



VALIDATION REPORT

TAEGISAN WIND POWER PROJECT


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KOREAN FOUNDATION FOR QUALITY



VALIDATION REPORT

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Approved by: Oh Chang Kwon Director of R&D Division 		Organisational unit: Korean Foundation for Quality (KFQ)	
Client: RCC(Response to Climate Change)		Client ref.: Seung Jae, Moon	

Summary:

Project Title : Taegisan Wind Power Project

Investor Country : Japan

Host Country : South Korea

Project Participants : POSCO Engineering and Construction Co., Ltd, Eurus Energy Japan

Applied Methodology(ver) : ACM 0002 (Version 07)

Sectoral Scope : 1-Energy Industries: Renewable Electricity Generation for a grid

Crediting Period : 10 years


Estimated GHG Emission Reduction: 59,669 ton CO₂ per year.

Project Size : Large Scale

Validation Report Status

☐ CAR/CL Requested
☐ Before DNA approval
☐ Resolution of Outstanding issues
☒ Full approval and submission for registration

As the result of the validation, it can be confirmed that the Taegisan Wind Power Project, as described in the revised PDD version 5 of 20 February 2009, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baselines and monitoring methodology ACM 0002(Ver.07). KFQ thus requests the registration of the project as a CDM project activity.

Work carried out by : Yu Shim JEONG (Audit team Leader, GHG auditor) Jin Pyoung AN(Audit team member, GHG auditor) Mi Jung LEE(Audit team member, Observer)	Work Verified by :  Jong Mun PARK
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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide Equivalent
DNA	Designated National Authority
GHG	Greenhouse gas(es)
KEPCO	Korea Electric Power Company
KPX	Korea Power Exchange Company
KFQ	Korean Foundation for Quality
MoV	Means of verification
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change

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1 INTRODUCTION

Korean Foundation for Quality (KFQ) has been engaged by RCC to perform a validation of the ‘Taegisan Wind Power Project’ in Korea. This validation report summarizes the findings of the validation of the project, performed on the basis of UNFCCC and host party’s criteria for CDM project, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

All the validation team’s conclusion and opinion on this project activity are made the PDD of version 05, 20 February 2009, as a basis. Final PDD has followed the structure and guidance in the latest relevant PDD template (CDM-PDD, Ver 03.2) and the ‘Guidelines for Completing the Project Design Document (CDM-PDD, Ver 06.2) for Large Scale CDM project.

The Project is classified with sectoral scope 1- Energy Industries (Renewable Electricity: Generation for a grid) and the wind farm is located on Taegi Mountain area in Hoengseong –gun and Pyeongchang-gun of Gangwon Province area. The Project consists of 20 wind turbines and turbine type is V-80-2.0MW from VESTAS in Denmark which has a capacity of 2.0 MW generating 92,856 MWh annually.

The expected CO₂ reduction is estimated to be 59,669 tCO₂e per year and 596,690 tCO₂e over the 10 year crediting period.

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP), and the project’s compliance with relevant UNFCCC and host countries criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).



1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD), the project's baseline study, monitoring plan and other relevant documents. The information in these documents is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed on the Marrakech Accords and the relevant decisions by the CDM Executive Board including the approved baseline and monitoring methodology. KFQ has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation 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.

1.3 Validation Team

The validation team consisted as follows:

Yu Shim JEONG (Audit team leader, GHG auditor)

Jin Pyoung AN (Audit team member, GHG auditor)

Mi Jung LEE (Audit team member, Observer)

The qualification of each individual validation team member is detailed in Appendix B to this report.

2 METHODOLOGY

The validation consists of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III The resolution of outstanding issues and the issuance of the final validation report and opinion.



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

- It organizes details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1. The completed validation protocol for the Taegisan Wind Power Project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfillment of project objectives is identified. Corrective Action Requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification (CL) is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

The validation team has assessed the proposed CAR with a positive result and after the closure of these CAR and CL the proponent has issued the final version of the PDD. On the basis of this the final validation report and opinion were issued.

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Validation Protocol Table 1: Mandatory Requirements for Clean Development Mechanism Project Activity			
Requirement	Reference	Conclusion	Cross reference/Comment
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>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 Validation report.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in five different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation Protocol Tables



2.1 Desk review of the Documents

The Project Design Document (PDD) version 01 was submitted 20 March 2008 and reviewed with additional background documents related to the project design including baseline and additionality of the project.

A complete list of all documents and proofs reviewed is listed in section 6, Reference, to this report.

Furthermore,

Main changes between the versions published for the 30 days stakeholders commenting period and the final version submitted for registration:

- Changes related to the CARs and CLs identified in the KFQ's draft validation report
- Change of Starting date of the Crediting period considering 8 weeks before requesting for registration
- Reflect PP and DOE's response to request for registration incomplete by EB

2.2 Follow-up Interviews with Project Stakeholders

In the period of 28 April 2008 to 30 April, KFQ performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Posco E&C and Eurus Japan - Byung Hun Lee - Sang Youl Lee - Kenji Kamei - Sung Nam Oh	➤ Project design ➤ Project technology, operation, maintenance ➤ Sustainable development issues ➤ Monitoring plan ➤ Environmental impacts(incl. EIA approval) ➤ Stakeholder consultation process
RCC - Seung Jae Moon - Jung A Kim	➤ Applicability of selected methodology ➤ Baseline determination ➤ Additionality ➤ Emission reductions calculation ➤ Crediting Period ➤ Approval by the host country
Hoengseong –Gun and Pyungchang-Gun Country Office - Jae Ho Park - Byung Dae Min - Byung Hee Son	➤ Environmental issues ➤ Stakeholder comments ➤ Sustainable development issues
Village chief - Ok Song Seo	➤ Environmental issues ➤ Stakeholder comments ➤ Sustainable development issues

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve any outstanding issues which need to be clarified prior to KFQ's positive conclusion on the project design. In order to guarantee the transparency of the validation process, the concerns raised by KFQ and responses provided by project participant are documented in Table 3 of the validation protocol in Appendix A.

For this project, nine Corrective Action Requests (CAR) and nine requests for Clarification (CL) were identified. These requests were presented to the project participant in a draft validation report in 25 July 2008. The additional information provided by the project participant to address theses requests and revised PDD of 20 February 2009 resolved the all Corrective Action Request and requests for Clarification to KFQ's entire satisfaction.

2.4 Internal Quality Control

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

3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

3.1 Participation Requirements

Korea has ratified the Kyoto Protocol and meets all participation requirements. The DNA of Korea has established clear CDM approval procedures, which include a thorough assessment of the project's capacity to reduce GHG emission, its alignment with Korean law, its environmental legislation and its sustainable development policies and approval of projects participants in the project activity.

The DNA of the Japan also has issued a Letter of Approval on 3 July 2008 and the DNA of the Republic of Korea has also issued a Letter of Approval on 8 October 2008, authorizing POSCO E&C and EURUS ENERGY JAPAN as a project participants and has provided confirmation that the project assists in achieving sustainable development.

Nevertheless, CAR 1 had to be raised in the course of the validation and was successfully closed (ref Annex: Validation Protocol- Table 3).

3.2 Project Design

The Taegisan Wind Power Project sites are located on Taegi Mountain both in Hoengseong-gun and Pyungchang-gun of the Gangwon Province. The Project consists of 20 wind turbines and



turbine type is V80-2MW wind turbine from VESTAS which has a capacity of 2 MW generating 92,856 MWh annually. The expected CO₂ reduction is estimated to be 59,669 tCO₂e per year and 596,690 tCO₂e over the 10 year crediting period.

All the description of the project as contained in the PDD was identified through objective evidence such as information in the website of wind turbine provider, VESTAS, report of preliminary Environmental Assessment and documents of permission of this project activity.

The considered project can be classified with Sectoral Scope 1-Energy Industries (Renewable Electricity: Generation for a grid). The wind park is connected to the grid owned by Korea Electric Power Company (KEPCO) and the project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO₂ emissions from electricity generation mainly by fossil fuel power plants.

Starting date of the project activity is 12 March 2007 which is the date of equipment purchase contract between POSCO E&C and equipment provider. KFQ confirmed that this starting date is the earliest date at which either the implementation of construction or real action of a project activity begins.

Expected operational lifetime of the project activity is 20 years and a fixed crediting period of 10 years has been chosen for the project, starting from February 1, 2009 or the date of CDM registration, whichever takes place latter.

The funding for the project does not lead to a diversion of official development assistance as according to the information obtained by the validation team. Financing of this project activity is planed through the Capital from project participants and commercial lending.

Nevertheless, CAR 2, CAR 3 and CL 9 had to be raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

3.3 Baseline Determination

The project applies the approved baseline and monitoring methodology ACM 0002_version 07: Consolidated baseline methodology for grid-connected electricity generation from renewable sources. The use of this methodology is appropriate as the project activity involves electricity capacity additions through wind sources.

The applied baseline methodology is justified as it has been demonstrated that the ‘Taegisan Wind Power Project’ ensures that:

- It is grid connected zero emission renewable power generation activity from wind energy as this project activity is operating through wind source and generated electricity is delivered to Korean Electricity System. Latter facts are identified by Ministry of Knowledge Economy (MKE) approval of electricity work.
 - The project does not involve switching from fossil fuel to renewable energy at the project site as this proposed project activity is Greenfield project activity.
 - The geographical and system boundaries for the relevant electricity grid are clearly defined and information on the characteristics is available.
- : According to ACM 0002(Version 07), the spatial extent of the project boundary includes the project site and is physically connected to the electricity system of Korea Electricity system of Korea Electric Power Corporation (KEPCO). The defined project boundary is in line with ACM 0002. Data and information on the KEPCO are available by the KEPCO Statistics of Electric Power in Korea.

Thus, electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the Combined Margin (CM) calculated latter.

