# VALIDATION REPORT

## BUNDLED WIND POWER PROJECT OF JEJU SPECIAL SELF-GOVERNING PROVINCE IN KOREA

REPORT NO. 2007-01

REVISION NO. 05(JANUARY 4, 2008)

**KOREAN FOUNDATION FOR QUALITY**

Report No : 2007-01 , rev. 05

# VALIDATION REPORT

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| Date of first issue:<br>May 10, 2007 | Project No.:<br>EC-723 |
| Approved by:<br>Oh Chang Kwon<br>Director of R&D Division | Organisational unit:<br>Korean Foundation for Quality (KFQ) |
| Client:<br>Korea Energy Management Corporation | Client ref.:<br>Ki Sub Lee |

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Summary:

Korean Foundation for Quality(KFQ) has been commissioned by Jeju Special Self-Governing Province and Korea Energy Management Corporation(KEMCO) to validate the Bundled Wind Power Project of Jeju Special Self-Governing Province in Korea. This validation report summarizes the findings of the validation of the project, performed on the basis of UNFCCC and host parties criteria for small-scale CDM project, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation of this project has been performed by desk reviews of the project design and the baseline and monitoring plan and on-site inspection, audits at the location of the project and follow-up interviews with project stakeholders and the resolution of the findings and the issuance of the final validation report and opinion.

The Bundled Wind Power Project is located in Haengwon-Ri and Sinchang-Ri of Jeju Island.
The Project consists of 8 wind turbines, has a capacity of 5.93 MW generating 12,727MWh annually. The expected $CO_2$ reduction is 9,201 ton per year.

As the result of the validation, it can be confirmed that the Bundled Wind Power Project of Jeju Special Self-Governing Province in Korea, as described in the revised PDD of December 31 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baselines and monitoring methodology AMS-I.D_Ver.11.

| | |
|---|---|
| Work carried out by :<br><br>Jong Moon Park (Audit team leader, GHG auditor)<br>Yu Shim Jeong (Audit team member, GHG auditor)<br>Jin Pyoung An (Audit team member, GHG auditor) | Internal Quality Control by :<br><br>Byung Ho Ko |

## 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 |
| 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 commissioned by Jeju Special Self-Governing Province and Korea Energy Management Corporation(KEMCO) to validate the Bundled Wind Power Project of Jeju Special Self-Governing Province in Korea. This validation report summarizes the findings of the validation of the project, performed on the basis of UNFCCC and host parties criteria for small-scale CDM project, as well as criteria given to provide for consistent project operations, monitoring and reporting.

## 1.1 Objective

The validation serves as a design verification and is a requirement of all CDM projects. 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 and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. 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 clients. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

## 1.3 Project Description

The considered project can be classified as a bundled small-scale CDM project and Project Scope is Energy Industries, Number 1.

The project sites are located in the towns of Haengwon and Sinchang of Jeju Island in Korea..

The Project consists of 8 wind turbines, has a capacity of 5.93 MW (2 x 0.85MW in Sinchang, 3 x 0.66MW and 3 x 0.75MW in Haengwon) generating 12,727MWh annually. The expected $CO_2$ reduction is 9,201 ton per year. The generator facilities was manufactured in Denmark.

Construction was managed by Jeju Special Self-Governing Province.

The bundled wind park is connected to the grid owned by Korea Electric Power Company (KEPCO). The project activity will generate greenhouse gas (GHG) emission reductions by avoiding $CO_2$ emissions from electricity generation mainly by fossil fuel power plants.

Project participants are Jeju Special Self-Governing Province and Korea Energy Management Corporation(KEMCO).

The project starting date is 17 January 2001 in Haengwon and 17 August 2004 in Sinchang.

The 10 year crediting period starts December 1, 2007.

## 1.4 Validation Team

The validation team consisted of following personnel :

Jong Moon Park (Audit team leader, GHG auditor)
Yu Shim Jeong (Audit team member, GHG auditor)
Jin Pyoung An (Audit team member, GHG auditor)

# 2 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documentation
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 small scale 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 organises, 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 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 fulfilment 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* may be used where additional information is needed to fully clarify an issue.

| ***Validation Protocol Table 1: Mandatory Requirements*** | | | |
|---|---|---|---|
| ***Requirement*** | ***Reference*** | ***Conclusion*** | ***Cross reference/Comment*** |
| *The requirements the project must meet.* | *Gives reference to the legislation or agreement where the requirement is found.* | *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.* | *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.* |

| ***Validation Protocol Table 2: Requirement checklist*** | | | | |
|---|---|---|---|---|
| ***Checklist Question*** | ***Reference*** | ***Means of verification (MoV)*** | ***Comment*** | ***Draft and/or Final Conclusion*** |
| *The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.* | *Gives reference to documents where the answer to the checklist question or item is found.* | *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.* | *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.* | *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.* |

| ***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*** |
| *If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.* | *Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.* | *The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section.* | *This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".* |

**Figure 1 Validation Protocol Tables**

## 2.1 Review of Documents

The Project Design Document(PDD) was submitted and reviewed and additional background documents related to the project design, baseline and additionality were reviewed.

## 2.2 Follow-up Interviews

In the period of April 16, 2007 to May 3, 2007, 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 |
|---|---|
| Jeju Special Self-Governing Province.<br>- Mr. Sung Who Kang<br>- Mr. Dong Sung Kim<br>- Mr. Jung Hwan Boo<br>- Mr Yang Gu Lee | ➢ Project design<br>➢ Technical equipment<br>➢ Sustainable development issues<br>➢ Additionality<br>➢ Crediting period<br>➢ Monitoring plan<br>➢ Management system<br>➢ Environmental impacts<br>➢ Stakeholder process |
| Korea Energy Management Corporation (KEMCO)<br>- Mr. Dong Sik Shin | ➢ Baseline<br>➢ Additionality<br>➢ Approval by the host country |
| Sinchang-ri village chief<br>- Mr. Soon Kwan Kang | ➢ Environmental issues<br>➢ Stakeholder comments<br>➢ Sustainable development issues |
| Haengwon-ri village chief<br>- Mr. Lim Sang yook | ➢ Environmental issues<br>➢ Stakeholder comments<br>➢ Sustainable development issues |
| Jeju National University<br>- Mr. Jong Chul Huh | ➢ Environmental issues |
| Office of the Prime Minister Republic of Korea | ➢ CDM requirements of Korean DNA |

## 2.3 Resolution of Clarification and Corrective Action Requests

Twelfth Corrective Action Requests and ten requests for Clarification were identified. These requests were presented to the project participant in a draft validation report in May 10, 2007. The additional information provided by the project participant to address theses requests and revised PDD of December 31, 2007 resolved the Corrective Action Request and all requests for Clarification to KFQ's entire satisfaction.

