




**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	Taegisan Wind Power Project (Ref. 2302)		
Scale of the project activity	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale		
Version number of the verification and certification report	Version 02.0		
Completion date of the verification and certification report	21/05/2021		
Monitoring period number and duration of this monitoring period	- Monitoring period number: 7 th - Duration of this monitoring period: 01/01/2019 ~ 14/05/2019(134days)		
Version number of the monitoring report to which this report applies	Version 02.0		
Crediting period of the project activity corresponding to this monitoring period	15/05/2009 ~ 14/05/2019 (10 years)		
Project participants	- POSCO Engineering and Construction Co., Ltd. - Eurus Energy Holdings Corporation		
Host Party	- Republic of Korea		
Applied methodologies and standardized baselines	Methodology : ACM0002 (Version 07) Selected standardized baseline : N/A		
Mandatory sectoral scopes	Sectoral scopes 1: Energy Industries (Renewable / Non-renewable sources)		
Conditional sectoral scopes, if applicable	N/A		
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	21,905 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
	N/A	19,359 tCO ₂ e	N/A
Name and UNFCCC reference number of the DOE	Korea Testing and Research Institute Ref: E-0056		
Name, position and signature of the approver of the verification and certification report	JINTAE KIM, Director 		

SECTION A. Executive summary

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Eurus Energy Holdings Corporation has commissioned Korea Testing and Research Institute (hereinafter referred to as "KTR") to carry out the 7th verification of the project titled "Taegisan Wind Power Project" (hereinafter referred to as project).

The verification team from KTR has reviewed the implementation of the monitoring plan (MP) of the registered CDM project. The Green House Gas (GHG) data for the monitoring period from 01/01/2019 to 14/05/2019 has been verified in a detailed manner by applying the set of requirements, audit practices and principles as required under the CDM Validation and Verification Standard for project activities (version. 02.0) of the United Nations Framework Convention for Climate Change (UNFCCC).

This report summarizes the findings and conclusions of this 7th verification of the UNFCCC registered project activity mentioned above. Objectives of the verification are review and ex-post determination of GHG emission reductions by an independent entity.

The objectives include the verification of:

- Implementation and operation of the project activity as given in the project design document (PDD),
- Compliance with the applied approved methodology and the provisions of the MP,
- Data given in the monitoring report (MR) by checking the monitoring records, the emissions reduction calculation and supporting evidence,
- Accuracy of the monitoring equipment,
- Quality of evidence, and
- Significance of reporting risks and risks of material misstatements.

The verification of this registered project is based on the validated PDD, the MR, emission reduction calculation spread sheet, supporting documents made available to the verifier and information collected through interviews and during the on-site assessment. Furthermore, publicly available information was considered as far as available and required.

The verification was carried out on the basis of the following requirements applicable to this project activity:

- Article 12 of the Kyoto Protocol,
- Guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1, and subsequent decisions made by the Executive Board and COP/MOP,
- Other relevant rules, including the host country legislation,
- CDM Validation and Verification Standard for project activities (version. 02.0),
- The Monitoring plan (MP), and
- Approved CDM Methodologies.

The following parties to the Kyoto Protocol and a project participant (PP) are involved in this project (Table A-1).

Table A-1: Project parties and project participants

Characteristic	Party	Project Participant
Host party	Republic of Korea	POSO CO Engineering and Construction Co., Ltd..
Annex I party	Japan	Eurus Energy Holdings Corporation

The details of the project location are given in table A-2. The location has been confirmed by the verification team visually and by using GPS during the on-site visit.

Table A-2: Project Location

Parameter	Project Location
Host Country	Republic of Korea
Region	Gangwon-do
Project Location address	Taegi-ri, Dunnae-myun, Hoengseong-gun and Mui-ri, Bongpyeong-myun, Pyeongchang-gun
Latitude of Power Plant	NORTH 37°32'
Longitude of Power Plant	EAST 128°20'

The verification team has reviewed essential events of the project occurred since the registration of the project on the UNFCCC website, <http://cdm.unfccc.int/Projects/DB/KFQ1226904451.62/view>, and presented them in the following Table A-3.

Table A-3: Project verification history

No.	Item	Date	Status
1	Registration Date	15/05/2009	-
2	Start of crediting period	15/05/2009-	-
3	1 st Monitoring period	15/05/2009 – 31/05/2010	CER issued
4	2 nd Monitoring period	01/06/2010 – 31/05/2011	CER issued
5	3 rd Monitoring period	01/06/2011 – 30/09/2012	CER issued
6	4 th Monitoring period	01/10/2012 – 31/12/2016	MR publication
7	5 th Monitoring period	01/01/2017 – 31/12/2017	CER issued
8	6 th Monitoring period	01/01/2018 – 31/12/2018	CER issued

The purpose of this project is to generate electricity using wind power at south western area in Korea. The Taegisan Wind Park consists of 20 units of 2 MW-wind turbines. The turbine model is VESTAS V80-2.0MW, a widely used around the world for large scale wind power generation projects. The VESTAS V80-2.0MW is a pitch regulated upwind turbine with active yaw and a rotor with three blades.

The proposed project was registered as a CDM project activity on 15/05/2009 with a crediting period of fixed 10 years from 15/05/2009 to 14/05/2019.

The verification team verified the key parameters for the project by physically checking the nameplates of wind generators along with their specification and other installed equipment during the on-site assessment. The verification team's findings are summarized in the Table A-4.

Table A-4: Specification of the Wind Turbines and Generators

Rotor	
Diameter (m)	80
Sweptarea (m ²)	5027
Rotational speed static, rotor (RPM)	16.7
Rotational speed operation interval rotor (RPM)	9.0 – 19.0
Rotational direction	Clockwise(front view)
Orientation	Upwind
Tilt (°)	6
Blade coning (°)	2
Number of blades	3
Aerodynamic brakes	Full feathering
Tip angle	Pitch regulated
Turbulence (%)	10

Specification Vestas V80-2MW wind turbine

Design Wind Speed (10 min. average)	Start up Wind Speed (m/s)	4
	Normal Wind Speed (m/s)	15
	Stop Wind Speed (m/s)	25
Generator	Nominal output	2000kW
	Operation data	50 / 60 Hz 690V
Weight	Nacelle	67.5 t
	Rotor	37.2 t

The project is composed of 20 wind turbines, each of which equipped with a 2MW generator, giving total capacity of 40MW (2MW x 20).

These 20 units are classified in two different ways: (1) by the administrative district located and (2) by the measuring scheme for the electricity supplied to the grid.