For calculation of Operating Margin, dispatch data analysis should be first choice according to ACM 0002 currently. But dispatch data analysis cannot be used because of an availability data. Therefore simple OM method is chosen. The choice for simple OM is justified since low-const/run resources constitute 42.63% which is less than 50% of the total grid generation in average of the five most recent years.

To calculate the Build Margin emission, there are two different options to choose. Based on forecast for the electricity composition in the source energy, in vase on fossil fuel, the capacity is expected not to fluctuate during the crediting period. From this consideration, option I, calculate the Build Margin emission factor ex-ante based on the most recent information available on plants for sample group m at the time of PDD submission, is selected for this project. For sample group m, the power plant capacity additions in the electricity system that comprise 20% of the system generation(in MWh) and that is selected since this group has larger annual generation(20.35%) than five plants that have been built recently(0.01%).

According to ACM 0002, the default of W_{OM} and W_{BM} are applied in CM calculation as follows, W_{OM} : 0.75 and W_{BM} : 0.25 . The Combined Margin is fixed ex-ante for the entire crediting period and thus, this emission factor will not need to be monitored.

Validation team has confirmed that the application, discussion and determination of the chosen baseline methodology are transparent and reasonable and baseline for this project activity is reasonably determined by validating the key assumption, calculations and rationales used in the PDD by checking the documents and sources referred to in the PDD.

Nevertheless, CAR 4, CAR 5, CL2, CL3, CL 4 and CL5 had to be raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

3.4 Additionality

As starting date of this project activity, 12 March 2007 is before the date of validation, validation team had assessed the evidences that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. The consideration of CDM benefits prior to the starting date of the project activity has been found in Board of Director meeting minute and agreements for Joint Development of PPs.

- On 26 December 2006, Each board of Director of POSCO E&C and Eurus Energy Japan approved investment in and promotion of this project on condition of CDM after reviewing the Executive Summary of the project which include analysis result for the revenue from this project with CDM and without CDM.
- Before this decision, the project participants also made agreement for Joint Development Business (30 November, 2005) and Joint Development Contract (3 February 2006) for wind power projects considering CDM.

Finally the validation team could reach to the conclusion that the incentive from CDM was seriously considered in the course of decision to proceed the project activity prior to starting date.

Also starting date of the project activity is the date of equipment purchase contract and it had been selected as the earliest date at which either the implementation or construction or real action of a project activity begins

PP has demonstrated and assessed additionality by applying the 'Tool for the demonstration and assessment of additionality' version 04 approved by the CDM Executive Board.

- Step 1. Identification of alternatives to the project activity consistent with current laws and regulations:
 - Sub-step 1a) Define alternatives to the project activity
Considering the back ground of the investor, the technology and circumstances, the only realistic alternatives are
 - ① the proposed project is not undertaken as CDM project activity
 - ② Construction of a power plant using other source of renewable energy with equivalent amount of installed capacity or equivalent amount of annual electricity output
 - ③ Supply of equivalent annual power output by the Grid where the proposed project is connected
 - Sub-step 1b) Consistency with mandatory laws and regulations
Identified alternative scenarios to the project activity that are in compliance with mandatory legislation and regulation taking into account the enforcement in the region of country and EB decisions* on national and/or sectoral policies and regulations. Selected alternative is in line with applicable legislation, regulations and EB decisions.

Besides wind farm project such as solar, geothermal power and biomass generation could be considered as grid-connected zero-emission renewable power generation activities. However the second alternative cannot be considered due to lack of exploitable hydro resource and topographically, wave and tidal source in the proposed project site.

And, the third alternative is determined as the baseline scenario of proposed project activity in the above 3.3.

The validation team concluded the identification of alternatives to the project activity is complete

Thus, PP has been demonstrated the additionality for the first alternative according to following steps, step 2~ step 4.

* According to EB 16th meeting report, this project activity is applied to Type E-'national and/or sectoral policies or regulations that have been implemented since the adoption by the COP of the CDM M&P may not be taken into account in developing a baseline scenario and this analysis is performed based on this hypothetical situation without regarding the 'Alternative Energy Development Promotion Act amended on March 2002'.

- Step 2. Investment Analysis

Taegisan Wind Power Project contains income other than CERs. Therefore Option I (Apply simple cost analysis) can not be selected since the project activity generates revenues other than CDM related income. Thus the project participant has chosen option III, benchmark analysis.

- Sub step 2b) Option III: Apply benchmark analysis

The benchmark analysis option has been adopted for the project activity as it generates revenues by the sale of power to the grid and Project IRR has been selected as the financial indicator. According to the 'Tool for the demonstration and assessment of additionality', 5.23% is selected as benchmark rate. This benchmark rate is decided based on lending rates, 3 Months CD rate + 0.6(risk premium) from the 2 commercial banks. 3 Months CD rate of second half of the year 2006 (2006.07.01~2006.12.15) was 4.63. KFQ examined the 'Loan Agreement from bank' regarding to the proposed project and CD rate in 2006 through public authority, KSDABOND. KFQ also found the CD rate have been increasing in Korea recently. Thus KFQ confirmed the selected benchmark rate is reasonable and appropriate for this project

- Sub step 2c) Calculation and comparison of financial indicator

All input values from the investment analysis report provided by project proponent has been validated by KFQ to confirm the validity and applicability at the time of the investment decision as followings.

KFQ reviewed the input values in:

- GSP PDD, and IAR (Investment Analysis Report)
- The FSR (Feasibility Study Report) that was presented in the board meeting and investment decision was formally taken based on this report.

Input vales in these documents are slightly different.

① Electricity generation: 92,856 MWh/yr (Load Factor: 26.5%)

The values from the FSR (95,897 MWh/yr) is slightly less than the value in PDD (98,099 MWh/yr). During on-site assessment, the PP did not demonstrate how 98,099 MWh/yr is estimated and why this value is applied.

In the course of corrective action process, PP selected 92,856 MWh/yr ($P=75\%$, Load factor= 26.5%) which is from the objective source, 'Taegisan Wind Farm Wind Resource and Energy Assessment (Jan. 2007), issued by 3rd party expertise company, PB Power, as project investor would or not decide to proceed with the project again before starting construction or commitment to big expenditure. Thus, we examined the value could get before starting date (12 March 2007) and assessed load factor(about $20\%\sim 27\%$) in similar projects in Korea.

After our examination, KFQ got a conclusion that this value is valid and applicable at the time of investment decision under comprehensive understanding of starting date and additionality.

② Investment cost: 82,295 Million KRW

Investment cost in FSR (86,069 Million KRW) is much bigger than the value in IAR (82,295 Million KRW). Thus, KFQ assessed validity of these two values by crosschecking with other similar projects and examined more documents such as Term loan agreement and EPC contract, etc. Validation team concluded that investment cost in IAR is more valid and applicable rather than value in FSR.

③ O&M Cost: 2.26% of total investment cost

The value in FSR (2,611.80 Million KRW) is much bigger than the value in IAR. Thus KFQ assessed validity of these two values by crosschecking with other similar projects and comparing the portion of O&M Cost (2.5% of total investment cost) with reference provided by Renewable energy center (<http://www.energy.or.kr>) in KEMCO. Additionally, validation team examined more documents such as Insurance proposal document from insurance company, general employ circumstances in the wind power plant Co. and maintenance & repair proposal document provided by equipment supplier, etc. We found that O&M Cost in FAR is overestimated as compared to other similar projects in Korea, and O&M Cost in EAR is below the reference. Thus, KFQ concluded that O&M Cost in the IAR is valid and also applicable even at the time of investment decision.

④ Tariff: 75.69 KRW/kWh

Tariff is different in two time points, 75.69 KRW/kWh in FSR and 79.47 KRW/kWh in GSP PDD. During on-site assessment, validation team found that the PP estimated electricity tariff at the time of PDD writing.

KFQ assessed the value in the FSR examining statistics provided by KPX (<http://epsis.kpx.or.kr>) to check its validity. KFQ confirmed that 75.69 KRW/kWh is almost same as KPX statistic, thus this value is estimated appropriately in the context of investment decision timing.

⑤ Period of assessment: 20 years

FSR was done for 20 years due to expected operation life of the proposed project activity is 20 years. After examining relevant standard such as IEC 61400 and considering other similar project's operational life time, KFQ concluded that period of assessment is valid.

The calculation is correct and all input values in investment analysis have been applied consistently.

- Sub step 2d) Sensitivity Analysis

A sensitivity analysis has also been conducted on the IRR like below parameters,

- : Total investment ($\pm 10\%$)
- : Electricity Sales Price ($\pm 20\%$)
- : O&M Cost ($\pm 10\%$)
- : Electricity Generation ($\pm 10\%$)

According to 'Guidance on the Assessment of Investment Analysis (Ver 02)', KFQ concluded the selection of parameters for sensitivity analysis is complete as there is no parameter except above 4 parameters constituting more than 20% of either total project costs or total project revenues.

The variation range of investment cost and O&M Cost were assessed by considering the fluctuation of past exchange rate, Korea's economic growth rate from 2003 to 2006 and EB guidance. The EB guidance recommended that sensitivity analysis should at least cover a range of +10 and -10% unless this is not deemed appropriate in the context of the specific project circumstances. Therefore, KFQ concluded that $\pm 10\%$ of



applied variation range for these two parameters is suitable for the proposed project activity.

As for Electricity tariff, KFQ analyzed past variation for 4yrs based on statistics from KPX (<http://epsis.kpx.or.kr>). Annual average of rising trend during last 4 years was less than 10%. Therefore $\pm 20\%$ of variation range of electricity sale prices applied is suitable for the proposed project.

The variation of electricity generation is assessed considering Load factors with each probability in wind power plants by PB Power and in similar wind power project in Korea. We concluded the applied $\pm 10\%$ range is reasonable.

KFQ confirmed that IRRs of the project activity with the applied range of parameters are all lower than benchmark rate even considering those circumstances which could bring various variations.

