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# VALIDATION REPORT

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## **24MW DONG YANG ENERGY PV(PHOTOVOLTAIC) POWER PLANT**

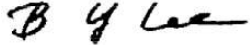
**REPORT No. 2009-16**

REVISION No. 02

**KOREAN FOUNDATION FOR QUALITY**




## VALIDATION REPORT

Date of first issue: 19 August 2009	Date of this revision 18 December 2009	Project No.: EC-890	Korean Foundation for Quality  13F, Woolim Lion's Valley B Bldg. 371-28 Gasan-dong, Geumcheon-gu, Seoul, Korea Tel. +82 2 2025 9061 Fax. +82 2 2025 9069 <a href="http://www.kfq.or.kr">http://www.kfq.or.kr</a>
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Client: DONG YANG ENERGY Co., Ltd.		Client ref.: Mr. Ki Ho Shin	

Summary:

**Project Title :** 24MW DONG YANG ENERGY PV(photovoltaic) power plant  
**Investor Country :** -  
**Host Country :** Republic of Korea  
**Project Participants :** DONG YANG ENERGY Co., Ltd.  
**Applied Methodology(ver) :** ACM 0002 (Version 10)  
**Technology/Measure to be employed :** 24MW photovoltaic power  
**Crediting Period :** 10 years  
**Estimated ER :** 21,874 tons CO<sub>2</sub>/yr  
**Project Size :** Large Scale  
**Validation Report Status**  
☐ CAR/CL Requested  
☐ Resolution of Outstanding issues  
☐ Before DNA approval  
☒ Full approval and submission for registration

As the result of the validation, it can be confirmed that 24MW DONG YANG ENERGY PV(photovoltaic) power plant as described in the revised PDD of 10 December 2009 (Ver.10), meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baselines and monitoring methodology ACM 0002(Version 10). KFQ thus requests the registration of the project as a CDM project activity.

Work carried out by :  Mi Jung LEE (Audit team Leader, GHG auditor) Yu Shim JEONG (Audit team member, GHG auditor) Nam Hoon KIM (Audit team member, Observer)	Work Verified by :  Jong Moon PARK 
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VALIDATION REPORT

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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 <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	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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 VALIDATION REPORT
 

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<i><b>Table of Contents</b></i>	<i><b>Page</b></i>
1 INTRODUCTION .....	3
1.1 Objective	3
1.2 Scope	3
1.3 Validation Team	4
2 METHODOLOGY .....	4
2.1 Desk Review of the Project Design Documents	6
2.2 Follow-up Interviews with Project Stakeholders	7
2.3 Resolution of Clarification and Corrective Action Requests	7
2.4 Internal Quality Control	8
3 VALIDATION FINDINGS .....	8
3.1 Participation Requirements	8
3.2 Project Design	9
3.3 Baseline Determination	10
3.4 Additionality	11
3.5 Monitoring Plan	19
3.6 Calculation of GHG Emissions	21
3.7 Environmental Impacts	22
3.8 Comments by Local Stakeholders	23
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS .....	23
5 VALIDATION OPINION .....	24
6 REFERENCE .....	26

Appendix A: Validation Protocol

Appendix B: Qualification of Validation Team

# 1 INTRODUCTION

Korean Foundation for Quality (KFQ) has been engaged by 'DONG YANG ENERGY Co., Ltd.' to perform a validation of the '24MW DONG YANG ENERGY PV (photovoltaic) power plant' in Republic of Korea (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 10, 10 December 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)', and the Proposed New Baseline and Monitoring Methodologies (ACM 0002) (Ver. 10) for Large Scale CDM project.

The Project is classified with sectoral scope 1- Energy Industries (Renewable Electricity: Generation for a grid) and photovoltaic power plant is located in Sinan-gun, Jeollanam-do of Korea. Total capacity of the project is 24MW, comprised of 108,864 pieces for 180W PV modules and 21,792 pieces for 200W PV modules on 682,500m<sup>2</sup> area with a predicted annual electricity supply to the KEPCO is 35,882 MWh.

The expected CO<sub>2</sub> reduction is estimated to be 21,874 tCO<sub>2</sub>e per year and 218,740 tCO<sub>2</sub>e over the 10 years crediting period.

## 1.1 Objective

The purpose of the 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 country's 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 employed a risk-based approach to the validation that is based on the recommendation in the validation and verification manual, focusing on the identification of significant risk for project implementation and 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:

Mi Jung LEE (Audit team Leader, GHG auditor)

Yu Shim JEONG (Audit team member, GHG auditor)

Nam Hoon KIM (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 document
- 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 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 (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.

<b>Validation Protocol Table 1: Mandatory Requirements for Clean Development Mechanism Project Activity</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference/Comment</b>
<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 <b>Corrective Action Request (CAR)</b> 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>

<b>Validation Protocol Table 2: Requirement checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<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 <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). <b>Clarification Request (CL)</b> is used when the validation team has identified a need for further clarification.</i>

<b>Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests</b>			
<b>Draft report clarifications and corrective action requests</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation conclusion</b>
<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 February 2009 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 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
- Changes related to the methodology revision as ACM 0002 version 10
- Changes related to crediting period as fixed crediting period of 10 year

## 2.2 Follow-up Interviews with Project Stakeholders

Issues identified by KFQ during the subsequent stages of the validation have been clarified through continuous communication with the project participants. The project participants have also provided underlying documentation for review by KFQ, confirming selected information and resolving issues identified in the validation.

In the period of 17 February and 19 February 2009, 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 summarized in Table 1.

**Table 1 Interview topics**

Interviewed organisation	Interview topics
DONG YANG ENERGY Co., Ltd. - Seung Soo MOON - Min Kyum KIM	<ul style="list-style-type: none"> <li>➤ Project design</li> <li>➤ Project technology, operation, maintenance</li> <li>➤ Sustainable development issues</li> <li>➤ Additionality</li> <li>➤ Environmental impacts(incl. EIA approval)</li> <li>➤ Stakeholder consultation process</li> <li>➤ Monitoring plan</li> </ul>
Ecoeye Co.,Ltd - John PARK - Ji Hye YOON	<ul style="list-style-type: none"> <li>➤ Applicability of selected methodology</li> <li>➤ Baseline determination</li> <li>➤ Additionality</li> <li>➤ Emission reductions calculation</li> <li>➤ Crediting Period</li> <li>➤ Approval by the host country</li> </ul>
Local government - Tae Sung HONG	<ul style="list-style-type: none"> <li>➤ Environmental issues</li> <li>➤ Stakeholder comments</li> <li>➤ Sustainable development issues</li> </ul>
Local resident representative - Tae Nam JOO	<ul style="list-style-type: none"> <li>➤ Environmental issues</li> <li>➤ Stakeholder comments</li> <li>➤ Sustainable development issues</li> </ul>

## 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, sixteen Corrective Action Requests (CAR) and three requests for Clarification (CL) were identified. These requests were presented to the project participant in a CAR/CL report in 26 February 2009. The additional information provided by the project participant to address these requests and revised PDD of 10 December 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**

The project participant is DONG YANG ENERGY Co., Ltd as the project owner from the host Party the Republic of Korea(hereinafter, Korea) and Host Party meets the requirements to participate in the CDM, ratified by the Kyoto Protocol.

The Letter of Approval (LoA) from Korea was obtained on 18 November 2009. The LoA confirms the project's contribution to sustainable development of Korea.

Validation team has checked the consistency of project participant's information in section A.3, Annex 1 of the PDD and DNA approval letter.

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

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

## 3.2 Project Design

The construction of photovoltaic power plant to generate power and contribute to sustainability of power generation of the KEPCO is the main objective of the proposed project.

The project has a total installed capacity of 24MW and is expected to supply 35,882 MWh to the KEPCO annually. The expected CO<sub>2</sub> reduction is estimated to be 21,874 tCO<sub>2</sub>e per year and 218,740 tCO<sub>2</sub>e over the 10 year crediting period.

The purpose of the project is to meet the growing electricity demand in KEPCO by the generation of zero carbon emission electricity utilizing renewable photovoltaic resources.

Moreover, the project will contribute to sustainable development by reducing dependence on fossil fuels for power generation. Furthermore it will contribute to the local economic development.

The starting date of the project has been validated by KFQ as 29 March 2007 which represents the date of construction agreement between PP and CONERGY who is module provider and has a role of maintenance and management the equipment as well. To confirm this date, validation team examined following dates.

- Construction agreement : 29 March 2007
- Approval of construction work : 1 May 2007
- Contract date of equipment purchasing : 21 May 2007

KFQ regarded this construction agreement as an official consent to the construction of the project plants and accepted this starting date is the earliest date at which either the implementation or construction or real action of a project activity begins.

Following this contract, construction was started on 10 May 2007 and initial grid connection with KPX on 16 November 2007. And commercial operating has been started on 22 November 2007.

The designed operational life time of the project is estimated as 20 years and fixed crediting period of 10 year is selected, starting on 1 March 2010 or on the date of registration of the CDM project activity whichever is later.

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 Equity investment from project participant and loan from bank.

All the description of the project as confirmed in the PDD was identified through objective evidences such as equipment purchasing contract, power generation business permission, etc.

Nevertheless, CAR 13, CL 1, CL2 and CL 3 were raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

### 3.3 Baseline Determination

The 24MW DONG YANG ENERGY PV (photovoltaic) power plant project applies the approved consolidated baseline methodology ACM 0002 “Consolidated baseline methodology for grid connected electricity generation from renewable sources” (version 10). The methodology is applicable to the project as the project activity is a grid-connected renewable power generation project activity that involves electricity capacity additions.

Thus, the baseline scenario is that in the absence of the project activity the equivalent electricity would, have been generated by the operation of grid-connected thermal power plants and by the addition of new generation sources.

The project boundary is determined as the KEPCO and selected sources/gases are also identified and described in the PDD correctly with valid justification for the project activity. And it meets the requirement of the methodology ACM 0002. Validation team validated the boundary and GHG sources by observation of the physical site visit, equipment to be employed and all project related documentations.

According to methodology ACM 0002, baseline emission is equal to the power supplied to grid multiplied by baseline emission factor EF<sub>y</sub>. The baseline emission factor is calculated as combined margin (CM): a weighted average of the Operating Margin Emission Factor (EF<sub>OM,y</sub>) and the Build Margin Emission Factor (EF<sub>BM,y</sub>).

The OM and BM Emission Factors have been calculated using the original data published in the ‘Statistic of Electric Power in Korea’ for year 2005 ~ 2007(KEPCO), the Status of generation facility for 2008(KPX) and Revised IPCC 2006 Guidelines (Carbon oxidation factor of each fuel and carbon emission factor).

The OM and BM emission factors are calculated to be 0.6817 and 0.3933 t CO<sub>2</sub>/MWh respectively and the CM (combined margin) of the project is calculated as 0.6096 t CO<sub>2</sub>/MWh. With an expected export of 35,882 MWh per year to the grid, the annual baseline emissions will be 21,874 t CO<sub>2</sub>e.