In terms of administrative district, the project site is located between Hoengseong-gun and Pyeongchang-gun in Gangwon Province: Nine units in Hoengseon-gun and eleven units in Pyeongchang-gun.

- Hoengseong-gun, Gangwon-do: 2MW x 9 units (unit number 5,6,8,9,11~15) = 18 MW
- Pyeongchang-gun, Gangwon-do: 2MW x 11 units (unit number 1~4,7,10,16~20) = 22 MW

Depending on the way how the electricity supplied to the grid is measured, these units are divided into two 20MW-groups consisting of 10 units each, i.e. electricity is supplied to the grid through two 20MW lines. One group consists of subgroup A and B, and the other group consists of subgroup C and D. Subgrouping of the units are as follows:

A: unit number 14~20

B: unit number 5~7

C: unit number 8~13

D: unit number 1~4

The verification team confirmed that the project was implemented as planned and described in the registered PDD and that the project activities are in accordance with the approved methodology ACM0002 (Version 07.0). The verification team also confirmed that the installed equipment essential for emission reduction runs reliably and has been calibrated appropriately.

Also, The verification team confirmed that the monitoring was performed in accordance with the registered PDD and that the GHG emission reductions were calculated without any significant misstatements. The GHG emission reductions were verified by checking the registered PDD, the MR (version. 01.0) and MR (version. 02.0), the relevant requirements and documents.

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	CHOI	Jiseon	KTR	X	X	X	X
2.	Verifier	IR	PARK	Hyemi	KTR	X	X	X	X

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	JUNG	Kyuhong	KTR
2	Approver	IR	KIM	Jintae	KTR

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.	Errors, omissions or misstatements of emission sources	Low	The verification team checks whether there are error, omission or misstatements of emission source during the monitoring period.	To be further confirmed by cross-checking the related documents and through on-site inspection.
2.	Errors, double counting, omissions, or misstatements of monitoring parameters	Medium	The verification team checks whether there are errors, omissions or misstatements of monitoring parameters during the monitoring period. In this project activity, there are a number of monitoring parameters requiring thorough checks.	To be further confirmed by cross-checking the related documents and through on-site inspection.
3.	Accuracy of monitoring instruments	Low	The MR described the accuracy of each meters in accordance with the registered PDD.	To be further confirmed by cross checking the related documents including on-site inspection.
4.	The delay of the calibration for some measuring instruments	Low	The MR described the calibration date and the validity based on the monitoring plan in the registered PDD.	To be further confirmed by checking the related documents and through on-site inspection
5.	IT system and data collection procedure for monitoring system	Low	The designated staffs record the collected data and calculate the emission reductions based on the Monitoring plan, the monitoring manual and the data records.	To be further confirmed by cross-checking the related documents and through on-site inspection.
6.	Organization and QA/QC system	Low	Roles and responsibilities were defined according to the registered PDD. Monitoring activities including the data collection procedure, training, etc. were defined in the MR according to the registered PDD.	To be further confirmed by the cross checking the related documents and through on-site inspection.

C.2. Consideration of materiality in conducting the verification

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This project is a large-scale CDM project activity achieving the total emission reductions of <300,000 tonnes of carbon dioxide equivalent per year; as such, a 2.0 % materiality threshold is applied to this monitoring period.

19,359 tCO₂e × 2% = 387 tCO₂e (round down)

There are three findings detected, it was considered as simple errors rather than a systematic reoccurring error and three CARs have been closed successfully. Therefore, the verification team decided that no additional audit procedures need to be conducted in order to reach a reasonable level of assurance. Accordingly, verification and sampling plan were not revised

SECTION D. Means of verification**D.1. Desk/document review**

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During the desk review, all documents initially provided by the PP and publicly available were reviewed by following the KTR internal quality procedures. The main documents reviewed are listed below:

- The final version of the PDD including the MP;
- The final version of the validation report,
- The 1st, 2nd, 3rd, 5th, 6th monitoring report and verification report,
- Approved methodology ACM0002 (version 07.0);
- The MR (version 01.0 and 02.0), including the claimed emission reductions for the project, and
- ER calculation sheet (version 01.0 and 02.0).

Other supporting documents, such as publicly available information from the UNFCCC website and background information were also reviewed

D.2. On-site inspection

Duration of on-site inspection: 13/04/2021				
No.	Activity performed on-site	Site location	Date	Team member
1.	<ul style="list-style-type: none"> • Opening meeting with the PPs - Verification purpose, methods, and schedule - Understand the background of the project • Site inspection - Verify the installed equipment - Verify the installed measurement equipment • Document review with the PPs. - Review of monitoring and reporting procedures - Cross-check all data and parameters monitored - Calibration records of measuring instruments • Closing meeting with the PPs - Summary of CAR, CL, and - Actions after the on-site assessment 	Gangwon-Do, Republic of Korea	13/04/2021	CHOI Jiseon PARK Hyemi

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Oh	Jinseon	TWPC	13/04/2021	<ul style="list-style-type: none"> - Involved personnel and responsibilities - Records of metering equipment - Training and practice of the operational personnel - Implementation of the MP - Monitoring data management - Data collection procedures - GHG calculation Report for ER 	CHOI Jiseon PARK Hyemi
2.	LEE	Chanhee	TWPC	13/04/2021	<ul style="list-style-type: none"> - Technical equipment and their operation - Monitoring and measuring instruments - Calibration procedures - Maintenance of Facility 	
3.	CHOI	Junmyoung	Eurus Energy Korea corporation	13/04/2021	<ul style="list-style-type: none"> - General aspects of the project - Quality management system 	

D.4. Sampling approach

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No sampling is used as the verification team visited on-site to confirm installed facilities in the project and reviewed all the documents such as, monthly reports, invoices, and SCADA system data, etc.

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	-	1	-
Compliance of the project implementation and operation with the registered PDD	-	-	-
Post-registration changes	-	-	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	1	-
Compliance with the calibration frequency requirements for measuring instruments	-	1	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	-	3	-

SECTION E. Verification findings

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

Means of verification	(VVS para. 352-353) The DOE shall determine whether the monitoring report was completed using the valid version of the applicable monitoring report form. The DOE shall state its opinion on the compliance of the monitoring report with the relevant form and instructions therein.
Findings	There is 1 CAR raised in this section.
Conclusion	<p>PP has submitted the monitoring report(version.01) by using the monitoring report form(version.07.0) for Global Stakeholder Consultation. However, it is no longer valid from 06/04/2021.</p> <p>Therefore, the CAR01 has been raised and closed successfully.</p> <p>PP has revised the monitoring report with the latest monitoring report form (version 08.0). And The verification team confirmed that the PP used the latest version of monitoring report form (version 08.0).</p> <p>The verification team also checked the completeness of revised MR (version 02.0) and found that all information has been accurately transferred to the latest version of form (CDM-MR-FROM, version 0.8).</p> <p>Also, it was concluded that the information in the monitoring report is completely complied with accordance with the Attachment of CDM-MR-FROM (version 08.0).</p>

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

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Not applicable.

