td><td>Turbocharged & Air-to-Air Aftercooled</td><td>Turbocharged & Air-to-Air Aftercooled</td></tr> <tr> <td rowspan="7">Generator</td><td>Generation set manufacture</td><td>HANATECH</td><td>HANATECH</td></tr> <tr> <td>Model</td><td>BBS-490</td><td>BBS-490</td></tr> <tr> <td>Type</td><td>Container Type Landfill Gas</td><td>Container Type Landfill Gas</td></tr> <tr> <td>Maximum Electrical Power Output (kW)</td><td>490</td><td>490</td></tr> <tr> <td>Voltage (V)</td><td>380</td><td>380</td></tr> <tr> <td>Frequency (Hz)</td><td>60</td><td>60</td></tr> <tr> <td>Speed (rpm)</td><td>1,800</td><td>1,800</td></tr> </tbody> </table> <p>It was confirmed that there were no changes in project design such as addition of component, extension of technology, and actual operational parameters.</p> <p>As per para. 269 of PS (version 3.0) and specific instruction for CDM-MR-FORM, PP shall demonstrate that the combined scale of the activities belonging to the same small-scale project type (Type I, II or III) remained under the limit of that type every year during the crediting period, or if, during any year of its crediting period, the combined scale goes beyond the limit of that type, cap the GHG emission reductions that are claimed for that year at the amount calculated with the limit of its type in section E.7 of MR. However, it was not demonstrated above in relevant section of the MR, thus the verification team raised a CL. (Refer to Appendix 4, Table 3, CL01)</p> <p>PP responds that there was no change in installation capacity and added description in section E.7 that this project is operated within 15MW which is small-scale limit in the updated MR (version 2.2).</p> <p>After PP submitted an updated MR (version 2.2), the verification team confirmed that E.7 is properly described in the updated MR. Further, through the document review for the specification of generators and checking for the nameplates of them during the site audit, it was confirmed that maximum output capacity of the plant is 0.98MW which is within small-scale limit of project Type I.</p> <p>Project operation Operation of the monitoring system & data collection system were operational during the monitoring period - the maintenance/ calibration periods of the monitoring instruments performed during the monitoring period and as described in the MR are complete, respective re-calculation of emission reductions during times</p>		Registered PDD (version 4.0) and MR (version 1.0 and 2.2)		Installed equipment	Engine	Engine manufacture	Baudouin	Baudouin	Model	12M26D660E301NG	12M26D660E301NG	Engine Type	Turbocharged & Air-to-Air Aftercooled	Turbocharged & Air-to-Air Aftercooled	Generator	Generation set manufacture	HANATECH	HANATECH	Model	BBS-490	BBS-490	Type	Container Type Landfill Gas	Container Type Landfill Gas	Maximum Electrical Power Output (kW)	490	490	Voltage (V)	380	380	Frequency (Hz)	60	60	Speed (rpm)	1,800	1,800
		Registered PDD (version 4.0) and MR (version 1.0 and 2.2)		Installed equipment																																	
	Engine	Engine manufacture	Baudouin	Baudouin																																	
		Model	12M26D660E301NG	12M26D660E301NG																																	
		Engine Type	Turbocharged & Air-to-Air Aftercooled	Turbocharged & Air-to-Air Aftercooled																																	
	Generator	Generation set manufacture	HANATECH	HANATECH																																	
		Model	BBS-490	BBS-490																																	
		Type	Container Type Landfill Gas	Container Type Landfill Gas																																	
		Maximum Electrical Power Output (kW)	490	490																																	
		Voltage (V)	380	380																																	
Frequency (Hz)		60	60																																		
Speed (rpm)		1,800	1,800																																		

	<p>of observations (if applicable) were done correctly in the project spreadsheets and in accordance with the registered PDD and the applied methodology. To check whether operational events during this monitoring period, the verification team reviewed raw data downloaded from server and daily work log if any, and found that there was no noticeable/specific event. All of events identified through this process were cross-checked against the events listed in MR and ER calculation spreadsheet.</p> <p>However, the verification team found the description of events described in the MR (version 1.0) is inconsistent with the evidences such as operational record, raw data from the server and the reason of events. Also, time period of event occurred on 14/12/2020 in MR (version 1.0) is not consistent with its raw data. (Refer to Appendix 4, Table3, CL 02)</p> <p>After PP submitted a revised MR, the verification team confirmed that PP properly updated descriptions in MR (version 2.2) for the operational record, raw data from the server, the reason of events and time period of event occurred on 14/12/2020 to match with the evidences.</p> <p>In such case of monitoring system errors, flow rate and methane concentration data are not automatically monitored and recorded in monitoring system. The verification team confirms no operational events related to ER calculation were omitted and any operational events were appropriately provided in MR and reflected in ER calculation as per objective evidence such as daily work log, hourly recorded operation data and raw data downloaded from the server.</p> <p>Management system and quality control and quality assurance</p> <p>The project was operated and monitored by the PP, NEWGEN. NEWGEN has the overall authority and responsibility for project management, monitoring and archiving of all data for the calculation of emission reduction, maintenance of project facility/equipment except for electricity meters.</p> <p>The electricity meters to monitor electricity export and electricity import were controlled, calibrated, and maintained under the responsibility of KEPCO. The PPs have the authority and responsibility for monitoring and archiving of data of electricity export and electricity import (refer to Section E.6.2).</p> <p>All of the parameter related to this project were automatically recorded in spreadsheet format, so the involvement of the personnel during normal operation is minimized. In case of any deficiency, appropriate procedures were in place. The verification team found that the quality assurance and quality control procedures in terms of equipment operation, maintenance as well as data reporting were covered by the PP's management system.</p> <p>It was found that staff in charge of operating the facility was periodically trained and relevant evidence, training records are provided. The verification team confirmed that management system and quality assurance related procedures were implemented as per the monitoring plan of the registered PDD.</p> <p>Consecutive monitoring period</p> <p>This is the 4th monitoring period since registration of this project activity. Through directly checking previous MR published on the UNFCCC CDM website, it was found that the MR of this monitoring period was prepared in consecutive manner and verification of the 4th monitoring period has been completed. Thus, the verification team of this monitoring period confirms monitoring periods of this project have been consecutive.</p>
Conclusion	<p>The raised CL 01 and CL 02 have been completely resolved.</p> <p>KFQ concluded that the project was implemented and operated according to the registered PDD based on confirmation of the followings:</p> <ul style="list-style-type: none"> • All physical features of the proposed CDM project activity including data collection systems and storage were in place and in accordance with the registered PDD;

	<ul style="list-style-type: none"> • All other relevant information provided in the MR was fully in accordance with the respective information stated in the registered PDD; • The information on project operation, the management system and quality assurance were complete, correct and in accordance with the registered PDD; • The management system and quality assurance and related procedures have implemented as stated in the MR and in accordance with the registered PDD; • The monitoring periods of this project is consecutive.
--	--

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents¹

There were no post registration changes identified by verification team during this verification.

However, during the first monitoring period (01/06/2017~16/07/2018), a temporary deviation from the registered monitoring plan. Refer to PRC-10379-001 (Approval date: 21/12/2018) for further information regarding temporary deviations in previous monitoring period.

E.4.2. Corrections

There were no post registration changes identified by verification team during this verification.

E.4.3. Changes to the start date of the crediting period

There were no post registration changes identified by verification team during this verification.

E.4.4. Inclusion of a monitoring plan

There were no post registration changes identified by verification team during this verification.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

There were no post registration changes identified by verification team during this verification.

E.4.6. Changes to the project design

There were no post registration changes identified by verification team during this verification.

However, there were changes to the project design identified by verification team during the 2nd and the 3rd verification.