Thus, the sensitivity analysis result consistently support the conclusion that proposed project activity is unlikely to be financially attractive.

In summary, KFQ checked the applied values thoroughly based on its local and sectoral expertise.

Based on KFQ's careful assessment, KFQ concluded the input values for investment analysis are appear to be valid at the time of investment decision was made. Suitable variation range for each parameter is applied for Sensitivity analysis.

Based on the data in investment analysis report, the project IRR without CER revenues has been assessed to be 2.3% which is well below than the benchmark rate, 5.23%. This shows that the project is not financially attractive in the absence of CDM benefits. Considering of the CERs sales revenues, the IRR of total investment of the project will be significantly increased from 3.9% with 10 EURO/t CO₂ and to 5.4% with 20 Euro/t CO₂.

- Step 4. Common Practice Analysis
 - Sub step 4a) Analysis other activities similar to the proposed project activity
- In Korea, wind power plants were started do be constructed in high gear since the end of 2003 due to development of the wind power technologies and policy of Korean

Government. Despite of national policy, ‘Alternative Energy Development Promotion Act’ total electricity generation (238,911 MWh) by wind power occupies 0.07% according to the official statistics provided by KEMCO. Also, small scale wind power facilities with capacity of 1KW ~ 750KW had been established until 2003 and MW scale facilities were started to establish since 2004.

- Sub step 4b: Discussion any similar options that are occurring
On technology being used, scale, regulatory framework and region etc, there are only 2 similar ones would be the Gangwon Wind Park (98MW) and the Youngduk Wind Park (39.6MW), and these projects are registered as CDM project in UNFCCC.

KFQ Validation team has confirmed this project activity is not a common practice in Korea through checking official sources applied in common practice analysis result,

Finally, we can state that the proposed project activity is additional as it would not have happened in the absence of CDM based on the available information.

Nevertheless, CAR 4, CAR 6, CAR 7 and CAR 8 had to be raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

3.5 Monitoring Plan

The monitoring methodology is in line with the approved monitoring methodology, ACM 0002_Ver.07 – Consolidated baseline methodology for grid-connected electricity generation from renewable sources. The selected monitoring methodology is applicable for the project activity as it involves grid-connected renewable power generation using wind energy.

The methodology is appropriate for the project activity because:

- there is suitable capacity for addition of electricity coming from wind sources
- there is sufficient and clear information given to identify the geographic and system boundaries for the relevant electricity grid in which the project activity is to be developed
- Data to calculate project emissions is obtainable

Information that needs to be monitored shall include the electricity generation from the proposed project activity, as mentioned above, measured automatically by the established meters. Electricity losses related to transportation, beyond those to the meter, shall not be considered

since they would be common to any power plant operating within the project boundaries.

The received electricity as a driving force for starting the operation and in emergencies will be measured by electric power meter. Electricity supplied by the project activity to the grid means a net amount of electricity transmitted to the grid excluding electricity consumed in the plant and received from grid.

Electricity supplied by the project activity to the grid will be measured hourly and recorded monthly. Additionally, the amount of electricity consumed in the plant will be measured and the received electricity as a driving force for starting the operation and in emergencies will be measured by electricity power meter. Thus, EGy means a net amount of electricity transmitted to the grid excluding electricity consumed in the plant and received from grid. And the amount of electricity consumed in the plant and received from the grid will be deducted from the emission reduction of the proposed project according to the monitoring.

Taegisan Wind Power Co., Ltd has the overall authority and responsibility for the project management including monitoring of every parameter for the accounting of reduction amount and reporting.

PP has following procedures provided by VESTAS. And there is a plan to revise considering real situation after completion of construction.

- Responsibilities and Authorities for project management
- Operational and maintenance
- Calibration of electricity meter
- Emergency management, etc

KFQ validated through interview by project stakeholders and documented procedures provided by Project proponent. We confirmed that this monitoring plan is in accordance with ACM 0002, that net amount of electricity transmitted to the grid, the only monitoring parameter for the project is contained in the monitoring plan, and that the monitoring arrangements described in the PDD can be properly implemented.

Nevertheless, CAR 5, CL 6, CL7 and CL8 had to be raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

3.6 Calculation of GHG Emissions

According to ACM 0002 (Version 07), emission reduction is calculated as following equation:

$$ER_y = BE_y - PE_y - L = BE_y$$

- BE_y (t CO₂): Baseline Emissions
- PE_y : Project Emissions
 - No project emissions need to be considered, as the project activity is a renewable energy project
- L : Leakage
 - According to ACM 0002, no leakage has to be considered for the proposed project activity

Baseline emission is calculating as net electricity supplied by the project activity to the grid (EG_y in MWh) times baseline emissions factor (EF_y in ton CO₂/MWh).

First, Electricity supplied to the Korean grid by the project activity (EG_y) is expected approximately 92,856 MWh/yr. In estimation of electricity generation, expected capacity factor, 26.5%, is applied.

In relation to the capacity factor, validation team has checked the capacity factor which is estimated in transparent and conservative manner with documentary evidence submitted by PP. Validation team has checked the study data, 'Taegisan Wind Farm Wind Resource and Energy Assessment (9 January 2007)', for the uncertainty and probability of experience in net energy yield by certainty levels for 1, 10 and 20 year return periods. Capacity factor of 26.5% has been decided which is the value of the probability of experience in net energy yield for certainty levels of 75%. Validation team thus has reached to the conclusion that the capacity factor for proposed project activity is estimated reasonably and not be considered as overestimated.

Second, the baseline emissions factor (EF_y in the CO₂/MWh) is calculated through the following steps. OM (Operating Margin) and BM (Build Margin) are calculated by using the data from existing power plants that provide electricity with the current grid-connected electricity generation:

- OM is calculated to be 0.7281 ton CO₂/MWh.
- BM is calculated to be 0.3859 ton CO₂/MWh.
- CM is calculated to be 0.6426 ton CO₂/MWh and is fixed ex-ante for the entire crediting period and this emission factor which is not need to be monitored.



The 596,690 ton CO₂ is estimated as emission reduction over the crediting period of emission reduction. Validation team concluded that the GHG calculation is transparent and the amount of estimated emission reduction is reasonable. Also validation team confirmed that all the assumptions and data used by PP are considered reasonable and the methodology has been applied correctly to calculate baseline emission and emission reductions.

Nevertheless, CAR 4, CAR 5, CL6 and CL 7 had to be raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

3.7 Environmental Impacts

According to the provisions of Enforcement Decree of the Act on Impact Assessment on Environment, Traffic, and Disasters, etc, any plant facility whose power source is solar power, wind power or fuel cell which is more than 100,000kW shall be carried out EIA. As Taegisan Wind Power Project whose facility capacity is 40MW, it is not required to be performed EIA.

Instead, in compliance with government requirements as specified in the Framework Act on Environmental Policy, an environmental assessment was undertaken and approved by Environmental Ministry in March 2007, and documented in the report entitled Taegisan Wind Power Project Construction Preliminary Environmental Assessment Report (PERS).

The PERS covers the sectors of natural environment, residential environment, and social/economical environment. There are few facts to be considered such as 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 & air quality. Every effort has been made to take into account and respond to all recommendations made to the PER in the course of government approval.

As an example, in order to protect radio interference, transmission lines which go through rural communities will be constructed underground, thus there is no influence of magnetic field between project site and Pyungchang transformer substation.

The proposed project activity will not have significant impacts on the environment.



Nevertheless, CL 1 had to be raised in the course of the validation and is successfully closed (ref Annex: Validation Protocol- Table 3).

3.8 Comments by Local Stakeholders

To receive stockholder's comments related with the Taegisan Wind Power Project, project executor held several project presentations to the stakeholders and newspaper report.

Summary of comments received are shown below:

- Preservation of natural scenery and contribution on welfare of the local residents
- Preventive measures in the natural outline destruction of the mountain and installation of a new observation platform on the site for sightseeing
- Air pollution from the site due to dusts such as arsenic acid and noise from the generators
- Damage limitation against radio interference of the areas where transmission lines go through and preventive measures for flood for the electric poles in the area

KFQ validation team has looked through the public hearing minutes and interviewed local stakeholders and has found all participants in the public hearing were agreed and supported this project activity and, look for development of local economy.

Validation team confirmed that all relevant local stakeholders have been invited to consultation via appropriate media, the summary of comments received as provided in the PDD are appropriate, and due accounts was taken properly and described in the PDD well.

Nevertheless, CAR 9 had to be raised in the course of the validation and is successfully closed (ref Annex: Validation Protocol- Table 3).

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

Korean Foundation for Quality published the project documents on <http://cdm.unfccc.int/Projects/Validation> on 22 March 2008 and invited comments within 20 April 2008 by Parties, stakeholders and non-governmental organisations.

No comment was received.

5 VALIDATION OPINION

Korean Foundation for Quality (KFQ) has performed a validation of the 'Taegisan Wind Power Project' in Republic of Korea. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and subsequent decision by the CDM Executive Board.

The validation is based on the information made available to us and the engagement conditions. And it has provided KFQ with sufficient evidence to determine the fulfillment of stated criteria. The validation consisted of the following 3 phases : i) a desk review of the project design, the baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the Resolution of outstanding issues and the issuance of the final validation report and opinion.

The Parties involved meet the requirements to participate in the CDM. The DNAs from Republic of Korea and Japan have provided approval of voluntary participation in the project and confirmation that the project assists in achieving sustainable development.

The validation did not reveal any information that indicated that the project can be seen as a diversion of official development assistance (ODA) funding towards Korea.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions. Additionally the assessment team reviewed the estimation of the projected emission reductions.

We can confirm that the indicated amount of emission reductions of 596,690 ton CO₂ over a fixed crediting period of 10 years, resulting in a calculated annual average of 59,669 ton CO₂, represents a reasonable estimation using the assumptions given by the project documents.