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

Means of verification	<p>(VVS para. 354-356) The DOE shall identify any concerns related to the conformity of the actual CDM project activity and its operation with the registered PDD and determine whether:</p> <p>(a) The implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PDD; or</p> <p>(b) Any deviation or the proposed or actual changes in the implementation or</p>
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	operation of the project activity comply with the relevant requirements of the “CDM project standard for project activities”. The DOE shall assess whether all physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM project activity specified in the registered PDD are in place and that the project participants have operated the project activity as per the registered PDD or any approved revised PDD.
Findings	There is no CAR/CL raised in this section.
Conclusion	<p>The project activity has been implemented as per the registered PDD and information from the UNFCCC website.</p> <p>The project is a wind power generation by 20 turbines with 2 MW capacity each. The total capacity of 20 turbines is 40 MW. By reviewing the documents concerning the completion of facility construction and through the site visit, the verification team confirmed that all required facilities were installed and being operated as described in the registered PDD. They were installed as described below during the period from 25/07/2007 (construction start date) to 26/12/2008 (commissioning date) as follows:</p> <ul style="list-style-type: none"> - Wind Turbine (V80) manufacturer: VESTAS Wind System (Denmark) - Plant design: Hyundai Engineering CO., Ltd. (Korea) - Installation work: POSCO Engineering and Construction Co., Ltd. (Korea) <p>The verification team confirmed that the construction start date is 25/07/2007 based on the document by POSCO and the approval from The Ministry of Commerce as the planned date 01/05/2007 was described in PDD and the commercial operation start date is 28/01/2009 based on the report to the Ministry of Knowledge Economy.</p> <p>The verification team also confirmed that the 20 wind turbine generators are divided into two groups having 10 turbine generators each. Turbine generators in each group share one 20MW transmission line to the central control panel of the site.</p> <p>In addition, the watt-hour meters for export and import electricity, SCADA (Supervisory Control and Data Acquisition) system and 2 transmission lines (22.9 kV 33km) were installed and being operated.</p> <p>The verification team confirmed that the physical features of the project activity in the registered PDD are in place and that the PP has operated the project activity as per the registered PDD during this monitoring period.</p>

E.4. Post-registration changes

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

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The verification team confirms that there is no temporary deviation during this monitoring period.

E.4.2. Corrections

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The verification team confirms that there is no corrections to the registered project.

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

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The verification team confirms that there is no change to the start date of the crediting period.

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.4.4. Inclusion of a monitoring plan

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The verification team confirms that there is no monitoring plan to be included in the registered project activity.

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

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The verification team confirmed that the revised MP was approved on 30 Mar 2011.

E.4.6. Changes to the project design

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The verification team confirms that there is no change to the project design of the registered project activity.

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

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Not applicable.

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

Means of verification	(VVS para. 357-359) The DOE shall determine whether the registered monitoring plan is in accordance with the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents. For monitoring aspects that are not specified in the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents, particularly in the case of small-scale methodologies (e.g. additional monitoring parameters, monitoring frequency and calibration frequency), the DOE should bring to the attention of the Board issues which may enhance the level of accuracy and completeness of the registered monitoring plan.
Findings	There is no CAR/CL raised in this section
Conclusion	The verification team confirmed that the project and the monitoring system has been implemented in accordance with the provisions of the registered PDD (version 05.0) and the applied monitoring methodology (ACM0002, version 07.0) and that this project has no monitoring aspect not specified in the methodology.

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	(VVS para. 360) Compliance with the registered PDD Check whether the value applied is in compliance with the registered PDD.		
Findings	There is no CAR/CL raised in this section.		
Conclusion	The PP has applied data and parameters fixed ex ante for monitoring and calculating the GHG emission reductions as follow.		
	Table E.6.1-1 Information of data and parameter fixed ex-ante		
	Data/parameter	Applied value	Source of data
OM Emission Factor of Grid, $EF_{grid,OM,y}$	0.7281 tCO ₂ e/MWh	$EF_{grid,OM,y}$ was calculated based on the ACM0002 (version 07.0) . Required values for the calculation were taken from the Statistics of Electric Power provided by the Korea Electric Power Corporation.	

	BM Emission Factor of Grid, $EF_{grid,BM,y}$	0.3859 tCO ₂ e/MWh	$EF_{grid,BM,y}$ was calculated based on the ACM0002(version 07.0). Required values for the calculation were taken from the Statistics of Electric Power provided by the Korea Electric Power Corporation
	Combined Emission Factor of Grid, $EF_{grid,CM,y}$	0.6426 tCO ₂ e/MWh	$EF_{grid,CM,y}$ was calculated based on the ACM0002(version 07.0). Required values for the calculation were taken from the Statistics of Electric Power ^{/24/} provided by the Korea Electric Power Corporation
	The verification team confirmed that the PP has applied all of data and parameter fixed ante adequately in calculating the GHG emission reductions according to the registered and validated PDD.		

E.6.2. Data and parameters monitored

Means of verification	<p>(VVS para. 361) The DOE shall determine whether:</p> <p>(a) The registered monitoring plan has been properly implemented and followed by the project participants;</p> <p>(b) All parameters stated in the registered monitoring plan and relevant Board decisions have been monitored and updated as applicable, including:</p> <ul style="list-style-type: none"> (i) Project emission or net removal parameters; (ii) Baseline emission or net removal parameters; (iii) Leakage parameters; (iv) Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the registered monitoring plan; <p>(c) The equipment used for monitoring is in accordance with section 9.2.6 below and is controlled and calibrated in accordance with the registered monitoring plan, the applied methodologies, the applied standardized baselines, Board guidance, local/national standards, or as per the manufacturer's specification;</p> <p>(d) Monitoring results are consistently recorded as per the approved frequency;</p> <p>(e) Quality assurance and quality control procedures have been applied in accordance with the registered monitoring plan.</p>
Findings	There is 1 CAR raised in this section
Conclusion	<p>According to the MP of the registered PDD (version 05.0) and monitoring methodology for which ACM0002 (version 07.0) has been applied, the monitoring parameters is the net electricity generated by this project.</p> <p>During the verification, this monitoring parameter has been verified with regard to the appropriateness of the applied measurement and determination method, the correctness of the values used in the ER calculation, the accuracy and applied QA/QC measures.</p> <p><u>Electricity supplied</u></p> <p>20 wind turbine generators are grouped into 2 banks. Each bank has 2 electric meters measuring exported electricity installed at the electric room of the wind power plant. In total, 2 main and 2 sub meters have been installed for measurement of exported electricity in the plant according to the registered PDD (version 05.0). If the main meters do not function properly, the sub meters will replace the main meters. The parameter $EG_{output,y}$ is obtained from the data from these four watt-hour meters.</p> <p>The quantity of electricity supplied to the grid is automatically and continuously measured and recorded daily by the meters in the electrical room at the plant site.</p>

The measured data are transferred to the internal database managed by the Business Administration team of Taegisan Wind Power Company (TWPC).