PRC during the 2nd verification

Reference number: PRC-10379-002

Approval date: 09/07/2020

PRC during the 3rd verification

Reference number: PRC-10379-003

Approval date: 01/04/2021

E.4.7. Changes specific to afforestation and reforestation project activities

N/A

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	The verification team reviewed the monitoring plan contained in the registered PDD against the applied methodologies: AMS-III.G. (version 09.0); AMS-I.D. (version 18.0), and the other applied methodological regulatory documents: ACM0001 (version 17.0); "TOOL04: Emissions from solid waste disposal sites (version 08.0)"; "TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 02.0)"; "TOOL06: Project emissions from flaring (version 02.0)"; "TOOL07: Tool to calculate the emission factor for an electricity system (version 05.0)".
Findings	It was found that there were no incompliance between the monitoring plan contained in the registered PDD and the applied methodologies, AMS-III.G. (version 09.0) and AMS-I.D. (version 18.0), and the other applied methodological regulatory documents: ACM0001 (version 17.0); TOOL04 (version 08.0); TOOL05 (version 02.0); TOOL06 (version 02.0); TOOL07 (version 05.0). Furthermore, it was identified that no standardized baselines were used in the project activity.
Conclusion	KFQ concluded that the monitoring plan contained in the registered PDD is in compliance with the applied methodologies, AMS-III.G. (version 09.0) and AMS-I.D. (version 18.0), the other applied methodological regulatory documents: ACM0001 (version 17.0); TOOL04 (version 08.0); TOOL05 (version 02.0); TOOL06 (version 02.0); TOOL07 (version 05.0). No standardized baselines are used in the project activity.

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	'Data and parameters fixed ex-ante' listed in the MR have been crosschecked & reviewed against – as applicable – the monitoring plan contained in the registered PDD as well as applied methodologies, applied tools, and other relevant CDM documentations, where applicable.			
Findings	Data/parameter (unit, description)	Source of data	Value(s) applied	KFQ Findings
	D _{CH₄,y} (tCH ₄ /m ³ CH ₄ , methane density)	PDD (version 4.0)/ TOOL06 (version 02.0)	0.0007168	Crosscheck of the value with the PDD & Monitoring plan and the applied methodological regulatory document showed compliance of parameter.
	GWP _{CH₄} (tCO _{2e} /tCH ₄ , global warming potential of methane)	PDD (version 4.0)/ Decision by CMP	25	Crosscheck of the value with the PDD & Monitoring plan and the applied methodological regulatory document showed compliance of parameter.
	OX (dimensionless unit, Oxidation)	PDD (version 4.0)/ TOOL04 (version 08.0)	0.1	Crosscheck of the value with the PDD & Monitoring

	factor)			plan and the applied methodological regulatory document showed compliance of parameter.
	EG_{m,y} (MWh, Net quantity of electricity generated and delivered to the grid by power unit m in year y)	PDD (version 4.0)	Not applicable	During this monitoring period, this parameter was not applied by the project activity
	FC_{i,m,y} (Mass or volume unit, Amount of fuel type i consumed by power unit m in year y)	PDD (version 4.0)	Not applicable	During this monitoring period, this parameter was not applied by the project activity
	NCV_{i,y} (GJ/mass or volume unit, net calorific value (energy content) of fuel type i in year y)	PDD (version 4.0)	Not applicable	During this monitoring period, this parameter was not applied by the project activity
	EF_{CO₂,i,y} (tCO ₂ /GJ, CO ₂ emission factor of fuel type i used in power unit m in year y)	PDD (version 4.0)	Not applicable	During this monitoring period, this parameter was not applied by the project activity
	EF_{OM,y} (tCO ₂ /MWh, Operating Margin emission factor)	PDD (version 4.0)	0.7403	Crosscheck of the value with the PDD & Monitoring plan and the applied methodological regulatory document showed compliance of parameter.
	EF_{BM,y} (tCO ₂ e/MWh, build Margin emission factor)	PDD (version 4.0)	0.5644	Crosscheck of the value with the PDD & Monitoring plan and the applied methodological regulatory document showed compliance of parameter.
	EF_{grid,y} (tCO ₂ /MWh, CO ₂ emission factor in power in year y)	PDD (version 4.0)	0.6523	Crosscheck of the value with the PDD & Monitoring plan and the

				applied methodological regulatory document showed compliance of parameter.
Conclusion	The verification team confirmed that all data and parameters fixed ex-ante were explicitly mentioned in the MR, and they were correctly and consistently applied. All values followed relevant documentation such as the registered PDD, the monitoring plan, and applied methodologies, applied tools, and other CDM related documentation, where applicable.			

E.6.2. Data and parameters monitored

Information flow & data collection system

Means of verification	<p>The verification team assessed the information flow and data collection system by means of physical inspection of all major components of the information flow & data collection system.</p> <p>Interviews with relevant staff were held in order to experience the system in action. Furthermore, the following documents were reviewed and cross-checked.</p> <p>Data generation and aggregation:</p> <ul style="list-style-type: none"> • Calibration records and certificates of measurement instruments • Certificates of the standard test gas for gas analyzer calibration • Measuring and recording frequency of each instrument were inspected through display panel onsite <p>Aggregation to recording:</p> <ul style="list-style-type: none"> • Daily electricity generation data • Monthly 'Confirmation of Power Purchase Transaction' (from KEPCO) • Monthly bills of imported electricity (from KEPCO) • Data cross-check between values from monitoring meters and values in control room & data cross check between data server and daily work log <p>Calculation and reporting:</p> <ul style="list-style-type: none"> • Crosscheck of implemented calculations in ER calculation spreadsheet against the PDD formulae • Data cross-check between the reports generated by the PP and ER calculation spreadsheets
Findings	<p>As stated in the MR and verified by the verification team, the common data flow system was used in the project activity for the following parameters:</p> <ul style="list-style-type: none"> • Methane fraction in LFG ($W_{CH_4,y}$) • Amount of LFG combusted in power plant ($LFG_{i,y}$) • Total amount of net electricity exported to grid-connected system ($EG_{PJ, facility,y}$) <p>The gas analyzer measures send signals continuously to the data server and the methane fraction ($W_{CH_4,y}$) were hourly recorded in electronic file.</p> <p>The flow meter sends signals continuously to the data server, and flow rate of LFG ($LFG_{i,y}$) were hourly recorded in electronic file. As the type of flow meter is thermal mass flow meter, reading flow rate is automatically converted into normalized cubic meter.</p> <p>In case that methane fraction ($W_{CH_4,y}$) and flow rate of LFG ($LFG_{i,y}$) are not transferred to the data server due to data server malfunction or maintenance of monitoring system, operational staff manually records hourly methane fraction ($W_{CH_4,y}$) and flow rate of LFG ($LFG_{i,y}$) indicated by measuring devices according to the 'Operating Manual-Wonju LFG Power Plant related CDM project'. These measuring devices are controlled and maintained under the responsibility of the PP, NEWGEN.</p>

	<p>To determine $EG_{PJ, facility, y}$, two data were used:</p> <ul style="list-style-type: none"> • The amount of electricity exported to the grid • The amount of electricity imported from the grid <p>The generated electricity is exported to the grid after consumed by the project facility. The amount of electricity exported to the grid is continuously measured and monthly recorded as per the registered PDD. KEPCO buys the electricity from the project activity and issues monthly 'Confirmation of Power Purchase Transaction' based on the measured records of exported electricity. Each monthly 'Confirmation of Power Purchase Transaction' states the quantity of electricity exported to the grid for the period from the first day to the last day of each month. In case of generator shutdown, electricity is imported from the grid to operate the project facility. The data of electricity imported from the grid is continuously measured and monthly recorded as per the registered PDD. KEPCO issues monthly bills based on these measured records of imported electricity.</p> <p>Electricity meter for exported electricity should be controlled, calibrated, and maintained following the related laws "Regulation on operation of electricity market" as described in the registered PDD. The verification team found that the laws "Regulation on operation of electricity market" requires that electricity meter shall be controlled, calibrated, and maintained as per "ENFORCEMENT DECREE OF MEASURES ACT". It was confirmed that the meter for exported electricity was controlled, calibrated, and maintained following "ENFORCEMENT DECREE OF MEASURES ACT" during this monitoring period. The verification team also confirmed that the electricity meter for imported electricity was maintained as per "ENFORCEMENT DECREE OF MEASURES ACT" for import meter as described in the registered PDD.</p> <p>The verification team found that the information flow and data collection system were functional during this monitoring period. Respective documents and results were made available to the verification team.</p>
Conclusion	The verification team confirmed that the information flow & data collection system met the requirements of the PDD as per the applied methodologies. Intervals (measuring frequency, reading frequency and recording frequency) were applied in accordance with the applied methodologies and the monitoring plan.