- $EF_{grid,CM,y} = (0.6817 \times 0.75) + (0.3933 \times 0.25) = 0.6096 \text{ CO}_2/\text{MWh}$

As greenhouse gases emission from the project can be considered to be zero and no leakage calculation is required according to ACM 0002 methodology, the emission reductions are equal to baseline emissions.

Finally, 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 as well as crosschecking similar registered CDM projects in Korea.

Nevertheless, CAR 2, CAR 3, CAR 4 and CAR 10 were to be raised in the course of the validation and were successfully closed (ref Annex: Validation Protocol- Table 3).

### **3.4 Additionality**

The additionality of the project has been established using the “Tool for the demonstration and assessment of additionality” version 05.2 approved by the CDM-EB.

Through our thorough investigation and analysis, we can state that proposed project activity is additional as it would not have happened in the absence of CDM. Details of the assessment for additionality of the project are as below.

#### **Identification of alternatives to the project activity consistent with current laws and regulations**

Four alternative baseline scenarios including the proposed project activity without CDM have been identified as follows in accordance with ACM 0002, VVM para 103 and para(4) of the “Tool for the demonstration and assessment of additionality(ver 05.2).

##### **Sub-step 1a: Define alternatives to the project activity.**

Alternative baseline scenarios are:

- a) The proposed project not taken as CDM project activity
- b) Construction of a fossil fuel plant with equivalent amount of installed capacity or annual electricity output
- c) Construction of a power plant using other sources of renewable energy with equivalent amount of annual electricity output
- d) Supply of equivalent annual power output by the grid where the proposed project is connected to.

The Korea government established “Act on the Promotion of the Development, Use and

Diffusion of New and Renewable Energy”(revised in 27/09/2006. No 7998 ) to encourage low-GHG emission and eco-friendly activity and depletion of fossil fuel is global topic as well. Considering the situation, even though a fossil fuel power plant is more economical than a renewable energy power plant such as this project activity, alternative b) is less applicable.

Furthermore, the alternative of using other renewable energy is unrealistic due to the lack of exploitable other renewable sources and geographically unfeasible. Thus alternative c) is less applicable.

Outcome of Step 1a are Alternative a) and d).

### **Sub-step 1b: Consistency with mandatory laws and regulations.**

All alternatives comply with the laws and regulatory requirements for electricity generation in Korea.

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.

There are no laws and regulations compelling the project developer to develop photovoltaic power plants. Therefore Alternatives a) and d) identified are in line with the requirement.

Thus the validation team concludes that the “Tool for the demonstration and assessment of additionality (Ver 05.2) has been correctly applied to the identification of alternatives to the project activity and the identification of alternatives are complete under relevant national and/or sectoral policies and circumstances.

### **Prior consideration and CDM continuation**

As starting date of the project activity (29 March 2007) is before 2 August 2008, the validation team had assessed the evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity instead of the evidence that the project participant informs a Korea DNA and/or the UNFCCC secretariat in writing of the commencement of the

project activity according to the ‘Guidance on the demonstration and assessment of prior consideration of the CDM, Version 03 (EB 49 meeting report, Annex 22). The consideration of CDM benefits prior to the starting date of the project activity has been found in the board meeting minute for investment decision held on 23 November 2006.

In line with the guidance of EB 49 meeting report, Annex 22, version 03, further evidences requested from the project participants were evaluated by KFQ. A summary of these evidences is provided in the following paragraphs.

On 15 May 2006, the project owner considered ‘Sinan PV power project’,\* as a CDM after internal feasibility study regarding the financial return of the project with CDM and without CDM and ‘Sinan PV power project plan’ which is the basis of decision making was established on 18 May 2006. Subsequently, board meeting took place in order to approve this project. To overcome the financial unattractiveness of the project, the Board of Directors formally approved developing the project under the frame of the CDM on 23 November 2006. At this board meeting, the project owner was well aware of CDM development and also implementation of the project activity without CDM was not feasible due to poor financial returns.

Through examining above and relevant documents, KFQ confirmed that the project owner was aware of the CDM prior to the starting date of the project, and that the benefits of the CDM were as decisive factor in the decision to proceed with the project activity.

Also the project participants have demonstrated through evidences and official documents that the sequence of the events is coherent and reliable under the additionality point of view.

Since construction agreement in 29 March 2007, PP had searched consulting company for CDM application and communicated with EPURON from August 2007 to March 2008, but the agreement with EPURON was not made. Thus the PP decided to switch the consulting company and the agreement for CDM consulting was made with Ecoeye Co., Ltd. in 30 November 2008. PP was seeking DOE to conduct validation and final validation contract was made between PP and KFQ on 24 December 2008.

Thus, KFQ confirmed that the project owner was aware of the CDM prior to the starting date of the project and found the gap between the documented evidence for demonstrating the continuation is satisfied according to the ‘Guidance on the demonstration and assessment of prior consideration of the CDM, Version 03 (EB 49 meeting report, Annex 22).

### **Investment analysis**

#### **▪ Choice of approach**

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\* Former name of the proposed project

The additionality of the project has been demonstrated by the existence of an investment barrier. The benchmark analysis option has been adopted for the project activity as it generates revenues by the sale of power to the grid and PP has no alternative with investment of comparable scale.

The project's financial viability evaluation is based on the NPV analysis.

▪ **Discount rate selection**

According to the 'Tool for the demonstration and assessment of additionality (version 05.2)', discount rate of this project has applied 3-year government bond rate as 4.83% which is the average value in 2006, before decision making for proposed CDM project, and is from Economic Statistics System provide by Bank of Korea.

PP found the 3-year government bond rate is the most appropriate financial indicator at the time of decision making. Also the validation team accepted the discount rate of the proposed project, 4.83% is valid value to use through our sectoral expertise.

▪ **Input values**

The input values used in the investment analysis esteemed based on the 'Sinan PV power project plan' reported on 18 May 2006 which are basic information to make decision of investment to this project activity.

The capacity of the project has been changed from 17MW on the 'Sinan PV power project plan' to 24 MW by the reason of land utilization and company's policy and also this change has been confirmed through the feasibility study conducted by the Standard Chartered Bank for loan contract on February 2007. Based on 'Sinan PV power project plan' the input values were adjusted to the value equivalence by the incremented capacity. Then, validation team assessed the validity of adjusted values and confirmed these input values are valid and applicable.

Furthermore, the audit team cross-checked the applied values with actual contracts or literatures etc. and compared them with KFQ's internal statistic results of the evaluation of photovoltaic power projects in Korea that are either already registered or currently under validation of CDM.

Therefore, KFQ was able to confirm that the input values in the investment analysis are valid and applicable at the time of investment decision and they have been applied consistently.

The details on assessment for validity and applicability of each input values are as follows:

- ① Investment cost: 183,529 million KRW (7,647 Million KRW/MW)



The investment cost in ‘Sinan Solar power project plan’ (130,000 million KRW, 7,647 million KRW/MW) at the time of decision making is smaller than the value in the GSP PDD (192,950 million KRW, 8,039 Million KRW/MW).

The validation team found the investment cost in GSP PDD was overestimated even considering the capacity increase. Thus PP adjusted the investment cost to 183,529 Million KRW (7,647 million KRW/MW) in final PDD by reflecting same unit cost to increased capacity (7MW) as investment decision making timing.

Also KFQ crosschecked this value with other 3 similar projects in Korea which shows unit investment cost of PV projects is the range of 5,160~8,500 million KRW/MW. In addition, according to ‘Notification for the investment unit cost of renewable energy in 2007’ noticed by Korea Energy Management Corporation, unit investment cost for PV power plant is 11,698 million KRW/MW(Tracking type). We verified this reference values is higher than the proposed project’s investment cost and could find the investment cost estimated as appropriate and valid.

In addition, audit team reviewed actual expenditure for this project activity such as construction, equipment purchasing etc. to confirm its validity. As the proposed project has been already completed construction, validation team was able to check that 188,344 Million RMB was already incurred as investment cost by the time of validation. And this actual incurred investment cost is slightly higher than the value in final PDD.

Thus, the validation team concluded this investment cost, 183,529 million KRW (7,647 million KRW/MW), is valid and appropriate for the project activity.

## ② O&M Cost: 900 million KRW/year (25.1 KRW/KWh)

O&M Cost in investment decision was estimated as 900 million KRW/year. However this value was adjusted by PP as 323 million KRW/year in GSP PDD. When compilation of GSP PDD, the PP made a mistake by reflecting only outsourcing cost for operation included O&M cost. Thus, PP adjusted the O&M cost to 900 million KRW reflecting outsourcing cost and other operation cost based on ‘Sinan PV power project plan’. The O&M cost is consists of outsourcing cost(incl. operation cost, maintenance cost, repair cost), labor cost, insurance, supervision cost and other cost.

To check validity of O&M cost, validation team reviewed the unit O&M cost for electricity generation with other 3 similar projects in Korea registered as CDM project and found that O&M cost for this proposed project activity(25.1 KRW/kWh) is lower than the average O&M cost (59 KRW/kWh).

Also O&M cost per total investment cost was cross-checked with the reference provided by 3<sup>rd</sup> party institution, Economic Feasibility of photovoltaic power generation source by

Korea Energy Economy Institute on 4 May, 2007. The O&M cost per total investment cost is less than 1% for photovoltaic power plant in Korea. According to this reference, the proposed project's O&M cost per total investment cost is 0.57% which is lower than the reference.

As well as above comparison, because the proposed project is under operation, audit team reviewed actual O&M cost for this project activity. The validation team could check as 1,003 million KRW/year for O&M cost which is higher than the value on final PDD.

Thus, KFQ concluded that O&M cost (KRW 900 million, 0.57% of total investment cost) applied is valid.

### ③ SMP : 85.92 KRW/KWh

PP estimated the SMP in the GSP PDD as 85.92 KRW/KWh from statistical data for photovoltaic power of average value in the year 2007 which is the timing of decision making.

KFQ analyzed this value through SMP trend for PV power through the statistics provided by Korea Power Exchange (KPX) (<http://epsis.kpx.or.kr>) and found the SMP trend increased by each year. We detected abnormal increase occurred in the year 2008(50%) due to international oil price fluctuation, thus we verified the annual increase rate during the year 2004 ~ 2009 was 15.5%. Even though this is not a common increase case, the increase rate was still lower than sensitivity range (+20%).

Furthermore, we confirmed the SMP(85.92 KRW/KWh) which adapted in the project is higher than the value of the three years before the decision making(71 KRW/KWh) and 85.92 KRW/KWh is valid and appropriate at the time of decision making.

### ④ Annual output to the Grid: 35,882 MWh/yr (Load factor : 17.1%)

Annual output was estimated as 25,465MWh(17MW, Load factor: 17.1%) that is based on daylight record (1,875hour/year) which is lower than 5 years of the average daylight record of Mokpo area where is the proposed project's location (2,094hour/year, Mokpo Weather station, <http://mokpo.kma.go.kr/index>) and also considered module loss, system loss and utility factor at the time of decision making, investigated by PP. Then when the time of capacity change to 24MW, annual output was calculated as 35,882 MWh/yr based on the same daylight record, losses and utility factor described above.