The verification team cross-checked the values stored in the internal database of PP against the data in the sales records provided by KPX and found them consistent.

However, the verification team found that the data for exported electricity in the sales records provided by KPX is not consistent with the data used in the MR (version 01.0) and ER calculation sheet (version 01.0).

Therefore, the CAR02 has been raised and closed successfully.

The verified quantity of supplied electricity is 32,565.463 MWh for this monitoring period.

Electricity Imported

As discussed in $EG_{output,y}$, 20 wind turbine generators are grouped into 2 banks. Each bank has one electric meter measuring imported electricity installed at the electric room of the wind power plant, i.e. two electric meters are installed at the project site for imported electricity.

The parameter $EG_{import,y}$ is obtained from the data from these two watt- hour meters

The quantity of electricity imported from the grid (#1, #2) is measured continuously and recorded monthly. The data is archived in the internal database managed by the Business Administration of TWPC.

The verification team cross-checked the values against the internal database of the PP and the data in the relevant electricity bill provided by Korea Electric Power Corporation (KEPCO) and found them consistent.

However, the verification team found the data for imported electricity in electricity bill provided by KEPCO is not consistent with the data used in the MR (version 01.0) and ER calculation sheet (version 01.0).

Therefore, the CAR02 has been raised and closed successfully.

The verified quantity of imported electricity is 62.473 MWh for this monitoring period.

Supplied/Imported Transmission Loss

The interface between the project and the grid is located at the Pyengchang 22.9kV substation which is owned by KEPCO, and located at approximately 33km west from the project site.

The watt-hour meters are installed at the Taegisan Wind Power Co., Ltd., not at the interface substation. Therefore, transmission loss between the project site and the substation needs to be considered for accurate determination of the net amount of electricity supplied to the grid.

The transmission losses for exported and imported electricity during this monitoring period were verified as 2,376.142MWh and 0.009 MWh, respectively.

Net electricity supplied to the grid

This parameter, EG_y is the quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity.

The verification team confirmed that the formula used in the ER calculation sheet is correct.

	<p>The net electricity delivered to the grid(EG_y) by the project activity is obtained by subtracting the quantity of electricity imported and transmission losses from the quantity of electricity supplied (Electricity supplied - Electricity imported - Transmission Loss in the supplied electricity - Transmission Loss in the imported electricity).</p> <p>The reported and verified quantity of net electricity (EG_y) supplied to the grid by the project activity during this monitoring period is 30,126.840 MWh.</p>
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E.6.3. Implementation of sampling plan

Means of verification	<p>(VVS para. 338 (c)) Sampling approach in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities", including:</p> <p>(i) A random sampling for cases where the project participants or the coordinating/managing entity did not apply a sampling approach;</p> <p>(ii) An acceptance sampling or another sampling approach for cases where the project participants or the coordinating/managing entity applied a sampling approach.</p>
Findings	There is no CARs raised in this section
Conclusion	The PPs did not apply any sampling plan to determine data and parameters monitored during the period. The verification team checked all documented evidences for ER calculation sheet.

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

Means of verification	<p>(VVS para. 365-371) The DOE shall determine whether the calibration of the measuring equipment that has an impact on the claimed GHG emission reductions or net anthropogenic GHG removals is conducted by the project participants at a frequency specified in the applied methodologies, the applied standardized baselines and/or the registered monitoring plan.</p> <p>If, during the verification of a certain monitoring period, the DOE identifies that the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (i.e. the results of delayed calibration are available), referring to the illustrative examples in the appendix, the DOE may conclude its verification, provided the following conservative approach is adopted in the calculation of GHG emission reductions or net anthropogenic GHG removals</p>
Findings	There is 1 CAR raised in this section.
Conclusion	<p>The verification team reviewed the information on the meters for imported and exported electricity in the MR (version 01.0), calibration/test reports and the applicable national law to confirm that there was no calibration delay during the monitoring period.</p> <p>The verification team verified the following parameters related to the meters measuring imported/exported electricity.</p> <p><u>$EG_{output,y}$ (Electricity exported)</u></p> <p>According to the approved MP, calibrations should be performed in accordance with the applicable national laws. Calibrations of the meters for exported electricity were conducted in accordance with the "Rules on the operation of electric utility market" by KPX, which requires 3 years 6 months \pm 6 months (3 years to 4 years) calibration interval for watt-hour meters with capacity larger than 1 MW.</p> <p>The verification team reviewed "Electric meter test reports" and found that the results meet the requirements given in the type approval standards stipulated by the Korea Agency for Technology and Standards (KATS).</p> <p>The verification team confirmed that calibration validity of meters was maintained throughout this monitoring period.</p> <p>The detailed information for each electricity meters is summarized below:</p>

	#1 Main meter	#1 Sub-meter
Type	Electric meter	Electric meter
Accuracy	0.5S.	0.5S.
Serial number	46026114	46026113
Calibration frequency	3 years 6 month ± 6 month	3 years 6 month ± 6 month
Date of installation	10/09/2008	10/09/2008
Date of previous calibration	21/08/2012	21/08/2012
Date of last calibration	10/07/2015	10/07/2015
Validity	10/07/2015 ~ 09/07/2019	10/07/2015 ~ 09/07/2019

	#2 Main meter	#2 Sub-meter
Type	Electric meter	Electric meter
Accuracy	0.5S.	0.5S.
Serial number	46026112	46026111
Calibration frequency	3 years 6 month ± 6 month	3 years 6 month ± 6 month
Date of installation	10/09/2008	10/09/2008
Date of previous calibration	21/08/2012	21/08/2012
Date of last calibration	10/07/2015	10/07/2015
Validity	10/07/2015 ~ 09/07/2019	10/07/2015 ~ 09/07/2019

By reviewing the above rules and Electric meter test reports for exported electricity, the verification team confirmed that the calibration has been performed properly in accordance with the applicable national law.