Assessment on data/ parameters

Detailed assessment on data and parameters monitored is described as below;
The table out of the CDM-VCR-FORM has been used for the assessment, following rows as needed have been added: Data/Parameter, Unit, Description, Source of data used, Value(s)

Data/Parameter	W_{CH_4}
Data Unit	%, volume basis ($m^3 CH_4/m^3 LFG$)
Description	Methane content in landfill gas in the year y
Source of data used	Measured by using a methane analyzer (measuring methane content directly)
Values(s)	40.327 % (average weighted by hourly flow rates of LFG)
Means of verification	The verification team checked whether the monitoring activities in relation to this parameter complied with the monitoring plan in the registered PDD by physically inspecting the applied measuring meters for generation, aggregation, recording and reporting. Furthermore, the verification team performed data crosscheck between raw data downloaded from the server and the ER calculation spreadsheet. All results were verified against the requirements out of monitoring plan and the applied methodologies. Procedures and records on calibration, maintenance, and QA/QC activities were reviewed and checked against the requirements out of the monitoring plan and the applied methodologies.
Findings	<p>The gas analyzer (S/N: 34001096) measuring methane fraction ($W_{CH_4, y}$) was physically inspected during on-site visit and are in accordance with the PDD.</p> <p>The gas analyzer sends signals continuously to the data server and the data were</p>

	<p>hourly recorded in electronic file at the same time as flow rate of LFG ($LFG_{i,y}$). In case that the methane fraction ($W_{CH_4,y}$) are not transferred to the data server due to data server malfunction or maintenance of monitoring system, the PP manually records hourly methane fraction ($W_{CH_4,y}$) in daily work log according to the 'Operating Manual-Wonju LFG Power Plant related CDM project'.</p> <p>The verification team checked that methane fraction was appropriately calculated as weighted average CH_4 concentration based on confirmed raw data. To prevent any omission of events that shall be considered in ER calculation, the verification team reviewed daily work log and raw data downloaded from server.</p> <p>Additionally, it was checked whether all the manually recorded data in the daily work log as well as raw data normally recorded were correctly applied in the ER calculation and, if any, the data that should be excluded in ER calculation was appropriately excluded in ER.</p> <p>Finally, all of events identified through above-mentioned process was cross-checked against the event listed in the MR and ER calculation spreadsheet. In conclusion, verification team confirmed that all the events to be considered in ER calculation especially excluding data are well reflected in ER calculation without any omission.</p> <p>The gas analyzer is accomplished with zero-span test using reference gas (mixture calibration). It was found that expiration date of reference gas used for span test for the gas analyser was 29/07/2020 but the gas was used for the tests on 21/08/2020 and 18/09/2020 during the gas was expired. (Refer to Appendix 4 / Table 2 / CAR 02). For the detail of this CAR, please refer to E.7.</p> <p>Other than above, valid calibration certificates covering the whole monitoring period are available for the used equipment and calibrations were carried out for a measuring range comparable with the actual measuring range and that the calibrations confirmed proper functioning of the monitoring equipment.</p>
Conclusion	<p>The raised CAR (ID 02) has been completely resolved.</p> <p>KFQ confirms that:</p> <ul style="list-style-type: none"> Monitoring of this parameter was carried out in accordance with the monitoring plan and any monitoring activities complied with it; Monitoring results of this parameter are consistently recorded as per the approved frequency; Measuring equipment used to monitor this parameter was calibrated in accordance with the monitoring plan, the applied methodology as well as methodological tools and the relevant guidance provided by the CDM EB (details on calibration are given in section E.7 below); The measured values during the expiration period of calibration gas are correctly and conservatively adjusted by applying the maximum permissible error of the instrument in accordance with VVS (Version 03.0). QA/QC procedures were suitable and applied in accordance with the monitoring plan and the applied methodology.

Data/Parameter	LFG _{i,y}	
Data Unit	m ³	
Description	Landfill gas destroyed via combustion in power plant in year y	
Source of data used	Measured by using gas flow meter	
Values(s)		
	Date	LFG _{i,y}
	01/07/2020-31/07/2020	208,747.000
	01/08/2020-31/08/2020	228,398.000
	01/09/2020-30/09/2020	220,856.000
	01/10/2020-31/10/2020	204,302.000
	01/11/2020-30/11/2020	177,906.000

	01/12/2020-31/12/2020	150,871.000
	01/07/2020~31/12/2020	1,191,080.00
Means of verification	The verification team checked whether the monitoring activities in relation to this parameter complied with the monitoring plan in the registered PDD by physically inspecting the applied measuring meters for generation, aggregation, recording and reporting. Furthermore, the verification team performed data crosscheck between raw data downloaded from the server and the ER calculation spreadsheet. All results were verified against the requirements out of monitoring plan and the applied methodologies. Procedures and records on calibration, maintenance, and QA/QC activities were reviewed and checked against the requirements out of the monitoring plan and the applied methodologies.	
Findings	<p>Flow rate of LFG ($LFG_{i,y}$) is measured by the flow meter (S/N: K-1609083). The meter sends signals continuously to the data server and the data of flow rate of LFG is hourly recorded in electronic file at the same time as methane fraction ($W_{CH_4,y}$) recording.</p> <p>In case that flow rate ($LFG_{i,y}$) and methane fraction ($W_{CH_4,y}$) are not transferred to the data server due to data server malfunction or maintenance of monitoring system, the PP manually records flow rate ($LFG_{i,y}$) every hour in daily work log according to the 'Operating Manual-Wonju LFG Power Plant related CDM project'.</p> <p>To prevent any omission of events that shall be considered in ER calculation, the verification team reviewed daily work log to identify number of events, period of each event, and response actions to the events. Also, daily work log was cross checked with hourly raw data of methane fraction and LFG flow rate to check exact start and end time of each event.</p> <p>Additionally, it was checked whether all the manually recorded data in the daily work log was correctly applied in the ER calculation and the data that should be excluded in ER calculation was appropriately excluded in ER.</p> <p>Finally, all of events identified through the process mentioned above was crosschecked against the event listed in the MR and ER calculation spreadsheet. In conclusion, verification team confirmed that all the events to be considered in ER calculation especially excluding data are well reflected in ER calculation without any omission.</p>	
Conclusion	<p>KFQ confirms that:</p> <ul style="list-style-type: none"> Monitoring of this parameter was carried out in accordance with the monitoring plan and any monitoring activities complied with it; Monitoring results of this parameter are consistently recorded as per the approved frequency; Measuring equipment used to monitor this parameter was calibrated in accordance with the monitoring plan, the applied methodology as well as methodological tools and the relevant guidance provided by the CDM EB (details on calibration are given in section E.7 below); QA/QC procedures were suitable and applied in accordance with the monitoring plan and the applied methodology. 	