We also confirmed the load factor has been analyzed by 3<sup>rd</sup> party institution, Meteo Control GmbH, having been involved in the energy and weather sectors for more than 30 years, and the load factor calculated as 15.9% which is lower than the PP's investigation.

The validation team investigated the load factor with other similar PV projects in Korea which registered as CDM projects shows that the range of load factor is 13.5%~19.5% which is higher than proposed project. As a result of investigation, we accepted the load factor(17.1%), estimated by PP regard to the project, through our sectoral expertise and relevant references.

The validation team confirmed this load factor(17.1%) and annual output(35,882 MWh/yr) is within the similar project's range and this values are appropriate under comprehensive understanding of additionality.

⑤ Residual Value: 0 %

Validation team checked it with Regulation of Financing on Electricity Business (Ministry of Commerce Industry and Energy, 6 April 2002) indicates residual value can be less than 5% of fixed asset and should be decided by project owner.

KFQ found that 0% of residual value does not have a significant impact on the NPV and therefore does not have an impact on the additionality of the project activity.

⑥ Operational lifetime: 20 years

In the validation process, the operational lifetime was estimated to 20 years based on the lifetime of module and inverter. The validation team confirmed lifetime of similar photovoltaic power project has its operational lifetime as 20 years and checked the module and inverter warranty is up to 20 years through warranty information by SOLAR POWER Inc.

Investment analysis was done for 20 years as expected operational lifetime of the proposed project activity. Referring to other similar project's operational life time, technical literatures and our technical expertise, KFQ concluded that period of assessment is valid.

The validation team has checked all sources of the NPV calculation, as presented in B.5 in the PDD. Furthermore the calculation spreadsheet was checked for confirming the correctness of calculation and the consistency of the used figures with the same stated in the PDD verified.

Thus, KFQ is able to confirm that the input values in PP's evaluation are valid and appropriate representing the economic situation of the project at the time of investment decision.

▪ **Sensitivity analysis**

A sensitivity analysis has been carried out for parameter contributing more than 20% to revenues or costs which are investment cost, O&M cost, SMP and electricity generation. A variation of  $\pm 20\%$  has been considered in the critical assumptions by consideration of circumstance of each parameter.

- ① Investment cost in this project is very dependent on exchange rate due to introducing of imported equipments from foreign companies. Thus the variation range of investment cost was assessed by considering the fluctuation of past exchange rate for past 10 years (1998~2007), and EB guidance. The validation team examined the fluctuation of past exchange rate by Korea Bank Economic Statistics System (<http://ecos.bok.or.kr/>). According to the statistics, the fluctuation range of exchange rate during last 10 years (1998~2007) was 9.9%. 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. Also considering the fluctuation of inflation rate for past 5 years (2004~2008) in Korea(3.16%), validation team deemed more than + 10% of inflation rate is unlikely to occur. Therefore, KFQ concluded that  $\pm 20\%$  of applied variation range for investment cost is suitable for the proposed project activity.

Furthermore, as this project activity is under operation, we could confirm the investment cost has been incurred amount as 188,344 million KRW which is bigger than the value used for investment analysis.

Thus it is hardly to decrease the investment cost to -20%.

- ② O&M cost is strictly connected with inflation rate. Thus the variation range of O&M cost is decided by considering the fluctuation of inflation rate for past 5 years (2004~2008) in Korea. According to Bank of Korea Economic Statistics System, inflation rate was 3.16%. Thus validation team deemed more than + 10% of inflation rate is unlikely to occur. Therefore, KFQ concluded that  $\pm 20\%$  of applied variation range for O&M cost is suitable for the proposed project activity.

Furthermore, as this project activity is under operation, we could confirmed the O&M cost has been incurred amount as 1,010 million KRW/year. Thus it is hardly to decrease the investment cost to -20%.

- ③ As for SMP, we analyzed its trend of past 3 years (2004~2006) based on statistics from KPX (<http://epsis.kpx.or.kr>). Annual average of increase rate for past 3 years was 15.1%. Also we analyzed the annual average of increase rate during the year 2007~2009 was 16.1%. Even though abnormal increase occurred in the year 2008(50%), the increase trend is still less than +20%. Thus validation team concluded that it is hardly to increase the SMP to +20%. In addition, the SMP is decreasing in the year 2009, so we confirmed the SMP is not expected increase in the future constantly.

- ④ The variation of electricity generation is assessed considering the fluctuation of amount of daylight in Mokpo area(Mokpo Weather station, <http://mokpo.kma.go.kr/index.jsp>) near to the project site during past 15 years (1992~2006). According to the statistics, fluctuation of amount of daylight is less than 5.77 %. Thus, validation team deemed  $\pm 20\%$  of rising trend for amount of daylight is unlikely to occur. Thus validation team concluded that it is hardly to

increase the electricity generation to +20%.

To conclude the sensitivity analysis it can be stated that under none of the assumed variation of variables calculated over '0'. Thus, the sensitivity analysis result consistently support the conclusion that proposed project activity is unlikely to be financially attractive.

#### ▪ **Common practice**

Despite of 3<sup>rd</sup> party's investigation (Samsung Economy Research Institute, August 2007), electricity generation by photovoltaic power occupies 0.003% compare with total electricity generation in Korea. Electricity generation by fossil fuel-base power plants is as dominated as over. KFQ validation team has examined the relevant documentary evidence such as statistics.

The common practice analysis has been performed considering the Korea as the relevant geographical extension and the basis of capacity limited over 12MW photovoltaic power plant according to the defined range for common practice in methodology ACM 0013. ACM 0013 noticed the comparable size for common practice is from 50% to 150% to the size of project activity. Because the proposed project is the largest photovoltaic power plant in Korea, no project found over than the project's capacity. Thus PP found only two projects such as LG Solar Energy Taean Photovoltaic Power Plant Project(14MW) and Gochang solarpark photovoltaic power plant Project(14.98MW) as complied with above limit, but these projects are under validation for CDM project.

The validation team confirmed that the proposed CDM project activity is remarkably large scale in Korea and no comparable project found. Thus the proposed CDM project activity is not common practice through checking official sources applied in common practice analysis.

To conclude the additionality assessment, we can state that according to all the documents we have reviewed, the additionality of the project based on the available information is fulfilled.

Nevertheless, CAR 5, CAR 6, CAR 7, CAR 8 and CAR 9 were 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 'Consolidated baseline methodology for grid-connected electricity generation from renewable sources' (Ver. 10). The selected monitoring methodology is applicable for the project activity as it involved grid-connected renewable power generation using solar energy.

In the project's photovoltaic power case, only baseline emissions need to be monitored. The

project emissions are regarded as zero and leakage emissions do not need to be considered when using ACM0002 version 10.

### 3.5.1 Parameters determined ex-ante

The emission factor is fixed ex-ante for the entire crediting period. The formulas and values selected for the calculation are listed in the PDD. Formulas and values were verified by KFQ and found correct.

For the calculation of the OM emission factor, the simple OM method is selected because low cost/must-run plants constitute less than 50% of the total grid generation in average of the five most recent years.

The calorific values indicated from country-specific data for the gross calorific value (GCV) from the Statistics of Electric Power in KOREA (2005~2007) and this was recalculated as net calorific value (NCV), using conversion factor suggested in the 2006 Revised IPCC Guidelines.

Baseline emissions factor (EFy in the CO<sub>2</sub>/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 0.6817 ton CO<sub>2</sub>/MWh.
- BM is calculated to be 0.3933 ton CO<sub>2</sub>/MWh
- CM is calculated to be 0.6096 ton CO<sub>2</sub>/MWh.

The emission factor is fixed ex-ante for the entire crediting period and this emission factor which is not need to be monitored. The formulas and values selected for the calculation are listed in the PDD. Formulas and values were verified by KFQ and found correct.

### 3.5.2 Parameters monitored ex-post

The main data needed to be monitored ex-post is the electricity delivered to the grid. According to the monitoring plan, the power metering will consider only the electricity supplied to the grid and imported electricity from the Grid. Two kinds of electricity measuring meters(7 power transmission meter and 7 power receiving meter) was installed, of which, the meters measur the quantity of power supplied to the grid and the electricity use of power plant supplied from the grid..

Electricity supplied by the project activity to the grid will be measured and recorded on a hourly basis by the sealed meter managed by Korea Power eXchange (KPX). Additionally, the amount of electricity consumed in the plant as a management usage can be read the meter managed by KEPCO. And it will double-check against sales invoice. Thus, we can confirm that the net supply (gross supply to the grid minus supply by the grid to the project) will be used in the emission reduction calculations and will be crosschecked with the sales receipt for the power supplied to the grid.

The metering instruments will be calibrated in accordance with the national standard but at least once in every 3 years and accuracy level of the meter is  $\pm 0.5\%$  for transmission meter and  $\pm 1.0\%$  for receiving meter.

CONERGY who is one of the equipment provider is in charge of maintenance and management of equipment and the DONG YANG ENERGY Co., Ltd. has the overall authority and responsibility for the project management including monitoring of every parameters.

The staffs involved in the CDM project monitoring in place by the time of its operation. The staffs concerned undertaking the monitoring tasks including collecting electricity data and archiving records, checking and analyzing the data, archiving relevant records and reporting. Therefore, the staffs have been received the training on monitoring to ensure the implementation of this monitoring plan regularly.

KFQ validated the monitoring plan of this project through interviewing project stakeholders. We confirmed that this monitoring plan is in accordance with ACM 0002 that all monitoring parameters for the project is contained in the monitoring plan and that the monitoring arrangements described in the PDD can be properly implemented.

Nevertheless, CAR 11 and CAR 12 were raised in the course of the validation and was successfully closed (ref Annex: Validation Protocol- Table 3).

### 3.6 Calculation of GHG Emissions

According to the methodology, emission reduction is calculated as following equation:

$$ER_y = BE_y - PE_y = BE_y$$

- $BE_y$  (t  $CO_2$ ): Baseline Emissions
- $PE_y$  : Project Emissions
  - No project emissions need to be considered, as project activity is a renewable energy project

Baseline emission is calculating as net electricity supplied by the project activity to the Grid ( $EG_{\text{facility}}$  in MWh) times baseline emissions factor ( $EF_y$  in ton  $\text{CO}_2/\text{MWh}$ ).

First, electricity supplied to the Korean Grid by the project activity is expected approximately 35,882 MWh/yr. In estimation of electricity generation, expected capacity factor, 17.1% is applied.

In relation to the load factor, validation team has checked the load factor which is estimated in transparent and conservative manner with documentary evidence submitted by PP as described in section 3.4 of this report. Validation team thus has reached to the conclusion that the load factor for proposed project activity is estimated reasonably and is not overestimated.

The amount of emission reduction, 218,740 ton  $\text{CO}_2$  is estimated over the 10 years 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 reduction.

### **3.7 Environmental Impacts**

According to the provisions of ‘Enforcement Decree of the Act on Impact Assessment on Environment, Traffic, and Disaster, etc.’, any plant facility whose power source is solar power, wind power of fuel cell which is more than 100,000kW shall be carried out EIA. As DONG YANG ENERGY PV(photovoltaic) power plant project whose facility is 24MW, it is not required to be performed EIA.