The responsibilities and authorities of monitoring and maintenance are clearly defined and a detailed monitoring plan has been developed. There is no need to monitor the grid CO₂ emission



coefficient as it is fixed ex-ante for the selected 10 years crediting period.

In our opinion, the Taegisan Wind Power Project, as described in the revised PDD of 5 February 2009(version 05), meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM 0002_Version 07. Thus the 'Taegisan Wind Power Project' will hence be recommended by KFQ for registration as a CDM project to UNFCCC.

6 REFERENCES

Reference No.	Documentation and/or website	Remarks
1	Project Design Document for CDM project ‘ Taegisan Wind Power Project’ - Version 01: 15 January 2008 - Version 05: 20 February 2009	
2	Supporting Excel Spreadsheet on Emission Factor Calculation , RCC - Version 01: 22 March 2008 - Version 03: 04 November 2008	
3	Supporting Excel Spreadsheet on Investment Analysis Report, RCC - Version 01: 22 March 2008 - Version 03: 04 November 2008	
4	ACM 0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Ver. 07) Annex 12, Methodological Tool: Tool to calculate the emission factor for an electricity system (Ver. 01) Methodological Tool: Tool for the demonstration and assessment of additionalilty (Ver. 05) Annex 35, Guidance on the Assessment of Investment Analysis	
5	Annex I country DNA Approval, 3 July 2008 Host country DNA Approval, 8 October 2008	
6	Agreement for Joint Development Business(30 November, 2005), POSCO E&C/Eurus Energy Japan Corporation Joint Development Contract(3 February 2006), POSCO E&C/Eurus Energy Japan Corporation BOD Minutes of POSCO E&C, Eurus Energy Japan (26 December 2006)	
7	Permission of electricity work approval by MOCIE(MKE), 22 March 2007	
8	Taegisan Wind Farm Wind Resources and Energy Assessment(9 January 2007), PB Power	
9	History of the Taegisan Wind Power Project(22 April 2008), POSCO E&C	
10	Wind turbine purchase agreement(March 12, 2007), POSCO E&C and Vestech Japan Corporation	
11	Loan Agreement, SCFB, 26 March 2007	
12	http://www.ksdabond.or.kr	
13	Preliminary Environmental Assessment(January, 2007), Ministry of Knowledge Economy	
14	O&M Cost for wind power project in Korea, The renewable energy center in KEMCO (29.05.2006). http://www.energy.or.kr/	
15	2002~2006 Statistics of Electric Power in Korea(2003~2007), KEPCO	

Appendix A

Validation protocol for CDM project activities

Table 1. Mandatory Requirements for Clean Development Mechanism(CDM) Project Activity

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12. 2	OK	Table 2, B.7~B.9
2. The project shall assist non-Annex I Parties in achieving sustainable development and the project has obtained confirmation by the host country that the project assists in achieving sustainable development.	Kyoto Protocol Art. 12. 2/ CDM M&P40 a	NO OK	Table 2, A.3.3 DNA approval of host party, Republic of Korea, is not submitted to DOE from PP.
3. The project shall assist non-Annex 1 Parties in contributing to the ultimate objective of UNFCCC.	Kyoto Protocol Art. 12. 2	OK	Table 2, B.4.4
4. The project shall have written approval of voluntary participation from the designated national authorities of each party involved.	Kyoto Protocol Art. 12. 5a CDM M&P 40a	NO OK	Table2, A.3.3 The approval letters of Korea and Japan DNA have not been received.
5. The emission reductions shall be real, measurable and give long-term benefits to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK	Table 2, Section B.4
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity.	Kyoto Protocol Art. 12.5c /M&P 43	OK	Table 2, Section B.5
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	D 17/CP.7 CDM M&P Appendix B. 2	OK	The proposed project activity can not be seen as a diversion of ODA funding towards Korea from Japan.
8. Parties participating in the CDM shall be designated a national authority for the CDM.	CDM M&P 29	OK	The office for government policy coordination is DNA in Korea for CDM. And the DNA of Japan is Liaison Committee for the Utilization of the Kyoto Mechanism Ministry of Foreign Affairs.
9. The host party and the participating Annex I party shall be a Party to the Kyoto Protocol.	CDM M&P 30/31a	OK	Host party, Republic of Korea has ratified the Kyoto Protocol on 8 November 2002. Annex I party, Japan, ratified the Kyoto Protocol on 04 June 2002.

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10. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM M&P 31b	OK	For Japan's assigned amount is 94% of the emission level in 1990.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM M&P 31b	OK	The validation has not in detail assessed Japan compliance with article 5 and 7 of the Kyoto Protocol. The Japan has in place a national system for estimating GHG emissions and annually submits in most recent inventory to the UNFCCC.
12. Comments by local stakeholders are invited, a summary of these provided and how due account was taken of any comments received.	CDM M&P 37b	OK	Table 2, Section E
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts and considered significant by the project participants of the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM M&P 37c	OK	Table 2, Section D
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM M&P 37e	OK	Table 2, Section B.1.1 and B.8
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM M&P 37f	OK	Table 2, Section B.8
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 day, and the project design documents and comments have been made publicly available.	CDM M&P 40	OK	They were invited to provide comments through the CDM website during 30 days from 22 March to 20 April 2008. No comment was received.
17. A baseline shall be established in a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM M&P 45c,d	OK	Table 2, Section B.6.1

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18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity of due to force majeure.	CDM M&P 47	OK	Table 2, Section B.6
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM M&P Appendix B, EB Decision	NO OK	The CDM PDD templates shall not be modified or deleted. B.6.1 and B.7.1 are altered in line with the CDM PDD as these section was not along with template in CDM PDD version 03. CDM-PDD is in conformance with the UNFCCC CDM-PDD format version 3.

Table 2. Requirements Checklist

MoV =Means of Verification, DR=Document Review, I=Interview

Question	Ref.	MoV	Comments	Draft. Concl.	Final Concl.
A. General Description of Project Activity					
A.1 Title of the project activity					
A.1 1 Does the used project title clearly enable to identify the unique CDM activity?	PDD A.1	DR	Title of project activity is ‘Taegisan Wind Power Project’ which is titled with the name of the project location and the energy source of the project. Hence, it can be clearly identified.	OK	OK
A.1 2 Are there any indication concerning the revision number and the date of the revision?	PDD A.1	DR	The available PDD for document review and on-site assessment is indicated as version 01 and has been completed on 20 February 2009 as version 05.	OK	OK
A.2 Description of the project activity					
A.2 1 Is the description delivering a transparent overview of the project activities?	PDD A.2	DR, I	An overview of the project is described transparently in section A.2 of the PDD. Accordingly, the proposed project is a wind power project in Hoengseong-gun and Pyungchang-gun, Gangwon Province. The total installed capacity of the project is 40MW, consisting of twenty 2MW turbines.	OK	OK
A.2 2 What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	PDD	DR, I	During the on-site assessment numerous proofs for the described assumptions were evidenced. They are summarized in the information reference list to this report. The following data deliver evidence for this project activity: - Preliminary Environmental Assessment: January 2007 - Permission of electricity work by MKE: 22 March 2007	OK	OK

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A.2 3 Is all information presented consistent with details provided by further chapters of the PDD?	PDD	DR	The required data delivered in the PDD is consistent with the information provided by the proofs.	OK	OK
A.2 4 Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	PDD A.4.3	DR	Yes, there are no contradictions in the PDD.	OK	OK
A.2 5 Will the project create other environmental or social benefits than GHG emission reductions?	PDD A.2	DR,I	Yes, it is described in A.2 of the PDD. Specifically, the project gives following benefits than GHG emission reductions: - Increase employment opportunities - Enhances the local infra structure - Diversifies sources of electricity generation	OK	OK
A.2 6 Has the host country confirmed that the project assists it in achieving sustainable development?	PDD A.2	DR	No, Host Government Approval has not obtained. This document is a prerequisite for registration as per CDM Modalities and Procedures 40(a). Thus, voluntary participation of PP and assisting in achieving sustainable development by this project activity are not identified.	CAR 1	OK
A.3 Participation requirements					
A.3.1 Which Parties and project participants are participating in the project?	PDD A.3	DR, I	The following parties are involved on the project activity: - Host Party, Republic of Korea: POSCO Engineering and Construction Co., Ltd - Annex I Party, Japan: Eurus Energy Japan	OK	OK
A.3.2 Is all information in participants/ Parties provided in consistency with details provided by further chapters of the PDD (in particular Annex I)?	PDD A.3	DR, I	The information of both participants given in Annex I is consistent with the information in A.3 of PDD.	OK	OK
A.3.3 Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by and involved party?	PDD A.2	DR	This project is bilateral CDM since Republic of Korea and Japan are involved parties for this project activity. Project participants have not received the both party's DNA approval. Especially PP has not received the host country approval from DNA of Republic of Korea to as certain the project activity meets with the host country's sustainable development criteria. Refer A.2.6.	CAR 1	OK

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A.4. Technological description of project activity					
A.4.1 Location of the project activity					
A.4.1.1 Does the information provided on the location of the project activity allow for a clear identification of the site?	PDD A.4.4	DR, I	The geographical coordination of the project activity is given in PDD. However, full detail of the location of the project activity to identify geographical boundaries is not correctly described in the PDD. Hoeungseong-Gun of Gangwon Province is identified as location of the project activity in the PDD. But project activity has been implemented in Hoengseong-Gun as well as Pyungchang-Gun.	CAR 2	OK
A.4.1.2 How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (Ownership, Licenses, Contracts etc.)?	PDD A.4.3	DR,I	<p>The project has a capacity of 40MW, comprising 20 wind turbine generators to be put in operation. This will be physically connected to the electricity system of Korea Electric Power Corporation (KEPCO). Thus the power plant and the KEPCO are defined as the project's system boundary.</p> <p>A number of documents give evidence that the project proponents can implement the project at the given site.</p> <ul style="list-style-type: none"> - The approval of EIA - Permission on electricity work by MKE 	OK	OK
A.4.2 Type and category(ies) and technology/measure of the project activity					
A.4.2.1 To which category (ies) does the project activity belong to? Is the category correctly identified and indicated?	PDD A.4.2	DR	The capacity of the project is 40MW and the generated electricity by wind source is supplied to KEPCO grid. Hence this project activity belongs to sectoral scope 1: Energy Industries (Renewable Source)- Renewable Electricity Generation for a Grid.	OK	OK