Data/Parameter	EG _{PJ, facility, y}											
Data Unit	MWh											
Description	Total amount of net electricity exported to grid-connected system											
Source of data used	Electricity meter records											
Values(s)	<p>The value of EG_{PJ, facility, y} during this monitoring was determined as the difference between total exported electricity to the grid (a) and total imported electricity from the grid (b).</p> <p>(a) Electricity exported to the grid</p> <table><tr><th>Date</th><th>Measured EG_{PJ, facility, y} (MWh)</th></tr><tr><td>01/07/2020-31/07/2020</td><td>171.698</td></tr><tr><td>01/08/2020-31/08/2020</td><td>212.443</td></tr><tr><td>01/09/2020-30/09/2020</td><td>207.648</td></tr><tr><td>01/10/2020-31/10/2020</td><td>181.966</td></tr></table>		Date	Measured EG _{PJ, facility, y} (MWh)	01/07/2020-31/07/2020	171.698	01/08/2020-31/08/2020	212.443	01/09/2020-30/09/2020	207.648	01/10/2020-31/10/2020	181.966
Date	Measured EG _{PJ, facility, y} (MWh)											
01/07/2020-31/07/2020	171.698											
01/08/2020-31/08/2020	212.443											
01/09/2020-30/09/2020	207.648											
01/10/2020-31/10/2020	181.966											

	01/11/2020-30/11/2020	161.186
	01/12/2020-31/12/2020	131.818
	01/07/2020~31/12/2020	1,066.759
	(b) Electricity imported from the grid	
	Date	Measured EG_{PJ, facility, y} (MWh)
	01/07/2020-31/07/2020(*)	0.266
	01/08/2020-31/08/2020	0.021
	01/09/2020-30/09/2020	0.151
	01/10/2020-31/10/2020	0.058
	01/11/2020-30/11/2020	0.253
	01/12/2020-31/12/2020	1.562
	01/07/2020~31/12/2020	2.311
	(*) As electricity bills only provides electricity import for each month, the PPs applied electricity import from 15/06/2020 to 31/07/2020 in ER calculation in a conservative manner.	
Means of verification	<p>The verification team checked whether the monitoring activities in relation to this parameter comply with the monitoring plan in the registered PDD by physically inspecting the applied measuring meters for generation, aggregation, recording and reporting.</p> <p>The verification team reviewed monthly 'Confirmation of Power Purchase Transaction' and monthly bills of electricity import issued by KEPCO. Furthermore, procedures and records on calibration, maintenance and QA/QC activities have been reviewed, discussed in interviews and checked against the requirements out of the monitoring plan and the applied methodologies</p>	
Findings	<p>The value of EG_{PJ, facility, y} is determined as the difference ((a)-(b)) between the quantity of electricity exported to the grid (a) and the quantity of electricity imported from the grid (b).</p> <p>Electricity exported to the grid (a) is measured by the electricity meter (S/N: CDM-08162027757) and monthly recorded as per the registered PDD. KEPCO issues monthly 'Confirmation of Power Purchase Transaction' based on the monthly electricity meter records.</p> <p>In case of generator shutdown, electricity is delivered from the grid to operate the project facility. The amount of electricity imported from the grid (b) is continuously measured by an electricity meter (S/N: 24176002263) and monthly recorded as per the registered PDD. KEPCO issues monthly bills for electricity import.</p> <p>Up to July of 2020, each monthly electricity bill states the amount of electricity import from the 15th day of the previous month to the 14th day of the corresponding month. From August of 2020, the KEPCO changed billing period and the bill states the amount of electricity from the 1st day of the last month to the end of the corresponding month.</p> <p>The verification team found that, for the quantity of electricity imported to the project plant/unit from the grid, the quantity for 01/07/2020-14/07/2020 is not included although it belongs to this monitoring period (01/07/2020-31/12/2020). Further, measured value for 01/10/2020-31/10/2020 (0.58MWh) was not matched to the evidence, electricity bill (0.058MWh) issued by KEPCO (08. 2020). Thus, the verification team raised a CAR. (Refer to Appendix 4, Table2, CAR 01)</p> <p>As a response to this CAR, PP submitted a revised MR (Version 2.2) and ER calculation spreadsheet (version 2.2) and explained that there was a change of billing for the imported electricity from KEPCO, thus bill for the period of 01/07/2020-14/07/2020 cannot be separately provided from the bill of 15/06/2020-14/07/2020. Further, PP corrected the error of measured value for 01/10/2020-31/10/2020 (from 0.58MWh to 0.058MWh).</p> <p>After PP submitted a revised MR and ER calculation spreadsheet, the verification team confirmed that PP included the quantity of imported electricity during 15/06/2020-31/07/2020 to the imported quantity of electricity of July 2020 as a proper conservative manner. Further, it was confirmed that error for measured</p>	

	<p>value for 01/10/2020-31/10/2020(0.58MWh) was updated to match to the evidence, electricity bill of respective period(0.058MWh) issued by KEPCO.</p> <p>KFQ verification team found that the information flow and data collection system were functional during this monitoring period. Respective documents and results were made available to the verification team.</p>
Conclusion	<p>The raised CAR (ID 01) has been completely resolved.</p> <p>KFQ confirms that:</p> <ul style="list-style-type: none"> Monitoring of this parameter was carried out in accordance with the monitoring plan and any monitoring activities complied with it; Monitoring results of this parameter are consistently recorded as per the approved frequency; Measuring equipment used to monitor this parameter was calibrated in accordance with the monitoring plan, the applied methodology as well as methodological tools and the relevant guidance provided by the CDM EB (details on calibration are given in section E.7 below); QA/QC procedures were suitable and applied in accordance with the monitoring plan and the applied methodology.

E.6.3. Implementation of sampling plan

Means of verification	N/A
Findings	N/A
Conclusion	N/A

E.7. Compliance with the calibration frequency requirements for measuring instruments

General statement

Means of verification	The means of verification in relation to the specific instruments are stated in detail in the tables further below.
Findings	The findings in relation to the specific instruments are stated in detail in the tables further below
Conclusion	<p>The verification team confirmed that:</p> <ul style="list-style-type: none"> The calibration of the measuring equipment was conducted as per the applied methodology and the monitoring plan. If applicable, the measured values during the delayed calibration periods are correctly adjusted by applying the maximum permissible error of the instrument as per the requirement of VVS.

The table of the CDM-VCR-FORM has been used for the assessment, following rows as needed have been added: Data/Parameter, Data Unit, Description, Serial Number, Type, Accuracy level, Calibration entity, Calibration frequency, Previous calibration (when applicable), Latest calibration, Applied period of max. permissible error (when applicable). Some parameters involve several instruments, table rows have been added as needed accordingly.

Data/Parameter	W_{CH_4}
Data Unit	%, volume basis ($m^3 CH_4/m^3 LFG$)
Description	Methane content in landfill gas in the year y
TAG Number / Serial Number	34001096
Type	Stationary gas analyser
Accuracy level	5% rel.
Calibration entity	KEMIK CORPORATION
Calibration frequency	Within 3 years
Latest calibration	Date: 04/09/2019 Validity: 04/09/2019 – 03/09/2022
Means of verification	The verification team checked the calibration records & meter history against the calibration requirements as per the applied methodologies, the monitoring plan in the registered PDD as well as the available instrument specifications.
Findings	It was found that the instrument (S/N: 34001096) physically existed and could be

	<p>identified by the same serial number as stated in the MR. It was found that the instrument had a valid calibration covering the whole verification period and was working within the specified error ranges as per available, suitable certificates.</p> <p>The PP performed zero/span tests in regular basis as per the PDD. The gas analyser was corrected if measured methane fraction of reference gas was deviated from standard methane fraction of reference gas by more than the accuracy level defined by manufacture's recommendation.</p> <p>However, it was found that Expiration date of Calibration gas used for span-zero test for methane analyser was 29/07/2020 but the gas was used for the tests on 21/08/2020 and 09/18/2020 during the gas was expired. (Refer to Appendix 4 / Table 2 / CAR 02)</p> <p>As a response to this CAR, PPs applied a recalculation for the time of missing valid calibrated gas cylinder by adding the maximum permissible error of the analyser (from 30/07/2020, the next day of expiration date, to 13/11/2020, the day test was taken using valid calibrated gas cylinder). The event was also added to the respective observations table in the updated MR (Version 2.2).</p> <p>The verification team confirmed that recalculation was done by applying max. permissible error to measured CH₄ concentration during the respective period due to expired validity of standard test gas (Start / End time of recalculation is in accordance with calibration time) in the updated ER calculation sheet (Version 2.2). Further, it was confirmed that the event was properly described in the updated MR (Version 2.2).</p> <p>The verification team checked evidence of the exchange of test gas and test record. It was found that the applied recalculation was implemented correctly in the ER spreadsheet and is traceable and transparent in accordance with VVS (Version 03.0).</p> <p>There were no events that the error of gas analyser was out of the accuracy level.</p>
Conclusion	<p>The raised CAR (ID 02) has been completely resolved.</p> <p>KFQ confirms that the calibration has been conducted as per the calibration frequency requirements and that the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan and the applied methodology.</p> <p>The measured values during the expiration period of calibration gas are correctly and conservatively adjusted by applying the maximum permissible error of the instrument in accordance with VVS (Version 03.0).</p>