EG_{import,y} (Electricity imported)

According to the approved MP, the calibration should be done in accordance with the national laws. The calibration of the KEPCO meter was conducted based on the "Enforcement Decree of the Measures Act", which requires a calibration every 3~4 years.

The verification team found that the date of the latest calibration and validity on calibration letter issued by KEPCO are inconsistent with monitoring report (version 01.0). Therefore, the CAR03 has been raised and closed successfully.

The calibrations have been performed before the calibration validity expires by the KEPCO, which is an accredited national calibration agency in Korea.

Therefore, the verification team confirms that calibrations of the watt-hour meters for imported electricity have been performed in accordance with the national law

The verification team also confirmed that calibration validity of meters was maintained throughout this monitoring period.

Thus, the detailed information for each electricity meters is summarized below:

	#1	#2
Type	Electric meter	Electric meter
Accuracy	0.5S.	0.5S.
Serial number	24176002316	24176002326
Calibration frequency	3 years 6 month ± 6 month	3 years 6 month ± 6 month
Date of installation	31/08/2018	31/08/2018
Date of last calibration	17/10/2018	17/10/2018
Validity	17/10/2018~ 16/10/2021	17/10/2018~ 16/10/2021

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>(VVS para. 372-374) The DOE shall assess the data and calculations of GHG emission reductions or net anthropogenic GHG removals achieved by from the registered CDM project activity.</p> <p>The DOE shall determine whether:</p> <p>(a) A complete set of data for the specified monitoring period is available. If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the DOE shall assess whether:</p> <p>(i) The most conservative values approach is applied to the parameters for the entire non-monitoring period in accordance with the provisions relating to the temporary deviation from the registered monitoring plan, the applied methodologies or the applied standardized baselines in the "CDM project standard for project activities"; or</p> <p>(ii) Alternative monitoring arrangements for the non-monitoring period are described, whether they apply conservative assumptions or discount factors to the calculations, and whether the alternative monitoring arrangements have been approved by the Board under the prior-approval track or to be approved by the Board under the issuance track in accordance with the provisions relating to temporary deviation from the registered monitoring plan, the applied methodologies or the applied standardized baselines in the "CDM project standard for project activities";</p> <p>(b) The information provided in the monitoring report has been cross-checked with other sources such as plant logbooks, inventories, purchase records and laboratory analysis;</p> <p>(c) The calculations of baseline GHG emissions or baseline net GHG removals, project GHG emissions or actual net GHG removals, and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodologies and, where applicable, the applied standardized baselines;</p> <p>(d) Any assumptions used in emission or removal calculations have been justified;</p> <p>(e) Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied;</p>
Findings	There is no CAR/CL raised in this section
Conclusion	<p>The verification team reviewed all the data related to GHG emission reduction calculation such as KPX data, KEPCO data, internal log on electricity generation, and etc. to confirm that data used in the MR (version 02.0) and the ER calculation sheet (version 02.0) is consistent with the data in the reviewed documents.</p> <p>The verification team verified the followings in relation to the ER calculation.</p> <p>The formula used for the determination of baseline emissions is consistent with the registered PDD.</p> $BE_y = EG_y \times EF_y$ <p>Where:</p> <p>EG_y is net electricity supplied by the project activity to the grid in year y, in MWh</p> <p>EF_y is baseline emission factor in year y, in tCO₂e/MWh according to the registered PDD</p> $EG_y = (EG_{\text{output},y} - EG_{\text{import},y}) - (TL_{y,\text{supply}} + TL_{y,\text{import}})$ <p>Where;</p> <p>EG_y-Net electricity supplied to the grid during the monitoring period (MWh);</p> <p>$EG_{\text{output},y}$: Electricity supplied to the grid (MWh);</p> <p>$EG_{\text{import},y}$: Electricity imported from the grid (MWh).</p> <p>TL_y : transmission loss(MWh)</p> <p>The KEPCO's 22.9kV substation between the project site and the grid is located at</p>

	<p>approximately 33km away from the project site in Pyengchang-gun. The watt-hour meters are installed at the Taegisan Wind Power Co., Ltd., not at the interface substation. Therefore, transmission loss between the project site and the substation needs to be considered for accurate determination of the amount of net electricity supplied to the grid,</p> $TL_y = KW \text{ Loss} \times T$ $= I^2 R_3 \times T$ <p>Where: $I = I_p / P.F$ I : Current on the transmission line (A) $P.F$: Power Factor of electricity generation (97%) $I_p = P / (1.732 \times 22.9 \times T)$ P : Electricity generation (KWh) T : Time (period) = 24x days R_3 : The phase resistance (ohm) of 3 transmission lines $R_3 = 3 \times R_1$ R_1 : The phase resistance (ohm) 1 phase resistance 22.9 : Voltage of power line from Taegisan Wind Park to the substation (kV)</p> <p>Determination of amount of parameter; EF_y: Baseline Emission Factor of Korea is calculated ex-ante and fixed during the crediting period. 0.6426 tCO₂e/MWh;</p> <p>R_1 : The Wire Resistance of transmission line is based on the transmission cable specifications by manufacturer, Daeil Wire Co., Ltd., Conmolink Co., Ltd. and Taihan Electric Wire Co., Ltd.</p> <p>1) Underground Transmission Line: Cable Length: 8km (2 parallel lines) Test Result of Resistance (per km): 0.07215 Total Resistance for underground T/L: $0.07215 \times 8 / 2 = 0.2886$</p> <p>2) Overhead Transmission Line 1: Cable Length: 22km Test Result of Resistance (per km): 0.1183 Total Resistance for overhead T/L: $0.1183 \times 22 = 2.6026$</p> <p>3) Overhead Transmission Line 2: Cable Length: 3km Test Result of Resistance (per km): $0.183 \times 3 = 0.549$</p> <p>Thus, GHG emission reduction is calculated as below by considering transmission loss: $BE_y = EG_y \times EF_y$ $= [(EG_{\text{output},y} - EG_{\text{import},y}) - (TL_{y,\text{supply}} + TL_{y,\text{import}})] \times EF_y$ $= [(32,565.463 - 62.473) - (2,376.142 + 0.009)] \times 0.6426$ $= 30,126.840 \text{ MWh} \times 0.6426 \text{ tCO}_2\text{e/MWh}$ $= 19,359.507 \text{ tCO}_2\text{e}$</p>
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E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	<p>(VVS para. 372-374) The DOE shall assess the data and calculations of GHG emission reductions or net anthropogenic GHG removals achieved by from the registered CDM project activity.</p> <p>The DOE shall determine whether:</p> <p>(a) A complete set of data for the specified monitoring period is available. If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the DOE shall assess whether:</p> <p>(i) The most conservative values approach is applied to the parameters for the entire non-monitoring period in accordance with the provisions relating to the temporary deviation from the registered monitoring plan, the applied</p>
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	<p>methodologies or the applied standardized baselines in the “CDM project standard for project activities”; or</p> <p>(ii) Alternative monitoring arrangements for the non-monitoring period are described, whether they apply conservative assumptions or discount factors to the calculations, and whether the alternative monitoring arrangements have been approved by the Board under the prior-approval track or to be approved by the Board under the issuance track in accordance with the provisions relating to temporary deviation from the registered monitoring plan, the applied methodologies or the applied standardized baselines in the “CDM project standard for project activities”;</p> <p>(b) The information provided in the monitoring report has been cross-checked with other sources such as plant logbooks, inventories, purchase records and laboratory analysis;</p> <p>(c) The calculations of baseline GHG emissions or baseline net GHG removals, project GHG emissions or actual net GHG removals, and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodologies and, where applicable, the applied standardized baselines;</p> <p>(d) Any assumptions used in emission or removal calculations have been justified;</p> <p>(e) Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied;</p>
Findings	There is no CAR/CL raised in this section
Conclusion	Project activity emission is considered as zero as per the methodology ACM0002 (version 07.0) and the registered PDD (version 05.0), i.e. $PE_y = 0$.