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A.4.2.1 Does the project design engineering reflect current good practices?	PDD A.4.3	DR, I	<p>The project design engineering reflects current good practices. The project is located in mountain thus the wind turbine is designed to withstand the most demanding requirements found in wind farms located in mountainous sites. The angles of the blades are constantly regulated so they are always pitched at the optimal angel for current wind conditions. At higher wind speed, the pitch regulating system keeps the power at nominal, regardless of the air temperature and density. At lower wind speed, it optimizes the power output by selecting the optimal RPM and pitch angle.</p> <p>But operation data of wind turbine such as cut-in wind speed, 52m/s, is not correct to information provided by VESTAS's website (www.vestas.com). Also hub-height in the PDD is inconsistent with the information on VESTAS V80-2.0MW technical specification provided by PP during on-site assessment.</p>	CAR 3	OK
A.4.2.2 Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	PDD A.4.3	DR, I	<p>VESTAS V80-2.0MW wind turbines will be used which has already been installed around the world for large scale wind power generation. Therefore, better performance in generation from this project activity is expected.</p> <p>Also, the common practice for electricity generation is still coal-fired power plant. Thus, the project definitely would result in a better performance than the common practice.</p>	OK	OK
A.4.2.2 Does the project make provisions for meeting training and maintenance needs?	PDD A.4.3/ B.7.2	I	<p>The project participants have provisions for the training and maintenance needs before the operation of the project. And 2 weeks training program will be provided by equipment provider and persons in charge of operation and maintenance will attend the planned training program.</p>	OK	OK
A.4.3 Estimated amount of emission reductions over the chosen crediting period					
A.4.3.1 Is the form required for the indication of projected emission reductions correctly?	PDD A.4.4	DR	<p>The project emission reductions are shown in chapter A.4.4 of the PDD according to the guidelines.</p>	OK	OK
A.4.3.2 Are the figures provided consistent with other data presented in the PDD?	PDD	DR	<p>Yes, the figures provided consistent with other data presented in the PDD.</p>	OK	OK
A.4.4 Public funding of the project activity					

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A.4.4.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	PDD A.4.5	DR,I	According to the statement in A.4.5 of the PDD there is no public funding for the project activity.	OK	OK
A.5. Contribution to Sustainable Development					
A.5.1 Is the project in line with relevant legislation and plans in the host country?	PDD A.2	DR,I	Preliminary Environmental Assessment was undertaken in January 2007 and approved on March 2007 by government authority. During on-site assessment, influence on scenery, topography and geological feature, radiation of electromagnetism and ecosystem has been found as the comment raised in the course of PEA. These issues were all clearly resolved but this is not fully described in the PDD.	CL 1	OK
A.5.2 Is the project in line with host-country specific CDM requirements?	PDD A.2.6 A.3.3 A.3.4	DR,I	Approval letter of Korea DNA have not been submitted to DOE from PP.	CAR 1	OK
A.5.3 Is the project in line with sustainable development policies of the host country?	PDD A.2.6 A.3.3 A.3.4	DR,I	Refer to A.3.3.	CAR 1	OK
A.5.4 Is the applied version the most recent one and/or is this version still applicable?	PDD B.1	DR	Yes, It is the latest version when the PDD was prepared.	OK	OK
B. Application of a baseline and monitoring methodology					
B.1 Title and reference of the approved baseline and monitoring methodology applied to the project activity					
B.1.1 Are reference number, version number, and title of the baseline and monitoring methodology clearly indicated?	PDD B.4	DR	The project applies the approved methodology ACM 0002 Version 07. In spite of the ‘Tool for the demonstration and assessment of additionality (Ver 04), and the ‘Tool to calculate the emission factor for an electricity system(Ver 01)’ are used, there are not clearly indicated in the PDD.	CL 2	OK
B.1.2 Is the applied version the most recent one and is this appropriate one?	PDD B.4	DR	Yes, All of applied methodology and tools are the latest version when the PDD was prepared.	OK	OK

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B.2 Justification of the choice of the project category					
B.2.1 Is the applied methodology considered the most appropriate one?	PDD B.1	DR	Yes. PP applied the most appropriate baseline and monitoring methodology for this project activity.	OK	OK
B.2.1 Are the applicability criteria in the baseline methodology all fulfilled and described in the PDD?	PDD B.2	DR	Approved baseline methodology ACM0002 is applicable to grid-connected renewable power generation project activities under several applicability conditions. However, the PP did not demonstrate full satisfaction with associated applicability conditions for this project activity in the PDD.	CL 3	OK
B.3 Description of the project boundary					
B.3.1 Does the project boundary include physical, geographical site where the project activity takes place?	PDD B.3	DR, I	The project has a capacity of 40MW, comprising 20 wind turbine generators to be put in operation. This will be physically connected to the electricity system of Korea Electric Power Corporation (KEPCO). Thus the power plant and the KEPCO are defined as the project's system boundary.	OK	OK
B.3.2 Do the spatial and technical boundaries as verified on-site comply with the discussion provided by indication included to the PDD?	PDD B.3	DR,I	Yes, the spatial and technical boundaries of the project activity in the PDD are complied with the facts verified on-site assessment.	OK	OK
B.4 Description of baseline and its development					
B.4.1 What is the baseline scenario? Has the baseline scenario been determined according to the methodology?	PDD B.4	DR	The project activity does not involve modification or retrofitting an existing power generation facility. According to ACM 0002, the baseline scenario is electricity delivered to the KEPCO grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the calculation of combined margin. The discussion and determination of the chosen baseline is transparent.	OK	OK
B.4.2 What other alternatives scenario have been considered and why is the selected scenario the most likely one?	PDD B.4	DR	No other alternative scenario for the project.	OK	OK

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B.4.3 Has the baseline scenario has been determined using conservative assumptions where possible?	PDD B.3 B.6	DR, I	Justification/Explanation of excluded emission source in B.3 of the PDD is not described reasonably.	CL 4	OK
			Load factor is the key factor to be considered in calculation of GHG emission reduction and investment analysis. However, PP did not demonstrate the justification of selected load factor, 28%, is reasonable.	CAR 4	OK
			There are several errors are found in emission factor calculation: 1. Step 2 - In the PDD, average of low-cost/must run generation during 2002~2006 is 42.88% which is not consistent to the official data and reference of it is not provided. 2. Step 3 - Description of factors that used in OM calculation, m, i and y, are not provided in the PDD. - The equation of EF_{OM} is not correct. Average of generation-weighted and the numerical mean are different. Therefore calculation relate to EF_{OM} shall re-calculated after alteration of the EF_{OM} . - A few power plants are omitted in OM calculation. 3. Step 4 - There is no description why Option 1 has been chosen for Build Margin calculation. - 2006 electricity generation of 'the power plants capacity additions in the electricity system that comprise 20% of the system generation (74,372,455 MWh) is not consistent with the figure (74,623,499MWh) in Annex 3 in the PDD. 4. Step 5 - Carbon emission factor and fraction of carbon oxidized in the '1996 Revised IPCC Guideline' are used instead of CO2 emission factor of fossil fuel in IPCC 2006. And unnecessary factor such as OXID are included for emission factor calculation - Considered power plant in BM calculation is not appropriate as some are omitted and some are included.	CAR5	OK
			And date of commissioning, capacity and other information used for each grid-connected power plant for calculation of the operating margin and build margin emission factor which are the requirement of the tool to calculated the emission factor for an electricity system are not provided in a	CL 5	OK

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			spreadsheet that should be attached to the PDD.		
B.4.4 Does the baseline scenarios sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	PDD B.5	DR	According to the EB 16th meeting Report, Annex 3, page 1 ‘Clarifications on the treatment of National and/or Sectoral policies and regulations (paragraph 45 (e) of the CDM Modalities and Procedures) in determining a baseline scenario’, which is “Type E-“national and/or Sectoral policies or regulations that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11November 2001) may not be taken into account in developing a baseline scenario (i.e. the baseline scenario should refer to a hypothetical situation without the national and/or Sectoral policies or regulations being in place)”, this analysis is performed based on this hypothetical situation without regarding the ‘Alternative Energy Development Promotion Act amended on March, 2002.’ According to the above decision, purchase price of electricity, which excludes subsidy through compensation for difference between generation costs by MOCIE, was applied to the investment analysis. However, there is no description whether to consider the ‘Act on the Promotion of the Development and Use of New and Renewable Resources of Energy’ amended in March 2002 in developing the baseline scenario based on 16 th and 22 nd EB meeting.	CAR 6	OK
B.4.4 Is the baseline scenario determination compatible with the available data and is all literature and sources clearly referenced?	PDD B.5/ B.6.2	DR,I	The data source for baseline scenario determination in the PDD is corresponding with data source in the supporting documents such as excel sheet of investment analysis and emission factor for the project activity.	OK	OK
B.5 Additionality determination					
B.5.1 Is the project additionality assessed according to the methodology?	PDD B.5	DR	As required by ACM0002, additionality was assessed according to the ‘Tool for the demonstration and assessment of additionality’(ver 04)	OK	OK
B.5.2 Is the analysis method identified appropriately?	PDD B.5	DR	Yes, the project assessed under a step-wise approach to demonstrate and assess additionality. These steps include: - Identification of alternatives to the project activity consistent with current laws and regulations - Investment analysis to determine that the proposed project activity is not the most economically of financially attractive - Common practice analysis	OK	OK