Data/Parameter	LFG _{i,y}
Data Unit	m ³
Description	Landfill gas destroyed via combustion in power plant in year y
TAG Number / Serial Number	K-1609083
Type	Thermal gas mass flowmeter
Accuracy level	±0.5% of F.S
Calibration entity	KOMETER
Calibration frequency	Within 3 years
Latest calibration	Date: 04/09/2019 Validity: 04/09/2019 – 03/09/2022
Means of verification	The verification team checked the calibration records & meter history against the calibration requirements as per the applied methodologies, the monitoring plan in the registered PDD as well as the available instrument specifications.
Findings	<p>It was found that the instrument (S/N: K-1609083) physically existed and could be identified by the same serial number as stated in the MR.</p> <p>The calibration of monitoring equipment is valid from 04/09/2019 to 03/09/2022. No delay of calibration was observed. Therefore, the instrument had a valid</p>

	calibration covering the whole verification period and was working within the specified error ranges as per available, suitable certificates.
Conclusion	KFQ confirms that the calibrated instrument was used for this monitoring period and was controlled in accordance with the monitoring plan and the applied methodology.

Data/Parameter	EGPJ,facility,y		
Data Unit	MWh		
Description	Total amount of net electricity exported to grid-connected system		
TAG Number / Serial Number		Electricity export	Electricity import
	Serial No.	08162027757	24176002263
Type	Watt-hour meter		
Accuracy level		Electricity export	Electricity import
	Accuracy level	±0.5s	±0.5s
Calibration entity	KTC		
Calibration frequency	7 years		
Latest calibration		Electricity export	Electricity import
	Date of latest calibration	04/07/2016	22/12/2017
	Valid until	03/07/2023	21/12/2024
Means of verification	The verification team checked the calibration records & meter history against the calibration requirements as per the applied methodologies, the monitoring plan in the registered PDD as well as the available instrument specifications.		
Findings	<p>During on-site inspection, it was found that two electricity meters (S/N: 08162027757 for an export meter and S/N: 24176002263 for an import meter) were physically existed and could be identified by the serial number and model as stated in the MR.</p> <p>The verification team checked specification of all the above-mentioned electricity meters and confirmed that type and accuracy level reported in the MR were correct following the actual installation.</p> <p>All the electricity meters (S/N: 08162027757 for an export meter and S/N:24176002263 for an import meter) are controlled, calibrated, and maintained under the responsibility of KEPCO.</p> <p>It was found that no delay of calibration has been observed. It was also confirmed that the instrument had a valid calibration covering the whole verification period and was working within the specified error ranges as per available, suitable certificates.</p>		
Conclusion	KFQ confirms that the calibrated instrument was used for this monitoring period and was controlled in accordance with the monitoring plan and the applied methodology.		

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	<p>KFQ has reviewed all data, parameters, and calculations with respect to the calculation of the baseline GHG emissions and checked them against the requirements out of the applied methodologies AMS-III.G. (version 09.0) and AMSI.D. (version 18.0), and relevant tools applied. KFQ has also assessed the completeness, quality, and appropriateness of the data, parameters and calculations.</p> <p>Furthermore, KFQ has assessed, whether any assumptions, emission factors, default values and other reference values – as applicable – used by the PPs have been justified and correctly applied, in line with the requirements. It has been further crosschecked – as applicable – any information with other sources available, such as but not limited to daily work log, raw data available in the</p>
------------------------------	---

	operators control room or on-site, etc.
Findings	<p>The baseline GHG emissions have been found to be 6,891 tCO₂e for the verification period. It was found that a complete set of data covering the monitoring period has been provided by the PP. Activity levels and non-activity parameters have been monitored in accordance with the monitoring plan, as applicable.</p> <p>The calculation was found to be correct as well as carried out in accordance with the formulae and methods described in the monitoring methodologies, AMS-III.G. (version 09.0) and AMS-I.D. (version 18.0), and the registered PDD.</p> <p>It was found that all emission factors, GWPs, default values, and reference values, as applicable, have been correctly justified, are explicitly mentioned in the MR and have been correctly applied. It was found that no assumptions are used that have any relevant influence on reported emission reductions.</p> <p>All necessary documentation is collected, referenced and aggregated and is easily accessible in spreadsheets and daily reports in electronic format. Measurements were performed by calibrated equipment, and key data could be cross-checked via other sources (if applicable).</p> <p>Further details on cross-checks for each parameter and the information flow are given in sections E.6.2 above.</p> <p>A detailed assessment of all relevant parameters for the verification period is given in E.6.1 and E.6.2 above.</p>
Conclusion	<p>KFQ confirms:</p> <ul style="list-style-type: none"> • All required data for calculation of the baseline GHG emissions were available for the whole verification period; • Suitable cross-checking of data was possible and has been performed as described; • The PPs have followed appropriate methods and formulae for calculating baseline GHG emissions have been followed; • Any emission factors, GWPs and default values and reference values – as applicable – that were applied in the calculation have been justified and correctly applied; • No assumptions were used; • The calculation of the baseline GHG emissions for the covered monitoring period is fully complete and based on suitable and verifiable evidence.

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	The verification team has reviewed all data, parameters and calculations with respect to calculation of the project GHG emissions to check whether project GHG emissions (if any) were determined in accordance with the applied methodologies and methodological regulatory documents as well as the registered PDD.
Findings	<p>As per AMS-III.G (version 09.0) and the registered PDD, the project emissions are only calculated as below.</p> $PE_y = PE_{\text{power},y}$ <p>Project emissions from electricity consumption are determined as per “TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 02.0) and “AMS-I.D.: Grid connected renewable electricity generation” (version 18.0).</p> <p>As per the AMS-I.D., the project activity does not belong to the categories of project activities in which project emissions have to be considered. The quantity of electricity imported from the grid should be deducted from the quantity of electricity exported to the grid as per the AMS I.D. Therefore, there were no project emissions due to electricity import from the grid except when there is on-site consumption of fossil fuels. In this case, project emissions from the use of fossil fuels should be calculated. It was confirmed that there were no CO₂ emissions from</p>

	on-site consumption of fossil fuels due to the project activity during this monitoring period. Hence, $PE_y = 0$ as per the applied methodologies and the registered PDD.
Conclusion	KFQ confirms that the PP approach with regard to project GHG emissions is correct and that no project GHG emissions need to be considered in the project based on the applied methodology.

E.8.3. Calculation of leakage GHG emissions

Means of verification	KFQ has checked, whether leakage emissions (if any) were determined by the PPs in accordance with the applied methodologies and methodological regulatory documents as well as the registered PDD.
Findings	KFQ has found that the approach applied by the PPs that leakage emissions need not to be considered (i.e. being considered zero, consequently) is in accordance to the applied methodologies AMS-III.G. (version 09.0) and AMS-I.D. (version 18.0)
Conclusion	KFQ confirms that the PPs approach with regard to leakage GHG emissions is correct and that no leakage GHG emissions need to be considered in the project activity based on the applied methodology.