E.8.3. Calculation of leakage GHG emissions

Means of verification	<p>(VVS para. 372-374) The DOE shall assess the data and calculations of GHG emission reductions or net anthropogenic GHG removals achieved by from the registered CDM project activity.</p> <p>The DOE shall determine whether:</p> <p>(a) A complete set of data for the specified monitoring period is available. If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the DOE shall assess whether:</p> <p>(i) The most conservative values approach is applied to the parameters for the entire non-monitoring period in accordance with the provisions relating to the temporary deviation from the registered monitoring plan, the applied methodologies or the applied standardized baselines in the “CDM project standard for project activities”; or</p> <p>(ii) Alternative monitoring arrangements for the non-monitoring period are described, whether they apply conservative assumptions or discount factors to the calculations, and whether the alternative monitoring arrangements have been approved by the Board under the prior-approval track or to be approved by the Board under the issuance track in accordance with the provisions relating to temporary deviation from the registered monitoring plan, the applied methodologies or the applied standardized baselines in the “CDM project standard for project activities”;</p> <p>(b) The information provided in the monitoring report has been cross-checked with other sources such as plant logbooks, inventories, purchase records and laboratory analysis;</p> <p>(c) The calculations of baseline GHG emissions or baseline net GHG removals, project GHG emissions or actual net GHG removals, and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodologies and, where applicable, the applied standardized baselines;</p> <p>(d) Any assumptions used in emission or removal calculations have been justified;</p> <p>(e) Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied;</p>
Findings	There is no CAR/CL raised in this section.
Conclusion	In accordance with ACM0002(version 07.0) and the registered PDD (version 05.0), the renewable energy project doesn't need to consider the leakage, i.e. $LE_y = 0$.

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

Means of verification	(VVS para. 372-374) The DOE shall assess the data and calculations of GHG emission reductions or net anthropogenic GHG removals achieved by from the registered CDM project activity.
Findings	There is no CAR/CL raised in this section.
Conclusion	<p>The formula used for the determination of emission reductions during the monitoring period was consistent with the registered PDD (version 05.0).</p> <p>The detailed ER calculation is as follow:</p> $BE_y = EG_y \times EF_y$ $= 30,126.840 \text{ MWh} \times 0.6426 \text{ tCO}_2\text{e/MWh}$ $= 19,359.507 \text{ tCO}_2\text{e}$ $PE_y = 0 \text{ tCO}_2\text{e}$ $LE_y = 0 \text{ tCO}_2\text{e}$ $ER_y = BE_y - PE_y - LE_y$ $= 19,359 \text{ tCO}_2\text{e}$ <p>As shown above, the emission reduction during the monitoring period (01/01/2019 -14/05/2019) is 19,359 tCO₂e. After thoroughly checking the records in the KPX database, the official document on the electricity obtained from the KEPCO grid and internal database of the PP, the verification team confirms that the calculation in the ER spreadsheet (version 02.0) is reproducible and accurate.</p>

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

Means of verification	DOE determined the CER achieved during this monitoring period with the estimated value and reason for increase if any.
Findings	There is no CAR/CL raised in this section
Conclusion	<p>The MR includes a comparison of the calculated actual emission reductions which is 19,359 tCO₂e with the ex-ante calculated values which is 21,905tCO₂e in the registered PDD (ver.05.0).</p> <p>The verification team confirmed that the actual GHG emission reductions and the estimates in the PDD are correctly stated in the MR by cross-checking the ER calculation sheet and the registered PDD.</p>

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

Means of verification	DOE determined the CER achieved during this monitoring period with the estimated value and reason for increase if any.
Findings	There is no CAR/CL raised in this section
Conclusion	<p>In this monitoring period, the actual emission reduction is lower than the expected emission reduction as calculated in the PDD (version 05.0).</p> <p>The electricity generation during this period is 30,126.840 MWh which is lower than the estimated electricity generation.</p> <p>The actual electricity generation was 11.6% lower than the estimated electricity generation. The main reason for lower electricity generation is due to the troubleshooting and overhaul of some wind turbines. The verification team's review of the operation log showing significantly low level of electricity generation at the time of troubleshooting/overhaul fully supported this reasoning.</p>

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 verification team determined the CER achieved during the first commitment period and second commitment period.
Findings	There is no CAR/CL raised in this section .

Conclusion	This monitoring period is from 01/01/2019 to 14/05/2019. Hence, the PP stated that the total amount of GHG emission reductions of this monitoring period as GHG emission reductions from 01/01/2019 onwards in the Monitoring report version 02.0. The verification team confirmed, through review of the related evidences provided by the PP, that this monitoring period is correct, and that both the total amount GHG emission reductions and the GHG emission reduction of the period from 01/01/2019 onwards are stated appropriately in the MR version 02.0.
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E.9. Assessment of reported sustainable development co-benefits

Means of verification	(VVS para. 375-377) If the project participants have monitored the sustainable development co-benefits of the registered CDM project activity, and requested the DOE to verify them, it shall assess whether: (a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the "CDM project standard for project activities"; (b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.
Findings	N/A
Conclusion	N/A

E.10. Global stakeholder consultation

Means of verification	(VVS para. 391-392) The DOE may request further information from the submitters of the comments. The DOE shall also inform the project participants of the comments received, and request their feedback within a specified timeframe. The DOE shall consider the input received and assess whether such comments are relevant to the CDM project activity;
Findings	N/A
Conclusion	N/A

SECTION F. Internal quality control

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Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance, and training of personnel in the framework of this CDM project activity have been defined in the approved MP. The procedures described in the MR are consistent with the MP and assessed as appropriate for the purpose. No significant deviation has been observed during the verification.