Instead of EIA, Prior Environmental Review(PER) was conducted and approved by local government on February 2006. The report of PER covered the sector of natural environment, residential environment and social/economic environment. The validation team checked that there was temporary problem such as sea pollution caused by initial construction. Every effort has been made for the problem and PP responded with recommendations in the course of initial construction phase.

According to PER and the interview with local stakeholders, the proposed project activity will not have significant impacts on the environment.



Nevertheless, CAR 14 was raised in the course of the validation and was successfully closed (ref Annex: Validation Protocol- Table 3).

### **3.8 Comments by Local Stakeholders**

To receive stakeholder's comments related to this project activity, PP held project presentation to the stakeholders and newspaper.

Summary or comments received are shown as below:

- Local residents inquired as to the benefits of the project to the region.
- Two local residents wanted to make a new entrance for constructing solar power plant because agriculture road is busy to use in farming season.

KFQ validation team has looked through the public hearing minutes and interviewed local representative and found all participants in the public hearing were agreed and supported this project activity.

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 15 and CAR 16 were raised in the course of the validation and was 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>. Starting date of the global stakeholder consultation process is 05 February 2009 and invited comments by Parties, stakeholders and non-governmental organizations during a period of 30 days.

No comment was received.

## 5 VALIDATION OPINION

*Korean Foundation for Quality (KFQ) has performed a validation of the '24MW DONG YANG ENERGY PV(photovoltaic) power plant' in Republic of Korea ('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 detailed in this report. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, KFQ can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose. 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 host country is Korea. The Korea DNA confirmed 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 CO<sub>2</sub> 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 218,740 ton CO<sub>2</sub> over 10 years fixed crediting period, resulting in a calculated annual average of 21,874 ton CO<sub>2</sub>, 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 CO<sub>2</sub> emission coefficient as it is fixed ex-ante for the selected 10 years crediting period.*

*In our opinion, the '24MW DONG YANG ENERGY PV(photovoltaic) power plant', as described in the revised PDD of 10 December 2009(version 10), 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 10. Thus the '24MW DONG YANG ENERGY PV(photovoltaic) power plant' will hence be recommended by KFQ for requesting for registration as a CDM project to UNFCCC.*

## 6. REFERENCES

Reference No.	Documentation and/or website	Remarks
1	PDD (Ver.01) : 24MW DONG YANG ENERGY PV(photovoltaic) power plant: 29 January 2009 PDD (Ver.10) : 24MW DONG YANG ENERGY PV(photovoltaic) power plant: 10 December 2009	
2	Supporting Excel Spreadsheet on Emission Factor Calculation , ECOEYE Co., Ltd. - Version 01: 29 January 2009 - Version 03:10 December 2009	
3	Supporting Excel Spreadsheet on Investment Analysis Report, ECOEYE Co., Ltd. - Version 01: 29 January 2009 - Version 04: 10 December 2009	
4	ACM 0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”(Version 10). Annex 12, Methodological Tool: Tool to calculate the emission factor for an electricity system (Ver. 2) Methodological Tool: Tool for the demonstration and assessment of additionalilty (Ver. 05.2) Annex 35, Guidance on the Assessment of Investment Analysis	
5	ACM0013: “Consolidated baseline and monitoring methodology for new grid-connected fossil fuel fired power plants using a less GHG intensive technology” (Ver.02.1)	
6	CDM promotion meeting minutes : DONG YANG ENERGY Co., Ltd. 15 May 2006 Sinan PV power project plan : DONG YANG ENERGY Co., Ltd. 18 May 2006 Meeting minutes for Board Meeting : DONG YANG ENERGY Co., Ltd., 23 November 2006 Certificate of company(PP) registration : 27 November 2006, Mokpo Tax Service	
7	PER, Seonam Engineering Co., Ltd., June 2006.	
8	1 <sup>st</sup> Feasibility Study from the Bank, Standard Chartered Bank, February 2007 2 <sup>nd</sup> Feasibility Study from the Bank, Standard Chartered Bank, June 2008	
9	1 <sup>st</sup> Bank loan agreement, Standard Chartered Bank, 28 March 2007 2 <sup>nd</sup> Bank loan agreement, Standard Chartered Bank, 30 July 2008	
10	Economic Feasibility of photovoltaic power generation source, 4 May, 2007, Korea Energy Economy Institute	

11	Approval of Initial Grid connection : 16 November 2007, Korea Power Exchange	
12	Economic Statistics System, Bank of Korea	
13	Test report for meter : 16 January 2008 ~ 9 July 2008, Korea mechanical & chemical Test Institute	
14	Inverter Specification : SunTechics	
15	Equipment warranty information, SOLAR POWER Inc.	
16	Commercial General Liability Insurance : 26 November 2008, Hyundai Marine & Fire Insurance	
17	Notification for the investment unit cost of renewable energy in 2007, Korea Energy Management Corporation	
18	CDM consulting contract for DONG YANG ENERGY PV(photovoltaic) power project: 30 November 2008, ECOEYE CO., Ltd.	
19	DOE contract: 26 December 2008, KFQ and DONG YANG ENERGY Co.,Ltd.	
20	Prior Environmental Report: February 2006, Seo Nam Engineering	
21	Feasibility Study Report for PV power plant, Korea Energy Economics Institute, 4 May 2007 Study report for new & renewable energy FIT improvement RPS connection plan: MKE, 31 March 2006	
22	2005~2007 Statistics of Electric Power in Korea(2006~2008), KEPCO	
23	Korea Bank Economic Statistics System, <a href="http://ecos.bok.or.kr/">http://ecos.bok.or.kr/</a>	
24	Regulation of Financing on Electricity Business, Ministry of Commerce Industry and Energy, 6 April 2002	
25	Alternative Energy Development Promotion Act : March, 2002, Ministry of Commerce, Industry and Energy (MOCIE)	
26	The Public Notice N0.2003-61 : 9 October 2003, No. 2004-104 on October, Korean Government	

27	Local resident meeting material : 2 April 2007, DONG YANG ENERGY Co.,Ltd.	
28	<a href="http://www.kpx.or.kr/">http://www.kpx.or.kr/</a> : Korean Power eXchange	
29	Daylight record of Mokpo area, <a href="http://www.kma.go.kr/index.html">http://www.kma.go.kr/index.html</a> , The Meteorological office	

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	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	OK	Table 2, A.3.3
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, B.6
4. The project shall have written approval of voluntary participation from the designated national authorities of each party involved.	Kyoto Protocol Art. 12. 5a/M&P 40 a	NO	The project has been proposed as a unilateral project
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.6.
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity.	Kyoto Protocol Art. 12.5c	OK	Table 2, Section B.4.
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	Table 2, Section A.4.5. The proposed project activity can not be seen as a diversion of ODA funding towards Republic of Korea.
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 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.



## Appendix A. KFQ Validation Protocol

10. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM M&P 31b	-	N/A
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	-	N/A
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.7.1
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.7
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 03 Mar. 2009 to 01 Apr. 2009.  No comment was received.
17. A baseline shall be established in a project-specific basis, in a transparent manner and taking into account relevant	CDM M&P 45c,d,	OK	Table 2, Section B.2

## Appendix A. KFQ Validation Protocol

national and/or sectoral policies and circumstances.			
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.2
19. The project design document is in accordance with the applicable CDM requirements for completing PDDs.	CDM M&P Appendix B, EB Decision	OK	CDM-PDD is in conformance with the UNFCCC CDM-PDD format version 03 and Guidelines Project Design Document (CDM-PDD) and the Proposed new baseline and monitoring methodologies (CDM-NM) Version 07.

**Table 2. Requirements Checklist**

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

Question	Ref.	MoV	Comments	Draft. Concl.	Final Concl.
<b>A. General Description of Project Activity</b>					
<b>A.1 Title of the project activity</b>					
A.1 1 Does the used project title clearly enable to identify the unique CDM activity?	PDD A.1	DR	The project title is “24MW DONG YANG ENERGY PV(photovoltaic) power plant”. The project titled with the capacity and the energy source of the project. Hence, it can be clearly identified.	<b>OK</b>	<b>OK</b>
A.1 2 Are there any indication concerning the revision number and the date of the revision?	PDD A.1	DR	The available GSP PDD is indicated as version 01 dated 29 January 2009, GSP started on 5 February 2009.	<b>OK</b>	<b>OK</b>
<b>A.2 Description of the project activity</b>					
A.2 1 Does the information provide the reader with a clear understanding of the proposed CDM activity?	PDD A.2/A.4	DR, I	Yes. The information provides the reader with a clear understanding of the proposed CDM project activity.  The proposed project is a photovoltaic power project in Jeollanamdo area in Republic of Korea. The total installed capacity of the project is 24MW, comprised of 108,864 pieces for 180W modules and 21,792 pieces for 200W modules on 682,500m <sup>2</sup> area. The project activity is expected an average annual power generation of 35,882 MWh during credit period. And also expected emission reduction as 21,874 ton CO <sub>2</sub> e/yr during credit period. This project is connected to the KEPCO grid in Republic of Korea. The overview of the project is transparently provided in section A.2 and A.4 of the PDD. During the on-site audit, the project activities described in the PDD have been proven by the validation team.  Validation team concluded that PDD contains a clear description of the	<b>OK</b>	<b>OK</b>

## APPENDIX A. KFQ VALIDATION PROTOCOL

			project which provides the reader with a clear understanding of the nature of the project activity and the technical aspects of its implementation.		
A.2 2 What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	PDD Sec.A/ B.	DR, I	<p>During the on-site assessment, numerous proofs for the described project activity were evidenced. They are summarized in the section 6 to this report.</p> <p>The planning is described in the ‘Sinan Solar power project plan’. The following data deliver evidences for the actual situation of the project activity:</p> <ul style="list-style-type: none"> <li>- Approval of PER: February 2006</li> <li>- Initial project permission: 8 January 2007</li> <li>- Construction agreement date: 29 March 2007</li> <li>- Approval of construction : 1 May 2007</li> <li>- Start of construction work: 10 May 2007</li> <li>- Initial equipment purchasing:21 May 2007</li> <li>- Initial grid connection : 16 November 2007</li> <li>- Commercial operation start: 22 November 2007</li> </ul> <p>This data have been evidenced during validation work. The required data are delivered in the PDD.</p>	<b>OK</b>	<b>OK</b>
A.2 3 Is all information presented consistent with details provided by further chapters of the PDD?	PDD A.2	DR	The information given in the PDD, such as, net electricity delivered to grid and annual emission reduction, are all consistent in further chapters. .	<b>OK</b>	<b>OK</b>
A.2 4 Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	PDD A.4.3	DR	Because the project activity is a renewable energy project, which will produce power for the substitution of grid electricity mainly from coal fired plants. Doubtless, this technology will reduce GHG emission significantly.	<b>OK</b>	<b>OK</b>
A.2 5 Will the project create other environmental or social benefits than GHG emission reductions?	PDD A.2	DR, I	<p>Yes. As a renewable energy project, the project substitute some coal fired power plant and produce positive environmental and economic benefits. Also it contributes to the local sustainable development. And also contribute to enhancing the local investment environment.</p> <p>However, contribution to local society from implementing the project should be described on PDD A.2.</p>	<b>CL 2</b>	<b>OK</b>
<b>A.3 Participation requirements</b>					