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	<p>KFQ has reviewed all data, parameters and formulae with respect to calculation of the GHG emission reductions and checked them against the requirements out of the applied methodologies and methodological regulatory documents as well as the registered PDD.</p> <p>KFQ has also assessed the completeness, quality and appropriateness of the data, parameters and calculations. Furthermore, it has been assessed, whether any assumptions, emission factors, default values, GWPs or other reference values – as applicable – used by the PP have been justified and correctly applied, in line with the requirements. As applicable, data and information used in calculation of GHG emission reductions were cross-checked with any information with other sources available such as but not limited to the data from the record of electricity sales, etc.</p> <p>Means of verification in respect of baseline GHG emissions, project GHG emissions and leakage GHG emissions that form the basis for calculation of the GHG emission reductions are stated in detail in sections E.8.1., E.8.2. and E.8.3. above.</p>
Findings	<p>The GHG emission reductions have been found to be 6,891 tCO₂e for the verification period. It was found that the first day in which CERs are being claimed in this verification period has been correctly specified by the PP, being 01/07/2020.</p> <p>A complete set of data covering the monitoring period has been provided by the PP. Activity levels and non-activity (ex-ante) parameter have been monitored in accordance with the monitoring plan in the registered PDD, as applicable.</p> <p>The calculation was found to be correct as well as carried out in accordance with the formulae and methods described in the monitoring methodologies AMS-III.G. (version 09.0), AMS-I.D. (version 18.0) and the registered PDD.</p> <p>It was found that all emission factors and default values and reference values, as applicable, have been correctly justified, are explicitly mentioned in the MR and have been correctly applied. It was found that no assumptions are used that have any relevant influence on reported emission reductions.</p> <p>It is checked that there were no errors in the transfer of data for the calculation of emissions reductions. KFQ confirms that rounding of digits has been applied both correctly and conservatively.</p> <p>It was found that the spreadsheets were made available completely by the PP and that all formulae have been correctly implemented and are accessible and</p>

	<p>traceable. Rounding of digits, where applicable, has been applied both correctly and conservatively.</p> <p>All necessary documentation is collected, referenced and aggregated and is easily accessible in spreadsheets and daily reports in electronic format. Measurements are performed by proper watt-hour meters, and key data could be cross-checked via other sources (if applicable). Further details on cross-checks for each parameter and the information flow are given in sections E.6.2 above.</p> <p>A detailed assessment of all relevant parameters for the verification period is given in E.6.1 and E.6.2 above.</p>
Conclusion	<p>KFQ confirms that:</p> <ul style="list-style-type: none"> • All required data for the calculation of GHG emission reductions were available for the whole verification period and no data were missing due to any non-monitoring of activity levels or non-activity parameters; • Suitable cross-checking of data was possible and has been performed as described; • The PPs have followed appropriate methods and formulae for calculating GHG emission reductions have been followed; • Any emission factors, GWPs and default values and reference values – as applicable – that were applied in the calculation have been justified and correctly applied; • No assumptions were used; • The calculation of the GHG emissions for the covered monitoring period is fully complete and based on suitable and verifiable evidence; • The first day in which CERs are being claimed in the verification period is 01/07/2020 and thus no pro-rata approach is applicable; • The amount of emission reductions claimed by the PPs for the verification period from 01/07/2020 to 31/12/2020, amounting to 6,891 tCO₂e, is correctly determined and calculated.

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	KFQ compared the ex-ante estimation of emission reductions in the registered PDD with the emission reductions reported by the PPs in the MR
Findings	KFQ found that the emission reductions for this monitoring period from 01/07/2020 to 31/12/2020 (184 days) in the PDD were estimated to be 8,131 tCO ₂ e (value rounded down). The actual emission reductions reported by the PPs during the same period were 6,891 tCO ₂ e and thus is lower than the value estimated in the PDD.
Conclusion	<p>KFQ confirms that:</p> <ul style="list-style-type: none"> • The overall emission reductions of the project activity were lower than the ex-ante estimation in the PDD; • The emission reductions claimed by the PPs are reasonable.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	As per the specific instructions of the CDM-VCR-FORM, in this section it is to be explained how the cause of any increase in the actual GHG emission reductions in this monitoring period were assessed in accordance with the applicable verification requirements in the VVS.
Findings	<p>The verification team confirmed that the actual emission reduction reported by PP during the same period was 6,891 tCO₂e, which is 15.3% lower than the estimate of the registered PDD.</p> <p>It was checked that the project activity still remains within small scale threshold and differences between estimated value in the registered PDD (version 4.0) and actual emission reduction is clearly provided in the MR (Version 2.2).</p>
Conclusion	KFQ confirms that the emission reductions claimed by the PPs are reliable.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The GHG emission reductions reported in the MR (Version 02.2) are 6,891 tCO ₂ e. As described in detail in Section E of this report, all relevant aspects of the project activity have been assessed in order to determine, whether the claimed emission reductions by the PP are correctly determined, reasonable and fairly stated and based on verifiable evidence and in accordance with the applied methodology and the registered PDD as well as applicable tools.
Findings	It was found that the project activity is implemented and operated according to the registered PDD and the monitoring of any and all data and parameters as well as calculation of baseline GHG emissions, project GHG emissions and GHG emission reductions is complete conducted in accordance with the registered PDD, the applied methodologies.
Conclusion	KFQ concluded that the GHG emission reductions reported in the MR and claimed by the PPs are correctly determined with 6,891 tCO ₂ e for the covered verification period between 01/07/2020 to 31/12/2020. This implies, that 100% of the reported GHG emission reduction in this verification period has been achieved in a period after the end of 31/12/2012, i.e. the first commitment period is untouched by this verification period.

E.9. Assessment of reported sustainable development co-benefits

Means of verification	The PP has neither developed sustainable development co-benefits nor monitored sustainable development co-benefits of the project activity; the section is therefore not applicable in this verification period.
Findings	N/A
Conclusion	N/A

E.10. Global stakeholder consultation

Means of verification	There were no comments received with regard to the stakeholder consultation conducted after the publication of the first MR in accordance with the "CDM project cycle procedure for project activities", the section is therefore not applicable in this verification period.
Findings	N/A
Conclusion	N/A

SECTION F. Internal quality control

According to KFQ's Procedure for deciding whether to proceed request for issuance, the final verification report and verification findings underwent a technical review before being submitted to the PPs for requesting issuance CERs. The technical review was performed by technical review team composed of a person qualified for this project activity in accordance with KFQ's qualification scheme for CDM project validation and verification.

SECTION G. Verification opinion

Through the verification of the MR of the CDM project activity "Wonju Landfill Gas Recovery Project for Electricity Generation" in accordance with CDM VVS, KFQ confirms that:

- The project activity has been implemented and operated as per the registered PDD (version 4.0, dated 18/01/2021);
- The installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- The monitoring plan is as per the applied methodologies;
- The monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan in the registered PDD and approved methodologies including applicable tool(s) and generated GHG emission reductions data;
- The GHG emission reductions in the MR (Version 2.2) are calculated without material misstatements.

KFQ's verification opinion refers to the project's GHG emissions and resulting GHG emission reductions reported both determined due to the valid and revised project's baseline, its monitoring plan and its associated documents.

Based on the information we have seen and evaluated, we confirm the followings:

Title of project activity	Wonju Landfill Gas Recovery Project for Electricity Generation
UNFCCC Reference Number	10379
Date of registration	01/06/2017
Registered PDD	Version 4.0 dated 18/01/2021
Methodology applied	AMS-III.G. (version 09.0) AMS-I.D. (version 18.0)
Final version of MR	2.2 (dated 17/11/2021)
Crediting period	01/06/2017~31/05/2024
Monitoring period	01/07/2020~31/12/2020
Total GHG emission Reductions Verified	Baseline emissions: 6,891 tonnes CO ₂ e Project emissions: 0 tonnes CO ₂ e Leakage: 0 tonnes CO ₂ e Emission reductions: 6,891 tonnes CO ₂ e

It is the opinion of KFQ that the amount of GHG emission reductions achieved by the project activity during this monitoring period is correct and that complies with all applicable CDM requirements.

