Verification and certification report form for CDM project activities

(Version 02.1)

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)
Version number of the verification and certification report	Version 02.0
Completion date of the verification and certification report	27/03/2019
Monitoring period number and duration of this monitoring period	6th monitoring period, 01/01/2018-31/12/2018
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(host) - Japan (Annex I country)
Applied methodologies and standardized baselines	Methodology : ACM0002 (Version 07) Selected standardized baseline : N/A
Mandatory sectoral scopes linked to the applied methodologies	Sectoral scopes : I Energy Industries (Renewable / Non-renewable sources)
Conditional sectoral scope(s) linked to the applied methodologies	N/A
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	59,669 tCO_2e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	56,072 tCO_2e
Name and UNFCCC reference number of the DOE	KTR (Korea Testing and Research Institute) (Ref. E-0056)
Name, position and signature of the approver of the verification and certification report	JINTAE KIM, Director 김 진 태

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 6th verification of the project titled "Taegisan Wind Power Project".

The verification team from KTR has reviewed the implementation of the monitoring plan (MP) of the registered project design document (PDD) version 05.0 /01/. The Green House Gas (GHG) data for the monitoring period covering from 01/01/2018to 31/12/2018 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 (ver. 02.0) /08/ of the United Nations Framework Convention for Climate Change (UNFCCC).

This report summarizes the findings and conclusions of this 6th verification of the UNFCCC registered project activity mentioned above.

The objectives of the verification are to review and to perform ex-post determination of the GHG emission reductions by an independent entity. The objectives include the verification of:
- Implementation and operation of the project activity as given in the PDD/01/,
- Compliance with applied approved methodology and the provisions of the registered the MP,
- Data given in the monitoring report (ver. 02.0) /10/ 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 revised MR (ver. 02.0) /10/, emission reduction calculation spreadsheet (ver.01.0) /11/, 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 for 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 (ver. 02.0) /08/,
- The Monitoring plan, and
- Approved CDM Methodology/07/.

The following parties to the Kyoto Protocol and project participants (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	POSOCO 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/KFQ 1226904451.62/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	1st Monitoring period	15/05/2009 – 31/05/2010	CER issued
4	2nd Monitoring period	01/06/2010 – 31/05/2011	CER issued
5	3rd Monitoring period	01/06/2011 – 30/09/2012	CER issued
6	4th Monitoring period	01/10/2012 – 31/12/2016	MR publication
7	5th Monitoring period	01/01/2017 – 31/12/2017	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/23/ 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 intervalrotor (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 t
	Rotor	37 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 × 9 units (unit number 5,6,8,9,11~15) = 18 MW
- Pyeongchang-gun, Gangwon-do: 2MW × 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 number14~20
B: unit number 5~7
C: unit number 8~13
D: unit number1~4

The verification team confirmed that the project was implemented as planned and described in the registered PDD/01/ and that the project activities are in accordance with the approved methodology ACM0002 (Version 07) /07/. The verification team also confirmed that the installed equipment essential for emission reduction runs reliably and has been calibrated appropriately.

The sequence of the 6th verification of this monitoring period (01/01/2018~ 31/12/2018) is given in the Table A-5 below:

Table A-5: Verification sequence

Topic	Date
Assignment of verification	21/01/2019
Uploading of MR	21/01/2019
On-site inspection	12/02/2019
Draft reporting finalized	28/02/2019
Pre-technical review finalized	11/03/2019
Final Reporting completed	18/03/2019
Technical review finalized	22/03/2019
Final reporting finalized	25/03/2019
Final Approval of the verification	27/03/2019

The verification team confirmed that the monitoring was performed in accordance with the registered PDD/01/ and that the GHG emission reductions were calculated without any significant misstatements. The GHG emission reductions were verified by checking the registered PDD/01/, the MR (ver. 1) /09/ and MR (ver. 2) /10/, 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	LEE	Bongjae	KTR	X	-	-	X
2.	Verifier	EI	SHIN	Woochul	KTR	X	X	X	X
3.	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	According to the applied methodology, the registered PDD and MR defined main emission sources of CO_2e which are the net electricity exported to the grid for the baseline. The error, omission or misstatements of emission source were not found during ahead of verification.	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	Two parameters are defined in the revised PDD. The quantity of electricity exported to the grid ($EG_{output,y}$) and the quantity of electricity imported from the grid ($EG_{import,y}$) are measured continuously. No error, omission or misstatements of	To be further confirmed by cross-checking the related documents and through on-site inspection.

			emission source were found during the verification.	
3.	Accuracy of monitoring instruments	Low	The MR described the accuracy as 0.5% for the meters and sub-meters measuring exported/imported electricity 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 included the calibration date and the validity information 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 MR, the monitoring manual and the data records. Automatic data collection system is mainly used and some data are manually recorded.	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.