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.

# 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.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

## 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 and its alignment with Korean law, its environmental legislation and its sustainable development policies.

The DNA of Korea approved at 20 September, 2007.

## 3.2 Project Design

The Bundled Wind Power Project consists of 8 wind turbines and turbine type is V-47/V-52/NM750 turbines which have a capacity of 5.93 MW generating 12,727 MWh annually. The expected $CO_2$ reduction is 9,201 ton/year. It is maintained and operated by Jeju Special Self-Governing Province.

The bundled wind park is connected to the grid owned by Korea Electric Power Company (KEPCO). The project activity will generate greenhouse gas (GHG) emission reductions by avoiding $CO_2$ emissions from electricity generation mainly by fossil fuel power plants.
Project participants are Jeju Special Self-Governing Province and Korea Energy Management Corporation(KEMCO).

The project contributes to sustainable development in the following ways:

- Reduce GHG emission and other air pollutants occurring from fossil fuel extraction, processing, transportation and burning.

- Help in economic social development of remote villages in Haengwon and Sinchang by making investment in that area.

The funding for the project does not lead to a diversion of official development assistance as according to the information obtained by the audit team ODA does not contribute to the financing of the project.

This project applies for a fixed crediting period of 10 years will be started at December 1, 2007. However the project starting date is 17 January 2001 in Haengwon and 17 August 2004 in Sinchang. The expected operational lifetime of the project activity is approximately 20 years respectively.

## 3.3 Baseline Determination

The project applies the approved simplified baseline methodology for small-scale CDM project activities AMS-I.D (Version 11) titled "Grid connected renewable energy generation". The use of this methodology is appropriate as the project activity involves electricity capacity additions through wind sources.

The PDD responds convincingly to each of the applicability criteria which are outlined in the baseline methodology.

Hence it can be confirmed that the application, discussion and determination of the chosen baseline methodology is transparent.

According to AMS I.D(Ver. 11), the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient(measured in kgCO2e/kWh) calculated in a transparent and conservative manner as;

(a) A combined margin(CM), consisting of the combination of operating margin(OM) and build margin(BM) according to the procedures prescribed in the approved methodology ACM0002, or
(b) The weight average emissions of the current generation mix. The data of the year in which project generation occurs must be used.

In order to determine the baseline of this project, (a) of the above baseline approaches is chosen. Therefore, the baseline of this project was established by ACM 0002/Version 06(19 May 2006).

For the Build Margin(BM) emission factor, the spatial extent is limited to the project electricity system of Jeju Island, because recent or likely future additions to transmission capacity does not enable significant increases in imported electricity and the amount of electricity supply from inland has not been rapidly increased over the last 3 years.

For the Operating Margin(OM), the average amount of electricity supply from inland to Jeju Island is occupied 41% of total electricity generation amount of Jeju island over last 3 years. When the OM emission factor is estimated which presents the current emission trend, in the

basis of ACM0002, it should reflect the value of OM emission factor supplied to Jeju island by using a weighted average of OM(Inland) and thus has been considered.

According to the steps for the baseline calculation methodology, Option (a) Simple OM and option 1 BM were chosen.

Operating Margin(OM) and Build Margin(BM) are calculated by using the data from existing power plants that provide electricity with the current grid-connected electricity generation, and with this result, the EFy(Emission Factor) can be calculated.

The baseline emission factor is calculated to be 0.7230 $tCO_2$ /MWh.

## 3.4 Additionality

The additionality of the project has been demonstrated according to attachment A to Appendix B of simplified modalities and procedures for small-scale CDM projects activities. The project participants provided explanation to show that the project activity would not have occurred anyway due to investment barrier.

As a result of economical analysis, NPV is lower than 0. It means that it does not have economical attraction.

Thus, the project activity is not a likely baseline scenario and that the emission reductions from the project are additional.

## 3.5 Monitoring Plan

The monitoring methodology is in line with the approved monitoring methodology ”AMS-I.D_Ver.11 – Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories”/5/ .

The electricity supplied to the grid is directly measured at the dispatch to the grid. The electric power generated by Jeju Special Self-Governing Province will be measured using energy meters with 5% accuracy. The department of transmission within Jeju Special Self-Governing Province is responsible for the monitoring activities.
The amount of electricity transmitted to the grid shall be measured automatically by the set-up meters. The measured variables are transferred to wind power plant, Korea Power Exchange and Jeju Special Self-Governing Province monitoring system simultaneously. The amount of electricity will be measured hourly and recorded monthly.

Electricity imported to and consumed in the plant recorded monthly and deducted from electricity dispatched.
There is no need to monitor the grid CO2 emission coefficient as it is fixed ex-ante for the selected 10 years crediting period.

Details of the data to be collected, the frequency of data recording, its certainty and format, and the project responsibility are clearly described. Collection and archiving of data is in both electronic and paper form. Data will be kept for two years after the last issuance of the CERs in paper and electric form.

Jeju Special Self-Governing Province has the overall authority and responsibility for the project management including monitoring of every parameters for the accounting of reduction amount and reporting.

## 3.6 Calculation of GHG Emissions

The project will displace fossil fuel-based electricity generation. While the project emissions and leakage are zero, baseline emissions are equal to emission of displaced fossil fuel-based electricity generation except the electricity consumed in the plant. The baseline emission coefficient calculations are based on the combined margin using option (a) Simple OM and option 1 BM according to the procedures prescribed in the approved methodology ACM0002_Ver.6.

