

VERIFICATION REPORT

POSCO Engineering and Construction Co., Ltd.
Eurus Energy Japan Corporation

1st Periodic Verification of
Taegisan Wind Power Project

CDM Reference No. 2302

Report No. GR10W0018D

1 August, 2011

JACO CDM

1st Periodic Verification Report

Date of first issue: 1 August, 2011		Project No.: UNFCCC Ref. No. 2302	
Approved by: Yasunori SHIMOI, CEO & President, JACO CDM			
Client: POSOCO Engineering and Construction Co., Ltd., Eurus Energy Japan Corporation			
<p>Summary:</p> <p>JACO CDM has performed a verification of the CDM project "Taegisan Wind Power Project". The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords".</p> <p>The management of Taegisan Wind Power Co., Ltd. (TWPC) is responsible for the preparation of the GHG emission data and the reported GHG emissions reductions by the "Taegisan Wind Power Project" including the development and maintenance of records and reporting procedures in accordance with the revised Monitoring Plan which is complying with the consolidated methodology ACM0002 version 07 and approved by UNFCCC on 30 March 2011 and registered PDD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the Project.</p> <p>The verifier confirmed that the project was implemented as planned and described in the validated and registered PDD as well as the revised Monitoring Plan approved by CDM Executive Board on 30, March, 2011 after the on-site assessment of the first verification and the validated monitoring plan applied by the proposed CDM project activity in accordance with the approved methodology ACM0002 version 07. The installed equipments being essential for generating emission reductions run reliably and the relevant meters are calibrated appropriately. The monitoring system is in place and the project is ready to generating GHG emission reductions.</p> <p>The verifier confirmed that the GHG emission reductions stated in the revised CDM Monitoring Report version 02 dated 27 June, 2011 based on the indicated 3CARs and 3CLs are calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:</p> <p><u>Reporting period:</u> From 15-05-2009 to 31-05-2010</p> <p><u>Verified emission in the above reporting period:</u></p> <p>Baseline emissions: 50,724tCO₂ equivalents</p> <p>Project emissions: 0 tCO₂ equivalents</p>			

Report No.: GR10W0018D		Indexing terms	
Report title: Verification report Taegisan Wind Power Project		Climate Change Kyoto Protocol Clean Development Mechanism Verification	
Work carried out by: Shigekazu OKA, Yukio TAKANO		<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organisational unit	
Work verified by: Tatsuo TANAKA, Teruo FUKUDA		<input type="checkbox"/> Limited distribution	
Date of this revision: 1 August, 2011	Rev. No.: 00	Number of pages: 19	<input type="checkbox"/> Unrestricted distribution

1st Periodic Verification Report

Abbreviations

CAR	Corrective Action Request
CDM	Clean Develop Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Green House Gas
IETA	International Emissions Trading Association
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
MP	Monitoring Plan
MW	Megawatt
O&M	Operation and Maintenance
PDD	Project Design Document
PEA	Preliminary Environmental Assessment
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation and Verification Manual
EEJC	Eurus Energy Japan Corporation
KEPCO	Korea Electric Power Corporation
KPX	Korea Power Exchange
POSCO	POSCO Engineering and Construction Co., Ltd.
TWPC	Taegisan Wind Power Co., Ltd.

1st Periodic Verification Report

Table of Contents	Page
1 INTRODUCTION	3
1.1 Objective	3
1.2 Scope	3
1.3 GHG Project Description	4
2 METHODOLOGY	5
2.1 Review of documentation	7
2.2 On-site inspections	7
2.3 Resolution of Corrective and Forward Action Requests	7
2.4 Internal Quality Control	8
3 VERIFICATION FINDINGS	8
3.1 Remaining issues, CARs, FARs from previous validation	8
3.2 Project Implementation	8
3.3 Internal and External data	12
3.4 Environmental and Social Indicators	12
3.5 Management and Operational System	13
3.6 Completeness of Monitoring	13
3.7 Accuracy of Emission Reduction Calculations	14
3.8 Quality of Evidence to Determine Emission reductions	15
3.9 Management System and Quality Assurance	15
4 PROJECT SCORE CARD	16
5 VERIFICATION STATEMENT	17
6 REFERENCES	18

Appendix 1: Verification Checklist

1st Periodic Verification Report

1. INTRODUCTION

1.1 Objective

Eurus Energy Japan Corporation has commissioned an independent verification JACO CDM Co., Ltd of its CDM project “Taegisan Wind Power Project”.

The objective of the verification work is to comply with the requirements of paragraph 62 of the CDM modalities and procedures.

This assessment shall:

- (a) Ensure that the project activity has been implemented and operated as per the registered PDD (version 04)* and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- (b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of CERs and verifiable and in accordance with applicable CDM requirements. The CDM Executive Board provided a standardized format for monitoring report to improve consistency in reporting of the implementation and monitoring of the project activity by project participants;
- (c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;
- (d) Evaluate the data recorded and stored as per the monitoring methodology

1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Designated Operational Entity of the monitored reduction in GHG emissions. The verification is based on the Monitoring Report provided, the validated project design document (PDD Version 05) including its monitoring plan and validation report, the applied monitoring methodology, relevant decisions, clarifications and guidance from the CMP and EB and any other information and references relevant to the project activity’s resulting emission reductions. These documents are reviewed against Kyoto Protocol requirements, UNFCCC rules, approved methodology ACM0002 version 07 and associated interpretations. JACO CDM, based on the recommendations in the Validation and Verification Manual, employs a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of CERs. The principles of accuracy, completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.

The verification shall consider both quantitative and qualitative information on emission reductions. Quantitative data comprises the monitoring report submitted to the verifier by the project entity. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

The verification team has been provided with the CDM Monitoring Report version 01 dated 27 August, 2010 on 8 Oct. 2010. This report is covering the period 15 May, 2009 to 31 May, 2010. The version 01 has been made publicly available On 11 Nov. 2010 on the UNFCCC web site (<http://cdm.unfccc.int/Projects/DB/KFQ1226904451.62/view>) and this monitoring report serves as the basis for the assessment presented herewith.

Based on the this Monitoring Report and other related documents provided, a document review and a fact finding mission in the form of an on-site assessment has taken place.

JACO CDM has conducted the first periodic verification for the CDM project “Taegisan Wind Power Project” based on the Kyoto Protocol requirements, modalities as agreed in Marrakech Accords and decisions of UNFCCC CDM EB, using the Validation and Verification Manual (VVM) version 01.2.

* Registered date: 02 June, 2006

1st Periodic Verification Report

Verification team

The verification team was formed considering the needs of competence for the team in the following aspects:

- Knowledge of the Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Skills in environmental auditing
- Quality assurance
- Technical aspects of wind power project
- Monitoring concepts
- Political, economical and technical conditions in host country

According to these requirements JACO CDM has composed following verification team in accordance with the appointment rules of the JACO CDM QC Manual.

Shigekazu OKA	JACO CDM Team Leader
Yukio TAKANO	JACO CDM Team Member

Duration of verification

(1) First Periodic Verification

Document Review:	From 01 November, 2010 to 07 December, 2010
On-site Assessment:	08 December, 2010 to 10 December, 2010
Reporting:	1 July, 2011

1.3 GHG Project Description

The Taegisan Wind Power Project (the "Project") is the largest wind power generation project in the Republic of Korea with the total capacity of 40 MW by 20 units of wind turbines under operation. The project site is located between Hoengseong-gun and Pyeongchang-gun in Gangwon Province area in Republic of Korea. Taegisan is the highest mountain in Hoengseong-gun and rises 1,261 meters above the sea level. The project is interconnected with the grid by the 22.9kV transmission line at the KEPCO's substation which is 33km away from the project site.

The Project was registered as a CDM project on 15 May, 2009 with the reference number of 2302, and has a fixed crediting period of 10 years with the starting date of 15 May, 2009.

According to the revised CDM Monitoring Report dated 27 July, 2011, the net electricity supplied to the grid is 79,351 MWh during 15 May, 2009 to 31 May, 2010 resulting emission reduction of 50,991 tons CO₂ eq., after correction by the accuracy of meter 78,935 MWh and 50,724 tons CO₂eq, although the generation of electricity of 97,181 MWh resulting of 62,448 tons CO₂ eq. per 1 year and 17 days was estimated based on the PDD and the validation stage (92,856 MWh and 59,669 tons CO₂ eq. per year).

The Project reduces the country's reliance on imported fossil fuels and contributes to the GHG reduction by using the renewable energy source as well.

Table 1. Taegisan Wind Turbine Specification

Rated output		2,000 kW
Design Wind	Start up wind speed (m/s)	4

1st Periodic Verification Report

Speed	Nominal wind speed (m/s)	15
	Stop wind speed (m/s)	25
Generator		Asynchronous Three Phase Generator
Rotor	Diameter (m)	80
	Hub Height (m)	80

2. METHODOLOGY

The proposed assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (Version 01.2, EB55 Annex 1), an initiative for all Applicant Entities, which aims to harmonize the approach, and quality of all such assessments.

In order to ensure transparency, a verification checklist was customized for the project, according to the Validation and Verification Manual. The checklist shows, in a transparent manner, criteria (requirements), means of verification and the results. The verification checklist serves the following purposes:

- It organizes, details and clarifies the requirements a CDM/JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been proved and the result of verification.

The verification checklist consists of 5 tables. The different columns in these tables are described in Figure 1 below. The completed checklist is enclosed in Appendix 1 to this report.

Figure 1: Verification Checklist Tables

Table 1: Implementation Status and Operation			
OBJECTIVE	Ref.	COMMENTS	Conclusion (incl. FARs/CARs)
The requirements the project must meet	Gives reference to the legislation or agreement where the requirement is found	Description of circumstances and further commendation to the conclusion.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. Clarification Request (CL) is used when the verification team has identified a need for further clarification. The Verification has additional Forward Action Requests (FAR) . FAR indicates essential risks for further verifications.