56,702 tCO_2e × 2% = 1,121 tCO_2e (rounded down)

When the verification plan is prepared, the verification team have assessed the nature, scale and complexity of the project activity by performing a strategic analysis of all activities relevant to the project activity.

The verification was carried out in accordance with the verification plan.

If an omission, misstatement, or erroneous reporting of information at an aggregated level leads to an overestimation of the total emission reductions achieved by a registered CDM project activity equal to or higher than the 2-percent threshold, the verification team would revise the overall verification plans and sampling plans after conducting additional risk assessment to assure the quality of the verification. However, the verification team conducted no more risk assessment since the difference between reported GHG emission reductions and the verified GHG emission reductions was lower than the 2-percent threshold.

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/01/ including the MP;
- The final version of the validation report/02/,
- The 1st, 2nd, 3rd, 5th verification report/03//04//05/06/,
- Approved methodology ACM0002 (Version 07) /07/;
- The MR (ver. 1 and 2), including the claimed emission reductions for the project/09//10/, and
- ER calculation sheet (ver.1) /11/.

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: 12/02/2019				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Implementation and Operation of the CDM project activity based on the registered Monitoring Plan and physical features of the project activity as per registered PDD	Gangwon-Do, Republic of Korea	12/02/2019	Woochul SHIN Hyemi PARK
2.	Information flows to generate, aggregate and report the monitoring parameters			
3.	Competency of operational personnel, monitoring personnel and calibrating agencies			
4.	Data collection procedures			
5.	Calibration performance and monitoring practices followed for the monitoring equipment used in the project activity			
6.	Quality Control and Quality Assurance procedures against the approved monitoring plan			
7.	Calibration and assumptions made in determining the GHG data and emission reduction			
8.	Compliance with CDM criterion and relevant guidance with respect to MP			
9.	Level of accuracy (Materiality) of the monitoring activity			

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Oh	Jinseon	TWPC	12/02/2019	- 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	Woochul SHIN Hyemi PARK
2.	LEE	Chanhee	TWPC	12/02/2019	- Technical equipment and their operation - Monitoring and measuring instruments - Calibration procedures - Maintenance of Facility	
3.	CHOI	Junmyoung	Eurus Energy Korea corporation	12/02/2019	- General aspects of the project - Quality management system	
4.	JUNG	Dajeong	Ecoeye	12/02/2019	- GHG calculation - Report for ER	

D.4. Sampling approach

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No sampling approach was taken during the verification. The verification team visited and verified all project sites.

The verification team verified and cross-checked all of the data used in the GHG emission reductions against the raw data measured by the PP and the data recorded in the internal management system.

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	-	-	-
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	-	1	-

Compliance of monitoring activities with the registered monitoring plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
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	-	1	-

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 no CAR/CL raised in this section
Conclusion	The verification team confirmed that the PP used the latest version of monitoring report form. (version 6.0) /12/

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	(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 project design document and determine whether: (a) The implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PDD; or (b) Any deviation or the proposed or actual changes in the implementation or 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 whether the project participants have operated the project activity as per the registered PDD or any approved revised PDD.
Findings	There are 1 CARs raised in this section.
Conclusion	The project activity has been implemented as per the registered PDD/01/ and information from the UNFCCC website. 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/01/. They were installed as described below during the period from 25/07/2007 (construction start date) to 26/12/2008 (commissioning date) as follows: - Wind Turbine (V80) manufacturer: VESTAS Wind System (Denmark) - Plant design: Hyundai Engineering CO., Ltd. (Korea) - Installation work: POSCO Engineering and Construction Co., Ltd. (Korea) The verification team confirmed that the construction start date is 25/07/2007 based on the document/16/ by POSCO and the approval from/17/ 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/18/ to the Ministry of

	Knowledge Economy. 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. 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. During the verification, the verification team found out that the data on the length of transmission line given in the transmission line map in Annex 2 of the MR is not consistent with the data used in the ER calculation sheet. For more information is found that Annex4. Therefore, the CAR01 has been raised and successfully closed.