Assuming the utilization rate of 24.5% for the project, the estimated annual production is 12,727MWh per year and hence – under the assumptions provided in the PDD which are deemed reasonable and conservative – the project is expected to reduce 92,010t$CO_2$ over the 10 years crediting period (9,201t$CO_2$ per year)

## 3.7 Environmental Impacts

According to the *Act on Assessment of Impact of Works on Environment, Traffic, and Disasters*, any plant facility whose power source is wind power that is more than 100MW shall be carried out the Environmental Impact Assessment (EIA). This project which is bundled by 4.23 MW and 1.7MW is not required to execute EIA.
As the project is a wind farm project, no significant environmental impacts are expected to occur during the life span of the project.

## 3.8 Comments by Local Stakeholders

Jeju Special Self-Governing Province held local stakeholders consultation meetings regarding the project to invite opinions of the identified stakeholders.

Summary of comments received are shown below:

- The noises from the power plants may adversely affect local communities including local surroundings.
- The visual effect by power plants should be considered.
- The location of power plants may be an obstacle against the migration of migratory birds.
- The local communities would like to be informed schedules and costs of the project.

In order to take due account for above comments, Jeju Special Self-Governing Province asked a study to the Jeju University before construction work. The Jeju University recommended that

based on the noise measurement the location of power plants should be located at least 500m away from the village. Therefore, the power plants were built over 500 m away from the village. Also, according to a study of Jeju University, the location of the power plants were settled with careful consideration and the height of them were limited to minimize any disturbance to migrating activity of birds and Jeju Special Self-Governing Province has informed schedules and costs of the project through continuous consultation meeting.

The province has also provided financial assistances to the local communities in Haengwon-Ri and Sinchang-Ri.

# 4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

Korean Foundation for Quality published the project documents on http://cdm.unfccc.int/Projects/Validation on 14 April 2007 and invited comments within 13 May 2007 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 Bundled Wind Power Project of Jeju Special Self-Governing Province in Korea. The validation was performed on the basis of UNFCCC criteria 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 have 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.*

*KFQ has received a confirmation by the host Party that the project activity assists it in achieving sustainable development.*

*By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of $CO_2$ 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 92,010 tonnes $CO_{2e}$, over a fixed crediting period of 10 years, resulting in a calculated annual average of 9,201 tonnes $CO_{2e}$, represents a reasonable estimation using the assumptions given by the project documents.*

*The monitoring responsibilities 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 Bundled Wind Power Project of Jeju Special Self-Governing Province in Korea, as described in the revised PDD of* December 31 2007, *meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baselines and monitoring methodology AMS-I.D_Ver.11. Thus the project will hence be recommended by KFQ for registration as a CDM project with the UNFCCC.*

# 6 REFERENCES

**Category 1 Documents:**

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

/1/ Jeju Special Self-Governing Province, Project Design Document – The Bundled Wind Power Project, March 30, 2007 Version 3 and December 31, 2007 Version 7.

/2/ Korea Energy Management Corporation(KEMCO), Two supporting Excel spreadsheets on financial and emission calculations for the Bundled Wind Power Project (Rev. 0)

/3/ Korea Energy Management Corporation(KEMCO), Revised Excel spreadsheets on financial and emission calculations for the bundled wind power project (Rev. 2)

**Category 2 Documents:**

*List background documents related to the design and/or methodologies employed in the design or other reference documents.*

/4/ International Emission Trading Association(IETA) & the World Bank's Prototype Carbon Fund(PCF) : Validation and Verification Manual. http://www.vvmanual.info

/5/ CDM-EB, AMS-I.D_Ver.11 – Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories

/6/ CDM-EB, ACM0002 _Ver. 6– Consolidated baseline methodology for grid-connected electricity generation from renewable source

/7/ Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities

# 7 CV$_S$ OF THE VALIDATION TEAM MEMBERS

## ■ Team Leader :

**Name :** Jong Moon Park
**Date of Birth :** April. 06. 1968 / MALE

### Academic Background

· Chonnam National University, B.S Degree in High molecular engineering, 1992

### Qualification

· CDM Verifier qualified by KFQ
· GHG Verifier(energy sector) qualified by KEMCO
· Korea GHG Verifier course Trainer
· ISO 14000 Lead Auditor qualified by KAB of Korea
· ISO 9000 Lead Auditor qualified by KAB of Korea
· K-OHSMS 18001 Lead Auditor qualified by KAB of Korea
· Environmental Labeling Auditor qualified by Ministry of Environment Republic of Korea

### Present Employment

· R & D Team, Kumho Polychem(1992~1995)
· Sustainability Management Team, KFQ(1995~ )

### Audit Exprience

· Verification of 3 GHG Emissions Report based on ISO 14064-1
  - KEMHO Group, 2007
  - Kia Automobile Co., 2006
  - Samsung Electronic Co. Semicondutor Div., 2006

· Validation of 2 Wind power CDM Projects CDM
  - Jeju Wind Power Project, 2007
  - Youngduk Wind Power Project, 2005

· Verification of 2 Domestic Reduction Project
  - Energy efficiency Improvement project, Korea Western Power Plant Co., 2007
  - Energy efficiency Improvement project in Process, S-oil Co., 2006

· Verification of Sustainability Report, 2 Power Plant Co.
  - Jungbu Power Plant Co.
  - Western Power Plant Co.