Table 2-1: Data Management System/Controls		
Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to	A score is assigned as follows: Full all best-practice expectations are implemented. Partial a proportion of the best practice expectations is	Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk

1st Periodic Verification Report

mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	implemented Limited this should be given if little or none of the system component is in place.	or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. Clarification Request (CL) is used when the verification team has identified a need for further clarification. The Verification has additional Forward Action Requests (FAR) . FAR indicates essential risks for further periodic verifications.
--------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Table 2-2: GHG calculation procedures and management control testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
<p>Identification of potential reporting risks based on an assessment of the emission estimation procedures.</p> <p>Identification of key source data. Focus on those risks that impact the accuracy, completeness and consistency of the reported data.</p>	<p>Identification of the key controls for each area with potential reporting risks. Assessment of adequacy of the key controls and eventually test that the key controls are actually in operation.</p> <p>Internal controls include, understanding of responsibilities and roles, reporting, reviewing and formal management approval of data, procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc.</p>	<p>Identification of areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks</p> <p>Areas where data accuracy, completeness and consistency could be improved are highlighted.</p>

Table 2-3: Detailed audit testing of residual risk areas and random testing

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including FARs)
<p>List of residual areas of risks of Periodic Verification Checklist Table 2-2 where detailed audit testing is necessary.</p> <p>In addition, other material areas may be selected for detailed audit testing.</p>	<p>The additional verification testing performed is described.</p> <p>Testing may include:</p> <ul style="list-style-type: none"> • Sampling cross checking of manual transfers of data • Recalculation • Spread sheet 'walk throughs' to check links and equations • Inspection of calibration and maintenance records for key equipment • Check sampling analysis results • Discussion with process engineers who have detailed knowledge of process 	<p>Having investigated the residual risks, the conclusions are noted here. Errors and uncertainties are highlighted.</p>

1st Periodic Verification Report

	uncertainty/error bands	
--	-------------------------	--

Table 2-4: Resolution of Corrective Action and Forward Action Requests			
Draft report clarifications and corrective action requests by verification team	Ref. to checklist question at table 1,2-1, 2, 3	Summary of project owner response	Verification team conclusion
Detailed FAR, CL and/or CAR pointed at previous table.	Item at the table where FAR/CL/CAR were found.	Answer of the project owner	Analysis and conclusion of the verification team

2.1 Review of Documentation

The monitoring reports submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is shown in References (chapter 6 of this report).

2.2 On-site inspections

Verification team visited TWPC office and project sites in Taegi-ri, Dunnae-myun, Hoengseong-gun and Mui-ri, Bongpyeong-myun, Pyeongchang-gun, Republic of Korea during 08 December, 2010 to 11 December, 2010. Interviewed organizations and topics are summarized in Table 2 below.

Table 2: Interviewed Organization and Topics at 1st Verification

Interviewed organizations/ visited sites	Interview topics/ Inspected items
TWPC Office	Project design and implementation / Monitoring plan / Internal and external data / Environmental and social indicators / Management & operational systems Calibration of the meters Monitoring Report and relevant documents GHG calculation and reporting procedures Environment and socio-economic impacts Stakeholders comments Compliance with National laws and regulations
TWPC Wind Power Site	Implementation of facilities (Wind turbines, Monitoring equipments & system) Operation of facilities Observation of operators
KPX Office (on 08 December, 2010)	Relation and role of KPX for Taegisan Wind Power Project /Calibration of the meters/ Management & operational systems for Taegisan Wind Power Project
Sapgyo3-ri Community Center	Stakeholders comments

2.3 Resolution of Corrective and Forward Action Requests

The objective of this phase of the verification was to resolve the requests for corrective actions and any other outstanding issues which needed to be clarified for JACO CDM's positive conclusion on the GHG emission reduction calculation.

Findings established during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CAR) is raised, where:

1st Periodic Verification Report

- i) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- ii) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reduction.
- iii) Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants

Clarification Request (CL) is raised, where:

- iv) If information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) are raised, where:

- v) The monitoring and reporting are required attention and/or adjustment for the next verification period.

All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

To guarantee the transparency of the verification process, the concerns raised and responses that have been given are summarized in chapter 3 below and documented in more detail in the verification checklist in Appendix 1.

2.4 Internal Quality Control

As final step of verification, the final documentation including the verification report and the checklist have to undergo an internal quality control by JACO CDM's Certification Determination Committee (CDC) to ensure that all procedures have been followed and all conclusions are justified. After the documents have been satisfactorily approved, then only the request for issuance is submitted to the CDM-EB with the relevant documents. Two-third of the CDC members is selected from outside of JACO CDM.

3. VERIFICATION FINDINGS

The verification team assessed and verified the followings in line with the 1st Verification Checklist as Appendix 1.

3.1 Remaining issues, CARs, FARs from previous validation

3.1.1 Discussion

Based on the validation report, the verification team identified no missing steps.

The project has been registered under the CDM reference number 2302, on 15 May, 2009.

3.1.2 Findings

None.

3.1.3 Conclusion

The project complies with the requirements.

3.2 Project Implementation

3.2.1 Discussion

Brief comments are shown as follows. As for detail, please refer to Appendix 1 "Table 1: Implementation Status and Operation".

(1) Physical Components

The Project is the wind power generation by 20 turbines with each capacity of 2 MW. Based on the

1st Periodic Verification Report

completion documents and the site visit, the verification team identified that all required facilities were installed and being operated as described in the PDD. They were installed during the period of 25-07-2007(construction start date) to 26-12-2008(last 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 was 25/07/2007 based on the document by POSCO and the approval of The Ministry of Commerce (/17/, /18/) as the planned date 1/5/2007 was described in PDD and the commercial operation start date was 28/01/2009 based on the report to Ministry of Knowledge Economy. (/19/)

The verification team also confirmed that the 20 wind turbine generators were divided into 4 groups and 2 groups had the same transmission lines to the central control panel of the site.

And also the watt-hour meters (export and import), checking system by PC and 2 transmission lines (22.9 kV 33km) were already operated.

It was confirmed that the physical components had been satisfactorily implemented.

And it is stipulated in the PDD that the generators (20 units) will be installed into two groups in Hoengseong-gun for 9 units and in Pyeongchang-gun 11 units. However, the generators are actually installed into 4 groups and connected by 2 lines to the grid substation. **(CL1)**

(2) Project boundaries

The project is interconnected at the grid substation located approximately 33 km away from the Project site. However the Watt-hour meters for electricity export from the Project and import from the grid are installed in the Project site. So the transmission loss from the site to the grid substation should be considered in the calculation of amount of electricity transmitted to the grid. **(CL3)**

And the validated monitoring plan was applied by the proposed CDM project activity in accordance with the approved methodology, ACM0002 ver.07

(3) Monitoring equipments

As for the meters for export electricity (KPX meter), the main meter with allowable error of $\pm 0.5\%$ and the sub-meter with allowable error of $\pm 0.5\%$ are installed based on the Korean regulation of the electricity measurement equipment. These meters are manufactured by Seochang Electric Communication Co. Ltd. And KEPCO meter is installed in parallel as the meter for import electricity, and the O&M is being done by KEPCO. Both KPX meters and KEPCO meter were confirmed to be formally sealed and calibrated when they were installed.

In the PDD (B7.1), the equipment must use the main metering equipment that has allowable error of $\pm 0.2\%$. However the accuracy class 0.5S meters were actually installed. So the description of the PDD (B7.) shall be modified appropriately. **(CAR1)**

The Client revised the original Monitoring Plan in the PDD (/32/) in order to make clear this point in the revised Monitoring Plan (/31/) which was approved by CDM EB on 30.March, 2011 and the revised Monitoring Manual(/2b/). Therefore, the verification team confirmed that the revised Monitoring Plan applied by the proposed CDM project activity was in accordance with the approved methodology, ACM0002 ver.07.

(4) Data uncertainty

The KPX meter for export electricity with error class of 0.5(main meter) and 0.5(sub-meter) as well as KEPCO meter for import with error class of 0.5 are installed in the TWPC Office.

The amount of export electricity monitored by the calibrated KPX meter and simultaneously transferred to TWPC central control system is daily compared with those of KPX shown on its website and 6 times per month with the KPX's receipt. If different, investigation of causes and corrective actions are taken and the result will be reported to the CDM project manager for appropriate follow-up measures. The amount of import electricity is measured automatically by the meters. The measured data is recorded monthly and checked out against KEPCO's receipts for accuracy and reliance. If the two amounts are different, internal investigation and corrective actions are taken in accordance with the Monitoring Manual. The verification team confirmed that the data of the amount of export and import electricity were strictly managed to avoid the misstatement.

(5) Calibration of meters

1st Periodic Verification Report

The verification team confirmed that the re-calibration after the installation were not conducted for both KPX meters (export electricity) and KEPCO meter (import electricity) because these meters were effective in this monitoring period in accordance with the PDD.

It is stipulated in the PDD that regarding sealing of the meters shall be performed regularly every two years after the installation. However the accuracy class 0.5S meters are actually calibrated after 3.5 years after the installation according to the regulation. So the description of the PDD shall be modified appropriately. **(CAR 2)**

(6) Data acquisition and data processing system

The amount of export electricity measured by KPX meter is also transferred automatically to TWPC central control system (PC) and the export electricity is checked 6 times per month with the KPX's receipt and archived in electronic way (daily, weekly monthly). The amount of import electricity is measured automatically by the meters. The measured data is recorded monthly and checked out against KEPCO's receipts for accuracy and reliance. The verification team confirmed that the data processing system were operated appropriately.

(7) Reporting procedures

The verification team confirmed that the amount of export electricity was being reported daily, monthly and yearly in the established formats and checked by responsible persons including the president with their signatures.

The procedures of data reporting including the roles and responsibilities have been established in the Monitoring Manual. However, the competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, qualification, etc. The personnel training should be conducted considering the competencies needed. **(CL 2)**

(8) Documented instructions

The Monitoring Manual has been established in detail based on the PDD and implemented regarding the main subject (a)Definition of Monitoring,(b) Purpose of Monitoring, (c) Organization for Monitoring, (d) Monitoring equipment, (e)Power Transmission, (f)Data acquisition and Storage, (g)Internal data verifying procedure, (h)Quality Assurance / Quality Control,(i)Audit, (j)Taking action against emergency, (k)Monitoring report, (l) Calibration, (m)Training .