E.4. Post-registration changes

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

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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. Change to the start date of the crediting period of the project activity

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

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 applied standards or tools

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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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N/A

E.5. Compliance of the registered monitoring plan with the methodology including applicable tools and standardized baselines

Means of verification	(VVS para. 354-356) The DOE shall determine whether the registered monitoring plan is in accordance with the applied methodologies including applicable tools

	and, where applicable, the applied standardized baselines. For monitoring aspects that are not specified in the applied methodologies and, where applicable, the applied standardized baselines, 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 (ver.05.0) /01/ and the applied monitoring methodology (ACM0002 Version 07) /07/ 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	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** (see table below) 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/01/.

Data/parameter	Applied value	Source of data
OM Emission Factor of Grid, $EF_{grid,OM,y}$	0.7281 tCO2/MWh	$EF_{grid,OM,y}$ was calculated based on the ACM0002 (ver. 7.0) /07/. Required values for the calculation were taken from the Statistics of Electric Power/24/ provided by the Korea Electric Power Corporation.
BM Emission Factor of Grid, $EF_{grid,BM,y}$	0.3859 tCO2/MWh	$EF_{grid,BM,y}$ was calculated based on theACM0002(ver. 7.0) /07/. Required values for the calculation were taken from the Statistics of Electric Power/24/ provided by the Korea Electric Power Corporation
Combined Emission Factor of Grid, $EF_{grid,CM,y}$	0.6426 tCO2/MWh	$EF_{grid,CM,y}$ was calculated based on theACM0002(ver. 7.0) /07/. Required values for the calculation were taken from the Statistics of Electric Power/24/ provided by the Korea Electric Power Corporation

E.6.2. Data and parameters monitored

Means of verification	(VVS para. 361) The DOE shall determine whether: (a) The registered monitoring plan has been properly implemented and followed by the project participants; (b) All parameters stated in the registered monitoring plan and relevant Board decisions38 have been monitored and updated as applicable, including: (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; (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; (d) Monitoring results are consistently recorded as per the approved frequency; (e) Quality assurance and quality control procedures have been applied in accordance with the registered monitoring plan.
Findings	There is no CAR/CL raised in this section
Conclusion	According to the MP of the registered PDD (ver. 5.0) /01/ and monitoring methodology for which ACM0002 (ver. 7.0) /07/ has been applied, the monitoring parameters is the net electricity generated by this project. 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. **Electricity supplied** Twenty 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 (ver.05) /01/. 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. 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. 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/25/ against the data in the sales records provided by KPX/26/ and found them consistent. The verified quantity of supplied electricity is 95,240.108 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/25/ against the internal database of the PP and the data in the relevant electricity bill provided by Korea Electric Power Corporation (KEPCO)/27/ and found them consistent. The verified quantity of imported electricity is 235.080 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 7,746.279 MWh and 0.061 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[/10/] is correct. The net electricity delivered to the grid by the project activity (EG_y) is obtained by subtracting the quantity of electricity imported from the quantity of electricity supplied (Electricity supplied – Electricity imported). The net electricity delivered to the grid considering transmission loss (NE) is obtained by subtracting transmission loss in the supplied and imported electricity (EG_y – Transmission Loss in the supplied electricity - Transmission Loss in the imported electricity). The reported and verified quantity of net electricity supplied to the grid by the project activity during this monitoring period is 87,258.688 MWh.

E.6.3. Implementation of sampling plan

Means of verification	(VVS para. 338 (c)) Sampling approach in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities", including: (i) A random sampling for cases where the project participants or the coordinating/managing entity did not apply a sampling approach; (ii) An acceptance sampling or another sampling approach for cases where the project participants or the coordinating/managing entity applied a sampling approach.
Findings	There is no CARs raised in this section
Conclusion	The PP did not apply sampling approach to determine data and parameters monitored during this monitoring period. The verification team confirmed this by checking all the documents submitted.

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

Means of verification	(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. 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
Findings	There is no CARs raised in this section
Conclusion	The verification team reviewed the information on the meters for imported and exported electricity in the MR (ver.1) [/09/], calibration/test reports[/28/] and the applicable national law to confirmed that there was no calibration delay during the monitoring period.