## APPENDIX A. KFQ VALIDATION PROTOCOL

<p>A.3 1 Has the DNA of the Host Party involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms?</p> <ul style="list-style-type: none"> <li>- The country is a Party to the Kyoto Protocol</li> <li>- Participation is Voluntary</li> <li>- The Host Party confirming that the proposed CDM project activity contributes to sustainable development of the country</li> <li>- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.</li> </ul>	PDD A.2	DR, I	DNA approval of host country has not been submitted to DOE.	<b>CAR 1</b>	<b>OK</b>
<p>A.3 2 Is the letter of approval from the Host Party is unconditional with respect to A.2.6 above?</p>	PDD A.2	DR, I	The LoA from Korea is unconditional with respect to the aspects mentioned above.	<b>CAR 1</b>	<b>OK</b>
<p>A.3 3 Has the DNA of the Annex I country involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms?</p> <ul style="list-style-type: none"> <li>- The country is a Party to the Kyoto Protocol</li> <li>- Participation is Voluntary</li> <li>- The Annex I country confirming that the proposed CDM project activity contributes to sustainable development of the country and assists it in archiving compliance with part of their emission reduction commitment under Art. 3 of the KP.</li> <li>- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration</li> </ul>			Annex I country is not involved in the project. “24MW DONG YANG ENERGY PV(photovoltaic) power plant” project is a unilateral CDM project with participating non-annex I country as a host party only.	<b>OK</b>	<b>OK</b>
<p>A.3 4 Is the letter of approval from the Annex I country is unconditional with respect to A.3.3 above?</p>			N/A	<b>OK</b>	<b>OK</b>

## APPENDIX A. KFQ VALIDATION PROTOCOL

A.3.5 Is the table required for the indication of project participants correctly applied?	PDD A.3	DR, I	Yes. The table in A.3 of the PDD is correctly applied. The host party involved in the project is Republic of Korea and the Annex –I Party has not participated because the project is unilateral CDM. DONG YANG ENERGY Co., Ltd. is the project participant from the Host Party.	OK	OK
A.3.6 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	Yes, the information provided is consistency with further chapters of the PDD. Through documents review and interview with the project owner, it has been confirmed that there are no entities other than those approved as project participants included in Section A.3 and Annex 1 of the PDD.	OK	OK
A.3.7 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.3,	DR, I	DNA approval of host country has been submitted to DOE together with MoC Countersigned by both parties to DOE.	CAR 1	OK
<b>A.4. Technological description of project activity</b>					
<b>A.4.1 Location of the project activity</b>					
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.4.1	DR	GSP coordinates of the project site is not well described in the section A.4.1.4 of the PDD.	CL 3	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.4.1	DR	Implementation of this project activity at this site is demonstrated through documents such as project plan, completion of PER, board meeting, approval of construction, PV module purchase etc. Furthermore, the commercial operation has been started.	OK	OK
<b>A.4.2 Categories of the project activity</b>					
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	Yes. The capacity of the project is 24 MW and the generated electricity by photovoltaic source is supplied to grid. Hence this project activity belongs to sectoral scope 1: Energy Industries (Renewable Source). Renewable Electricity Generation for a Grid.  The category is correctly identified and indicated in A.4.2 of the PDD.	OK	OK

## APPENDIX A. KFQ VALIDATION PROTOCOL

<b>A.4.3 Technology to be employed by the project activity</b>					
A.4.3.1 Does the project design engineering reflect current good practices?	PDD A.4.3	DR, I	<p>Yes. The high technology is implemented for the photovoltaic power project. The module composed as 108,864 pieces for 180W and 21,792 pieces for 200W from CONERGY. And the inverters were installed from SUNTECHNICS.</p> <p>The company, CONERGY and SUNTECHNICS., who is one of the worldwide leading suppliers in the field of photovoltaic power energy, have strong points for high efficiency, superior conversion rate and exceptional low-lit performance for their products. Also this project is installed with tracking systems which have higher efficiency. Thus, the validation team has justified that PP has reflected current good practice. Technical specifications of PV modules and inverters were provided by PP during on site assessment.</p>	<b>OK</b>	<b>OK</b>
A.4.3.2 Does the description of technology to be applied provide sufficient and transparent input/information to evaluate its impact on the GHG balance?	PDD A.4.3	DR, I	<p>Yes. The project activity comprises the use of photovoltaic power for the substitution of grid supplied electricity mainly from coal fired plants. There is no doubt that this technology will reduce the GHG emissions significantly.</p>	<b>OK</b>	<b>OK</b>
A.4.3.3 Does the implementation of the project activity require any technology transfer from Annex-I-countries to the host country(ies)?	PDD A.4.3	DR, I	No. This project is a unilateral CDM	<b>OK</b>	<b>OK</b>
A.4.3.4. Is the technology implemented by the Project activity environmentally safe?	PDD A.4.3	DR, I	Yes. In accordance with the approved PER, it will not cause any significant environmental impacts.	<b>OK</b>	<b>OK</b>
A.4.3.5. Is the information provided in compliance with actual situation or planning?	PDD A.4.3	DR, I	Yes. It is compliance with actual situation. The information provided in the PDD and has been evidenced by various proofs. Please kindly refer A.2.2 of this protocol.	<b>OK</b>	<b>OK</b>
A.4.3.6 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	Yes. The technology for installation of photovoltaic power plant has been fully developed and successfully implemented in Korea. The technology applied in the proposed project is no different characters compared to others applied in similar photovoltaic power plants.	<b>OK</b>	<b>OK</b>

## APPENDIX A. KFQ VALIDATION PROTOCOL

			Also, the common practice for electricity generation is still coal-fired power plant. Hence, the project definitely would result in a better performance than the common practice.		
A.4.3.7. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	PDD A.4.3	DR, I	We do not expect that there will be a substitution because the photovoltaic modules and the other equipments have already been commissioned.	OK	OK
A.4.3.8 Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	PDD A.4.3	DR, I	Yes. The project owner, DONG YANG ENERGY Co., Ltd. has established training plan to guarantee a safe operation and maintenance during the lifetime. The staffs have been received the training on monitoring to ensure the implementation of this monitoring plan regularly.	OK	OK
A.4.3.9 Does the project make provisions for meeting training and maintenance needs?	PDD A.4.3	DR, I	The provision of meeting training for operation, maintenance and safety made by PP and it will be conducted every two month.	OK	OK
<b>A.4.4 Estimated amount of emission reductions over the chosen crediting period</b>					
A.4.4.1 Is the form required for the indication of projected emission reductions correctly?	PDD A.4.4,	DR	Yes. The project emission reductions are shown in PDD chapter A4.4 Table A-3 according to the guidelines.	OK	OK
A.4.4.2 Are the figures provided consistent with other data presented in the PDD?	PDD	DR	Yes. The yearly emission reduction is estimated to be 21,874 t CO <sub>2</sub> which is the result of emission factor of the times the annual electricity fed to the grid. The same figure is quoted in the entire PDD.	OK	OK
<b>A.4.5 Public funding of the project activity</b>					
A.4.5.1 Public funding for the project from parties in Annex I shall not be a diversion of official development assistance.	PDD A.4.5	DR, I	Yea. The validation did not reveal any information that indicates that the project can be seen as diversion of official development assistance (ODA) funding towards Republic of Korea.	OK	OK



<b>B. Application of a baseline and monitoring methodology</b>					
<b>B.1 Title and reference of the approved baseline and monitoring methodology applied to the project activity.</b>					
B.1.1 Are reference number, version number, and title of the baseline and monitoring methodology clearly indicated?	PDD B.1	DR	<p>The project applies the approved methodology ACM0002 version 10</p> <p>However, applied tool to the project, shall be used the approved latest version.</p> <ul style="list-style-type: none"> <li>- “the tool to calculate the emission factor for an electricity system” Version 08</li> <li>- “the tool for the demonstration and assessment of additionality” Version 08</li> <li>- “the tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion”, Version 08</li> </ul>	<b>CAR 2</b>	<b>OK</b>
B.1.2 Is the applied version the most recent one and/or is this version still applicable?	PDD B.1,	DR	Please refer to B.1.1 of this protocol	<b>CAR 2</b>	<b>OK</b>
<b>B.2 Justification of the choice of the project category</b>					

## APPENDIX A. KFQ VALIDATION PROTOCOL

B.2.1 Is the applied methodology considered the most appropriate one?	PDD B.2	DR	<p>The project is a grid-connected generation from a renewable energy source and does not involve on-site fuel switch from fossil fuels to a renewable source.</p> <p>Justification of the choice of the methodology is provided in B.2 of the PDD.</p> <ul style="list-style-type: none"> <li>- Utilization of solar power resource</li> <li>- Not involving switching from fossil fuels to renewable energy at the project site</li> <li>- The geographic and system boundaries can be clearly identified and the information of this grid is available.</li> </ul> <p>Thus, baseline and monitoring methodology is the most applicable for this project among the existing approved baseline methodologies.</p> <p>However, the small scale CDM methodology (AMS I D) mentioned in PDD B.2 and B3 which is not applied to this project activity.</p>	CAR 3	OK
B.2.2 Are the applicability criteria in the baseline methodology all fulfilled and described in the PDD?	PDD B.2,	DR	<p>The project is the installation of a photovoltaic power plant. The project does not involve switching from fossil fuels to renewable energy at the site of the project activity. The geographical and system boundaries for the electricity grid can be clearly identified and the information on the characteristics of the grid available. The project is in conformance with all applicability criteria of ACM 0002 version 10.</p>	OK	OK
<b>B.3 Description of the sources and gases included in the project boundary</b>					
B.3.1 Do the spatial and technological boundaries as verified on-site comply with the discussion provided by the PDD?	PDD B.3	DR	<p>Yes, The project's spatial boundaries are defined in section B.3 of the PDD.</p> <p>The spatial extent of the proposed project boundary includes the proposed project power plant and all power plants connected physically to Korea Electric Power Corporation (KEPCO) which is the unique grid system in Korea. Thus the validation team confirmed the power plant and the KEPCO are defined as the project's system boundary through reviewing a document such as grid connection documents (16 November 2007) and interview with participants. It could also be verified from the tables in Annex 3.</p>	OK	OK