The simplified Manual is easy to be accessed by the persons working on the project.

(9) Qualification and training

The qualification of the personnel has been established in the Monitoring Manual. The verification team confirmed that the personnel performing the task had the appropriate competence for executing the task.

The competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, qualification, etc. The personnel training should be conducted considering the competencies needed. **(CL 2 same as above)**

The verification team confirmed the records of the trainings specified in the PDD and the revised Monitoring Manual..

(10)Responsibilities

Roles and responsibilities are clearly stipulated in the Monitoring Manual in line with the PDD from the top management to the manager level. Monitoring section has a responsibility of operating and managing generators and measuring machines, and Audit section has a responsibility of internal audit, QA/QC and maintenance.

(11) Trouble shooting procedures

The export electricity is monitored by main meter and sub-meter. In case of main meter problems (malfunction/inspection and repair works), sub-meter reading will be used.

The import electricity is monitored by the KEPCO meter. The procedures in the case of emergency of these meters have been established in the Monitoring Manual.

The verification team confirmed that the trouble shooting procedures are appropriate.

1st Periodic Verification Report

3.2.2 Findings

The verification team visited the electricity room to inspect meters and all 20 wind turbines during on site assessment. The verification team confirmed that all the required facilities were installed, and the monitoring system with the documented procedures was established and implemented except the points as described in the following findings.

Corrective Action Request 1

It is stipulated in the PDD (B7.1) that the equipment must use the main metering equipment that has allowable error of $\pm 0.2\%$. However the accuracy class 0.5S meters are actually installed. So the description of the PDD (B7.) shall be modified appropriately

Response

When PP planed the project, the electricity generated is transferred to the grid through one line. Therefore, accuracy of meters is planed as $\pm 0.2\%$ in accordance with Act on operation of electricity market. But while PP was discussing about project design, PP was decided that the electricity generated was transferred to the grid through two lines each with 20MW after PDD was finished. As a result, the meters were installed with accuracy of $\pm 0.5\%$ in accordance with Act on operation of electricity market.

In addition, the right to choice accuracy of meters belongs to KPX so the meter was installed by KPX (Korea Power Exchange) in accordance with Act on operation of electricity market.

The monitoring plan of the PDD was revised.

Corrective Action Request 2

It is stipulated in the PDD that regarding sealing of the meters shall be performed regularly every two years after the installation. However the accuracy class 0.5S meters are actually calibrated after 3.5 years after the installation according to the regulation. So the description of the PDD shall be modified appropriately.

Response

In the PDD, frequency of meter calibration is every two year. But Korea regulation was amended in December 2007. Therefore, monitoring plan needs to be revised to meet regulation in Korea. It complies with the methodology (ACM0002 ver.07). In the methodology, it is specified that all measurements should be conducted with calibrated measurement equipment according to relevant industry standards. For the project, a relevant industry standard is "Act on operation of electricity market July, 2010".

The monitoring plan of the PDD was revised.

Clarification Request 1

It is stipulated in the PDD that the generators (20 units) will be installed into two groups in Hoengssoon-gun for 9 units and in Pyeongchang-gun 11units. However, the generators are actually installed into 4 groups and connected by 2 lines to the grid substation. So the description of the Monitoring Report should be stipulated appropriately.

Response

The revised Monitoring Report dated 27 June 2011 (version 02) was submitted to the DOE.

Clarification Request 2

The competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, qualification, etc. The personnel training should be conducted considering the competencies needed.

Response

The revised Monitoring Manual dated 12 May 2011 (ver 1.3) was submitted to the DOE.

1st Periodic Verification Report

3.2.3 Conclusion

Corrective Action Request 1

The monitoring plan of the PDD was revised. The procedure of the revision is according to the decision of EB 49, Annex 28.

Based on this revision, request for revision of the monitoring plan was submitted on 21 January 2011 by the verifier and this revision was approved by the CDM EB on 30 March 2011.

It was confirmed and then CAR 1 was resolved.

Corrective Action Request 2

The monitoring plan of the PDD was revised. The procedure of the revision is according to the decision of EB 49, Annex 28.

Based on this revision, request for revision of the monitoring plan was submitted on 21 January 2011 by the verifier and this revision was approved by the CDM EB on 30 March 2011.

It was confirmed and then CAR 2 was resolved.

Clarification Request 1

The revised Monitoring Report described the system layout much clearly. Therefore CL 1 was clarified and resolved.

Clarification Request 2

The revised Monitoring Manual (Organization for Monitoring) was revised properly. CL 2 was clarified and resolved.

The project complies with the requirements.

3.3 Internal and External data

3.3.1 Discussion

(1) Internal data

In the case of normal operation, the amount of export electricity monitored by the KPX meters simultaneously is transferred to TWPC central control system, and is compared with those of KPX shown on its website. In case of main meter problems (malfunction/inspection and repair works), sub-meter reading is used. The amount of import electricity is measured automatically by the meters. The measured data is recorded monthly and checked out against KEPCO's receipts for accuracy and reliance. The amount of export electricity is being reported daily, monthly and yearly in the established formats and checked by responsible persons including the president with their signatures.

(2) External data

The Certificates of 6 times per month transaction amount issued by KPX (export electricity) and the monthly receipt from KEPCO (import electricity) are used for the calculation of emission reductions in the Monitoring Report after checking with the internal data.

Emission coefficient is a fixed value throughout the crediting period.

3.3.2 Findings

None

3.3.3 Conclusion

The project complies with the requirements.

3.4 Environmental and Social Indicators

3.4.1 Discussion

According to Article 4, paragraph 3 of "Act on Assessment of impacts of Works on Environment, Traffic, Disasters, etc." and its enforcement decree (Article 2, paragraph 3), any plant facility whose power source is solar power, wind power or fuel cell is more than 100,000kW shall be carried out EIA (Revised 16/9/2005). As facility capacity of this project was 40,000kW, it was not required to be

1st Periodic Verification Report

performed EIA. However, Preliminary Environmental Assessment (PEA) was performed as specified in “National Land Planning and Utilization Act” (Article 6, subparagraph 2) and the enforcement decree (Article 7, paragraph 1) of “Framework Act on Environmental Policy”

PEA was performed by an environmental impact assessment agency, Taeil Environment Co., Ltd. Additionally review for impacts on natural scenery and review for ecology of fauna and flora were performed respectively in 2006 and 2007 by Taeil Environment Co., Ltd. and UPEHCO Korea Co., Ltd. According to the requirement of authorities in charge and each report was published in 2007.

The PEA covers the sectors of natural environment, residential environment and social/economical environment. The PEA report(2007) was mainly contained influence on the scenery, natural geographical features, radio interference & radiation of electromagnetism, influence on ecosystem, land use, noise & vibration, waste water and sewage and dust and air quality. Every effort had been made to take into account and respond to all recommendations made to the report in the course of government approval. This project activity was not had significant impacts on the environment. (/36/) Later on the Post Environmental Assessment was conducted in 2010, it was reported that Taegisan Wind Power met all environmental standards specified in environmental policy fundamental law. (/37/) In addition to the review regarding the environmental management at the TWPC office, the verification team visited Sapgyo3-ri community center, in the nearest village from the project site, and interviewed the officer, the village leader and other villagers. The verification team confirmed that the project was contributing to the village's economy (ex. The increase of the tourists and donation from TWPC), with no significant environmental impacts as evaluated by the Environmental Monitoring Committee.

3.4.2 Findings

None

3.4.3 Conclusion

The project complies with the requirements.

3.5 Management and Operational System

3.5.1 Discussion

The Monitoring Manual has been established and implemented as described in 3.2.1 (7) and (9) above.

3.5.2 Findings

Clarification Request 2 Same as 3.2.2 above.

3.5.3 Conclusion

Clarification Request 2 Same as 3.2.3 above.

The project complies with the requirements.

3.6 Completeness of Monitoring

3.6.1 Discussion

All data of the export electricity monitored by the KPX meters are transferred, aggregated, compared and stored electronically. The collected data transferred to TWPC central control system are compared with those of KPX shown on its website. And the amount of import electricity is measured automatically by the meters. The measured data is recorded monthly and checked out against KEPCO's receipts for accuracy and reliance.

The reporting procedures including the roles and responsibilities as well as the emergency provisions are documented in the Monitoring Manual established in accordance with the monitoring plan in the PDD.

3.6.2 Findings

None

1st Periodic Verification Report

3.6.3 Conclusion

The project complies with the requirements.

3.7 Accuracy of Emission Reduction Calculations**3.7.1 Discussion**

The reporting procedures reflect the monitoring plan content. There are no greenhouse gas emissions from the project. The critical parameter for the determination of GHG emissions is the generation amount of electricity, which is measured by the calibrated meters. The calibration has been done properly in accordance with the established procedure. The carbon emission factor is calculated in accordance with ACM0002 as indicated in the PDD and the value is fixed throughout the crediting period.

The estimate of the CERs in the registered PDD and actual emission reductions in this monitoring period (15/5/2009 to 31/5/2010) is indicated in the monitoring report. Table 3 below shows the comparison of PDD values and emission reductions in this monitoring period.

Table 3: CERs of PDD and actual values

	PDD	PDD x (365+17)/365 (15/5/2009 – 31/5/2010)	1st monitoring period (15/5/2009 – 31/5/2010)
CERs (tonCO₂eq.)	59,669	62,448	50,724
% to PDD	---	100	81.2

The achievement of 1st period (15/5/2009 to 31/5/2010) was approximately 19% less than the estimate of the PDD.

3.7.2 Findings**Corrective Action Request 3**

The accuracy of meters for monitoring electricity was 0.5S, while the accuracy of the meters described in the registered PDD is 0.2S. So the difference of the accuracy class occurs the errors of electricity amount. And CER is to be deducted the amount of errors.

Response

The accuracy of meter for monitoring electricity was 0.5s(the maximum error for the meter is 0.5%), while the accuracy of the meter described in the registered PDD is 0.2s(0.2% as maximum error). Therefore, corrections were conducted based on the accuracy level of the meters. The Monitoring Report was revised and submitted to DOE. (/1b/)

Clarification Request 3

The parameters for transmission loss calculation should be indicated with the evidences (resistance and distance etc.).