The verification team verified the following parameters related to the meters measuring imported/exported electricity.

$EG_{output,y}$ (Electricity exported)

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" /29/ by KPX, which requires 3 years 6 months ± 6 months (3 years to 4 years) calibration interval for watt-hour meters with capacity larger than 1 MW.

The verification team reviewed "Electric meter test reports" /30/ and found that the results meet the requirements given in the type approval standards/31/ stipulated by the Korea Agency for Technology and Standards (KATS).

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

The detailed information for each electricity meters is summarized below:

	#1 Main meter	#1 Sub-meter
Type	Electric meter	Electric meter
Accuracy	0.5S.	0.5S.
Serial number	46026114	46026113
Calibration frequency	3 years 6month ±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/30/ 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"/32/, which requires a calibration every 3~4 years.
The calibrations have been performed before the calibration validity expires by the Korea Testing Certification (KTC), 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.

During the this monitoring period, the electricity meters for imported electricity have been replaced with new meters on 31/08/2018. Information on these meters is summarized as follows;

Before change

	#1	#2
Type	Electric meter	Electric meter
Accuracy	0.5S.	0.5S.
Serial number	02112005008	02112004932
Calibration frequency	3 years 6 month ± 6 month	3 years 6 month ± 6 month
Date of installation	25/06/2012	25/06/2012
Date of last calibration	21/11/2014	21/11/2014
Validity	21/11/2014~ 20/11/2018	21/11/2014~ 20/11/2018

After change

	#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	31/08/2018	31/08/2018
Validity	31/08/2018~ 30/11/2021	31/08/2018~ 30/11/2021

By reviewing the above rules and calibration certificates of Electric meters[/33/] for imported electricity, the verification team confirmed that calibrations have been performed properly in accordance with the applicable national law.

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	(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. The DOE shall determine whether: (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: (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 (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 alterative 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”; (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; (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; (d) Any assumptions used in emission or removal calculations have been justified;

	(e) Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied;
Findings	There is one CAR raised in this section
Conclusion	The verification team reviewed all the data related to GHG emission reduction calculation such as KPX data/34/, KEPCO data/27/, internal log/25/ on electricity generation, and etc. to confirm that data used in the MR (ver.1)/09/ and the ER calculation sheet (ver.1)/11/ is consistent with the data in the reviewed documents. The verification team verified the followings in relation to the ER calculation. The formula used for the determination of baseline emissions is consistent with the registered PDD/01/. $BE_y = EG_y \times EF_y$ Where: EG_y is net electricity supplied by the project activity to the grid in year y, in MWh EFy is baseline emission factor in year y, in tCO2e/MWh according to the registered PDD/01/ $EG_y = (EG_{output,y} – EG_{import,y}) - (TL_{y,supply} + TL_{y,import})$ Where; EG_y-Net electricity supplied to the grid during the monitoring period (MWh); $EG_{output,y}$: Electricity supplied to the grid (MWh); $EG_{import,y}$: Electricity imported from the grid (MWh). TL_y : transmission loss(MWh) The KEPCO's 22.9kV substation between the project site and the grid is located at 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, TL_y=KW Loss x T $= I^2 R_3 \times T$ Where: I = Ip / P.F I : Current on the transmission line (A) P.F : Power Factor of electricity generation (97%) Ip= P / (1.732 x 22.9 x 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 Teaegisan Wind Park to the substation (kV) Determination of amount of parameter; EF_y: Baseline Emission Factor of Korea is calculated ex-ante and fixed during the crediting period. 0.6426tCO2e/MWh; 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/35/. 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 x 8 / 2 = 0.2886 2) Overhead Transmission Line 1:

	Cable Length: 22km Test Result of Resistance (per km): 0.1183 Total Resistance for overhead T/L: 0.1183 x 22 = 2.6026 3) Overhead Transmission Line 2: Cable Length: 3km Test Result of Resistance (per km): 0.183 x 3 = 0.549 Thus, GHG emission reduction is calculated as below by considering transmission loss: $BE_y = EG_y \times EF_y$ $= [(EG_{output,y} – EG_{import,y}) - (TL_{y,supply} + TL_{y,import})] \times EF_y$ = [(95,240.108 – 235.080) - (7,746.279 + 0.061)] x 0.6426 = 87,258.688 MWh x 0.6426 tCO2e/MWh = 56,072.433 tCO2e

E.8.2. Calculation of project GHG emissions or actual 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. The DOE shall determine whether: (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: (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 (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 alterative 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”; (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; (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; (d) Any assumptions used in emission or removal calculations have been justified; (e) Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied;
Findings	There is no CAR/CL raised in this section
Conclusion	Project activity emission is considered as zero as per the methodology ACM0002 (ver.7.0) /07/ and the registered PDD (ver.05.0) /01/, i.e. $PE_y = 0$.