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B.5.3 Is the most suitable financial indicator clearly identified (IRR, NPV, Cost benefit ratio, or (levelized) unit cost)?	PDD B.5	DR	According to the tool, IRR is used as financial indicator for benchmark analysis of this proposed project and this is derived from the bankers view.	OK	OK
B.5.4 Is the calculation of financial figures for this indicator correctly done for all alternatives and the project activity?	PDD B.4/ B.5	DR,I	<p>As required by ACM0002, additionality has been assessed by applying the ‘Tool for the demonstration and assessment of additionality’(ver 04).</p> <ul style="list-style-type: none"> Step 1. Identification of alternatives to the project activity consistent with current laws and regulations <p>Sub-step 1a) Define alternatives to the project activity: The only realistic alternatives are</p> <ol style="list-style-type: none"> ① The proposed project not taken as CDM project activity.. ② Construction of a power plant using other source of renewable energy with equivalent amount of installed capacity or equivalent amount of annual electricity output. ③ Supply of equivalent annual power output by the Grid where the proposed project is connected. <p>Sub-step 1b) Consistency with mandatory laws and regulations: Identified realistic and credible alternatives scenario to the project activity that are in compliance with mandatory legislation and regulation taking into account the enforcement in the region of country and EB decisions on national and/or sectoral policies and regulations. Selected alternative is in line with applicable legislation, regulations and EB decisions.</p> <p>The second alternative is not considered a realistic alternative due to the lack of exploitable hydro resources in the proposed project site and topographically, wave and tidal source is impossible. Also owing to the project site is mostly surrounded by mountains, the plenty of sunshine for solar energy source is shortage and has not been well developed.</p> <p>The first alternative has been demonstrated that it has additionality by following steps, step 2~ step 4.</p> <p>Thus, the third alternative is the baseline scenario of proposed project activity.</p>		

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			<ul style="list-style-type: none"> Step 2. Investment Analysis Taegisan wind power project contains income other than CERs. Therefore Option I (Apply simple cost analysis) can not be selected since the project activity generates revenues other than CDM related income. Thus the project participants have chosen option III, benchmark analysis. <p>Sub step 2b) Option III: Apply Benchmark analysis The PP has chosen 5.6% for benchmark rate. However, PP did not demonstrate with objective evidence whether the selected benchmark rate is appropriate and reasonable for the investment analysis.</p> <p>Sub step 2c) Calculation and comparison of financial indicator Input values applied for investment analysis such as total investment cost, expected revenue and expected expense are not provided in the PDD. Also PP should explain why electricity tariff and electricity generation between FSR and EAR are different and its validity. .</p> <p>Sub step 2d) Sensitivity Analysis In sensitivity analysis, the electricity sale price and electricity generation were considered. But O&M cost and investment cost is not considered whereas these variables constitute more than 20% of total project costs. Also PP didn't demonstrate in detail whether the range of variations for each parameter is suitable for the project context.</p> <ul style="list-style-type: none"> Step 4 . Common Practice Analysis Sub step 4a) Analysis other activities similar to the proposed project activity According to sub-step 4a of the additionality tool, project participant provided an analysis of any other activities similar to the proposed project activity whether and to which extent similar activities have already diffused in the relevant region. <p>Sub step 4b) Discussion any similar options that are occurring Description of similar activities to proposed project activity step 5, impact of CDM registration, is not necessary step to perform in the additionality assessment.</p>	CAR 7	OK
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B.5.5 Is the sensitivity analysis reasonably done?	PDD B.5	DR, I	Refer B.5.4	CAR 7	OK
B.5.6 Have other activities in the host country/region similar to the project activity been identified and are these activities appropriately analyzed by the PDD?	PDD B.5	DR, I	Yes. Beside wind farm project such as solar, geothermal power and biomass generation could be considered as grid-connected zero-emission renewable power generation activities. However the project developers and investors are not considering other way except wind power project in the project site because of the given condition of the area and economical feasibility.	OK	OK
B.5.7 Is the analysis presented in a transparent manner including publicly available proofs for the utilized data? And all assumptions applied in a conservative manner?	PDD B.5	DR, I	Refer B.5.4	CAR 7	OK
B.5.8 Is the project technology likely to be substituted by other or more efficient technologies within the project period?	PDD	DR,I	The project technology will not be likely substituted by other technology.	OK	OK
B.5.9 Does the project requires extensive initial training and maintenance efforts in order to work as presumed during the project period?	PDD A.2/ B.7.2	DR,I	In the course of validation, it was identified that PP has a plan to attend training program titled 'V80-2.0MW Operation & Maintenance Training Program' provided by VESTAS. 4 persons from Taegisan Wind Power Corporation who is the CDM project manager will be attend this program.	OK	OK
B.6. Baseline Scenario Determination					
B.6.1. Has the baseline been established on a project-specific basis?	PDD B.4	DR	The project is applied the approved methodology ACM0002 version 07: consolidated baseline methodology for grid-connected electricity generation from renewable sources	OK	OK
B.6.2 Does the selected baseline represents the most likely scenario among other possible and/or discussed scenarios?	PDD B.4	DR	The practical and feasible baseline scenario for project activity is 'supply of equivalent annual power output by the Grid where the proposed project is connected' and this is well described in the PDD.	OK	OK
B.6.4 Have the major risks to the baseline been identified?	PDD B.4	DR	No major risks are foreseen as the mix of the grid components are unlikely to change in the near future.	OK	OK
B.7 Calculation of GHG Emission Reductions – Project emissions					

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B.7.1 Are all aspects related to direct and indirect GHG emissions captured in the project design?	PDD B.3/ B.6.4	DR	The project emissions are considered zero in accordance with the approved methodology.	OK	OK
B.8 Calculation of GHG Emission Reductions – Baseline emissions					
B.8.1 Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	PDD B.3	DR,I	Refer to B.4.	CL 4/5 CAR 4/5/6	
B.8.2 Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	PDD B.3	DR	Baseline boundaries are established according to rules of the approved methodology ACM 0002.	OK	OK
B.8.3 Are the GHG calculations documented in a complete and transparent manner?	PDD B.6.3	DR	There is no description how to estimate the electricity delivered to the grid by the project activity for GHG calculation.	CL 6	OK
B.8.4 Have conservative assumptions been used when calculating baseline emissions?	PDD B.6.3	DR	Refer to B.4	CL 4/5 CAR 4/5/6	
B.9 Calculation of GHG Emission Reductions – Leakage					
B.9.1 Are potential leakage effects beyond the chosen project boundaries properly identified?	PDD B.6.3	DR	N/A	OK	OK
B.10 Emission Reductions					
B.10.1 Will the project result in fewer GHG emissions than the baseline scenario?	PDD B.6.3/ B.6.4	DR,I	The project is forecasted to reduce CO ₂ emissions 63,038 tCO ₂ e/yr average over the crediting period.	OK	OK
B.11 Monitoring Methodology					
B.11.1 Is the monitoring methodology previously approved by the CDM Executive Board?	PDD B.7.2	DR	Yes, The project is applied approved methodology ACM0002 version 07: consolidated baseline methodology for grid-connected electricity generation from renewable sources	OK	OK

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B.11.2 Is the monitoring methodology applicable for this project and is the appropriateness justified?	PDD B.7.2	DR	Yes, applied monitoring methodology is applicable for this project activity and appropriateness is justified in the PDD.	OK	OK
B.11.3 Does the monitoring methodology reflect good monitoring and reporting practices?	PDD B.7.2	DR	Yes. The monitoring methodology reflects good monitoring and reporting practice.	OK	OK
B.11.4 Is the discussion and selection of the monitoring methodology transparent?	PDD B.7.2	DR	Yes. The discussion and selection of the monitoring methodology is described transparently.	OK	OK
B.12 Monitoring of Project Emissions					
B.12.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	PDD B.7.1	DR	N/A	OK	OK
B.13 Monitoring of Baseline Emissions					
B.13.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	PDD B.7.1	DR	Monitoring of the EGy: electricity supplied by the project activity to the grid, is not corresponded with ACM0002 Ver.7.	CL 7	OK
B.13.2 Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	PDD B.7.1	DR	Refer B.4.	CL4/5 CAR 4/5/6	
B.13.3 Will it be possible to monitor/measure the specified baseline indicators?	PDD B.7.1	DR	There is only one factor to be monitored, EGy, and it is going to be monitored by meter hourly and recorded monthly.	OK	OK
B.14 Monitoring of Leakage					

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B.14.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	PDD B.6.3	DR,I	N/A	OK	OK
B.15 Monitoring of Sustainable Development Indicators/ Environmental Impacts					
B.15.1 Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?			N/A	OK	OK
B.16 Project Management Planning					
B.16.1 Is the authority and responsibility of overall project management clearly described?	PDD B.7.2	DR,I	In the PDD, project owner and CDM project manager have all role and responsibilities of overall project management, However, exact role and responsibilities for each party is not defined.	CL 8	OK
B.16.2 Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD B.7.2	DR,I	Validation team has identified that PP has plan to develop the procedure and provision of operation and maintenance including registration, monitoring, measuring and reporting on this proposed project activity.	OK	OK
B.16.3 Are procedures identified for training of monitoring personnel?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.4 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.5 Are procedures identified for calibration of monitoring equipment?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.6 Are procedures identified for maintenance of monitoring equipment and installations?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.7 Are procedures identified for monitoring, measurements and reporting?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK

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B.16.8 Are procedures identified for day-to-day records handling(including what records to keep, storage area of records and how to process performance documentation)	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.9 Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.10 Are procedures identified for review of reported results/data?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.11 Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.12 Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
B.16.13 Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	PDD B.7.2	DR,I	Refer B.16.2	OK	OK
C. Duration of the Project/ Crediting Period					
C.1 Are the project's starting date and operational life time clearly defined and evidenced?	PDD C.1	DR, I	<p>Identification of starting date of project activity is not based on the 'Glossary of CDM terms (Ver. 03), the starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins.</p> <p>1 October 2007 is described as starting date of project activity in the PDD, validation team has found that permission to generate electricity is before this date.</p> <p>As the starting date of this project activity is before date of validation, the information/objective evidence of the incentive from the CDM was seriously considered in the decision to proceed with the project activity shall be described in the PDD</p>	CAR 8	OK