### Research & Development

· Review of Korea GHG emissions quantification guideline for Utility sector developed Korea electric power research institute
· Development of GHG Accreditaion Scheme in Korea, MOCIE
· Korea GHG Verifier Training Course Development(5 day course), MOCIE
· Development of National Approval Instruction for CDM project for Korea DNA

· Development of domestic registration and certification scheme for GHG Reduction Project

## ■ Team Member 1 :

**Name :** Yu Shim Jeong
**Date of Birth :** Feb. 28. 1969 / FEMALE

### Academic Background

· SungKyunKwan University, B.S Degree in Chemical engineering, 1991
· SungKyunKwan University, M.S Degree in Chemical engineering, 1994

### Qualification

· CDM Verifier(energy sector) qualified by KFQ
· GHG Verifier(energy sector) qualified by KEMCO
· Korea GHG Verifier course Trainer
· ISO 14000 Lead Auditor(energy sector) qualified by KAB of Korea
· ISO 9000 Auditor qualified by KAB of Korea
· CPA

**Present Employment**

· Environmental Consulting Div., Korea Standard Association(1994~1997)
· Sustainability Management Team, KFQ(1997~ )

**Audit Exprience**

· Verification of 3 GHG Emissions Report based on ISO 14064-1
  - KEMHO Group, 2007
  - Kia Automobile Co., 2006
  - Samsung Electronic Co. Semicondutor Div., 2006

· Validation of 2 Wind power CDM Projects CDM
  - Jeju Wind Power Project, 2007
  - Youngduk Wind Power Project, 2005

· Verification of 2 Domestic Reduction Project
  - Energy efficiency Improvement project, Korea Western Power Plant Co., 2006
  - Energy efficiency Improvement project in Process, S-oil Co., 2006

· Verification of Sustainability Report, 2 Power Plant Co.
  - Jungbu Power Plant Co.
  - Western Power Plant Co.

**Research & Development**

· Review of Korea GHG emissions quantification guideline for Utility sector developed Korea electric power research institute
· Development of GHG Accreditaion Scheme in Korea, MOCIE
· Korea GHG Verifier Training Course Development(5 day course), MOCIE
· Development of National Approval Instruction for CDM project for Korea DNA

· Development of domestic registration and certification scheme for GHG Reduction Project

## ■ Team Member 2 :

**Name :** Jin Pyoung An
**Date of Birth :** May. 12. 1968 / MALE

### Academic Background

· Pusan National University, B.S Degree in Environmental engineering, 1993

### Qualification

· CDM Verifier qualified by KFQ
· GHG Verifier(energy sector) qualified by KEMCO
· Korea GHG Verifier course Trainer
· ISO 14000 Lead Auditor qualified by KAB of Korea
· ISO 9000 Auditor qualified by KAB of Korea
· K-OHSMS 18001 Auditor qualified by KAB of Korea
· Environmental Labeling Auditor qualified by Ministry of Environment Republic of Korea

**Present Employment**

· Environmental Control Team, LS Industrial Systems(1993~2000)
· Sustainability Management Team, KFQ(2000~ )

**Audit Exprience**

· Verification of 1 GHG Emissions Report based on ISO 14064-1
  - KEMHO Group, 2007

· Validation of 1 Wind power CDM Projects CDM
  - Jeju Wind Power Project, 2007

· Verification of 2 Domestic Reduction Project
  - Energy efficiency Improvement project, Korea Western Power Plant Co., 2007
  - Waste heat recovery project, GS Power., 2007

· Verification of Sustainability Report, 2 Power Plant Co.
  - Jungbu Power Plant Co.
  - Western Power Plant Co.

**Research & Development**

· Development of GHG Accreditaion Scheme in Korea, MOCIE
· Development of domestic registration and certification scheme for GHG Reduction Project

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# Appendix A

## Validation protocol for Small scale CDM project activities

**Table 1. Mandatory Requirements for Small Scale 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 | The project has been proposed as a unilateral project. |
| 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/SSC M&P 23a | OK | Table 2, Section A.3 |
| 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, Section A.3 |
| 4. The project shall have written approval of voluntary participation from the designated national authorities of each party involved. | Kyoto Protocol Art. 12. 5a/SSC M&P 23a | OK | Table 2, Section A.3.2 |
| 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.7 |
| 6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity. | Kyoto Protocol Art. 12.5c /SSC M&P 26 | OK | Table 2, Section B.3 |
| 7. Potential public funding for the project form Parties in Annex I is not a diversion of official development assistance. | D 17/CP.7 CDM M&P Appendix B. 2 | OK | No public funding is involved. |
| 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 |
| 9. The host country is a Party to the Kyoto Protocol. | CDM M&P 30 | OK | Republic of Korea has approved Kyoto Protocol on 8 November 2002. |
| 10. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in 6(c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity. | SSC M&P 12a, c | OK | Table 2, Section A.1 |
| 11. The PDD shall conform with the SSC PDD format. | SSC M&P, Appendix A | OK | The Simplified Project Design Document for Small-Scale Project Activities; Version 03 from 22 December 2006 is used for submitting. |

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| 12. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category. | SSC M&P 22e | OK | Table 2, Section A.1.3<br>The project activity confirms to category I.D "Grid connected renewable electricity generation(Ver. 11)" |
| 13. Comments by local stakeholders are invited, a summary of these provided and how due account was taken of any comments received. | SSC M&P 22b | OK | Table 2, Section E |
| 14. If required by the host party, an analysis of the environmental impacts of the project activity is carried out and documented. | SSC M&P 22c | OK | Table 2, Section D |
| 15. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available. | SSC M&P 23b, c | OK | They were invited to provide comments through the CDM website during 30 days from 14 April 2007 to 13 May 2007.<br>No comment was received. |