The whole procedure of quality management was verified by the verification team by interviewing the responsible personnel and by checking the CDM Monitoring Manual provided by PP.

SECTION G. Verification opinion

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Eurus Energy Holdings Corporation has commissioned Korea Testing and Research Institute (KTR) to carry out the 7th periodic verification of the project: "Taegisan Wind Power Project (UNFCCC Ref.2302)", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions by replacing the electricity generated from fossil fuel fired power plants with the electricity generated from the wind power generation plant. This verification covers the period from 01/01/2019 to 14/05/2019 (including both days).

During the course of the verification, 3 Corrective Action Requests (CARs) were raised and successfully closed. The verification was carried out based on the monitoring report (version 01.0), the revised monitoring report (version 02.0), the registered PDD (version 05.0), the ER calculation sheet (version 02.0), the validation report (ver. 02.0), and other supporting documents made available to KTR by the PP. The verification included assessment of evidences relevant to the amounts related to the project's GHG emission

reductions for this monitoring period.

As a result of this verification, the verification team concluded that:

- All operations of the project are implemented and installed as planned and described in the registered PDD.
- The monitoring plan is in accordance with the applied approved CDM methodology, i.e. ACM0002 (version 07.0) "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".
- The installed meters, which are essential for measurement of parameters required for emission reduction calculation, have been calibrated appropriately.
- The monitoring system is in place and fully functional. The project has achieved GHG emission reductions as intended.

KTR's verification approach was based on the requirements defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive board. The examination includes assessment of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for this monitoring period.

As a result of the 7th periodic verification, the verification team confirms that the GHG emission reductions are calculated in a conservative and appropriate manner without any material misstatements. The verification team has also confirmed that the information included in the revised monitoring is correct and that the emission reduction achieved has been determined correctly. Based on the information seen and evaluated, the verification team confirms the following:

Project Title :	Taegisan Wind Power Project
UNFCCC ref no:	2302
Crediting period :	15/05/2009 ~ 14/05/2019
Monitoring Report :	Version 02.0
Methodology used for verification :	ACM0002(version 07.0)
Applicable monitoring period :	01/01/2019 - 14/05/2019
VVS version	VVS 2.0
Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period	19,359 tCO ₂ e

SECTION H. Certification statement

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As above

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
GHG	Green House Gas
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KATS	Korea Agency for Technology and Standards
KEPCO	Korea Electric Power Corporation
KP	Kyoto Protocol
KPX	Korea Power Exchange
KTC	Korea Testing Certification
KTR	Korea Testing and Research Institute
MP	Monitoring Plan
MR	Monitoring Report
PDD	Project Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
SCADA	Supervisory Control And Data Acquisition
TR	Transformer
TWPC	Taegisan Wind Power Company
UNFCCC	United Nations Framework Convention for Climate Change
VVS	Clean Development Mechanism Validation and Verification Standard
WTG	Wind Turbine Generator

Appendix 2. Competence of team members and technical reviewers

Certificate for Achievement



KTR
한국화학융합시험연구원
K O R E A T E S T I N G & R E S E A R C H I N S T I T U T E

Certificate of Authorization

Name : CHOI, Jiseon

Date of Birth : September 21th, 1984

Certificate Number : 2021CDM - 001


We, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 7.0 and CDM Quality procedure (CDM-QP-07)

Scope of Authorization :


CODE	TECHNICAL AREA	STATUS
1.1	Thermal energy generation	Lead Validator/Verifier
1.2	Renewables	Lead Validator/Verifier
3.1	Energy demand	Lead Validator/Verifier
13.1	Solid waste and waste water	Lead Validator/Verifier
13.2	Manure	Lead Validator/Verifier

Valid until : February 22th, 2024

February 23th, 2021



한국화학융합시험연구원
Korea Testing and Research Institute





한국화학융합시험연구원

K O R E A T E S T I N G & R E S E A R C H I N S T I T U T E

Certificate of Authorization

Name : PARK, Hyemi
Date of Birth : February 15th, 1986
Certificate Number : 2019CDM - 003

We, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 7.0 and CDM quality procedure (CDM-QP-07).

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
1.2	Energy generation from renewable energy sources	Full-time Validator/Verifier
13.1	Waste handling and disposal	Full-time Validator/Verifier

Valid until : July 5th, 2022

July 5th, 2019



한국화학융합시험연구원장
 Korea Testing and Research Institute





한국화학융합시험연구원

K O R E A T E S T I N G & R E S E A R C H I N S T I T U T E

Certificate of Authorization

Name : JUNG, Kyuhong
 Date of Birth : February 1st, 1977
 Certificate Number : 2019CDM - 001

We, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 7.0 and CDM Quality procedure (CDM-QP-07)

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
1.1	Thermal energy generation	Lead Validator/Verifier
1.2	Renewables	Lead Validator/Verifier
3.1	Energy demand	Lead Validator/Verifier
4.1	Cement and lime production	Lead Validator/Verifier
13.1	solid waste and wastewater	Lead Validator/Verifier