E.8.3. Calculation of leakage GHG emissions

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. The DOE shall determine whether: (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: (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 (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 alterative 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"; (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; (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; (d) Any assumptions used in emission or removal calculations have been justified; (e) Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied;
Findings	There is no CAR/CL raised in this section.
Conclusion	In accordance with ACM0002(ver.7.0)[/07/] and the registered PDD (ver.05.0)[/01/], 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	The formula used for the determination of emission reductions during the monitoring period was consistent with the registered PDD (ver.05.0)[/01/]. The detailed ER calculation is as follow: $BE_y = EG_y \times EF_y$ = 87,258.688 MWh x 0.6426 tCO2e/MWh = 56,072.433 tCO2e PE_y= 0 tCO2e LE_y = 0 tCO2e $ER_y = BE_y - PE_y - LE_y$ = 56,072 tCO2e As shown above, the emission reduction during the monitoring period (01/01/2018 - 31/12/2018) is 56,072 tCO2e. After thoroughly checking the records[/34/] in the KPX database, the official document[/16/] on the electricity obtained from the KEPCO grid and internal database[/25/] of the PP, the verification team confirms that the calculation in the ER spreadsheet (ver.1) [/11/] is reproducible and accurate.

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	The MR includes a comparison of the calculated actual emission reductions which is 56,072 tCO_2e with the ex-ante calculated values which is 59,669tCO_2e in the registered PDD (ver.05.0)/01/. 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/01/.

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	In this monitoring period, the actual emission reduction is lower than the expected emission reduction as calculated in the PDD (ver.05.0). The electricity generation during this period is 95,240.108 MWh which is lower than the estimated electricity generation (92,856MWh/year). The actual electricity generation was 6.0% 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/21/ showing significantly low level of electricity generation at the time of troubleshooting/overhaul fully supported this reasoning.

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	The actual monitoring period does not fall into the first commitment period.

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.

SECTION G. Verification opinion

>>
Eurus Energy Holdings Corporation has commissioned Korea Testing and Research Institute (KTR) to carry out the 6th 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 01/01/2018 to 31/12/2018 (including both days).
The verification was carried out based on the monitoring report (ver. 1.0), the revised monitoring report (ver. 02.0), the registered PDD (ver. 05.0), the ER calculation sheet (ver. 01.0), 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.
During the course of the verification, 1 Corrective Action Requests (CARs) were raised and successfully closed.
After completing the verification activities, 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 (ver.7.0) "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.
- The information included in the revised monitoring report is correct and that the emission reduction achieved has been calculated in a conservative and appropriate manner without any material misstatements.

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(ver07.0)
Applicable monitoring period :	01/01/2018 - 31/12/2018
VVS version	VVS 2.0
Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period	56,072 tCO_2e

SECTION H. Certification statement

>>
As above

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
BOP	Balance Of Plant
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COP/MOP	The Conference of the Parties serving as the meeting of the Parties to the Protocol
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reduction
FAR	Forward Action Request
GHG	Green House Gas
GIS	Gas Insulated Switchgear
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
KOREA TESTING & RESEARCH INSTITUTE

Certificate of Authorization

Name : **LEE, Bongjae**
Date of Birth : **August 6th, 1978**
Certificate Number : **2016CDM - 002**

We, KTR, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 6.0 and Quality System of the KTR CDM.