## Table 2. Requirements Checklist

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

| Question | Ref. | MoV | Comments | Draft. Concl. | Final Concl. |
|---|---|---|---|---|---|
| **A. Project Description**<br>The project design is assessed. | | | | | |
| **A.1. Small scale project activity**<br>It is assessed whether the project qualifies as small scale CDM project activity. | | | | | |
| A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6(c) of decision 17/CP.7 on the modalities and procedures for the CDM? | PDD A.2 | DR,I | Yes, the Bundled installed capacity is 5.93 MW and thus meeting the threshold of small-scale project activities of less than or equal to 15 MW | **OK** | **OK** |
| A.1.2 The small scale project activity is not a debundled component of a larger project activity? | PDD A.4.5 | DR,I | It has been verified that the criteria of Appendix C of the simplified modalities and procedures were satisfied. It is not a debundled project activity. | **OK** | **OK** |
| A.1.3 Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities? | PDD A.4.2 | DR | Yes, the project activity confirms to category I.D "Grid connected renewable electricity generation(Ver. 11)" | **OK** | **OK** |
| **A.2. Project Design.**<br>Validation of project design focuses on the choice of technology and the design documentation of the project. | | | | | |
| A.2.1 Are the project's spatial(geographical) boundaries clearly defined? | PDD A.4.1 | DR,I | The address of the Haengwon wind power plant is not correct in the PDD. (Haengwon wind power plant : Bukjeju-Gun Haengwon-Ri) | **CAR1** | **OK** |
| A.2.2 Are the project's system(components and facilities used to mitigate GHG's) boundaries clearly defined? | PDD A.4.1, B.3 | DR,I | Numbers and capacity of the turbine in Haengwon and Sinchang are not correct in the PDD. (Haengwon wind power plant : 850kw*2EA, Sinchang wind power plant : 660kw*3EA, 750kw*3EA)<br>Physical location and unique identification of 6 turbines for the CDM activity among 15 turbines in Haengwon wind park project are not clearly defined in the PDD. | **CAR2**<br>**CL1** | **OK** |

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| A.2.3 Does the project design engineering reflect current good practices ? | PDD A.4.2 | DR,I | Yes, the power generation technology employs environmentally safe & sound technology including state of the turbines. | **OK** | **OK** |
| A.2.4 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.4.2 | DR | Yes, the project employs turbines manufactured by Vestas and NEG-Micon. A brief technical description of the turbines installed is included in the Table 1 of the PDD. | **OK** | **OK** |
| A.2.5 Does the project make provisions for meeting training and maintenance needs? | PDD A.4.2 | DR,I | Yes, Jeju Special Self-Governing Province has entered into an operation and maintenance contract with Vestas, which is renewed annually. | **OK** | **OK** |
| A.2.6 Has the PDD form been duly filled? | PDD | DR | Annex 2 and Annex 4 in the PDD are not completed. | **CL2** | **OK** |
| **A.3. Contribution to Sustainable Development** The project's contribution to sustainable development is assessed | | | | | |
| A.3.1 Will the project create other environmental or social benefits than GHG emission reductions? | PDD A.2 | DR,I | Yes, the project has social and environmental benefits besides GHG emission reduction. But, It was not sufficiently described in the PDD. | **CL3** | **OK** |
| A.3.2 Has the host country confirmed that the project assists it in achieving sustainable development? | PDD A.2 | DR,I | Host Government Approval has not obtained. This document is a prerequisite for registration as per CDM Modalities & Procedures 40(a). | **CAR3** | **OK** |
| **B. Project Baseline** The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario. | | | | | |
| **B.1. Baseline Methodology** It is assessed whether the project applies an appropriate baseline methodology | | | | | |
| B.1.1 Does the project apply an approved methodology and the correct version thereof? | PDD B.1 | DR | Yes, the project applies AMS-I.D(Ver 11) and ACM 0002(Ver 06) | **OK** | **OK** |
| B.1.2. Are the applicability criteria in the baseline methodology all fulfilled? | PDD B.1 | DR | Yes, the project is satisfied with the applicability criteria in the baseline methodology. | **OK** | **OK** |

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| **B.2. Baseline Scenario Determination**<br>*The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.* | | | | | |
| B.2.1. What is the baseline scenario? | PDD B.4 | DR | The project applies one of the simplified baseline methodologies proposed for the small-scale project activity category I.D, i.e the baseline is the annual kwh generated by the project times an emission factor calculated in accordance with ACM 0002. | **OK** | **OK** |
| B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one? | PDD B.4 | DR | The project is to be connected to the grid. | **OK** | **OK** |
| B.2.3. Has the baseline scenario been determined according to the methodology? | PDD B.4 | DR,I | The following assumptions are not explained with sufficient data in the PDD.<br>a) The source of the ratio of electricity supply from inland to Jeju Island is occupied 40% of total electricity generation amount of Jeju Island.<br>b) The source of the power plants capacity additions on the electricity system that comprise 20% of the system generation and that have been built most recently in Jeju Island.<br><br>Simple OM is chosen for calculating the operating margin emission factor but the term, 'average OM' is used in part of the PDD.<br><br>The simple OM can only be used where low cost/must run resources constitute less than 50% of total grid generation in average of the five most recent years. However, average of six years (2000~2005) data is used instead of five most recent year data in Table 4 of the PDD.<br><br>The equation for calculating emission on the baseline is not accordance with AMS-I.D. (PDD: BEy=EGy*BEy) | **CAR4**<br><br>**CL4**<br><br>**CAR5**<br><br>**CAR6** | **OK** |
| B.2.4. Has the baseline scenario been determined using conservative assumptions where possible? | PDD B.4 | DR,I | Refer to B.2.3<br>Utilization factor 25% is not determined in transparent manner. | **CAR7** | **OK** |

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| B.2.5 Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? | PDD B.4 | DR | Refer to A.2 of PDD | **OK** | **OK** |
| B.2.6 Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced? | PDD B.4 | DR | Total amount of electricity produced From Jeju itself in the PDD is not correspond with data from the Electric Power Statistics Information System.<br><br>The source of $NCV_i$, $EF_{CO2i}$, for calculating $COEF_i$ are not clearly defined in the PDD. | **CAR8**<br><br>**CL 5** | **OK** |
| B.2.7 Have the major risks to the baseline been identified? | PDD B.4 | DR | The project is located in island. Thus the grid boundary of the project is unique compared with other CDM projects inland in Korea. | **OK** | **OK** |
| **B.3. Additionality Determination**<br>*The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.* | | | | | |
| B.3.1 Is the project additionality assessed according to the methodology? | PDD B.5 | DR | According to the attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the project additionality is assessed by investment analysis.<br>But, the details for analysis are not provided. | **CAR9** | **OK** |
| B.3.2 Are all assumptions stated in a transparent and conservative manner? | PDD B.5 | DR | In order to demonstrate the addtionality of the proposed project, the project design document describes that the project are faced with investment barriers due to its negative NPV. In addition, it had been verified<br>that the NPV was properly calculated with verifiable values including total investment costs, O&M costs, discount rate, electricity tariff, and price of purchasing electricity through the related documentation.<br>The discount rate for the project has been determined as 7% according to 2nd Basic plant of long term electric supply and demand, 2004, Ministry of commerce industry and energy and this rate is usually using in investment in korea. According to sensitivity analysis, NPV is still below 0 in consideration of the financial debentures and cooperate bond which values are at the project promoting time. Appropriateness of the discount rate and calculation of NPV is validated again. | **OK** | **OK** |
| B.3.3 Is sufficient evidence provided to support the relevance of the arguments made? | PDD B.5 | DR,I | Refer to B.3.1 | **OK** | **OK** |