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C.2 Is the start of the crediting period clearly defined and reasonable?	PDD C.2.2. 1	DR,I	PP selected 10 years as fixed crediting period. However information on it is provided incorrect section of the PDD.	CL 9	OK
D. Environmental Impacts					
D.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	PDD D.1	DR,I	Refer A.5.1	CL 1	OK
D.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	PDD D.1	DR, I	Yes, Korea requires a PEA (Preliminary Environment Assessment) for such projects which has been completed and approved in March 2007.	OK	OK
D.3 Will the project create any adverse environmental effects?	PDD D.1	DR, I	Referred to the PER, the project will create no significant negative environmental impacts.	OK	OK
D.4 Are transboundary environmental impacts considered in the analysis?			N/A	OK	OK
D.5 Have identified environmental impacts been addressed in the project design?	PDD D.1	DR, I	Refer A.5.1	CL 1	OK
D.6 Does the project comply with environmental legislation in the host country?	PDD D.1	DR, I	Refer to D.2.	OK	OK
E. Stakeholder Comments					
E.1 Have relevant stakeholders been consulted?	PDD E.1	DR, I	POSCO E&C and Eurus Energy Japan are holding public hearing and meeting to local stakeholder since 2006 and they are putting many efforts to hear comments from the stakeholders.	OK	OK
E.2 Have appropriate media been used to invite comments by local stakeholders	PDD. E.1	DR, I	The project developers informed the object of the project as well as its future plan through various media: public hearing meeting, Gangwon Daily News (4 February 2006), Yonhap News (22 August 2007), EBN Industrial News, KBS Wonju station etc.	OK	OK

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E.3 If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	PDD E.1	DR, I	There are no regulation/laws for stakeholder consultation process.	OK	OK
E.4 Is a summary of the stakeholder comments received provided?	PDD E.2	DR, I	Some received comments such as radio interference & plan for ecosystem preservation from local stakeholder are not described in PDD through interview with local stakeholders and public hearing minutes.	CAR 9	OK
E.5 Has due account been taken of any stakeholder comments received?	PDD E.3	DR, I	Refer to E.4.	CAR 9	OK

Table 3. Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 : Approval letter of Korea and Japan DNA have not been submitted to DOE by PP.	A.2.6 A.3.3 A.3.4	Approval letter of Korea DNA (8 Oct. 2008) and Japan DNA (03 Jul. 2008) has been submitted to DOE.	CAR 1 is closed.
CAR 2 : Full detail of the location of the project activity to identify geographical boundaries is not correctly described in the PDD. Hoeungseong-Gun of Gangwon Province is identified as location of the project activity by the PDD. But project activity has been implemented in Hoengseong-Gun as well as Pyungchang-Gun.	A.4.1.1	The exact location of the project is defined as 128°20' E, 37°32' N. The provided information on the location of the project activity indicates the project location clearly.	CAR 2 is closed.
CAR 3 : Operation data of wind turbine such as cut-in wind speed, 52m/s, in not correct to information provided by VESTAS's website (www.vestas.com). Also hub-height in the PDD is inconsistent with the information on VESTAS V80-2.0MW technical specification provided by PP during on-site assessment.	A.4.2.1	Validation team has been identified revised information is correctly provided in the PDD and the correctness of those information is reviewed through VESTAS's website.	CAR 3 is closed.
CAR 4 : Load factor is the main factor to be considered in calculation of GHG emission reduction and investment analysis. However, PP did not demonstrate the justification of selected load factor, 28%, is reasonable and considered in conservativeness manner.	B.4.3	Capacity factor of 26.5% has been selected which is the value of the probability of 75%. In relation to the factor, validation team has checked the study data, 'Taegisan Wind Farm Wind Resource and Energy Assessment' reports performed by 3 rd expert body. And crossed checked with factor of similar wind park projects in Korea.	CAR 4 is closed.

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		Validation team thus has reached to the conclusion that the capacity factor for proposed project activity is estimated reasonably.	
<p>CAR 5 : There are several errors are found in emission factor calculation:</p> <p>1. Step 2</p> <ul style="list-style-type: none"> - In the PDD, average of low-cost/must run generation during 2002~2006 is 42.88% which is not consistent to the official data and reference of it is not provided. - <p>2. Step 3</p> <ul style="list-style-type: none"> - Description of factors that used in OM calculation, m, i and y, are not provided in the PDD. - The equation of EF_{OM} is not correct. Average of generation-weighted and the numerical mean are different. Therefore calculation relate to EF_{OM} shall re-calculated after alteration of the EF_{OM}. - - Some power plant is omitted in OM calculation. <p>3. Step 4</p> <ul style="list-style-type: none"> - There is no description why Option 1 has been chosen for Build Margin calculation. - 2006 electricity generation of 'the power plants capacity additions in the electricity system that comprise 20% of the system generation (74,372,455 MWh) is not consistent with the figure (74,623,499MWh) in Annex 3 in the PDD. - <p>4. Step 5</p> <ul style="list-style-type: none"> - Carbon emission factor and fraction of carbon oxidized in the '1996 Revised IPCC Guideline' are used instead of CO2 emission factor of fossil fuel in 	B.4.3	<p>1. Step 2</p> <ul style="list-style-type: none"> - Average of low-cost/must run generation of total grid generation during 2002~2006 has been corrected to 42.63% and validation team has been checked this value with official data, 2002~2006 Statistics of Electric Power in Korea (KEPCO). <p>2. Step 3</p> <ul style="list-style-type: none"> - All the factors included in OM calculation have been described correctly according to the tool in section B.6.1 in the PDD. - According to the 'Tool to calculate the emission factor for an electricity system(Ver. 01), the EF_{OM} has been correctly calculated as the generation-weighted average emissions per unit net electricity of all generating power plants serving the system. - All the plants need to be considered in OM calculation are included. <p>3. Step 4</p> <ul style="list-style-type: none"> - As build margin emission factor is calculated ex-ante for proposed project activity and this is well described in the B.6.1 in the PDD. - According to the official data provided by KEPCO, 2006 electricity generation of 'The power plants capacity additions in the electricity system that comprise 20% of the system generation are corrected as 74,379,386MWh in B.6.1 and Annex E in the PDD. <p>4. Step 5</p> <ul style="list-style-type: none"> -Carbon emission factor and fraction of carbon oxidized in 2002 are correctly used for emission factor calculation. 	CAR 5 is closed.

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<p>IPCC 2006. And unnecessary factor such as OXID are included for emission factor calculation</p> <ul style="list-style-type: none"> - Considered power plant in BM calculation is not appropriate as some are omitted and some are included. 		<p>- All the relevant power plants in BM calculation are considered.</p>	
<p>CAR 6 :</p> <p>According to the EB 16th meeting Report, Annex 3, page 1 ‘Clarifications on the treatment of National and/or Sectoral policies and regulations (paragraph 45 (e) of the CDM Modalities and Procedures) in determining a baseline scenario’, which is “Type E-“national and/or Sectoral policies or regulations that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001) may not be taken into account in developing a baseline scenario (i.e. the baseline scenario should refer to a hypothetical situation without the national and/or Sectoral policies or regulations being in place)”, this analysis is performed based on this hypothetical situation without regarding the ‘Alternative Energy Development Promotion Act amended on March, 20021.’ According to the above decision, purchase price of electricity, which excludes subsidy through compensation for difference between generation costs by MOCIE, was applied to the investment analysis.</p> <p>However, there is no description whether to consider the ‘Act on the Promotion of the Development and Use of New and Renewable Resources of Energy’ amended in March 2002 in developing the baseline scenario based on 16th and 22nd EB meeting.</p>	<p>B.4.4</p>	<p>As Korean Government established the ‘Act on the promotion of the Development, Use and Diffusion of new and Renewable Energy’ to encourage use and develop the renewable energy source in Korea in 2002. According to this decision, purchase price of electricity, which excludes subsidy through compensation for difference between generation costs by MOCIE, was applied to the investment analysis.</p> <p>All of above mentioned information were well described in the B.5 of the PDD.</p>	<p>CAR 6 is closed.</p>
<p>CAR 7 :</p> <ul style="list-style-type: none"> • Step 2. Investment Analysis Sub step 2b) Option III: Apply Benchmark analysis The PP has chosen 5.6% for benchmark rate. However, PP did not demonstrate with objective 	<p>B.2.7</p>	<p>Based on the official and objective evidence of basic information on financing, investment analysis is re-described and validation team has checked that the entire financing source are clearly used and justified. Benchmark rate is changed from 5.6% to 5.23%. This loan was made</p>	<p>CAR 7 is closed.</p>