Response

The evidences of transmission lines were submitted to the DOE.

3.7.3 Conclusion**Corrective Action Request 3**

The Monitoring Report was revised. The verification team confirmed that the correction of emission reduction was conducted on the revised Monitoring Report. (/1b/)

1st Periodic Verification Report

CAR3 was resolved.

Clarification Request 3

The distance between the substation and the project site is 33 km, as it was described 26.8 km in the PDD. Verification team confirmed the transmission line is 33 km by the evidence provided by the project participant. (/8/)

The transmission cables' specification was explained in the impedance map.(/9/)

The verification team confirmed that the transmission loss was calculated and deducted from the generation amount properly based on these data.(/5/)

CL3 was resolved.

The project complies with the requirements.

3.8 Quality of Evidence to Determine Emission Reductions

3.8.1 Discussion

The critical parameters used for the determination of the emission reductions are

- Electricity generation
- CO₂ emission factor

The verification team confirmed that the figures of the export and import electricity stated in the Monitoring Report were the same as those of Certificates of transactions issued by KPX and KEPCO for the covering period (15/5/2009 to 31/5/2010), and also the application of CO₂ emission factor was correct.(/3/,/4/,/5/)

3.8.2 Findings

Clarification Request 3 Same as 3.7.2 above.

3.8.3 Conclusion

Clarification Request 3 Same as 3.7.3 above

The project complies with the requirements.

3.9 Management System and Quality Assurance

3.9.1 Discussion

The Monitoring Manual has been established and implemented as described in 3.2.1 (8) above.

As for the open issue, **CL 2** pointed out in the verification was discussed. And the verification team identified that the initial CDM Monitoring Report provided was not described the competences of the responsible organization and personnel for the issuance of the CDM activities. (**CL 2**)

3.9.2 Findings

Clarification Request 2 Same as 3.2.2 above

3.9.3 Conclusion

Clarification Request 2 Same as 3.2.3 above.

The project complies with the requirements.

1st Periodic Verification Report

4. PROJECT SCORE CARD

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Calculated Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan. The indicated CL 1 was clarified.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	Meters used for measuring electricity are calibrated. The indicated CAR 1, CAR 2 and CL 2 were resolved.
	Data calculations	✓	✓	✓	The indicated CAR 3 and CL 3 were resolved. The transmission loss of the electricity was calculated appropriately. Emission reductions are re-calculated correctly.
	Data management & reporting	✓	✓	✓	Data management system is in place.
Consistency	Changes in the project	✓	✓	✓	There are no changes in the project.

1st Periodic Verification Report

5. VERIFICATION STATEMENT

JACO CDM has performed a verification of the CDM project "Taegisan Wind Power Project". The verification is based on the currently valid documentation of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords".

The management of Taegisan Wind Power Co., Ltd. (TWPC) is responsible for the preparation of the GHG emission data and the reported GHG emissions reductions by the "Taegisan Wind Power Project" including the development and maintenance of records and reporting procedures in accordance with the revised Monitoring Plan which is complying with the consolidated methodology ACM0002 version 07 and approved by UNFCCC on 30 March, 2011 and registered PDD.

The verifier confirms that the project is implemented as planned and described in the validated and registered PDD as well as the revised Monitoring Plan approved by CDM Executive Board on 30, March, 2011 after the on-site assessment of the first verification and the validated monitoring plan applied by the proposed CDM project activity in accordance with the approved methodology ACM0002 version 07. The installed equipments being essential for generating emission reductions run reliably and the relevant meters are calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

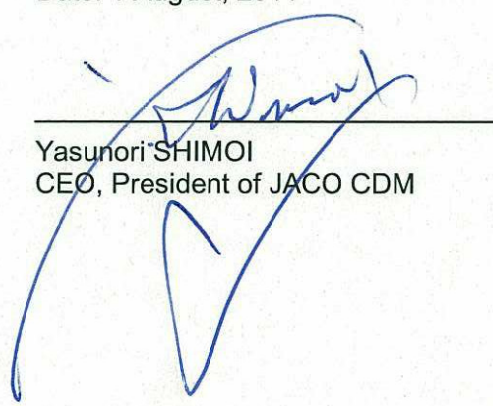
The verifier confirmed that the monitoring was done in accordance with the monitoring plan and the GHG emission reductions in the revised Monitoring Report version 02, dated 27 June 2011 are calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 15-05-2009 to 31-05-2010

Verified emission in the above reporting period:

Baseline emissions:	50,724 tCO ₂ equivalents
Project emissions:	0 tCO ₂ equivalents
Emission reductions:	50,724 tCO ₂ equivalents

Date: 1 August, 2011



Yasunori SHIMOI
CEO, President of JACO CDM

1st Periodic Verification Report

6. References

Category 1 Documents:

List documents provided by the Client that relate directly to the GHG components of the project.

These should have been used as direct sources of evidence for the verification conclusions, and are usually further checked through interviews with key personnel.

- /1a/ CDM Monitoring Report (15 May, 2009 to 31 May, 2010) Version 01< dated 27/08/2010>
- /1b/ CDM Monitoring Report (15 May, 2009 to 31 May, 2010) Version 02< dated 27/06/2011>
- /2a/ Monitoring Manual (Version 1.0, dated 01 January, 2011)
- /2b/ Monitoring Manual (Version 1.3, dated 12 May, 2011)
- /3a/ Monthly exchange amount of electric power for Taegisan Wind Power Co., Ltd. by KPX (period:15/05/2009 to 31/05/2010) (Original)
- /3b/ Monthly exchange amount of electric power for Taegisan Wind Power Co., Ltd. by KPX (period:15/05/2009 to 31/05/2010) (Translation)
- /4a/ Monthly electric power usage for Taegisan Wind Power Co., Ltd. by KEPCO (period:15/05/2009 to 31/05/2010) (Original)
- /4b/ Monthly electric power usage for Taegisan Wind Power Co., Ltd. by KEPCO (period:15/05/2009 to 31/05/2010) (Translation)
- /5/ Calculation of Emission Reduction & Transmission Loss for Taegisan WP (period: May 2009 to May 2010)
- /6a/ Calibration Report of watt-hour meters<A/B lines Main/Sub meters> (Initial calibration for KPX meters) (Original)
- /6b/ Calibration Report of watt-hour meters<A/B lines Main/Sub meters> (Initial calibration for KPX meters) (Translation)
- /7/ Calibration Report of watt-hour meter <A/B lines Import meters> (Initial calibration for KEPCO meters)
- /8/ Completion of construction inspection (30/01/2009)
- /9a/ The Result of performance test (Certificate of Resistance (ACSR-AW/OC 240sq)
- /9b/ The Result of performance test (Certificate of Resistance (RP-ABC-W 150sq)
- /9c/ The Result of performance test (Certificate of Resistance (CNCV-W 250sq)
- /10/ Map of transmission line to the substation
- /11/ WTG Record of Maintenance (2009-2010)
- /12/ Training Record
- /13/ Contract for joint development (decision as CDM PJ)
- /14/ ENGINEERING,PROCUREMENT AND CONSTRUCTION CONTRACT FOR HOENGSEONG WIND POWER PROJECT
- /15/ The Service Contract
- /16/ Wind Turbine Purchase Agreement (12 Mar. 2007)
- /17/ The approval of the construction (13/06/2007)
- /18/ The Statement for Starting Construction Work (20/08/2007)
- /19a/ Taking-Over Certificate (Phase 1) (20/11/2008)
- /19b/ Taking-Over Certificate (Phase 2) (26/12/2008)
- /20/ Starting Commercial Operation for Wind Power (28/01/2009)
- /21/ Wind Turbine Description (04/03/2005) Vestas
- /22/ Examples of actual reporting of monitoring results by paper(daily, monthly, yearly)
- /23/ Brochure of Taegisan Wind Power Co., Ltd.
- /24/ Act on Operation of Electricity Market (June 2010)
- /25/ Law regarding Measurement Act. No.9496 (18 Mar. 2009)

1st Periodic Verification Report

Category 2 Documents:

List background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents should have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.

- /31/ Revised Monitoring Plan (approved 30 Mar. 2011)
- /32/ PDD Version 05 (20 Feb. 2009)
- /33/ Validation Report (by Korean Foundation for Quality, 25/12/2009)
- /34/ Methodology ACM0002 Version 07
- /35/ UNFCCC VVM version 01.2
- /36/ Preliminary Environmental Assessment(Jan. 2007)
- /37/ Post Environmental Assessment (Nov. 2010)

Persons interviewed:

List persons interviewed during the initial verification, or persons contributed with other information that are not included in the documents listed above.