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| B.3.4 If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity? | PDD B.5 | DR,I | Yes, the project activity was considered as CDM on August 2001 and on April 2003 in case Haengwon and Sinchang respectively.<br>The relevant evidences was provided to the DOE and DOE verified it. | **OK** | **OK** |
| **B.4 Calculation of GHG Emission Reductions – Project emissions**<br>*It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.* | | | | | |
| B.4.1 Are the calculations documented according to the approved methodology and in a complete and transparent manner? | PDD B.6 | DR | No project emissions are likely as this is a wind power project. | **OK** | **OK** |
| B.4.2 Have conservative assumptions been used when calculating the project emissions? | PDD B.6 | DR | Refer to B.4.1 | **OK** | **OK** |
| B.4.3 Are uncertainties in the project emission estimates properly addressed? | PDD B.6 | DR | Refer to B.4.1 | **OK** | **OK** |
| **B.5 Calculation of GHG Emission Reductions – Baseline emissions**<br>*It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.* | | | | | |
| B.5.1 Are the calculations documented according to the approved methodology and in a complete and transparent manner? | PDD B.6 | DR | Refer to B.2.3 | **OK** | **OK** |
| B.5.2 Have conservative assumptions been used when calculating the baseline emissions? | PDD B.6 | DR | No, the estimation of emission reduction is not consistent in various page of the PDD.<br>(page 3: 6,644.6 t $CO_2$ e, page 6: 9,292 t $CO_2$ e, page 13: 9,290 t $CO_2$ e) | **CAR10** | **OK** |
| B.5.3 Are uncertainties in the baseline emission estimates properly addressed? | PDD B.6 | DR | Refer to B.2.3 | **OK** | **OK** |

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| **B.6 Calculation of GHG Emission Reductions – Leakage**<br>*It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.* | | | | | |
| B.6.1 Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner? | PDD B.6 | DR | For the wind power project, no leakage need be considered. | **OK** | **OK** |
| B.6.2 Have conservative assumptions been used when calculating the leakage emissions? | PDD B.6 | DR | Refer to B.6.1 | **OK** | **OK** |
| B.6.3 Are uncertainties in the leakage emission estimates properly addressed? | PDD B.6 | DR | Refer to B.6.1 | **OK** | **OK** |
| **B.7 Emission Reductions**<br>*The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.* | | | | | |
| B.7.1 Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change. | PDD B.6 | DR | Yes, the project is expected to reduce 92,010t$CO_2$ over the 10 years crediting period (9,201t$CO_2$ per year) and thus replaces fossil based electricity generation. | **OK** | **OK** |
| **B.8 Monitoring Methodology**<br>*It is assessed whether the project applies an appropriate baseline methodology.* | | | | | |
| B.81 Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner? | PDD B.7 | DR | Yes, the monitoring plan documented according to the approved methodology AMS-I.D(Ver 11) | **OK** | **OK** |
| B.8.2 Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later? | PDD B.7 | DR, I | Monitoring plan in the PDD does not cover the project monitoring requirements such as the calibration frequency of electricity meter and retention time of EGy data. | **CAR11** | **OK** |
| **B.9 Monitoring of Project Emissions**<br>*It is established whether the monitoring plan provides for reliable and complete project emission data over time.* | | | | | |

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| B.9.1 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 | DR | Not applicable to the project. | **OK** | **OK** |
| B.9.2 Are the choices of project GHG indicators reasonable and conservative? | PDD B.7 | DR | Refer to B.9.1 | **OK** | **OK** |
| B.9.3 Is the measurement *method* clearly stated for each GHG value to be monitored and deemed appropriate? | PDD B.7 | DR | Refer to B.9.1 | **OK** | **OK** |
| B.9.4 Is the measurement *equipment* described and deemed appropriate? | PDD B.7 | DR | Refer to B.9.1 | **OK** | **OK** |
| B.9.5 Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements? | PDD B.7 | DR | Refer to B.9.1 | **OK** | **OK** |
| B.9.6 Is the measurement *interval* identified and deemed appropriate? | PDD B.7 | DR | Refer to B.9.1 | **OK** | **OK** |
| B.9.7 Is the *registration, monitoring, measurement* and *reporting* procedure defined? | PDD B.7 | DR | Refer to B.9.1 | **OK** | **OK** |
| B.9.8 Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed? | PDD B.7 | DR | Refer to B.9.1 | **OK** | **OK** |
| B.9.9 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 | DR | Refer to B.9.1 | **OK** | **OK** |

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| **B.10 Monitoring of Baseline Emissions**<br>*It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.* | | | | | |
| B.10.1 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 | Refer to B.8.2 | **OK** | **OK** |
| B.10.2 Are the choices of baseline GHG indicators reasonable and conservative? | PDD B.7.1 | DR | Yes, it complies with the AMS-I.D. | **OK** | **OK** |
| B.10.3 Is the measurement *method* clearly stated for each baseline indicator to be monitored and also deemed appropriate? | PDD B.7.1 | DR | Yes, the individual electricity generation from each plant and the electricity consumed in the plant will be monitored. | **OK** | **OK** |
| B.10.4 Is the measurement *equipment* described and deemed appropriate? | PDD B.7.1 | DR,I | Electricity measuring meter was set up transparently in accordance with "Law regarding measurement" and "Act on operation of electricity market" and sealed after affirmation of the Korea Power Exchange and Korea Electric Safety Corporation. | **OK** | **OK** |
| B.10.5 Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements? | PDD B.7.1 | DR,I | Yes, the allowable error of the data is within ±0.5% according to the Electricity Enterprises Act.<br>The procedure for calibration and maintenance of monitoring equipment is in place. | **OK** | **OK** |
| B.10.6 Is the measurement *interval* for baseline data identified and deemed appropriate? | PDD B.7.1 | DR,I | Electricity Data will be measured hourly and recorded monthly. | **OK** | **OK** |
| B.10.7 Is the *registration, monitoring, measurement* and *reporting* procedure defined? | PDD B.7.1 | DR,I | Role and responsibility for reporting is defined. However it was not shown in the PDD. | **CL6** | **OK** |
| B.10.8 Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed? | PDD B.7.1 | DR,I | Refer to B.8.2 | **OK** | **OK** |