## APPENDIX A. KFQ VALIDATION PROTOCOL

B.3.2 Does the project boundary include the physical delineation of the proposed CDM project activity?	PDD B.3	DR	Yes. The project boundary includes the physical delineation of the proposed CDM project activity. The spatial extent of the proposed project boundary includes the proposed project power plant and connected physically to KEMCO grid that the proposed project power plant is connected to.	<b>OK</b>	<b>OK</b>
B.3.3 Are all emission sources and gases related to the baseline scenario and leakage clearly identified and described in a complete and transparent manner?	PDD B.3.	DR	Yes. Emission sources and gases related to the baseline scenario identified In the PDD.  However, baseline source and project activity source is not defined in accordance with ACM 0002 version 10. For example, N <sub>2</sub> O shall be excepted in Baseline source.	<b>CAR 4</b>	<b>OK</b>
<b>B.4 Description of how the baseline scenario is identified and description of the identified baseline scenario</b>					
B.4.1 What is the baseline scenario? Has the baseline scenario been determined according to the methodology?	PDD B.4,	DR, I	According to ACM 0002 version 10, the baseline scenario is 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 calculation of Combined Margin. The baseline is represented by the combined margin of the grid the activity will be connected to.	<b>OK</b>	<b>OK</b>
B.4.2 What other alternatives scenario have been considered and why is the selected scenario the most likely one? Does baseline scenario include all potential realistic and credible baseline scenario in the discussion taking into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	PDD B.4,	DR, I	No. All alternative scenario has not been discussed in the GSP PDD as only two alternatives were considered. 1) Construction of fossil fuel plant with equivalent amount of installed capacity or annual electricity output 2) Supply equivalent annual power out by the Gird where the proposed project is connected to.	<b>CAR 5</b>	<b>OK</b>
B.4.3 Does PDD provide all the assumptions and data used by the project participants including reference and sources? And is all the documentation used for establishing the baseline scenario and correctly quoted and interpreted in the PDD?	PDD B.4,	DR, I	Yes. All the assumptions and data used by the PP including reference and sources are provided in the PDD. And all the documentation is used for establishing the baseline scenario and correctly quoted and interpreted in the PDD	<b>OK</b>	<b>OK</b>

# APPENDIX A. KFQ VALIDATION PROTOCOL

B.4.4 All the assumptions and data used by the project participants are listed in the PDD? Is it justified appropriately, supported by evidence and can be deemed reasonable?	PDD B.4	DR, I	Yes. The assumptions and data used by the PP are listed in B.4 in the PDD. It is justified appropriately and supported by evidence. And also it deems reasonable.	OK	OK
<b>B.5 Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):</b>					
B.5.1 Is evidence provided, that CDM has been considered seriously in the decision to proceed with the project activity?	PDD B.5,	DR,I	<p>The starting date of the project has been validated by KFQ as 29 March 2007 which represents the date of construction agreement between PP and CONERGY who is module provider and has a role of maintenance and management the equipment as well. To confirm this date, validation team examined following dates during on-site assessment:</p> <ul style="list-style-type: none"> <li>- Construction agreement : 29 March 2007</li> <li>- Approval of construction work : 1 May 2007</li> <li>- Contract date of equipment purchasing : 21 May 2007</li> </ul> <p>However all related activity such as starting date of construction, commercial operating date were not described in the timeline of the project activity.</p> <p>As starting date of project activity is before 2 August 2008, validation team reviewed whether the PP considered CDM benefits prior to the starting date of the project activity in accordance with the guidance of EB 48 Annex 61 version 02. A summary of these evidences is provided in the following paragraphs.</p> <p>On 15 May 2006, the project owner considered ‘Sinan PV power project, as a CDM after internal feasibility study regarding the financial return of the project with CDM and without CDM and ‘Sinan PV power project plan’ which is the basis of decision making was established on 18 May 2006. Subsequently, board meeting took place in order to approve this project. To overcome the financial unattractiveness of the project, the Board of Directors formally approved developing the project under the frame of the CDM on 23 November 2006. At this board meeting, the project owner was well aware of CDM development and also implementation of the project activity without CDM was not feasible due to poor financial returns.</p> <p>Through examining above and relevant documents, KFQ confirmed that</p>	CAR 6	OK

## APPENDIX A. KFQ VALIDATION PROTOCOL

			<p>the project owner was aware of the CDM prior to the starting date of the project, and that the benefits of the CDM were as decisive factor in the decision to proceed with the project activity.</p> <p>Also the project participants have demonstrated through evidences and official documents that the sequence of the events is coherent and reliable under the additionality point of view.</p> <p>However continuation of project activity since decision making on 23 November 2006 (Board meeting) to secure CDM status in paralle with the implementation of the project activity.</p>		
B.5.2 Is the project additionality assessed according to the methodology?	PDD B.5,	DR, I	As required by ACM0002 Version 10, additionality was assessed according to the 'Tool for the demonstration and assessment of additionality'(ver 05.2).	<b>OK</b>	<b>OK</b>
B.5.3 Have realistic and credible alternatives been identified providing comparable outputs or services? (step 1a)	PDD B.5,	DR, I	Please refer to B.4.2	<b>CAR 5</b>	<b>OK</b>
B.5.4 Is the project activity without CDM included in these alternatives?(Step 1a)	PDD B.5	DR, I	Please refer to B.4.2	<b>CAR 5</b>	<b>OK</b>
B.5.5 Is a discussion provided for all identified alternatives concerning the compliance with applicable laws and regulations? (step 1b)	PDD B.5	DR, I	<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&amp;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.</p>	<b>OK</b>	<b>OK</b>

## APPENDIX A. KFQ VALIDATION PROTOCOL

			There are no laws and regulations compelling the project developer to develop photovoltaic power plants.		
B.5.6 In case the PDD argues that specific laws are not enforced in the country or region Is evidence available concerning that statement? (step 1b)	PDD B.5	DR, I	Please refer to B.5.5	<b>OK</b>	<b>OK</b>
B.5.7 Do the PDD provide a verifiable description of the identified baseline scenario including a description of the technology?	PDD B.5	DR, I	Yes, Refer to B.5.3 ~ B.5.6	<b>OK</b>	<b>OK</b>
B.5.8 All the assumptions and data used by the project participants are listed in the PDD? Is it justified appropriately, supported by evidence and can be deemed reasonable?	PDD B.5	DR, I	Yes, Refer to B.5.3 ~ B.5.6	<b>OK</b>	<b>OK</b>
B.5.9 All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD	PDD B.5	DR, I	Yes, Refer to B.5.3 ~ B.5.6	<b>OK</b>	<b>OK</b>
B.5.10 In case of applying step 2: investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)?	PDD B.5,	DR, I	Yes. 3 analysis methods are provided according to the Tool for the demonstration and assessment of additionality version 05.2. Because the proposed project generates economic benefits through the sales of electricity other than CDM revenue, therefore, the Option I (simple cost analysis) can't be taken. Moreover, Option II(investment comparison analysis) can't be adopted either as there are no similar investment project in alternatives identified. Concluding, Option III (benchmark analysis) is the only applicable one. Thus Option III is applied and choice of it is valid.	<b>OK</b>	<b>OK</b>
B.5.11 Is the most suitable financial indicator clearly identified (IRR, NPV, Cost benefit ratio, or (levelized) unit cost)?	PDD B.5,	DR, I	As for financial analysis, NPV was applied as financial indicator.	<b>OK</b>	<b>OK</b>

## APPENDIX A. KFQ VALIDATION PROTOCOL

B.5.12 Are Input values used valid and applicable at the time of the investment decision taken by the project participant?	PDD B.5,	DR, I	The input figures such as discount rate (4.83%), total investment cost (192,950 million KRW), O&M cost (323 million KRW), SMP (85.92 KRW/KWh) and annual output to the Grid (35,882 MWh/yr, 17.1% of load factor) for financial analysis in the GSP PDD were not demonstrated.	<b>CAR 7</b>	<b>OK</b>
B.5.13 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	Calculation of NPV for project activity in the spreadsheet is correctly done. However input vales for NPV calculation were not demonstrated. Please refer to B.5.12.	<b>OK</b>	<b>OK</b>
B.5.14 Is the sensitivity analysis reasonably done?	PDD B.5	DR, I	No. There is no description of selection of parameters to conduct sensitivity analysis for this project in financial analysis as well as range of variation of it.	<b>CAR 8</b>	<b>OK</b>
B.5.15 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	No. Common practice analysis for the proposed project activity has not been conducted in the PDD.	<b>CAR 9</b>	<b>OK</b>
B.5.16 If similar activities are occurring: Is it demonstrated that in spite of these similarities the project activity would not be implemented without the CDM component (step 4b)?	PDD B.5,	DR, I	Pls. kindly refer to B.5.15 of protocol	<b>CAR 9</b>	<b>OK</b>
B.5.17 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	Pls. kindly refer to B.5.15 of protocol	<b>CAR 9</b>	<b>OK</b>
<b>B.6 Emission Reductions</b>					
<b>B.6.1. Explanation of methodological choices</b>					

## APPENDIX A. KFQ VALIDATION PROTOCOL

B.6.1.1. Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	PDD B.6.1,	DR, I	<p>Baseline emission is determined as per ACM 0002 version 10 and the “Tool to calculate the emission factor for an electricity system”(Ver. 2) under section B.6.1 of the PDD.</p> <p>The following steps are taken as per the Tool to calculate the emission factor for an electricity system to determine the baseline emission factor.</p> <ul style="list-style-type: none"> <li>- STEP 1. Identify the relevant electricity systems.</li> <li>- STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional).</li> <li>- STEP 3. Select a method to determine the operating margin (OM).</li> <li>- STEP 4. Calculate the operating margin emission factor according to the selected method.</li> <li>- STEP 5. Identify the group of power units to be included in the build margin (BM).</li> <li>- STEP 6. Calculate the build margin emission factor.</li> <li>- STEP 7. Calculate the combined margin (CM) emissions factor.</li> </ul> <p>The ex-ante approach is chosen for the calculation of the emissions factor and will be fixed during the first crediting period. The value of grid emission factor in the PDD is appropriated assessed and correct.</p>	OK	OK
B.6.1.2. Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	PDD B.6.1,	DR, I	<p>The justification of choosing the simple OM and option 1 for BM calculation has been clearly demonstrated in PDD.</p> <p>All the data are referring to the latest available from Statistics of Electric Power in Korea (2005~2007) and IPCC 2006 default values.</p>	OK	OK
B.6.1.3. Are the formulae required for the determination of project emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	PDD B.6.1,	DR, I	<p>According to the methodology, the project emission due to project activity needs not to be considered.</p>	OK	OK
B.6.1.4. Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	PDD B.6.1,	DR, I	<p>Yes. The formulae to calculate the baseline emissions are correctly presented. They are in compliance with the ones in the defined methodology ACM0002 version 10.</p>	OK	OK
B.6.1.5. Is the choice of options to determine the emissions factor (OM, BM) justified in a suitable and transparent manner?	PDD B.6.1	DR, I	<p>Yes, the choices of options to determine the Emission Factor are fully justified in the PDD.</p> <p>For the calculation of the operating margin (OM) the simple OM emission factor calculation method is selected due to a lack of availability. Following EB guidance, the average emission factor for the grid for each fuel type is calculated based on a 3-year average of the most recent statistics available. The simple OM emission factor is calculated as 0.6817</p>	OK	OK