- /41/ Mr. Byoung-Mo Koo (Senior Executive Vice President, Taegisan Wind Power Co., Ltd.)
- /42/ Mr. Eun-Hwan Lee (General Manager, Taegisan Wind Power Co., Ltd.)
- /43/ Mr. Jung-Han Noh (Operator, Taegisan Wind Power Co., Ltd.)
- /44/ Mr. Jung-Kyu Park (Deputy General Manager, Eurus Energy Korea Corporation.)
- /45/ Mr. Kenji Kamei (Director, Eurus Energy Korea Corporation.)
- /46/ Mr. Jong-Gyu Kim (General Manager, RCC Co., Ltd.)
- /47/ Mr. Hee-Sung Lee (RCC Co., Ltd.)
- /48/ Mr. Jae-Whan Koh (Manager, Electricity Market Department Market Settlement Team, Korea Power Exchange)
- /49/ Mr. Bum-Soo Kim (Manager, Electricity Market Department Market Settlement Team, Korea Power Exchange)
- /50/ Mr. Byeong-Dae Min (Hoengseong-gun Local Government)
- /51/ Mr. Jong-Sun Lee (Village mayor, Taegi-ri, Dunnae-myun, Hoengseong-gun)
- /52/ Mr. Dae-Yun Lee (Village resident, Taegi-ri, Dunnae-myun, Hoengseong-gun)

Appendix 1: Verification Checklist

1st Periodic Verification Checklist

for

Taegisan Wind Power Project

Monitoring Period: 15 May 2009 to 31 May 2010
(CDM Ref. No. 2302)

Table 1: Implementation Status and Operation

Table 2: GHG Data Management & Calculation

Table 1: Implementation Status and Operation

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
A. Opening Session			
A.1.Introduction to audits	/41/~ /47/	<ul style="list-style-type: none"> ▶ DOE explained to the project participants about the purpose, scope and process of the verification at the meeting room of the project site of Taegisan Wind Power Project Co., Ltd. on 09 December, 2010. ▶ Participants: <ul style="list-style-type: none"> - Project participants: Eurus Energy Korea Corporation; Mr. Jung-Kyu Park, Taegisan Wind Power Co., Ltd ; Mr. Byoung-Mo Koo Mr. Eun-Hwan Lee, RCC Co., Ltd ; Mr. Jong-Gyu Kim, Mr. Hee-Sung Lee ,. - Verification team: JACO CDM Team Leader ; Mr. Shigekazu OKA JACO CDM Team member ; Mr. Yukio TAKANO 	OK
A.2.Clarification of access to data archives, records, plans, drawings etc.	/1/ ~ /25/	<ul style="list-style-type: none"> ▶ The relevant data, archives, records, plans and drawings were provided to the verification team. 	OK
A.3.Contractors for equipment and installation works Who has installed the equipment? Who was contracted for planning etc.?	/1/ /14/ /15/ /21/	<ul style="list-style-type: none"> ▶ Wind Turbine(V80) made by Vestas Wind System (Denmark) ▶ Plant design: HYUNDAI Engineering Co., LTD. ▶ Installation work by: POSCO Engineering and Construction Co., Ltd. (Korea) 	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
A.4. Commissioned date Project should be installed and commissioned at time of 1st verification in so far as the project should be ready to generate emission reductions afterwards.	/1/ /13/ /15/ ~ /20/ /32/	▶ -Construction Start date: 25-07-2007 -Commissioning date: 06-10-2008~26-12-2008 -Completion of the Construction: 30-01-2009 -Commercial Operation date: 28-01-2009 ▶ The date of decision as CDM project: 03-02-2006.	OK
B. Open issues indicated in validation report			
B.1. Open issues in validation report	/1/ /32/ /33/	▶ Based on the validation report, the verification team identified no missing steps. ▶ The project was registered under the CDM reference number 2302, on 15 May, 2009.	OK
C. Implementation Status of the project This part is covering the checks during the on-site inspection at the project's site.			
C.1. Physical components Check the installation of all required facilities and equipment as described by the PDD.	/1/ ~/23/ /32/ /33/	▶ V80 wind turbine generators made by Vestas Wind Systems (2MW × 20units) were installed during the period of 25-07-2007 to 26-12-2008(last Commissioning date). ▶ As the evidences of completion of the installation, the takeover certifications were provided. ▶ During the on-site verification, the verification team visited all of the 20 wind turbine generators to check the installation, and also checked the related meters (export and import) and checking system by PC, transformers (22.9 kV), etc. ▶ The verification team also has confirmed that the 20 wind turbine generators are divided into 2 groups and each group has the same transmission line to the central control panel of the site.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
C.2. Project boundaries Check whether the project boundaries are still in compliance with the ones indicated by the PDD.	/1/ /2/ /8/ /10/ /32/ /33/	<p>► The interface between the Grid company and Taegisan site should be the KEPCO's substation which is located approx.33 Km (PDD 26.8 Km) away from the site.</p> <p>► Clarification Request 1</p> <p>It is stipulated in the PDD that the generators (20 units) will be installed into two groups in Hoengseon-gun for 9 units and in Pyeongchang-gun 11units.However, the generators are actually installed into 4 groups and connected by 2 lines to the grid substation.. So the description of the Monitoring Report should be stipulated appropriately.</p>	CL 1
C.3. Monitoring and metering systems Check whether the required metering systems have been installed. The meters have to comply with appropriate quality standards applicable for the used technology.	/1/ /2/ /6/ /7/ /10/ /24/ /32/	<p>► The main meter with allowable error of $\pm 0.5\%$ (PDD $\pm 0.2\%$) and the sub-meter with allowable error of $\pm 0.5\%$ (PDD $\pm 0.2\%$) for the export electricity(KPX meter) were installed based on the regulation of the electricity measurement equipment. And the calibration at the installation was conducted by KPX ;</p> <p>[KPX meter]</p> <p>A and B line (Main meter) Serial No.: 46026112 -Manufactured by Seochang Electric Communication Co. Ltd., -Tested on 10.09.2008 (Sub-meter) Serial No.: 46026111 -Manufactured by Seochang Electric Communication Co. Ltd., -Tested on 10.09.2008</p> <p>C and D line (Main meter) Serial No.: 46026114 -Manufactured by Seochang Electric Communication Co. Ltd. -Tested on 10.09.2008 (Sub-meter) Serial No.: 46026113 -Manufactured by Seochang Electric Communication Co. Ltd. -Tested on 10.09.2008</p> <p>► The meter for the import electricity was installed. It is the property of</p>	

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		<p>KEPCO and O&M is being done by KEPCO. And the calibration at the installation was conducted by LS Industrial System Co. Ltd., as follows;</p> <p>[KEPCO meter]</p> <p>A and B line</p> <p>Serial No.: 0067477 -Manufactured by LS Industrial System Co., Ltd.(LGRW34-05) -Tested on 10.09.2008</p> <p>C and D line</p> <p>Serial No.: 0067467 -Manufactured by LS Industrial System Co., Ltd.(LGRW34-05) -Tested on 10.09.2008</p> <p><u>Corrective Action Request 1</u></p> <p>It is stipulated in the PDD (B7.1) that the equipment must use the main metering equipment that has allowable error of $\pm 0.2\%$. However the accuracy class 0.5S meters are actually installed based on the regulation of the electricity measurement equipment. So the description of the PDD (B7.) shall be modified appropriately.</p>	CAR1
<p>C.4. Data uncertainty</p> <p>How will data uncertainty be determined for later calculations of emission reductions? Is this in compliance with monitoring and metering equipment?</p>	<p>/1/ ~ /9/ /22/ /24/ /32/</p>	<ul style="list-style-type: none"> ▶ KPX meters for export electricity with error class of 0.5(main meter) and 0.5(sub-meter) as well as KEPCO meters for import with error class of 0.5 are installed in the Taegisan Site. ▶ The amount of export electricity measured by KPX meter is also transferred automatically to Taegisan central control system(PC) and archived in electronic way (daily, weekly, monthly). ▶ The collected variables transferred to Taegisan central control system are compared with those of KPX shown on its website. If the two variables compared are different, the electricity meters and other related equipments shall be checked. The results will be reported to the CDM project manager. The causes of differences are not found, the electricity 	

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		<p>supplied to the grid is decided by discussing with KPX.</p> <p>► The amount of import electricity is daily recorded and examined the KEPCO's invoices of the records against the data in six times a month. And the amount of import electricity is compared monthly with the KEPCO's invoice.</p> <p><u>Corrective Action Request 1</u> (Same as Table.1 C.3.)</p> <p>It is stipulated in the PDD (B7.1) that the equipment must use the main metering equipment that has allowable error of $\pm 0.2\%$. However the accuracy class 0.5S meters are actually installed. So the description of the PDD (B7.) shall be modified appropriately.</p> <p><u>Corrective Action Request 3</u></p> <p>The accuracy of meters for monitoring electricity is 0.5S, while the accuracy of the meters described in the registered PDD is 0.2S. So the difference of the accuracy class occurs the errors of electricity amount. And CER is to be deducted the amount of errors.</p>	<p>CAR1</p> <p>CAR3</p>
<p>C.5. Calibration and quality assurance</p> <p>Check how monitoring and metering systems are subject to calibration and quality assurance routines</p> <p>a) with installation</p> <p>b) during future operation</p>	<p>/1/</p> <p>/2/</p> <p>/5/</p> <p>/6/</p> <p>/7/</p>	<p>► Calibration records were provided. Calibration records at installation are shown in C.3. above.</p> <p>► <u>Corrective Action Request 2</u></p> <p>It is stipulated in the PDD that regarding sealing of the meters shall be performed regularly every two years after the installation. However the accuracy class 0.5S meters are actually calibrated after 3.5 years after the installation according to the regulation. So the description of the PDD shall be modified appropriately.</p>	<p>CAR 2</p>
<p>C.6. Data acquisition and data processing systems</p> <p>Check the eligibility of used systems.</p>	<p>/1/</p> <p>/2/</p> <p>/22/</p>	<p>► The system is established in the Monitoring Manual.</p> <p>The amount of export electricity measured by KPX meter is also transferred automatically to Taegisan central control system(PC) and archived in electronic way.</p>	<p>OK</p>

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
	/32/	<ul style="list-style-type: none"> ▶ The electricity generated is recorded six times a month by Teagisan Wind Power. The person in charge of data acquisition record the electricity generated on 3rd, 8th, 13th, 16th, 27th and last day of every month through KPX's home page. ▶ The monthly and yearly electricity generated is recorded based on the collected data. ▶ The monthly data is double checked with its receipt. ▶ The daily, monthly and yearly electricity generated is confirmed by KPX homepage. ▶ The amount of import electricity is daily recorded by reading the KEPCO meter and is compared with the KEPCO's invoices. 	
C.7. Reporting procedures Check how reports with relevance for the later determination of emission reductions will be generated	/1/ /2/ /32/	<ul style="list-style-type: none"> ▶ The amount of export electricity was being reported daily, monthly and yearly in the established formats and checked by responsible persons including the president with their signatures. ▶ Six times a month, monthly data are stored in the folder in charge of data analysis. ▶ Data copied from the computer in charge of data analysis is stored continuously ▶ The procedures are indicated in the Monitoring Manual. 	OK
C.8. Documented instructions Check whether the personnel performing tasks with sensitivity for the monitoring of emission reductions have access and knowledge of documented instructions, forming a part of the project's management system.	/1/ /2/ /32/	<ul style="list-style-type: none"> ▶ Documented instructions in the Monitoring plan have been established in the Monitoring Manual (Main subject). ▶ The qualification of the personnel has been established in the Monitoring Manual (Organization for Monitoring). 	OK
C.9. Qualification and training Check whether the personnel performing tasks with sensitivity for the monitoring of emission re-	/1/ /2/ /12/	<ul style="list-style-type: none"> ▶ The qualification of the personnel has been established in the Monitoring Manual (Organization for Monitoring, QA/QC, Training).. ▶ Each responsible person related to CDM monitoring is carried out the training. And the training record should be kept by the responsible person. 	