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
1.1	Thermal energy generation	Lead Validator/Verifier
1.2	Energy generation from renewable energy sources	Lead Validator/Verifier
3.1	Energy demand	Lead Validator/Verifier
4.1	Cement and lime production	Lead Validator/Verifier
13.1	Solid waste and waste water	Lead Validator/Verifier

Valid until : July 19th, 2019

July 19th, 2016

한국화학융합시험연구원장
Korea Testing and Research Institute

Certificate for Achievement

KTR
한국화학융합시험연구원
KOREA TESTING & RESEARCH INSTITUTE

Certificate of Authorization

Name : **SHIN, Woochul**
Date of Birth : **January 10th, 1957**
Certificate Number : **2017CDM - 005**

We, KTR, hereby certify that above mentioned person is qualified for the technical areas specified below in compliance with Appendix 2 of CDM Accreditation Standard Ver 6.0 and Quality System of the KTR CDM.

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
10.1	Fugitive emissions from oil and gas	Part-time Validator/Verifier
11.1	Emissions of fluorinated gases	Part-time Validator/Verifier
11.2	Refrigerant gas production	Part-time Validator/Verifier

Valid until : December 18th, 2020

December 19th, 2017

한국화학융합시험연구원장
Korea Testing and Research Institute

Certificate for Achievement

KTR
한국화학융합시험연구원
KOREA TESTING & RESEARCH INSTITUTE

Certificate of Authorization

Name : **PARK, Hyemi**
Date of Birth : **February 15th, 1986**
Certificate Number : **2016CDM - 004**

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 6.0 and Quality System of the KTR CDM.

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 19th, 2019

July 19th, 2016

한국화학융합시험연구원장
Korea Testing and Research Institute

Certificate for Achievement

KTR
한국화학융합시험연구원
KOREA TESTING & RESEARCH INSTITUTE

Certificate of Authorization

Name : **JUNG, Kyuhong**
Date of Birth : **February 1st, 1977**
Certificate Number : **2016CDM - 001**

We, hereby authorize the above mentioned person according to the quality management system of the KTR CDM.

Scope of Authorization :

CODE	TECHNICAL AREA	STATUS
1.1	Thermal energy generation	Lead Validator/Verifier
1.2	Energy generation from renewable energy sources	Lead Validator/Verifier
3.1	Energy demand	Lead Validator/Verifier
4.1	Cement sector(complex)	Lead Validator/Verifier
13.1	Waste handling and disposal	Lead Validator/Verifier

Valid until : July 19th, 2019

July 19th, 2016

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 (ver.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/filestorage/R/H/Z/RHZC4LOATDPU9X2NK8QIBWSFG70VE1/VR_Ver%2002.pdf?t=aUl8cDR5ZnRzfDCMq3bAwrSy0opQe7X7ci-H	Others
3	DOE(JACO)	The 1st verification report	http://cdm.unfccc.int/filestorage/J/1/Q/J1Q26SGYHFAD95NWETU0CRV348BX7Z/Taegisan%201st%20Verification%20Report.pdf?t=RnN8cDR5Zng0fDDjIyOV00H_s5Pchxr_JIl0	Others
4	DOE(JACO)	The 2nd verification report	http://cdm.unfccc.int/filestorage/F/C/4/FC4Y8KA0N17WDRBJ6EIQMZS3HLX2TV/Verification%20Report_Taegisan%20WP_2nd.pdf?t=Y1l8cDR5ZncwfDDCeD1REKVKxgbHO3PpT8xJ	Others
5	DOE(JACO)	The 3rd verification report	http://cdm.unfccc.int/filestorage/g/f/FR2HM3GAVIZNL8CB6K9TE75UYO4WQJ.pdf/Verification%20Report_Taegisan%203rd.pdf?t=dUN8cDR5Znl5fDAjASWY855m54ELy79evYtJ	Others
6	DOE(KTR)	The 5th verification report	http://cdm.unfccc.int/filestorage/G/R/6/GR6UTN9XKV73I2PEC1AOMF5LQH8Y4Z/2302_5th_VR.pdf?t=Yld8cG5tN2QwfDBtVgYELji7FWYyqh3dE8a4	Others
7	UNFCCC	ACM0002 methodology (Version 07)	N/A	
8	UNFCCC	CDM validation and verification standard for project activities(ver. 02.0)	N/A	Others
9	Ecoeye Co., Ltd. (Project consultant)	The MR (ver. 1)	N/A	PP
10	Ecoeye Co., Ltd. (Project consultant)	The MR (ver. 2)	N/A	PP
11	Ecoeye Co., Ltd. (Project consultant)	ER calculation sheet (ver. 1)	N/A	PP
12	UNFCCC	MR template(version 6.0)	N/A	Others
13	PP	Drawing showing the monitoring points	N/A	PP
14	PP	Resistance calculation data	N/A	PP
15	PP	Electricity transmission line map	N/A	PP
16	POSCO	Document of the construction	N/A	Others
17	POSCO	The approval of the construction	N/A	Others
18	POSCO	The Statement for Starting Construction Work	N/A	Others
19	PP	Taking-Over Certificate (Phase 1)	N/A	PP
20	PP	Taking-Over Certificate (Phase 2)	N/A	PP
21	PP	Starting Commercial Operation for Wind Power	N/A	PP
22	PP	Actual reporting of monitoring results(daily, monthly)	N/A	PP
23	PP	Specification of equipment	N/A	PP
24	KEPCO	Statistics of Electric Power	N/A	Others