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<p>evidence whether the selected benchmark rate is appropriate and reasonable for the investment analysis.</p> <p>Sub step 2c) Calculation and comparison of financial indicator</p> <p>Input values applied for investment analysis such as total investment cost, expected revenue and expected expense are not provided in the PDD. Also PP should explain why electricity tariff and electricity generation between FSR and EAR are different and its validity. .</p> <p>Sub step 2d) Sensitivity Analysis In sensitivity analysis, the electricity sale price and electricity generation were considered. But O&M cost and investment cost is not considered whereas these variables constitute more than 20% of total project costs. Also PP didn't demonstrate in detail</p>		<p>under 3 months CD rate + 0.6 and the weighted average interest rates of those loans from outside for the period is 4.63% during the second half of the year 2006, (1 July 2006~ 15 December 2006). It is verified through the 'Loan agreement' documents and official website, www.ksdabond.or.kr. Validation team also found the CD rate have been increasing in Korea recently. Thus KFQ confirmed the selected benchmark rate is reasonable.</p> <p>All the basic information for investment analysis was provided in the PDD. We confirmed that listed input values have been consistently applied in all calculations. The electricity tariff and electricity generation are re-applied for investment analysis as 75.69 KRW/KWh which is from FSR. KFQ concluded it is valid after assessment.</p> <p>92,856MWh/yr is applied as amount of electricity generation in investment analysis. PP selected 92,856 MWh/yr (P=75%, Load factor=26.5%) which is from the objective source, 'Taegisan Wind Farm Wind Resource and Energy Assessment (Jan. 2007), issued by 3rd party expertise company, PB Power, as project investor would or not decide to proceed with the project again before starting construction or commitment to big expenditure. Thus, we examined the value could get before starting date (12 March 2007) and assessed load factor(about 20%~27%) in similar projects in Korea.</p> <p>After our examination, KFQ got a conclusion that this value is valid and applicable at the time of investment decision under comprehensive understanding of starting date and additionality.</p> <p>OM cost and investment cost were additionally considered for sensitivity analysis as these factors are to be considered to determine in which scenario the project activity would pass the benchmark. Range of variation of each parameter in sensitivity analysis was detail in the PDD. Validation team has confirmed that variation range is suitable based on the past trends and our project context knowledge.</p>	
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<p>whether the range of variations is reasonable in the project context.</p> <p>Description of similar activities to proposed project activity step 5, impact of CDM registration, is not necessary step to perform in the additionality assessment.</p>											
<p>CAR 8 : Identification of starting date of project activity is not based on the ‘Glossary of CDM terms (Ver. 03), the starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins.</p> <p>1 October 2007 is described as starting date of project activity in the PDD, validation team has found that permission to generate electricity is before this date.</p> <p>As the starting date of this project activity is before date of validation, the information/objective evidence of the incentive from the CDM was seriously considered in the decision to proceed with the project activity shall be described in the PDD</p>	C.1	<p>Starting date of the project activity is 12 March 2007 which is the date of equipment purchase contract between POSCO E&C and equipment provider. KFQ confirmed that this starting date is the earliest date at which either the implementation of construction or real action of a project activity begins.</p> <table><tr><th>Project activity</th><th>Date</th></tr><tr><td>Equipment purchase contract</td><td>12/03/2007</td></tr><tr><td>Approval of electricity business by MKE</td><td>22/03/2007</td></tr><tr><td>Bank Loan Agreement</td><td>26/03/2007</td></tr></table> <p>The consideration of CDM benefits prior to the starting date of the project activity has been confirmed by the documented evidence, Executive Summary. Each board of Director of POSCO E&C and Eurys Energy Japan approved investment and promotion of this project on condition of CDM based on the Executive Summary of the project 26 December 2006. In this report, revenue from this project was analyzed and compared through IRR with CDM and without CDM.</p>	Project activity	Date	Equipment purchase contract	12/03/2007	Approval of electricity business by MKE	22/03/2007	Bank Loan Agreement	26/03/2007	CAR 8 is closed.
Project activity	Date										
Equipment purchase contract	12/03/2007										
Approval of electricity business by MKE	22/03/2007										
Bank Loan Agreement	26/03/2007										
<p>CAR 9 : Some received comments such as radio interference & plan for ecosystem preservation from local stakeholder are not described in PDD through interview with local stakeholders and public hearing minutes.</p>	E.4	<p>All the received comments identified in public hearing minutes and by interviewing local stakeholders were fully described in the PDD.</p>	CAR 9 is closed.								
<p>CL 1 : Preliminary Environmental Assessment was undertaken in January 2007 and approved on March 2007 by</p>	A.5.1	<p>All the issues pointed in PER are clearly described in the revised PDD.</p>	CL 1 is closed.								

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government authority. During on-site assessment, influence on scenery, Topography and geological feature, radiation of electromagnetism, and ecosystem have been found in the PER report. However this is not fully described in the PDD.			
CL 2 : The project applies the approved methodology ACM0002 version 07. In spite of the ‘Tool for the demonstration and assessment of additionality (Ver 4)’, and the ‘Tool to calculate the emission factor for an electricity system’ are used, there are not described in the PDD.	B.1.1	Every methodology and tools used for this project activity are described in the PDD.	CL 2 is closed.
CL 3 : Approved baseline methodology ACM0002 is applicable to grid-connected renewable power generation project activities under several applicability conditions. However, the PP is not demonstrated full satisfaction with associated applicability conditions for this project activity in the PDD.	B.2.1	Each applicability criteria listed in the selected approved methodology ACM 0002 are fully demonstrated in the PDD.	CL 3 is closed.
CL 4 : Justification/Explanation of excluded emission source is not described reasonably.	B.2.2	According to ACM 0002, justifications of included and/or excluded emission source of baseline and project activity are correctly described in the revised PDD.	CL 4 is closed.
CL 5 : Date of commissioning, capacity and other information used for each grid-connected power plant for calculation of the operating margin and build margin emission factor which are the requirement of the tool to calculated the emission factor for an electricity system are not provided in a spreadsheet that should be attached to the PDD.	B.4.3	According to the ‘Tool to calculate the emission factor for an electricity system’, information on each grid-connected power plant such as date of commissioning, capacity and fuel types and etc. are documented in a spreadsheet and it is attached to the PDD.	CL 5 is closed.

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CL 6 : There is no description how to estimate the electricity delivered to the grid by the project activity for GHG calculation.	B.8.3	Electricity delivered to the grid by this project activity will be measured hourly via electricity meter which has allowable error of $\pm 0.2\%$. And this is the net amount of electricity transmitted to the grid excluding electricity consumed in the plant and received from the grid.	CL 6 is closed.
CL 7 : Monitoring of the EGy: electricity supplied by the project activity to the grid, is not corresponded with ACM0002 Ver.7.	B.13.1	Electricity supplied by the project activity to the grid will be measured hourly and record monthly in electronically. The measurement will be in compliance with the National Guidelines and requirements of the LPX for accuracy and reliability. And calibration will be carried out according to relevant national standards and regulations by authorized organization.	CL 7 is closed.
CL 8 : In the PDD, project owner and CDM project manager have all role and responsibilities of overall project management. However, exact role and responsibilities for each party is not defined.	B.16.1	Exact role and responsibilities of overall project management including	CL 8 is closed.
CL 9 : PP selected 10 years as fixed crediting period. However information on it is provided incorrect section of the PDD.	C.2	Information of crediting period is well described in correct section of the PDD.	CL 9 is closed.

Appendix B
Qualification of Validation Team

<div data-bbox="878 236 1048 290" data-label="Image"></div> <div data-bbox="315 338 987 384" data-label="Section-Header"> <h2>GHG Validator/Verifier Certificate</h2> </div> <div data-bbox="501 443 801 489" data-label="Text"> <p>Yu-Shim Jeong</p> </div> <div data-bbox="448 496 853 531" data-label="Text"> <p>Certificate number: GHG 04006</p> </div> <div data-bbox="409 547 891 584" data-label="Text"> <p>Sectoral Scope: 01,02,03,04,05,10,11,12</p> </div> <div data-bbox="486 600 813 635" data-label="Text"> <p>Expert Scope: 04,05,11,12</p> </div> <div data-bbox="528 651 768 683" data-label="Text"> <p>Date: 9 MAY 2007</p> </div> <div data-bbox="306 753 992 941" data-label="Text"> <p>This validator/verifier is qualified by KFQ's Qualification requirements to conduct validation and verification for Carbon offset project and organization's Greenhouse Gas Emissions Report.</p> </div> <div data-bbox="499 983 799 1019" data-label="Text"> <p>Valid until: 8 May 2010</p> </div> <div data-bbox="360 1034 936 1070" data-label="Text"> <p>Authorized by Korean Foundation for Quality</p> </div> <div data-bbox="244 1181 577 1264" data-label="Image"></div> <div data-bbox="595 1160 1041 1294" data-label="Text"> <p>대표인 한국품질재단 한국품질인증센터 이 사 장 김 우 www.kfq.or.kr 13FL, Woomin Life's Valley / Bldg. 271-28, Gaseon-Dong, Gurocheon-Gu, Seoul 153-800, Korea</p> </div>	<div data-bbox="1803 226 1973 280" data-label="Image"></div> <div data-bbox="1258 327 1919 371" data-label="Section-Header"> <h2>GHG Validator/Verifier Certificate</h2> </div> <div data-bbox="1440 432 1733 478" data-label="Text"> <p>Jin-Pyoung An</p> </div> <div data-bbox="1384 488 1787 521" data-label="Text"> <p>Certificate number: GHG 04007</p> </div> <div data-bbox="1364 539 1807 574" data-label="Text"> <p>Sectoral Scope: 04, 05, 10, 11, 12, 13</p> </div> <div data-bbox="1373 590 1800 625" data-label="Text"> <p>Expert Scope: 04, 05, 10, 11, 12, 13</p> </div> <div data-bbox="1467 641 1704 675" data-label="Text"> <p>Date: 9 MAY 2007</p> </div> <div data-bbox="1252 745 1926 935" data-label="Text"> <p>This validator/verifier is qualified by KFQ's Qualification requirements to conduct validation and verification for Carbon offset project and organization's Greenhouse Gas Emissions Report.</p> </div> <div data-bbox="1431 978 1738 1011" data-label="Text"> <p>Valid until: 8 MAY 2010</p> </div> <div data-bbox="1303 1031 1868 1066" data-label="Text"> <p>Authorized by Korean Foundation for Quality</p> </div> <div data-bbox="1187 1181 1518 1264" data-label="Image"></div> <div data-bbox="1527 1160 1973 1294" data-label="Text"> <p>대표인 한국품질재단 한국품질인증센터 이 사 장 김 우 www.kfq.or.kr 13FL, Woomin Life's Valley / Bldg. 271-28, Gaseon-Dong, Gurocheon-Gu, Seoul 153-800, Korea</p> </div>
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