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
<p>ductions has the appropriate competences, capabilities and qualifications to ensure the required data quality.</p>	/32/	<ul style="list-style-type: none"> ▶ If the responsible person is changed, a new responsible person should be trained about CDM monitoring. ▶ Related employee should be trained every two years in accordance with the Electricity Enterprises Act. ▶ If major changes occur in the monitoring manual, the document is revised and the staffs related to the CDM project is trained according to the revised monitoring manual. ▶ Clarification Request 2 <p>The competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, qualification, etc. The personnel training should be conducted considering the competencies needed.</p>	CL2
<p>C.10. Responsibilities</p> <p>Check whether all tasks required to gather data and prepare a monitoring report with the necessary quality have been allocated to responsible employees.</p>	/1/ /2/ /32/	<ul style="list-style-type: none"> ▶ Roles and responsibilities are clearly stipulated in the Monitoring Report and in line with the description of B7.2. of the PDD. ▶ According to the Monitoring Report above. <ul style="list-style-type: none"> -The Member for Management (CEO) has a total responsibility of operation and management of CDM business of Taegisan. -General manager manages and audit the whole CDM Business. -Manager has a responsibility of audit and QA/QC -Assistant Manager has a responsibility of monitoring the amount of electricity generated and measuring the electricity supplied and imported. -Staff has a responsibility of data recording and verifying. -Another staff has a responsibility of meters calibration and maintenance. ▶ Clarification Request 2 (Same as Table.1 C.9.) <p>The competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, quali-</p>	CL 2

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		fication, etc. The personnel training should be conducted considering the competencies needed.	
C.11. Troubleshooting procedures Check whether there are possibilities of redundant data monitoring in case of having problems with the used monitoring equipment. Such procedures may reduce risks for the buyers of emission reductions (e.g. the Client)	/1/ /2/ /11/ /32/	<ul style="list-style-type: none"> ▶ The procedure has been established in the Monitoring Manual (Procedure of data acquisition, Taking action against emergency). ▶ The monthly data is double checked with its receipt. If two variables compared are different, KPX checks its data base to compare the receipt with its data base. And the electricity meters and other equipment shall be checked if they are working properly by internal investigation and procedures regulated in the related laws. Then the result will be reported to the CDM project manager for appropriate follow-up measures. Even after the internal investigation and procedures in related laws, if the reason why those two variables are different is not found, then data stored in SCADA will be used in the first place according to "Act on operation of electricity market". ▶ If any emergency status occurs in any of Taegisan Wind Power facility, the person in charge of maintenance must report and record them. 	OK
D. Internal Data Identifying the internal GHG data sources and ways in which the data have been collected, calculated, processed, aggregated and stored should be assessed accuracy and reliability of the internal GHG data.			
D.1. Type and sources of internal data Acquire information on type and source of internal GHG data, which is used in calculations of emission reductions. e.g.. "continuous direct measurements", "site-specific correlations", "periodic direct measurements", "use of models" and/or "use of default emissions factors".	/1/ /2/ /32/	<ul style="list-style-type: none"> ▶ The amount of export electricity is continuously monitored by the KPX calibrated meters (main meters and sub-meters). And the amount of import electricity is also continuously monitored by the calibrated KEPCO meters. ▶ Reporting system: Refer to C.7. ▶ The emission factor was calculated as a weighted sum of the OM(3 years vintage data) and BM emission factors based on the ACM0002 by 	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		using the data from KEPCO and IPCC default values as described in the PDD. Emission Factor: 0.6426 tCo2/Gj	
D.2. Data collection How is data collected and processed? What are the means of quantifying emissions from the different data sources?	/1/ /2/ /32/	▶ The data is collected and processed by digital data acquisition system mentioned in C.4 to C.8.	OK
D.3. Quality assurance Does internal data collection underlie sufficient quality assurance routines?	/1/ ~ /7/ /22/ /32/	▶ The amount of export electricity monitored by the calibrated KPX meters (main meter and sub-meter) and simultaneously transferred to Taegisan central control system is compared with those of KPX shown on its web-site. If the two variables compared are different, KPX checks its data base to compare the receipt with its data base. And the electricity meters and other equipment shall be checked if they are working properly by internal investigation and procedures regulated in the related laws. Then the result will be reported to the CDM project manager for appropriate follow-up measures. Even after the internal investigation and procedures in related laws, if the reason why those two variables are different is not found, then data stored in SCADA will be used in the first place according to "Act on operation of electricity market". ▶ In case of main meter problems (malfunction/inspection and repair works), sub-meter reading will be used according to the Monitoring plan . ▶ The amount of import electricity is daily checked by reading the KEPCO meter and is compared monthly with the KEPCO's invoice. Refer to C.6. ▶ If the two variables are different, internal investigation and corrective actions are taken [Monitoring plan]. ▶ The meters were authorized through the formal process to have the allowable error of data within $\pm 0.5\%$ (for main meter) and $\pm 0.5\%$ (for sub-meter) required by the legal regulation. And the meters were calibrated as frequently as required by the related laws and the regulation of KPX (Monitoring plan). Refer to C.3., C.5.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		<ul style="list-style-type: none"> ▶ The amount of export electricity is being reported daily, monthly and yearly in the established formats and checked by responsible persons including the president with their signatures. Refer to C.7. 	
D.4. Significance and reporting risks Assess the significance and reporting risks related to the different internal data sources. Potential reporting risks may be related to the calculation methods, accuracy of data sources and data collection and/or the information systems from which data is obtained. The significance of and risks associated with the data source indicate the level of verification effort required at a later stage.	Ditto	<ul style="list-style-type: none"> ▶ The potential reporting risks are considered to be small based on the facts described in D.3. above. 	OK
E. External Data Especially for data of baseline emissions there might be the necessity to include external data sources. The access to such data and a proof of data quality should be part of verification. If it is deemed to be necessary, an entity delivering such data should be audited.			
E.1. Type and sources of external data Acquire information on type and source of external data, which is used in calculations of emission reductions	/3/ /4/	<ul style="list-style-type: none"> ▶ As for the amount of export electricity, the Certificate issued by KPX describing the monthly amount of transaction is used for the calculation of emission reductions. ▶ As for the amount of import electricity, the Certificate issued by KEPCO describing the monthly amount of transaction is used for the calculation of emission reductions. 	OK
E.2. Access to external data How is data transferred? How can reproducibility of data set be ensured?	Ditto	<ul style="list-style-type: none"> ▶ Both Certificates by KPX and by KEPCO are issued upon request of Taegisan Wind Power Company for the purpose of making the Monitoring Report. 	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
E.3. Quality assurance Does external data underlie any quality assurance routines?	Ditto	► The amounts of electricity transaction in both Certificates above are assured by the procedures described in D.3. above.	OK
E.4. Data uncertainty Is it possible to assess the data uncertainty of external data? Are such routines included in reporting procedures?	Ditto	► Ditto	OK
E.5. Emergency procedures Are there any procedures which will be applicable if there is no access to relevant external data?	/2/	► The procedures applicable in the case of emergency of the KXP meters, KEPCO meter, etc. are established in the Monitoring Manual.	OK
F. Environmental and Social Indicators A Monitoring Plan may comprise environmental and/or social indicators which could be necessary to monitor for the success of the project activity.			
F.1. Implementation of measures A project activity may demand for the installation of measures (e.g. filtering systems or compensation areas), which are exceeding the local legal requirements. A check of the implementation or realization of such measures should be part of the verification.	/32/ /36/ /37/	► According to the regulation, EIA was not required. However, Preliminary Environmental Assessment (PEA) was conducted to assess the impact on environment, and aviation operation in the project region. There were no serious impacts according to the PDD. The PEA was covered the sectors of natural environment, residential environment, and social/economical environment. ► Post Environmental Assessment was also conducted. It was covered water quality, noise, vibration, Radio interference and ecosystem.	OK
F.2. Monitoring equipment Check where necessary whether the required metering systems have been installed. The meters have to comply with appropriate quality standards	/32/ /36/ /37/	► No specific stationary monitoring equipments were installed. The PEA measurement was conducted by the environmental impact assessment agency, Taeil Environment Co., Ltd.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
applicable for the used technology.			
F.3. Quality assurance procedures What quality assurance procedures will be applied for such data?	/32/ /37/	▶ The measurement is commissioned to the external experts(Taeil Environment Co., Ltd, Myeong Seung Engineering Co., Ltd.)).	OK
F.4. External data Check the quality, reproducibility and uncertainty of external data.	/32/ /36/ /37/	<ul style="list-style-type: none"> ▶ PEA was performed by an environmental impact assessment agency, Taeil Environment Co., Ltd. ▶ The monitoring of environmental impacts above was conducted by the Committee and the measurement was commissioned to Taeil Environment Co., Ltd. above. ▶ Post Environmental Assessment was performed by Myeong Seung Engineering Co., Ltd. ▶ The verification team visited Dunnae-myon community center, nearest village from the project site, and interviewed the officer, the village leader and other villagers. The verification team confirmed that the project was contributing to the village's economy (ex. the increase of the tourists and donation from TWPC), with no significant environmental impacts. 	
G. Management and Operational System In order to ensure a successful operation of a Client project and the credibility and verifiability of the ERs achieved, the project must have a well defined management and operational system.			
G.1.Documentation The system should be documented by manuals and instructions for all procedures and routines with relevance to the quality of emission reductions. The accessibility of such documentations to	/2/	▶ The Monitoring Manual has been established in detail based on the PDD and implemented regarding the main subject (1)Definition of Monitoring,(2) Purpose of Monitoring, (3) Organization for Monitoring, (4) Monitoring equipment, (5)Power Transmission, (6)Data acquisition and Storage, (7)Internal data verifying procedure, (8)Quality Assurance / Quality Con-	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
persons working on the project has to be secured.		trol,(9)Audit, (10)Taking action against emergency, (11)Monitoring report, (12) Calibration, (13)Training . <ul style="list-style-type: none"> ► The simplified Manual is easy to be accessed by the persons working on the project. 	
G.2.Qualification and training The system should describe the requirements on qualification and the need of training programs for all persons working on the emission reduction project. Performed training programs and certificates should be archived by the system.	Ditto	<ul style="list-style-type: none"> ► The qualification and training program are described in the documentation above in detail in line with the Monitoring Plan of the PDD. ► As for the training records, refer to C.9. ► Clarification Request 2 (Same as Table.1 C.9 and C.10.) The competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, qualification, etc. The personnel training should be conducted considering the competencies needed. 	CL2
G.3.Allocation of responsibilities The allocation of responsibilities should be documented in written manner.	Ditto	<ul style="list-style-type: none"> ► Allocation of responsibilities is described in detail in the Monitoring Report in line with the description of B7.2.of the PDD. 	OK
G.4.Emergency procedures The system should contain procedures which provide emergency concepts in case of unexpected problems with data access and/or data quality.	Ditto	<ul style="list-style-type: none"> ► The Emergency procedures has been established in the Monitoring Manual (Taking action against emergency). ► If stoppage of monitoring process occurs because of need for calibration, every detailed replacement procedures must be recorded in log sheet. (This sheet includes precise record of stoppage time and the reason of the stoppage (based on DD-MMM-YYYY, HH:MM format)). ► Follow regulation on electric operation, when the data is omitted from project facility failure, calibration, measuring meters failure. ► Responsible person is described in “3. Organization for monitoring” 	OK
G.5.Data archiving	Ditto	<ul style="list-style-type: none"> ► The system of archiving the relevant data has been established in the 	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
The system should provide routines for the archiving of all data which is required for verifying the project's performance in the context of consecutive verifications.		<p>Monitoring Manual (Data acquisition and Storage, QA/QC).</p> <ul style="list-style-type: none"> ▶ Six times a month, monthly data are stored in the folder in charge of data analysis. ▶ Six times a month, monthly data are copied from the computer in charge of data analysis and stored continuously for backup. ▶ Taegisan Wind Power Co. records the electricity supplied to the grid six times a month. The recorded data is double checked with the receipt of it. ▶ The monthly and yearly electricity consumed is recorded in excel sheet and managed by Taegisan Wind Power Co. The electricity consumed is double checked with the receipt of it. 	
<p>G.6. Monitoring report</p> <p>The system includes procedures for the calculation of emission reductions and the preparation of the monitoring report.</p>	Ditto	<ul style="list-style-type: none"> ▶ The procedures of Monitoring report has been established in the Monitoring Manual (Monitoring report). ▶ CDM monitoring report is written by a person in charge of it and the writing frequency rely on given conditions. 'Issued date', 'Revised version', 'Monitoring period' should be properly recorded every time. The written monitoring report should be confirmed and approved by both of Shareholders. ▶ <u>Clarification Request 3</u> <p>The parameters for transmission loss calculation should be indicated with the evidences (resistance and distance etc.).</p>	CL 3
<p>G.7. Internal audits and management review</p> <p>The system includes internal control procedures, which allow the identification and solution of problems at an early stage.</p>	Ditto	<ul style="list-style-type: none"> ▶ The Internal audit system is established and documented in the Monitoring Manual (Audit) and implemented. ▶ The Management Review (monitoring verification) is established, documented in the Monitoring Manual (Monitoring report) and implemented. 	OK