25	PP	internal database	N/A	PP
26	PP	sales records	N/A	PP
27	KEPCO	Monthly electricity bill	N/A	Others
28	Calibration entity	calibration/test reports	N/A	Others
29	KPX	Rules on the operation of electric utility market	N/A	Others
30	KEPCO	Electric meter test reports	N/A	Others
31	KTC	type approval standards	N/A	Others
32	KEPCO	Enforcement Decree of the Measures Act	N/A	Others
33	Calibration entity	Calibration certificates of Electric meters	N/A	Others
34	KPX	Monthly exchange amount of electric power	N/A	Others
35	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				
Project participant response				**Date:**
N/A				
Documentation provided by project participant				
N/A				
DOE assessment				**Date:**
N/A				

Table 2. CL from this verification

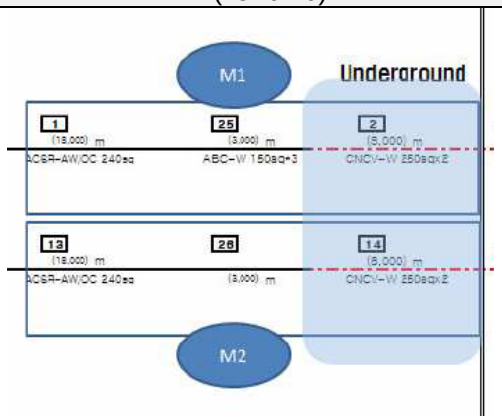
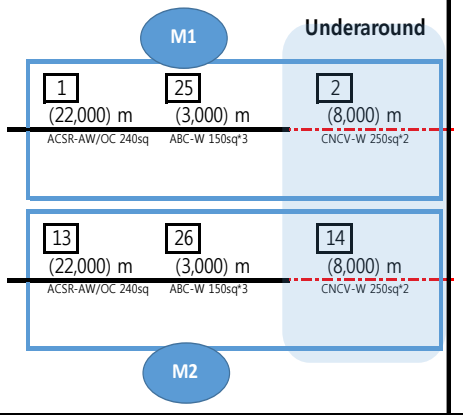
CL ID		**Section no.**		**Date:**
Description of CL				
Project participant response				**Date:**
N/A				
Documentation provided by project participant				
N/A				
				Date:
N/A				

Table 3. CAR from this verification

CAR ID	CAR1	**Section no.**	E.3	**Date:** 12/02/2019
Description of CAR				
The verification team found out that the data on the length of transmission line given in the transmission line map in Annex 2 of the MR is not consistent with the data used in the ER calculation sheet.				
Project participant response				**Date:** 14/02/2019
The PP submitted the revised MR (ver. 02.0) which includes a corrected transmission line map in Annex 2.				
Documentation provided by project participant				
The revised MR (ver. 02.0)/10/.				
DOE assessment				**Date:** 15/02/2019

The verification team confirmed that the transmission line map in Annex 2 of the revised MR (ver. 02.0)[10] is appropriately corrected.

Transmission line maps before and after the revision are compared below:

	MR(ver.01.0)	MR(ver.02.0)
Annex2. Transmission line map		

The verification team confirmed that the transmission lines are consist of 22km of single phase overhead line, 3 km of triple phase overhead line, and 8 km of underground line, and that ER calculations in the ER calculation sheet (ver. 01.0) have been performed appropriately using the correct line length value for each transmission line mentioned. The length of the transmission lines are confirmed by 'Electricity transmission line map[15]' and interview.

Therefore, CAR01 has been successfully closed.

Table 4. FAR from this verification

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

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