## APPENDIX A. KFQ VALIDATION PROTOCOL

			<p>t CO<sub>2</sub>/MWh.</p> <p>For the calculation of the build margin (BM), BM calculated by following The power plants capacity additions in the electricity system that comprise 20% of the system generation and that have been built most recently. The BM is calculated as 0.3933 t CO<sub>2</sub>/MWh.</p> <p>The combined margin of 0.6096 t CO<sub>2</sub>/MWh is fixed ex-ante for the entire credit period. In summary, the emission factor calculation is in a complete and transparent manner.</p>		
B.6.1.6. In case of alternative weighing factors for the Combined Margin: Is the quantification of the alternative weighing factor justified in a suitable and transparent manner?	PDD B.6.1	DR, I	The default weights for photovoltaic power projects in the methodological tool version 2 (OM: 0.75 and BM 0.25 respectively) are used.	<b>OK</b>	<b>OK</b>
B.6.1.7. Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	PDD B.6.1,	DR, I	No leakage is considered according to the methodology.	<b>OK</b>	<b>OK</b>
B.6.1.8. Are formulae required for the determination of emission reductions correctly presented?	PDD B.6.1,	DR, I	Formulae in the PDD are clearly presented of the determination of the emission reduction. As the project emission and leakage are both zero, the emission reduction is equal to the baseline emission.	<b>OK</b>	<b>OK</b>
<b>B.6.2. Data and parameters that are available at validation</b>					
B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied Methodology?	PDD B.6.2,	DR, I	Yes. A list of parameters is presented according to ACM 0002 version 10.	<b>OK</b>	<b>OK</b>
B.6.2.2. Is the choice of ex-ante or ex-post vintage of OM and BM factors clearly specified in the PDD?	PDD B.6.2,	DR, I	For the calculation of the emission reductions, the ex-ante approach is chosen which is clearly stated in B.6.3 of PDD.	<b>OK</b>	<b>OK</b>

## APPENDIX A. KFQ VALIDATION PROTOCOL

B.6.2.3 Are all Parameters included properly. - Title in line with methodology? - Data unit correctly expressed? - Appropriate description? - Source clearly referenced? - Correct value provided? - Has this value been verified? - Choice of data correctly justified? - Measurement method correctly described?	PDD B.6.2,	DR, I	No. It is not clear for the data source of EF <sub>co2</sub> . And basis of converting coefficient of NCV from GCV shall be definitely explained.	<b>CAR 10</b>	<b>OK</b>
<b>B.6.3. Ex-ante calculation of emission reductions</b>					
B.6.3.1. Is the projection based on the same procedures as used for future monitoring?	PDD B.6.3	DR, I	Yes, the ex-ante approach is adopted for calculation of the emissions grid factor and will not be changed. Therefore, the net electricity fed to the grid will be the key parameter to determine the annual baseline emission, namely, the annual projection.	<b>OK</b>	<b>OK</b>
B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?	PDD B.6.3,	DR, I	Yes, the calculation processes are completely demonstrated and consistent with the ones of Annex 3.	<b>OK</b>	<b>OK</b>
B.6.3.3. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	PDD B.6.3	DR, I	The emission factor of the defined grid and annual emission reductions are consistent with the figures in other chapters of the PDD.	<b>OK</b>	<b>OK</b>
<b>B.6.4. Summary of the ex-ante estimation of emission reductions</b>					
B.6.4.1. Will the project results in fewer GHG emissions than the baseline scenario?	PDD B.6.4	DR, I	Yes. Being a photovoltaic power, no emissions will result due to the project activity under normal circumstances.  The amount of estimated emission reduction by this project activity is 21,874 ton CO <sub>2</sub> /yr.	<b>OK</b>	<b>OK</b>
B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	PDD B.6.4	DR, I	Yes. The table is complete. It includes the emission due to the project activity, baseline emission, leakage emissions and the overall emission reductions. .	<b>OK</b>	<b>OK</b>
B.6.4.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	PDD B.6.4	DR, I	Yes. The validation team found that construction process is completed and is under operation since November 2007. The lifetime of the project is expected to be 20 years and fixed crediting period is chosen.	<b>OK</b>	<b>OK</b>

## APPENDIX A. KFQ VALIDATION PROTOCOL

			The emission reductions for each year and total emission reductions are indicated in the Table of B.6.4 of the PDD.		
B.6.4.4. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	PDD B.6.4	DR, I	Yes. The data is consistent throughout the whole PDD.	<b>OK</b>	<b>OK</b>
B.6.4.5. Does all estimate of the baseline emission replicate using the data and parameter values provided in the PDD?	PDD B.6.4	DR, I	Yes. All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.	<b>OK</b>	<b>OK</b>
<b>B.7. Application of the monitoring methodology and description of the monitoring plan</b>					
<b>B.7.1. Data and parameters monitored</b>					
B.7.1.1. Is the list of parameters presented by chapter B.7.1 considered to be complete with regard to the requirements of the applied methodology?	PDD B.7.1,	DR, I	Because the ex-ante approach for the calculation of the emissions factor is implemented, the net electricity fed into the grid is the key parameters required to be monitored. This parameter has been included in table B.7.1 in the PDD in accordance with ACM 0002 version 08.  However ACM 0002 version 10 is finally applied to the project activity and EG <sub>v</sub> is changed to EG <sub>y facility</sub> .	<b>OK</b>	<b>OK</b>
B.7.1.2 Are the parameter included properly? - Title in line with methodology? - Data unit correctly expressed? - Appropriate description of parameter? - Source clearly referenced? - Correct value provided for estimation? - Has this value been verified? - Measurement method correctly described? - Correct reference to standards? - Indication of accuracy provided? - QA/QC procedures described? - QA/QC procedures appropriate?	PDD B.7.1,	DR, I	Yes. According to methodology and tools, all parameters are listed in chapter.	<b>OK</b>	<b>OK</b>
<b>B.7.2. Description of the monitoring plan</b>					

## APPENDIX A. KFQ VALIDATION PROTOCOL

B.7.2.1. Is the operational and management structure clearly described and in compliance with the envisioned situation?	PDD B.7.2	DR, I	No. Operational and management structure in the PDD was not consistent with project implementation. It should be described in practical way to implement during crediting period.	<b>CAR 11</b>	<b>OK</b>
B.7.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	PDD B.7.2,	DR, I	Yes. According to the PDD, the annual output from the power plant will be measured and recorded hourly. Electricity sales invoices will also be obtained as a cross- check.  And roles and responsibilities have been defined for the relevant staff involved in CDM monitoring.	<b>OK</b>	<b>OK</b>
B.7.2.3. Does the monitoring plan provide current good monitoring practice?	PDD B.7.2	DR, I	Yes. Followings are included in a monitoring plan in monitoring manual developed by PP. <ul style="list-style-type: none"> <li>- CDM data and record keeping arrangements</li> <li>- Data collection</li> <li>- CDM data quality control and quality assurance</li> <li>- CDM staff training</li> </ul> Validation team found that there are 14 meters to monitor delivered electricity to the Grid (7 meters) and imported electricity from the Grid (7 meters). However it was not correctly described in the PDD. Also responsibility of data collecting and data archiving was not clear as well as calibration and exchange cycle of measuring meter	<b>CAR 12</b>	<b>OK</b>
B.7.2.4. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	PDD B.7.2	DR, I	N/A	<b>OK</b>	<b>OK</b>
<b>B.8. Date of completion of the application of the baseline study and monitoring methodology an the name of the responsible person(s)/entity(ies)</b>					
B.8.1. Is there any indication of a date when the baseline was determined?	PDD B.8	DR	Yes. The baseline of the first version of PDD was determined on 19 January 2009.	<b>OK</b>	<b>OK</b>
B.8.2. Is this consistent with the time line of the PDD history?	PDD B.8	DR	Yes, The date of accomplishing the baseline calculation is on 19 January 2009, after that the 1st version of PDD is completed on 29 January 2009 which is also used for GSP and on site assessment.	<b>OK</b>	<b>OK</b>

## APPENDIX A. KFQ VALIDATION PROTOCOL

B.8.3. Is the information on the person(s) / entity(ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	PDD B.8	DR	Yes, The responsible for the application of the baseline and monitoring methodology provided person, CEO of Ecoeye Co.,Ltd., Dr. Jung, Jae-Soo, indicated in section B.8of the PDD.	<b>OK</b>	<b>OK</b>
B.8.4. Is information provided whether this person/entity is also considered a project participant?	PDD B.8	DR	Yes. The above mentioned person is not from project participant's company.	<b>OK</b>	<b>OK</b>
<b>C. Duration of the Project/ Crediting Period</b>					
C.1 Are the project's starting date and operational life time clearly defined and evidenced?	PDD C.1,	DR, I	The starting date of project activity, date of construction agreement: 29 March 2009 is clearly defined and it is consistent with the evidences that provided by PP during on-site assessment. And the operational lifetime is expected to be 20 years and this is demonstrated by reviewing the documents such as specification of module during physical site visit.	<b>OK</b>	<b>OK</b>
<b>C.2. Choice of the crediting period and related information</b>					
C.2.1. Is the assumed crediting period clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max.10 years)?	PDD C.2,	DR	Yes. Renewable crediting period of max 7 years with potential for 2 renewals was chosen in the GSP PDD. But it has been changed to fixed crediting period of 10 years during validation phase.  The life time of the project is stated as 20 years. And fixed crediting period of 10 years is considered reasonable.	<b>OK</b>	<b>OK</b>
C.2.2 Is the start of the crediting period clearly defined and reasonable?	PDD C.2.1.1,	DR, I	No. The starting date of the crediting period described in PDD A.4.4 (1 January 2009) and C.2.1.1 (1 July 2009) is inconsistent.	<b>CAR 13</b>	<b>OK</b>
<b>D. Environmental Impacts</b>					
<b>D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts</b>					

## APPENDIX A. KFQ VALIDATION PROTOCOL

D.1.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	PDD D.1,	DR,I	No. Summary of the environmental impact from PER, such as environmental impacts and its measures were not reflected in PDD but it was checked through PER during on-site assessment.	<b>CAR 14</b>	<b>OK</b>
D.1.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	PDD D.1,	DR, I	No. If any power plant using solar, wind or fuel cell as a power source has more than 100,000kW(100MW) of capacity, the environmental should be conducted in accordance with the annexed list number 1 of the enforcement regulation subordinated to the “Act on Assessment of Impacts of Works on Environment, Traffic, and Disasters, etc.”, one of the laws in Korea.  In the case of this project, the capacity of generation is 24MW. Therefore it is not necessary for this project to perform EIA in conformity with the legal restriction. But instead of EIA, PER was conducted by Seonam Engineering Co.,Ltd in February 2006.	<b>OK</b>	<b>OK</b>
D.1.3 Will the project create any adverse environmental effects?	PDD D.1,	DR, I	It could be checked by document review on site that the impacts as natural environment, living environment and social/economic environmental in the PER. Referred to the PER, the project will create no significant environmental impacts.	<b>OK</b>	<b>OK</b>
D.1.4 Are transboundary environmental impacts considered in the analysis?	PDD D.1,	DR, I	The proposed photovoltaic plant is located within Republic of Korea, and it has no transboundary environmental impacts: hence this section is not applicable.	<b>OK</b>	<b>OK</b>
<b>D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Part</b>					
D.2.1 Have identified environmental impacts been addressed in the project design?	PDD D.1,	DR, I	Referring to the PER and the approved document, the impacts on the environment are not significant. Please refer D.1 of protocol.	<b>OK</b>	<b>OK</b>
D.2.2 Does the project comply with environmental legislation in the host country?	PDD D.1,	DR, I	Yes, the project is in conformity with the environmental legislation of Republic of Korea and the PER has been completed by authorized organization.	<b>OK</b>	<b>OK</b>
<b>E. Stakeholder Comments</b>					