Table 2: GHG Data Management & Calculation

Table 2-1: Data Management System/Controls

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. A score is assigned as follows:

- Full - all best-practice expectations are implemented.
- Partial - a proportion of the best practice expectations is implemented
- Limited - this should be given if little or none of the system component is in place.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
1. Defined organisational structure, responsibilities and competencies		
1.1 Position and roles Position and role of each person in the GHG data management process is clearly defined and implemented, from raw data generation to submission of the final data. Accountability of senior management must also be demonstrated.	Full	▶ According to the Monitoring Report, Taegisan Wind Power CEO takes a total responsibility to operate and manage the whole CDM business of Taegisan. (Refer to Verification Checklist Table.1 C.10.)
1.2 Responsibilities Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees.	Full	Ditto
1.3 Competencies needed Competencies needed for each aspect of the GHG determination process are analysed. Personnel competencies are assessed and training programme implemented as required.	Partial	▶ Clarification Request 2: (Same as Initial Verification checklist C.9 and C.10.) The competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, qualification, etc. The personnel training should be conducted considering the competencies needed.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
2. Conformance with monitoring plan		
2.1 Reporting procedures Reporting procedures should reflect the monitoring plan content. Where deviations from the monitoring plan occur, the impact of this on the data is estimated and the reasons justified.	Full	<ul style="list-style-type: none"> It was confirmed that the reporting was being conducted in accordance with the Manual of CDM Monitoring established based on the Monitoring Plan in the PDD. (Refer to Initial Verification Checklist C.6., C.7.)
2.2 Necessary Changes Necessary changes to the monitoring plan are identified and changes are integrated in local procedures as necessary.	Partial	<ul style="list-style-type: none"> <u>Corrective Action Request 1</u> (Same as Table.1 C.3.) It is stipulated in the PDD (B7.1) that the equipment must use the main metering equipment that has allowable error of $\pm 0.2\%$. However the accuracy class 0.5S meters are actually installed. So the description of the PDD (B7.) shall be modified appropriately <u>Corrective Action Request 2</u> (Same as Table.1 C.5.) It is stipulated in the PDD that regarding sealing of the meters shall be performed regularly every two years after the installation. However the accuracy class 0.5S meters are actually calibrated after 3.5 years after the installation according to the regulation. So the description of the PDD shall be modified appropriately.
3. Application of GHG determination methods		
3.1 Methods used There are documented description of the methods used to determine GHG emissions and justification for the chosen methods. If applicable, procedures for capturing emissions from non-routine or exceptional events are in place and implemented.	Full	<ul style="list-style-type: none"> In the Monitoring Report, the calculation of the electricity supplied to the grid is adequately defined as [export electricity – import electricity] based on the methodology ACM0002 Version 07 and calculated properly. Both export electricity and import electricity are properly recorded and used for the calculation of emission reductions.
3.2 Information/process flow An information/process flow diagram, describing the entire process from raw data to reported totals is developed.	Full	<ul style="list-style-type: none"> Information/process flow is established in the Monitoring plan in line with the PDD and Monitoring Manual.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
3.3 Data transfer Where data is transferred between or within systems/spreadsheets, the method of transfer (automatic/manual) is highlighted - automatic links/updates are implemented where possible. All assumptions and the references to original data sources are documented.	Full	<ul style="list-style-type: none"> ▶ All data of the export electricity is transferred, aggregated, compared and stored electronically. And the data of import electricity is read from the meter and recorded manually on the site and compared with the electronic data from KEPCO. Refer to Verification checklist Table.1 D.3.
3.4 Data trails Requirements for documented data trails are defined and implemented and all documentation are physically available.	Full	<ul style="list-style-type: none"> ▶ Procedures for measurement, recording and archiving are confirmed as complying with the monitoring plan of the PDD and Monitoring Manual.
4. Identification and maintenance of key process parameters		
4.1 Identification of key parameters The key physical process parameters that are critical for the determination of GHG emissions (e.g. meters, sampling methods) are identified.	Partial	<ul style="list-style-type: none"> ▶ The key parameters for the determination of GHG emissions are the amount of electricity exported and imported measured by calibrated meters. ▶ To be checked the detail data for the transmission loss calculation. ▶ Clarification Request 3 (Same as Table.1 G.6.) The parameters for transmission loss calculation should be indicated with the evidences (resistance and distance etc.).

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
<p>4.2 Calibration/maintenance Appropriate calibration/maintenance requirements are determined.</p>	Partial	<p>► The verification team confirmed that the calibrations of meters for export and import were conducted in accordance with the Monitoring Plan in the PDD. Refer to Initial Verification checklist C.3., C.5.</p> <p>Calibration record</p> <p>[KPX meter]</p> <p>A and B line : (Main meter) Serial No.: 46026112 Date 10.09.2008 (Sub-meter) Serial No.: 46026111 Date 10.09.2008</p> <p>C and D line : (Main meter) Serial No.: 46026114 Date 10.09.2008 (Sub-meter) Serial No.: 46026113 Date 10.09.2008</p> <p>[KEPCO meter]</p> <p>A and B line : (Main meter) Serial No.: 0067477 Date 10.09.2008 C and D line : (Main meter) Serial No.: 0067467 Date 10.09.2008</p> <p>► <u>Corrective Action Request 2</u> (Same as Table.1 C.5.)</p> <p>It is stipulated in the PDD that regarding sealing of the meters shall be performed regularly every two years after the installation. However the accuracy class 0.5S meters are actually calibrated after 3.5 years after the installation according to the regulation. So the description of the PDD shall be modified appropriately..</p>
5. GHG Calculations		