Valid until : July 4th, 2022

July 5th, 2019



한국화학융합시험연구원장
 Korea Testing and Research Institute



Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	PP	Final version of the PDD (version 05.0)	http://cdm.unfccc.int/Projects/DB/KFQ1226904451.62/iProcess/KTRCert1516080827.98/view	PP
2	DOE(kfq)	The Final version of the validation report	http://cdm.unfccc.int/filestore/R/H/Z/RHZC4LOATDPU9X2NK8QIBWSFG70VE1/VR_Ver%2002.pdf?t=aUI8cDR5ZnRzfDCMq3bAw_rSy0opQe7X7ci-H	Others
3	DOE(JACO)	The 1 st verification report	http://cdm.unfccc.int/filestore/J/1/Q/J1Q26SGYHFA D95NWETU0CRV348BX7Z/Taegisan%201st%20Verification%20Report.pdf?t=RnN8cDR5Zng0fDDjlyOV00H_s5Pchxr_JlI0	Others
4	DOE(JACO)	The 2 nd verification report	http://cdm.unfccc.int/filestore/F/C/4/FC4Y8KA0N17WDRBJ6EIQMZS3HLX2TV/Verification%20Report_Taegisan%20WP_2nd.pdf?t=Y1l8cDR5ZncwDDCeD1REKVKxqbHO3PpT8xJ	Others
5	DOE(JACO)	The 3 rd verification report	http://cdm.unfccc.int/filestore/g/f/FR2HM3GAVIZNL8CB6K9TE75UYO4WQJ.pdf/Verification%20Report_Taegisan%203rd.pdf?t=dUN8cDR5Znl5fDAjASWY855m54ELy79evYtJ	Others
6	DOE(KTR)	The 5 th verification report	http://cdm.unfccc.int/filestore/G/R/6/GR6UTN9XKV73I2PEC1AOMF5LQH8Y4Z/2302_5th_VR.pdf?t=Yld8cG5tN2QwfDBtVgYELji7FWYygh3dE8a4	Others
7	UNFCCC	ACM0002 methodology (version 07.0)	N/A	Others
8	UNFCCC	CDM validation and verification standard for project activities(version 02.0)	N/A	Others
9	Ecoeye Co., Ltd. (Project consultant)	Monitoring report · version 01.0 · version 02.0	05/03/2021 19/04/2021	PP
10	Ecoeye Co., Ltd. (Project consultant)	ER calculation sheet · version 01.0 · version 02.0	05/03/2021 19/04/2021	PP
11	UNFCCC	MR template(version 08.0)	N/A	Others
12	PP	Drawing showing the monitoring points	N/A	PP
13	PP	Resistance calculation data	N/A	PP
14	PP	Electricity transmission line map	N/A	PP

15	POSCO	Document of the construction	N/A	Others
16	POSCO	The approval of the construction	N/A	Others
17	POSCO	The Statement for Starting Construction Work	N/A	Others
18	PP	Taking-Over Certificate (Phase 1)	N/A	PP
19	PP	Taking-Over Certificate (Phase 2)	N/A	PP
20	PP	Starting Commercial Operation for Wind Power	N/A	PP
21	PP	Actual reporting of monitoring results(daily, monthly)	N/A	PP
22	PP	Specification of equipment	N/A	PP
23	KEPCO	Statistics of Electric Power	N/A	Others
24	PP	internal database	N/A	PP
25	PP	sales records	N/A	PP
26	KEPCO	Monthly electricity bill	N/A	Others
27	KEPCO	Calibration letter	N/A	Others
28	KPX	Rules on the operation of electric utility market	N/A	Others
29	KEPCO	Electric meter test reports	N/A	Others
30	KTC	type approval standards	N/A	Others
31	KEPCO	Enforcement Decree of the Measures Act	N/A	Others
32	Calibration entity	Calibration certificates of Electric meters	N/A	Others
33	KPX	Monthly exchange amount of electric power	N/A	Others
34	Daeil Wire Co., Ltd., Conmolink Co., Ltd. and Taihan Electric Wire Co., Ltd	Transmission cable specifications	N/A	Others

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

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

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

Table 2. CL from this verification

CL ID	Section no.	Date:
Description of CL		
N/A		
Project participant response		Date:
N/A		
Documentation provided by project participant		
N/A		
DOE assessment		Date:
N/A		

Table 3. CAR from this verification

CAR ID	Section no.	Date:
01	E.1	13/04/2021
Description of CAR		
The monitoring report form (ver. 07.0) used by PP is no longer valid from 06/04/2021. Therefore, the CAR01 was raised.		
Project participant response		Date: 23/04/2021
Revised MR (version 02.0) using latest version of form(CDM-MR-FORM, ver8.0) has been submitted to the DOE		
Documentation provided by project participant		
The revised MR (ver. 02.0)		
DOE assessment		Date: 28/04/2021
The verification team checked the completeness of revised MR (version 02.0) and found that all information has been accurately transferred to the latest version of form (CDM-MR-FROM, version 08.0). Also, it was concluded that the information in the MR (version.02.0) is completely complied with accordance with the Attachment of CDM-MR-FROM (version 08.0). Therefore, the CAR01 was closed successfully.		

CAR ID	Section no.	Date:
02	E.6.2	13/04/2021
Description of CAR		
The verification team found that the data for exported electricity in the sales records provided by KPX and the data for imported electricity in electricity bill provided by KEPCO are not consistent with the data used in the MR (version 01.0) and ER calculation sheet (version 01.0). Therefore, the CAR02 was raised.		
Project participant response		Date: 23/04/2021
The PP submitted the revised MR (version 02.0) and ER calculation sheet(version 02.0) to the DOE		
Documentation provided by project participant		
The revised MR (ver. 02.0)		
The revised ER calculation sheet (ver. 02.0)		
DOE assessment		Date: 28/04/2021

The verification team confirmed that the data from revised MR (version 02.0) and ER calculation sheet (version 02.0) are consistent with the evidences

Comparison table for both electricity generation/ electricity consumption is given as follows:

Division	EG _{output} (KWh)	EG _{import} (KWh)
MR(version 01.0)	40,246.632	59,411
MR(version 02.0)	32,565.463	62.472

Therefore, the CAR02 was closed successfully.

CAR ID	03	Section no.	E.7	Date: 13/04/2021
Description of CAR				
The latest calibration date of imported electricity meter in the calibration letter issued by KEPCO is not inconsistent with the date in the MR (version 01.0) Therefore, the CAR03 has been raised.				
Project participant response				Date: 23/04/2021
The PP submitted the revised MR (version 02.0)				
Documentation provided by project participant				
The revised MR (ver. 02.0)				
DOE assessment				Date: 28/04/2021
For electricity import watt-hour meters, the comparison table of latest calibration date has been given as follows:				
(Before)				
Serial number	Date of the latest calibration	Validity		
24176002316	31/08/2018	31/08/2018 ~ 30/11/2021		
24176002326	31/08/2018	31/08/2018 ~ 30/11/2021		
(After)				
Serial number	Date of the latest calibration	Validity		
24176002316	17/10/2018	17/10/2018 ~ 16/10/2021		
24176002326	17/10/2018	17/10/2018 ~ 16/10/2021		
By reviewing calibration report and revised MR(ver.02.0), the verification team confirmed that the calibration date in revised MR(ver.02.0) is consistent with the calibration report for electricity import watt-hour meters and they have been calibrated in a timely manner according to the national calibration frequency. Furthermore, the calibration validity is still covered during this monitoring period Therefore, the CAR03 was closed successfully.				

Table 4. FAR from this verification

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

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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		