SECTION H. Certification statement

Korean Foundation for Quality has performed the periodic verification of the emission reductions that have been reported for the CDM project activity "Wonju Landfill Gas Recovery Project for Electricity Generation" (UNFCCC registration ref. no. 10379) for the period from 01/07/2020 to 31/12/2020.

The PPs are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project. It is KFQ's responsibility to express an independent verification statement on the reported GHG emission reductions from the project.

KFQ conducted the verification on the basis of the monitoring methodologies AMS-III.G. (version 09.0) and AMS-I.D. (version 18.0), the registered PDD (version 04.0) and the MR (Version 2.2). The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

KFQ's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. KFQ planned and performed the verification by obtaining evidence and other information and explanations that KFQ considers necessary to give reasonable assurance on the reported GHG emission reductions.

In our opinion, the GHG emissions reductions of the "Wonju Landfill Gas Recovery Project for Electricity Generation" (UNFCCC registration ref. no. 10379) for the period from 01/07/2020 to 31/12/2020 are fairly stated in the MR (Version 2.2).

The data generation, aggregation, recording, calculation and reporting of GHG emission reductions were conducted correctly on the basis of the approved baseline and monitoring methodologies

AMS-III.G. (version 09.0) and AMS-I.D. (version 18.0), and the monitoring plan contained in the registered PDD.

Hence, KFQ is able to certify that the emission reductions from “Wonju Landfill Gas Recovery Project for Electricity Generation” during the period from 01/07/2020 to 31/12/2020 are 6,891 tCO₂e.

Signed on behalf of the Korean Foundation for Quality

Signature : 

Name : Yu Shim JEONG, Managing Director of Energy·Climate Change Assessment Division

Date : 19/11/2021

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved consolidated methodology
AMS	Approved Methodology Small Scale
CAR	Corrective action request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification request
CMP	COP/MOP Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CP	Crediting period
DCS	Distributed control system
DOE	Designated operational entity
FAR	Forward action request
GHG	Greenhouse gas(es)
GWP	Global warming potential
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
KEPCO	Korea Electric Power Corporation
KFQ	Korean Foundation for Quality
LNG	Liquefied natural gas
MoC	Modalities of communication
MP	Monitoring plan
MR	Monitoring report
PCP	CDM project cycle procedure for project activity
PDD	Project design document
PP	Project participant
PS	CDM project standard for project activity
QMS	Quality management system
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM validation and verification Standard for project activity

Appendix 2. Competence of team members and technical reviewers



CERTIFICATE OF COMPETENCE

Name : PyungHee Jang

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.1 Thermal Energy Generation
- 1.2 Renewables

He is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 29 March 2019.

Sustainability Management Institute
Mi Jung LEE



CERTIFICATE OF COMPETENCE

Name: Su Hyun PARK

Qualification:

	Validation	Verification
-Lead auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.2 Renewables
- 3.1 Energy demand
- 5.2 Caprolactam, Nitric acid, Adipic acid
- 13.1 Solid waste and wastewater

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 18 May 2020.

Energy·Climate Change Assessment Division
Nam Hoon KIM



CERTIFICATE OF COMPETENCE

Name: Gee Hyun YANG

Qualification:

	Validation	Verification
-Lead auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Auditor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

1.1 Thermal energy generation

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 29 March 2021.

Energy Climate Change Assessment Division

Pyung Hee JANG



CERTIFICATE OF COMPETENCE

Name: Mi Jung Lee

Qualification:

	Validation	Verification
-Lead auditor	■	■
-Auditor	<input type="checkbox"/>	<input type="checkbox"/>
-Technical Expert	<input type="checkbox"/>	<input type="checkbox"/>
-Local Expert	<input type="checkbox"/>	<input type="checkbox"/>

Scopes of Expertise:

Technical Area (TA)

- 1.1 Thermal energy generation
- 1.2 Renewables
- 3.1 Energy demand
- 5.1 Chemical industry
- 5.2 Caprolactam, Nitric acid, Adipic acid
- 11.1 Emissions of fluorinated gases
- 11.2 Refrigerant gas production
- 13.1 Solid waste and wastewater
- 13.2 Manure

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 5 July 2019.

Sustainability Management Institute
Yu Shim JEONG

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Project participants	Monitoring report • Version 1.0 • Version 2.2	27/05/2021 17/11/2021	Project participants
2	Project participants	Emission reduction calculation spreadsheet • Version 1.0 • Version 2.2	27/05/2021 17/11/2021	Project participants
3	Project participants	CDM project design document • Version 4.0	18/01/2021 https://cdm.unfccc.int/Projects/DB/KFQ1496315809.99/view	Project participants
4	KFQ	CDM validation report • Version 01.1	01/06/2017 https://cdm.unfccc.int/Projects/DB/KFQ1496315809.99	Others
5	KFQ	Post-registration change validation Report (PRC-10379-001) • Version 2.1 Post-registration change validation Report (PRC-10379-002) • Version 2.1 Post-registration change validation Report (PRC-10379-003) • Version 02.0	21/12/2018 https://cdm.unfccc.int/PRCCContainer/DB/prcp654253653/view 09/07/2020 https://cdm.unfccc.int/PRCCContainer/DB/prcp213713045/view 19/01/2021 https://cdm.unfccc.int/PRCCContainer/DB/prcp134552895/view	Others
6	Ministry of Environment & Korea Environment Corporation	Status of Waste Generation and Treatment	From 2014 to 2020 https://www.recycling-info.or.kr/rrs/stat/envStatList.do?menuNo=M13020201	Project participants
7	Wonju city	Notification of acceptance of change of the air emission facility	22/10/2018	Project participants
8	HANA TECH Inc.	Specification of the electricity generator set (BBS-490)	-	Project participants
9	Baudouin	Specification of electricity generator engine (12M26GAS)	-	Project participants
10	Madur ELECTRONICS	Specification of methane analyser (WCH ₄ y, S/N: 34001096)	-	Project Participants
11	Madur ELECTRONICS	Warranty Certificate of Gas Analyzer (S/N: 34001096)	09/09/2016	Project Participants
12	KEMIK Corp.	Methane (CH ₄) Continuous	04/09/2019	Project

		Automatic Meter Test Report (S/N: 34001096)		Participants
13	AirKorea Co., LTD	Standard gas analysis report Standard gas analysis report	30/07/2019 10/11/2020	Project Participants
14	KOMETER	Specification of flow meter (import, S/N: K-1609083)	-	Project Participants
15	KOMTER	Calibration Certificate of Gas Flow Meter (S/N: K-1609083)	04/09/2019	Project Participants
16	Namjun Co., Ltd.	Specification of electricity meter (export, S/N: 8162027757)	-	Project Participants
17	DM Power	Specification of electricity meter (import, S/N: 24176002263)	-	Project Participants
18	KTC	Certificate of electricity meter (export, S/N: 8162027757)	04/07/2016	Project Participants
19	KTC	Certificate of electricity meter (import, S/N: 24176002263)	22/12/2017	Project Participants
20	Project Participants	Raw data downloaded from server	01/07/2020-31/12/2020	Project Participants
21	Project Participants	Daily work log (with manually recorded data)	01/07/2020-31/12/2020	Project Participants
22	KEPCO	Monthly bills of electricity imported from 15/06/2020 to 31/12/2020	From July 2020 to December 2020	Project Participants
23	KEPCO	Confirmation of Power Purchase Transaction	01/07/2020-31/12/2020	Project Participants
24	Project Participants	Operating Manual-Wonju LFG Power Plant related CDM project · Version 09	08/09/2019	Project Participants
25	Project Participants	Training report 2020	30/11/2020	Project Participants
26	Project Participants	Internal audit report · 2020	21/12/2020	Project Participants
27	CDM EB	Methodologies and tools · AMS-III.G.: Landfill methane recovery (Version 09.0)	28/11/2014 Published under: https://cdm.unfccc.int/methodologies/DB/0KHNES8D09H134V3TZDQ47C3LQL3H2	Others
28		<ul style="list-style-type: none"> AMS-I.D.: Grid connected renewable electricity generation (Version 18.0) TOOL04: Emissions from solid waste disposal sites (Version 08.0) TOOL05: Baseline, project and/or leakage emissions from 	28/11/2014 Published under: https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFXQQOFQQH4SBK 04/05/2017 27/11/2015	