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| B.10.9 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.7.1 | DR | Refer to B.8.2 | **OK** | **OK** |
| **B.11 Monitoring of Leakage**<br>*It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.* | | | | | |
| B.11.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage? | PDD B.6.3 | DR | Leakage is not applicable according to AMS- I.D. | **OK** | **OK** |
| B.11.2 Are the choices of project leakage indicators reasonable and conservative? | PDD B.6.3 | DR | Refer to B.11.1 | **OK** | **OK** |
| B.11.3 Is the measurement *method* clearly stated for each leakage value to be monitored and deemed appropriate? | PDD B.6.3 | DR | Refer to B.11.1 | **OK** | **OK** |
| **B.12 Monitoring of Sustainable Development Indicators/ Environmental Impacts**<br>*It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.* | | | | | |
| B.12.1 Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country? | PDD D.1 | DR | Not applicable to the project. | **OK** | **OK** |
| B.12.2 Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts? | PDD D.1 | DR | Refer to B.12.1 | **OK** | **OK** |
| B.12.3 Are the sustainable development indicators in line with stated national priorities in the Host Country? | PDD D.1 | DR | Refer to B.12.1 | **OK** | **OK** |

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| **B.13 Project Management Planning**<br>*It is checked that project implementation is properly prepared for and that critical arrangements are addressed.* | | | | | |
| B.13.1 Is the authority and responsibility of overall project management clearly described? | PDD B.7.2 | DR,I | During the interview, it was noted that Jeju Special Self-Governing Province is having authority and responsibility of overall project management. | **OK** | **OK** |
| B.13.2 Are procedures identified for training of monitoring personnel? | PDD B.7.2 | DR,I | The monitoring personnel are well qualified and they have training plan for other person. | **OK** | **OK** |
| B.13.3 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions? | PDD B.7.2 | DR,I | Generating electricity through the wind turbines does not lead to any emissions. | **OK** | **OK** |
| B.13.4 Are procedures identified for review of reported results/data? | PDD B.7.2 | DR,I | Internal review procedure is in place. | **OK** | **OK** |
| B.13.5 Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting? | PDD B.7.2 | DR,I | Procedures are available as part of the existing system procedures. | **OK** | **OK** |
| **C. Duration of the Project/ Crediting Period**<br>*It is assessed whether the temporary boundaries of the project are clearly defined.* | | | | | |
| C.1 Are the project's starting date and operational lifetime clearly defined and evidenced? | PDD C.1 | DR | No, the project starting date is not found in the PDD. | **CAR12** | **OK** |
| C.2 Is the start of the crediting period clearly defined and reasonable? | PDD C.2 | DR | No, This project applies a crediting period of 10 years. But 21 years is described at Section B.5 in the PDD. | **CL7** | **OK** |

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| **D. Environmental Impacts**<br>*Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.* | | | | | |
| D.1 Does host country legislation require an analysis of the environmental impacts of the project activity? | PDD D.1 | DR | Not be required. | **OK** | **OK** |
| D.2 Does the project comply with environmental legislation in the host country? | PDD D.1 | DR | Yes. | **OK** | **OK** |
| D.3 Will the project create any adverse environmental effects? | PDD D.1 | DR,I | No, the wind energy project carries minimal environmental impacts. | **OK** | **OK** |
| D.4 Have environmental impacts been identified and addressed in the PDD? | PDD D.1 | DR,I | No, Jeju Special Self-Governing Province already conducted a study to mitigate environmental impacts before the project construction but it has not sufficiently described. | **CL8** | **OK** |
| **E. Stakeholder Comments**<br>*The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.* | | | | | |
| E.1 Have relevant stakeholders been consulted? | PDD E.1 | DR,I | Stakeholders have been consulted many times for each plant. | **OK** | **OK** |
| E.2 Have appropriate media been used to invite comments by local stakeholders | PDD E.1 | DR,I | Yes, Hallailbo, Jejuilbo and Yonhapnews have been used. | **OK** | **OK** |
| 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 | Not be required. | **OK** | **OK** |

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| E.4 Is a summary of the stakeholder comments received provided? | PDD B.2 | DR,I | No, a summary of the stakeholder comments received is not sufficiently provided in the PDD. But It was found on site assessment. | **CL9** | **OK** |
| E.5 Has due account been taken of any stakeholder comments received? | PDD E.3 | DR,I | No, due account taken is not sufficiently provided in the PDD. | **CL10** | **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 :**<br>The address of the Haengwon wind power plant is not correct in the PDD.<br>(Haengwon wind power plant : Bukjeju-Gun Haengwon-Ri) | A.2.1 | The address of plants have been corrected in the PDD.<br>(Haengwon wind power plant : Jeju-Si Gujwa-Eup Haengwon-Ri) | CAR 1 is closed. |
| **CAR 2 :**<br>Numbers and capacity of the turbine in Haengwon and Sinchang are not correct in the PDD.<br>(Haengwon wind power plant : 850kw*2EA,<br>Sinchang wind power plant : 660kw*3EA, 750kw*3EA) | A.2.2 | It have been corrected in the PDD.<br>(Sinchang wind power plant : 850kw*2EA,<br>Haengwon wind power plant : 660kw*3EA, 750kw*3EA) | CAR 2 is closed. |
| **CAR 3 :**<br>Host Government Approval has not obtained. This document is a prerequisite for registration as per CDM Modalities & Procedures 40(a). | A.3.2 | See the attached approval letters of Korean DNA. The DNA of Korea approved and received at 20 September, 2007. | CAR 3 is closed. |
| **CAR 4 :**<br>The following assumption are not explained with sufficient data in the PDD.<br>a) The source of the ratio of electricity supply from inland to Jeju Island is occupied 40% of total electricity generation amount of Jeju Island.<br>b) The source of the power plants capacity additions on the electricity system that comprise 20% of the system generation and that have been built most recently in Jeju island. | B.2.3 | The ratio of electricity supply from inland to Jeju Island(41%) have been recalculated with 2003~2005 data published by KPX in a transparent manner.<br>And The source of the power plants capacity additions on the electricity have been provided. | CAR 4 is closed. |
| **CAR 5 :**<br>The simple OM can only be used where low cost/must run resources constitute less than 50% of total grid generation in average of the five most recent years. However, average of six years (2000~2005) data is used instead of five most recent year data in Table 4 of the PDD. | B.2.3 | It have been recalculated with 5 most recent years(2001~2005). | CAR 5 is closed. |