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
<p>5.1 Use of estimates and default data</p> <p>Where estimates or default data are used, these are validated and periodically evaluated to ensure their ongoing appropriateness and accuracy, particularly following changes to circumstances, equipment etc. The validation and periodic evaluation of this is documented.</p>	Partial	<ul style="list-style-type: none"> ▶ The emission factor was calculated and fixed during the validation stage as a weighted sum of the OM(3 years vintage data) and BM emission factors based on the ACM0002 by using the data from KEPCO and IPCC default values as described in the PDD. The current circumstances do not necessitate evaluation of the factor. ▶ <u>Corrective Action Request 3</u> (Same as Table.1 C.4.) The accuracy of meters for monitoring electricity is 0.5S, while the accuracy of the meters described in the registered PDD is 0.2S. So the difference of the accuracy class occurs the errors of electricity amount. And CER is to be deducted the amount of errors.
<p>5.2 Guidance on checks and reviews</p> <p>Guidance is provided on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented. This includes spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.</p>	Full	<ul style="list-style-type: none"> ▶ Reporting procedures have been already established in the Monitoring plan in the PDD. ▶ The name of the person/organization of preparation and approval of the Monitoring Report is clearly indicated in the Monitoring Manual.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
<p>5.3 Internal verification</p> <p>Internal verifications include the GHG data management systems, to ensure consistent application of calculation methods.</p>	Full	<ul style="list-style-type: none"> ▶ The internal verification system is established and documented in the Monitoring Manual (Collecting data in Monitoring report). ▶ The collected data is used when monitoring verification is carried out. The collected data is as follows <ol style="list-style-type: none"> 1) Final PDD of Taegisan Wind Power Project) 2) CDM Monitoring Manual 3) Calibration record of measuring meter 4) Relevant emergency plans 5) Record on situation related increase and decrease of electricity generated 6) Data of electricity generated and imported 7) Receipt of electricity generated and imported 8) Training plan and record 9) Any other relevant evidences and document <p>The verification team confirmed that the collected data were verified properly.</p>
<p>5.4 Internal validation</p> <p>Data reported from internal departments should be validated visibly (by signature or electronically) by an employee who is able to assess the accuracy and completeness of the data. Supporting information on the data limitations, problems should also be included in the data trail.</p>	Partial	<ul style="list-style-type: none"> ▶ The verification team confirmed that the collected data was reported visibly by paper and checked by the responsible persons with signatures in accordance with the established procedures. ▶ The name of the person/organization of preparation and approval of the Monitoring Report is clearly indicated in the Monitoring Manual.
<p>5.5 Data protection measures</p> <p>Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).</p>	Full	<ul style="list-style-type: none"> ▶ The key parameters are being measured and recorded in the respective documents / registers in paper and electronic form. ▶ The monitored data in the form of paper documents are archived in the company office.
<p>5.6 IT systems</p> <p>IT systems used for GHG monitoring and reporting should be tested and documented.</p>	Full	<ul style="list-style-type: none"> ▶ Ditto

Table 2-2: GHG calculation procedures and management control testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
<p>Potential reporting risks based on an assessment of the emission estimation procedures can be expected to occur in the following field of action.</p> <ul style="list-style-type: none"> ➤ Raw data collection ➤ Reports/ database from which data is obtained ➤ Calculation methods <p>Key source data applicable to the project assessed are hereby:</p> <ul style="list-style-type: none"> ➤ Metering records (for electricity production) ➤ Accounting records (for electricity consumed) <p>Appropriate calibration and maintenance of equipment resulting in a high accuracy of data supplied should be in place.</p> <p>It is hereby needed to focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may includes:</p> <ul style="list-style-type: none"> ➤ Manual transfer of data ➤ Unclear origins of data ➤ Accuracy due to technological limitations 	<p>Regarding the potential reporting risks identified in the left column, following mitigation measures are observed during the document review and the on-site assessment.</p> <ul style="list-style-type: none"> ▶ The amount of electricity transmitted to the grid is measured automatically by the KPX meter, and simultaneously transferred to Taegisan central control system. The data are collected and archived electronically, and Taegisan always compares the data with those of KPX shown on its website. The amount of electricity consumed in the project site is daily checked by reading the KEPCO meter and is compared monthly with the KEPCO's invoice ▶ If the two variables are different, internal investigation and corrective actions are taken in accordance with the established Monitoring plan. ▶ The electricity measuring meters were installed, calibrated and sealed in accordance with the regulations and they were calibrated after the installation as frequently as required by the description of the PDD.. 	<p>(1) The procedures for the CDM Business operation including the competencies and responsibilities for each function have not been clearly defined and documented.</p> <p>(2) The both meters of export and import electricity were set at the project site located approx. 33 km away from the grid substation.</p>

Table 2-3: Detailed audit testing of residual risk areas and random testing

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
(1) The procedures for the CDM Business operation including the competencies and responsibilities for each function have not been clearly defined and documented.	The verification team confirmed in the on-site assessment that the competencies needed to each function were not stipulated in the Monitoring Manual, and the trainings have not been implemented considering the competencies needed.	Having investigated the residual risks (1), the verification team comes to the following conclusion. The following open issues have been identified. ► <u>Clarification Request 2</u> The competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, qualification, etc. The personnel training should be conducted considering the competencies needed.
(2) The both meters of export and import electricity were set at the project site located approx. 33 km away from the grid substation.	The verification team considers that the interface between the project and the grid is at the grid substation and the electricity transmitted to the grid should be monitored at the substation in principle, and the present situation has the risk of overestimation of the net amount of electricity transmitted to the grid considering the transmission loss between the project site and the substation.	Having investigated the residual risks (2), the verification team comes to the following conclusion. The following open issues have been identified. ► <u>Clarification Request 3</u> The parameters for transmission loss calculation should be indicated with the evidences (resistance and distance etc.).

Table 2-4: Resolution of Corrective Action and Forward Action Requests

Draft report clarifications and forward action request by audit team	Ref. to check-list Table 1 to 2-3	Summary of project owner response	Audit team conclusion
<p><u>Corrective Action Request 1</u></p> <p>It is stipulated in the PDD (B7.1) that the equipment must use the main metering equipment that has allowable error of $\pm 0.2\%$. However the accuracy class 0.5S meters was actually installed. So the description of the PDD (B7.) shall be modified appropriately</p>	<p>Table.1 C.3 C.4.</p> <p>Table.2-1 2.2</p>	<p>When PP planed the project, the electricity generated is transferred to the grid through one line. Therefore, accuracy of meters is planed as $\pm 0.2\%$ in accordance with Act on operation of electricity market. But while PP was discussing about project design, PP was decided that the electricity generated is transferred to the grid through two lines each with 20MW after PDD was finished. As a result, the meters were installed with accuracy of $\pm 0.5\%$ in accordance with Act on operation of electricity market.</p> <p>In addition, the right to choice accuracy of meters belongs to KPX so the meter was installed by KPX (Korea Power Exchange) in accordance with Act on operation of electricity market.</p> <p>The monitoring plan of the PDD was revised. The procedure of the revision is according to the decision of EB 49, Annex 28.</p>	<p>Based on this revision, request for revision of the monitoring plan was submitted on 21 January 2011 by the verifier and this revision was approved by the CDM EB on 30 March 2011.</p> <p>OK. CAR1 was resolved.</p>
<p><u>Corrective Action Request 2</u></p> <p>It is stipulated in the PDD that regarding sealing of the meters shall be performed regularly every two years after the installation. However the accuracy class 0.5S meters are actually calibrated after 3.5 years after the installation according to the regulation. So the description of the PDD shall be modified appropriately.</p>	<p>Table.1 C.5.</p> <p>Table.2-1 2.2 4.2</p>	<p>In the PDD, Frequency of meter calibration is every two year. But Korea regulation was amended in December 2007. Therefore, monitoring plan needs to be revised to meet regulation in Korea. It complies with the methodology (ACM0002 ver.07). In the methodology, it is specified that all measurements should be conducted with calibrated measurement equipment according to relevant industry standards. For the project, a relevant industry standard is "Act on operation of electricity market July, 2010".and "Law regarding measurement"</p> <p>The monitoring plan of the PDD was revised. The procedure of the revision is according to the decision of EB 49, Annex 28.</p>	<p>Ditto</p> <p>OK. CAR2 was resolved.</p>

Verification Checklist of Taegisan Wind Power Project

<p><u>Corrective Action Request 3</u></p> <p>The accuracy of meters for monitoring electricity is 0.5S, while the accuracy of the meters described in the registered PDD is 0.2S. So the difference of the accuracy class occurs the errors of electricity amount. And CER is to be deducted the amount of errors.</p>	<p>Table.1 C.4.</p> <p>Table.2-1 5.1</p>	<p>The accuracy of meter for monitoring electricity is 0.5s(the maximum error for the meter is 0.5%), while the accuracy of the meter described in the registered PDD is 0.2s(0.2% as maximum error). Therefore, corrections are conducted based on the accuracy level of the meters.</p> <p>The Monitoring Report was revised.</p>	<p>Verification team confirmed that the correction was conducted and described in the Monitoring Report.</p> <p>OK. CAR3 was resolved.</p>
<p><u>Clarification Request 1</u></p> <p>It is stipulated in the PDD that the generators (20 units) will be installed into two groups in Hoengseon-gun for 9 units and in Pyeongchang-gun 11units.However, the generators are actually installed into 4 groups and connected by 2 lines to the grid substation.. So the description of the Monitoring Report should be stipulated appropriately.</p>	<p>Table.1 C.2.</p>	<p>The revised Monitoring Report (outline of the project) dated 27 May 2011 (version 1.2) was submitted to the DOE.</p>	<p>OK</p>
<p><u>Clarification Request 2</u></p> <p>The competencies needed for the CDM activities should be analysed with respect to each function and stipulated in the CDM Monitoring Manual, taking into consideration the education, work experience, qualification, etc. The personnel training should be conducted considering the competencies needed.</p>	<p>Table.1 C.9</p> <p>C.10.</p> <p>G.2.</p> <p>Table.2-1 1.3</p> <p>Table.2-3 (1)</p>	<p>The Monitoring Manual (Organization for Monitoring) was revised properly.</p> <p>The revised Monitoring Manual (version 1.3) dated 12 May, 2011 was submitted to the DOE.</p>	<p>OK</p>
<p><u>Clarification Request 3</u></p> <p>The parameters for transmission loss calculation should be indicated with the evidences (resistance and distance etc.)..</p>	<p>Table.1 G.6.</p> <p>Table.2-1 4.1.</p> <p>5.1.</p> <p>Table.2-3 (2)</p>	<p>The evidences of transmission lines were submitted to the DOE.</p> <p>The distance between the substation and the project site is 33 km.</p> <p>The transmission cables' specification was explained in the impedance map.</p>	<p>OK</p>