		<p>electricity consumption and monitoring of electricity generation (Version 02.0)</p> <ul style="list-style-type: none"> • TOOL06: Project emissions from flaring (Version 02.0) • TOOL07: Tool to calculate the emission factor for an electricity system (Version 05.0) • TOOL08: Tool to determine the mass flow of a greenhouse gas in a gaseous stream (Version 03.0.0) 	<p>20/07/2012</p> <p>27/11/2015</p> <p>27/11/2015</p> <p>All published under: https://cdm.unfccc.int/Reference/tools/index.html</p>	
		<p>Forms</p> <ul style="list-style-type: none"> • Monitoring report form (Version 08.0) • Monitoring report form (Version 09.0) • Verification and certification report form for CDM project activities (Version 04.0) 	<p>06/04/2021</p> <p>08/10/2021</p> <p>06/04/2021</p> <p>All published under: https://cdm.unfccc.int/Reference/PDDs_Forms/index.html</p>	Others
		<p>Standards</p> <ul style="list-style-type: none"> • CDM project standard for project activities (Version 02.0) • CDM project standard for project activities (Version 03.0) • CDM validation and verification standard for project activities (Version 02.0) • CDM validation and verification standard for project activities (Version 03.0) 	<p>28/11/2018</p> <p>09/09/2021</p> <p>28/11/2018</p> <p>09/09/2021</p> <p>All published under: https://cdm.unfccc.int/Reference/Standards/index.html</p>	Others
		<p>Procedures</p> <ul style="list-style-type: none"> • CDM project cycle procedure for project activities (Version 02.0) • CDM project cycle procedure for project activities (Version 03.0) • Checklist for requests for issuance for project activity (Version 02.0) • Checklist for requests for issuance for project activity (Version 03.0) 	<p>28/11/2018</p> <p>09/09/2021</p> <p>23/08/2019</p> <p>07/10/2021</p> <p>All published under: https://cdm.unfccc.int/Reference/Procedures/index.html</p>	Others
		<p>Guidelines</p> <ul style="list-style-type: none"> • Guideline on the application of materiality in verifications (Version 02.0) 	<p>20/02/2015</p> <p>Published under: https://cdm.unfccc.int/Reference/Guidclarif/index.html</p>	Others

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	N/A	Section no.	N/A	Date: DD/MM/YYYY
Description of FAR				
N/A				
Project participant response				Date: DD/MM/YYYY
-				
Documentation provided by project participant				
-				
DOE assessment				Date: DD/MM/YYYY
-				

Table 2. CL from this verification

CL ID	01	Section no.	E.3	Date: 08/10/2021
Description of CL				
As per para. 269 of PS (version 3.0) and specific instruction for CDM-MR-FORM, PP shall demonstrate that the combined scale of the activities belonging to the same small-scale project type (Type I, II or III) remained under the limit of that type every year during the crediting period, or if, during any year of its crediting period, the combined scale goes beyond the limit of that type, cap the GHG emission reductions that are claimed for that year at the amount calculated with the limit of its type in section E.7 of MR. However, it was not demonstrated above in relevant section of the MR.				
Project participant response				Date: 17/11/2021
PP confirms that there was no change in installation capacity and added description in section E.7 that this project is operated within 15MW which is small-scale limit.				
Documentation provided by project participant				
Updated MR (Version 2.2)				
DOE assessment				Date: 18/11/2021
The verification team confirmed that E.7 is properly described in the updated MR. Further, through the document review for the specification of generators and checking for the nameplates of them during the site audit, it was confirmed that maximum output capacity of the plant is 0.98MW which is within small-scale limit of project Type I.				

CL ID	02	Section no.	E.3	Date: 08/10/2021
Description of CL				
The verification team found the description of events described in the MR (version 1.0) is inconsistent with the evidences such as operational record, raw data from the server and the reason of events. Also, time period of event occurred on 14/12/2020 in MR (version 1.0) is not consistent with its raw data				
Project participant response				Date: 17/11/2021
PP revised MR description of the events to match with operational record, raw data from the server. Period of event occurred on 14/12/2020 in MR was updated to match with its raw data.				
Documentation provided by project participant				
Updated MR (Version 2.2) Updated ER calculation spreadsheet (version 2.2) Operational record (14/12/2020) Raw data (14/12/2020)				
DOE assessment				Date: 18/11/2021
After PP submitted a revised MR (Version 2.2) and ER calculation spreadsheet (version 2.2), the verification team confirmed that PP properly updated descriptions in MR for the operational record, raw data from the server, the reason of events and time period of event occurred on 14/12/2020 to match with the evidences				

Table 3. CAR from this verification

CAR ID	01	Section no.	E.6	Date: 08/10/2021
Description of CAR				
For the quantity of electricity imported to the project plant/unit from the grid, the quantity for 01/07/2020-14/07/2020 is not included although it belongs to this monitoring period (01/07/2020-31/12/2020). Further, measured value for 01/10/2020-31/10/2020 (0.58MWh) was not matched to the evidence, electricity bill (0.058MWh) issued by KEPCO (08. 2020)				
Project participant response				Date: 17/11/2021
There was a change of billing for the imported electricity from KEPCO, thus bill for the period of 01/07/2020-14/07/2020 cannot be separately provided from the bill of 15/06/2020-14/07/2020. Thus, PP included the imported electricity of 15/06/2020-31/07/2020 to 01/07/2020-31/07/2020 as a conservative manner. Further, PP corrected the error of measured value for 01/10/2020-31/10/2020(from 0.58MWh to 0.058MWh)				
Documentation provided by project participant				
Updated MR (Version 2.2) Updated ER calculation spreadsheet (version 2.2)				
DOE assessment				Date: 18/11/2021
After PP submitted a revised MR and ER calculation spreadsheet, the verification team confirmed that PP included the quantity of imported electricity during 15/06/2020-31/07/2020 to the imported quantity of electricity of July 2020 as a proper conservative manner. Further, it was confirmed that error for measured value for 01/10/2020-31/10/2020(0.58MWh) was updated to match to the evidence, electricity bill of respective period(0.058MWh) issued by KEPCO.				

CAR ID	02	Section no.	E.7	Date: 08/10/2021
Description of CAR				
Expiration date of reference gas used for span test for the gas analyser was 29/07/2020 but the gas was used for the tests on 21/08/2020 and 18/09/2020 during the gas was expired.				
Project participant response				Date: 17/11/2021
PPs applied a recalculation for the time of missing valid calibrated gas cylinder by adding the maximum permissible error of the analyser. The event was also added to the respective observations table in the updated MR (Version 2.2).				
Documentation provided by project participant				
Updated MR (Version 2.2) Updated ER calculation spreadsheet (version 2.2)				
DOE assessment				Date: 18/11/2021
The verification team confirmed that recalculation was done by applying max. permissible error to measured CH ₄ concentration during the respective period due to expired validity of standard test gas (Start / End time of recalculation is in accordance with calibration time) in the updated ER calculation sheet (Version 2.2). Further, it was confirmed that the event was properly described in the updated MR (Version 2.2).				

Table 4. FAR from this verification

FAR ID	N/A	Section No.	N/A	Date: DD/MM/YYYY
Description of FAR				
N/A				
Project participant response				Date: DD/MM/YYYY
-				
Documentation provided by project participant				
-				
DOE assessment				Date: DD/MM/YYYY
-				

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	6 April 2021	Revision to: <ul style="list-style-type: none"> • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN); • Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		