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| **CAR 6 :**<br>The equation for calculating emission on the baseline is not accordance with AMS-I.D. (PDD: BEy=EGy*BEy) | B.2.3 | It have been corrected in the PDD.<br>(PDD: BEy=EGy*EFy) | CAR 6 is closed. |
| **CAR 7 :**<br>Utilization factor 25% is not determined in transparent manner. | B.2.4 | The assumption process is explained and data was provided for justifying utilization factor determined as 24.5%. | CAR 7 is closed. |
| **CAR 8 :**<br>Total amount of electricity produced from Jeju itself in the PDD is not correspond with data from the Electric Power Statistics Information System. | B.2.6 | The correct information is provided in the PDD. | CAR 8 is closed. |
| **CAR 9 :**<br>According to the attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the project additionality is assessed by investment analysis.<br>But, the details for analysis are not provided. | B.3.1 | The details for analysis are provided to the DOE. | CAR 9 is closed. |
| **CAR 10 :**<br>The estimation of emission reduction is not consistent in various page of the PDD.<br>(page 3: 6,644.6 t $CO_2$ e, page 6: 9,292 t $CO_2$ e, page 13: 9,290 t $CO_2$ e) | B.5.2 | The amount of emission reduction(9,201 t $CO_2$ e) is reestimated based on relevant assumption and data and provided in the revised PDD. | CAR 10 is closed. |
| **CAR 11 :**<br>Monitoring plan in the PDD does not cover the project monitoring requirements such as the calibration frequency of electricity meter and retention time of EGy data. | B.8.2 | Monitoring plan including the Calibration frequency of electricity meter(every 3 yr) and retention time of EGy data(2 yrs after the last issuance of CERs) have been established and reflected in the revised PDD. | CAR 11 is closed. |
| **CAR 12 :**<br>No, the project starting date is not found in the PDD. | C.1 | The project starting date is provided in the revised PDD(17 January 2001 in Haengwon and 17 August 2004 in Sinchang) according to the definition in the glossary of terms;<br>a) for Haengwon:<br>- date agreed by community: 17 Jan 2001<br>- contract date for constraction: 19 Oct 2001<br>- start date for construction: 22 Oct 2001<br>- finished date for construction: 23 April 2003 | CAR 12 is closed. |

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| | | - real action date: 4 April 2003<br>b) for Sinchang:<br>- date agreed by community: 17 Aug 2004<br>- contract date for constraction: 20 April 2005<br>- start date for construction:.26 April 2005<br>- finished date for construction: 23 Feb 2006<br>- real action date: 23 Feb 2006 | |
| **CL 1 :**<br>Physical location and unique identification of 6 turbines for the CDM activity among 15 turbines in Haengwon wind park project are not clearly defined in the PDD. | A.2.2 | The location of project activities with identification number of wind turbines have been provided to the DOE and have also been included in the revised PDD. | CL 1 is closed. |
| **CL 2 :**<br>Annex 2 and Annex 4 in the PDD are not completed. | A.2.6 | Annex 2 and Annex 4 in the PDD are completed. | CL 2 is closed. |
| **CL 3 :**<br>the project has social and environmental benefits besides GHG emission reduction. But, It was not sufficiently described in the PDD. | A.3.1 | It is sufficiently described in the PDD. | CL 3 is closed. |
| **CL 4 :**<br>Simple OM is chosen for calculating the operating margin emission factor but the term, 'average OM' is used in part of the PDD. | B.2.3 | The choice of simple OM is justified and<br>The term, 'average OM' is deleted in part of the revised PDD. | CL 4 is closed. |
| **CL 5 :**<br>The source of $NCV_i$, $EF_{CO2i}$, for calculating $COEF_i$ are not clearly defined in the PDD. | B.2.6 | The relevant information is provided in the revised PDD. | CL 5 is closed. |
| **CL 6 :**<br>Role and responsibility for reporting is defined. However it was not shown in the PDD. | B.10.7 | The relevant information is provided in the section B.7.2 of the revised PDD. | CL 6 is closed. |
| **CL 7 :**<br>No, This project applies a crediting period of 10 years. But 21 years is described at Section B.5 in the PDD. | C.2 | 21 years is deleted in Section B.5 in the revised PDD. | CL 7 is closed. |
| **CL 8 :**<br>No, Jeju Special Self-Governing Province already conducted a study to mitigate environmental impacts before the project construction but it has not sufficiently described. | D.4 | The relevant information is provided in the section E.3 of the revised PDD. | CL 8 is closed. |

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| **CL 9 :**<br>No, a summary of the stakeholder comments received is not sufficiently provided in the PDD. But It was found on site assessment. | E.4 | The relevant information is provided in the section E.2 of the revised PDD. | CL 9 is closed. |
| **CL 10 :**<br>No, due account taken is not sufficiently provided in the PDD. | E.5 | The relevant information is provided in the section E.3 of the revised PDD. | CL 10 is closed. |