## APPENDIX A. KFQ VALIDATION PROTOCOL

<b>E.1. Brief description how comments by local stakeholders have been invited and compiled</b>					
E.1.1 Have relevant stakeholders been consulted?	PDD E.1,	DR, I	Yes. Local residents meeting for receiving stakeholder's comments took place in 2 April 2007. The stakeholder consultation process is fully described in the PDD and the validation team reviewed meeting material during on-site assessment. Thus the validation team got a conclusion the local stakeholder consultation is the adequacy of implementation in the process of the proposed project activity.	<b>OK</b>	<b>OK</b>
E.1.2 Have appropriate media been used to invite comments by local stakeholders?	PDD.E.1	DR, I	Yes. Please kindly refer E.1.1 of protocol.	<b>OK</b>	<b>OK</b>
E.1.3 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 regulations/laws in Republic of Korea for carrying out the stakeholder consultation process for this project activity.	<b>OK</b>	<b>OK</b>
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	PDD E.1,	DR, I	Yes. The process is described detailed, including a comprehensive summary of the received comments of the stakeholders.	<b>OK</b>	<b>OK</b>
<b>E.2. Summary of the comments received</b>					
E.4 Is a summary of the stakeholder comments received provided and is the stakeholders commented identified?	PDD E.2,	DR, I	No. Summary of the stakeholder comments received from the meeting held on 2 February 2007 is not provided in the PDD.	<b>CAR 15</b>	<b>OK</b>
E.5 Has due account been taken of any stakeholder comments received?	PDD E.3,	DR, I	No. Due account taken for the comment received is not described in the PDD.	<b>CAR 16</b>	<b>OK</b>
<b>F. Annexes 1-4</b>					
<b>Annex 1: Contact Information</b>					

## APPENDIX A. KFQ VALIDATION PROTOCOL

F.1.1 Is the information provided consistent with the one given under section A.3?	PDD A.3/ Annex 1	DR	Yes, the information provided is consistent with one given under section A.3.	OK	OK
F.1.2 Is the information on all private participants and directly involved Parties presented?	PDD A.3/ Annex 1	DR	Yes.	OK	OK
<b>Annex 2: Information regarding public funding</b>					
F.1.3 Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	PDD A.4.5/ Annex 2	DR,I	It is stated that the project does not receive any public funding from Annex I countries as this project activity is unilateral project.	OK	OK
F.1.4. If necessary: Is an affirmation available that any such funding from Annex – countries does not result in a diversion of ODA?	PDD A.4.5/ Annex 2	DR	NA		
<b>Annex 3: Baseline information</b>					
F.1.5. If additional background information on baseline data is provided: Is this information consistent with data presented by other section of the PDD?	PDD B.5/Annex 3	DR,I	Yes. Please kindly refer to B.5 of protocol. All the data used for baseline calculation are consistent throughout the PDD.	OK	OK
F.1.6. Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	PDD B.5/Annex 3	DR,I	Pls. see B.5 of protocol.	OK	OK
F.1.7. Does the additional information substantiate/support statements given in other section of the PDD?	Annex 3	DR	Annex 3 presents all the data used for the emission factor calculation.	OK	OK
<b>Annex 4: Monitoring information</b>					
F.1.8. If additional background information on monitoring is provided: Is this information consistent with data presented in other section of the PDD?	PDD B.7.2/Annex 4	DR,I	N/A	OK	OK



## APPENDIX A. KFQ VALIDATION PROTOCOL

F.1.9.Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	PDD B.7.2/A nnex 4	DR,I	N/A	<b>OK</b>	<b>OK</b>
F.1.10.Do the additional information and/or documented procedures substantiate/support statements given in other section of the PDD?	PDD B.7.2/A nnex 4	DR,I	N/A	<b>OK</b>	<b>OK</b>

**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 and validation team	Validation team conclusion
<b>CAR 1:</b>  DNA approval of host country has not been submitted to DOE.	A.3.1 A.3.2 A.3.7	Approval letter of Korea DNA (18 December 2009) has been submitted to DOE together with MoC by PP.  This document is a prerequisite for registration as per CDM Modalities and Procedures 40(a). The LoA from the DNA of Korea has been issues on 18 December 2009 and submitted to DOE by PP. The LoA shows that Korea has ratified the Kyoto Protocol in November 2002, the project assists Korea in achieving sustainable development and is entered into voluntarily. The LoA refers to the precise proposed CDM project activity title in the PDD being submitted for registration. The LoA from Korea is unconditional with respect to the aspects mentioned above.	CAR 1 is closed
<b>CAR 2</b>  Applied tool and methodology at the project, shall be used the approved latest version. - “the tool to calculate the emission factor for an electricity system” Version 08 - “the tool for the demonstration and assessment of additionality” Version 08 - “the tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion”, Version 08	B.1.1 B1.2	PP corrected the version of tool and methodology as approved latest version. It was reflected on PDD as follows.  The project applies the approved methodology ACM0002 version 10. ‘Tool for the demonstration and assessment of additionality (Ver. 05.2)’, and the ‘Tool to calculate the emission factor for an electricity system (Ver. 2)’ are used. The 8 <sup>th</sup> version of ACM0002 is the latest version where the PDD was prepared and published for the GSP. The additionality tool (Ver 05.2) and the ‘Tool to calculate the emission factor for an electricity system (Ver 2) are the most recent version when completing this report. Validation team checked this non-conformity is simple error by PP.	CAR 2 is closed
<b>CAR 3:</b>  The small scale CDM methodology (AMS I D) mentioned in PDD B.2 and B3 which is not applied to this project activity.	B.2.1	Approved consolidated baseline and monitoring methodology : ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”-ACM0002 (Version 10) has been quoted in PDD B1, B.2 and B.3. Validation team checked this non-conformity is simple error by PP.	CAR 3 is closed

<p><b>CAR 4:</b></p> <p>Baseline source and project activity source is not defined in accordance with ACM 0002 version 10. For example, N<sub>2</sub>O shall be accepted in Baseline source.</p>	<p>B.3.3</p>	<p>According to “Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM) (Ver. 07)” and ACM 0002 version 10, PP defined the sources and gases included in the project boundary as follows.</p> <table><tr><th></th><th>Source</th><th>Gas</th><th>Included</th><th>Justification / Explanation</th></tr><tr><td rowspan="3">Baseline Emission</td><td rowspan="3">Grid electricity production</td><td>CO<sub>2</sub></td><td>Included</td><td>According to ACM0002 only CO<sub>2</sub> emissions from electricity generation should be accounted for.</td></tr><tr><td>CH<sub>4</sub></td><td>Excluded</td><td>According to ACM0002</td></tr><tr><td>N<sub>2</sub>O</td><td>Excluded</td><td>According to ACM0002</td></tr><tr><td rowspan="3">Project Emission</td><td rowspan="3">Electricity Generation from Solar power</td><td>CO<sub>2</sub></td><td>Excluded</td><td>Zero-emission grid-connected electricity generation from renewable energy</td></tr><tr><td>CH<sub>4</sub></td><td>Excluded</td><td>Zero-emission grid-connected electricity generation from renewable energy</td></tr><tr><td>N<sub>2</sub>O</td><td>Excluded</td><td>Zero-emission grid-connected electricity generation from renewable energy</td></tr></table> <p>Validation team confirmed that the sources and gases included in the project boundary are suitable.</p>		Source	Gas	Included	Justification / Explanation	Baseline Emission	Grid electricity production	CO <sub>2</sub>	Included	According to ACM0002 only CO <sub>2</sub> emissions from electricity generation should be accounted for.	CH <sub>4</sub>	Excluded	According to ACM0002	N <sub>2</sub> O	Excluded	According to ACM0002	Project Emission	Electricity Generation from Solar power	CO <sub>2</sub>	Excluded	Zero-emission grid-connected electricity generation from renewable energy	CH <sub>4</sub>	Excluded	Zero-emission grid-connected electricity generation from renewable energy	N <sub>2</sub> O	Excluded	Zero-emission grid-connected electricity generation from renewable energy	<p>CAR 4 is closed.</p>
	Source	Gas	Included	Justification / Explanation																										
Baseline Emission	Grid electricity production	CO <sub>2</sub>	Included	According to ACM0002 only CO <sub>2</sub> emissions from electricity generation should be accounted for.																										
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		N <sub>2</sub> O	Excluded	Zero-emission grid-connected electricity generation from renewable energy																										
<p><b>CAR 5:</b></p> <p>All alternative scenario has not been discussed in the GSP PDD as only two alternatives were considered.</p>	<p>B.4.2 B.5.3 B.5.4</p>	<p>According to the ACM 0002 version 10, alternative scenario have been well described in the PDD as below:</p> <p><b>Sub-step 1a: Define alternatives to the project activity.</b></p> <p>Alternative baseline scenarios are:</p> <ul style="list-style-type: none"><li>a) The proposed project not taken as CDM project activity</li><li>b) Construction of a fossil fuel plant with equivalent amount of installed capacity or annual electricity output</li><li>c) Construction of a power plant using other sources of renewable energy with equivalent amount of annual electricity output</li><li>d) Supply of equivalent annual power output by the grid where the proposed project is connected to</li></ul> <p>The Korea government established “Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy”(revised in 27/09/2006. No 7998) to encourage low-GHG emission and eco-friendly activity and depletion of fossil fuel is global topic as well. Considering the situation, even though a fossil fuel power plant is more economical than a</p>	<p>CAR 5 is closed.</p>																											

## APPENDIX A. KFQ VALIDATION PROTOCOL

		<p>renewable energy power plant such as this project activity, alternative b) is less applicable.</p> <p>Furthermore, the alternative of using other renewable energy is unrealistic due to the lack of exploitable other renewable sources and geographically unfeasible. Thus alternative c) is less applicable.</p> <p>Outcome of Step 1a are alternative a) and d).</p> <p><b>Sub-step 1b: Consistency with mandatory laws and regulations.</b> All alternatives comply with the laws and regulatory requirements for electricity generation in Korea. 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&amp;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.</p> <p>There are no laws and regulations compelling the project developer to develop photovoltaic power plants. Therefore Alternatives a) and d) identified are in line with the requirement.</p>	
<p><b>CAR 6:</b></p> <p>All related activity such as starting date of construction, commercial operating date were not described in the timeline of the project activity.</p> <p>And continuation of project activity since decision making on 23 November 2006 (Board meeting) to secure CDM status in</p>	B.5.1	<p>Timeline of project activity is revised in the PDD as below table. Since construction agreement in 29 March 2007, PP had searched consulting company for CDM application and communicated with EPURON from August 2007 to March 2008, but the agreement with EPURON was not made. Thus the PP decided to switch the consulting company and the agreement for CDM consulting was made with Ecoeye Co., Ltd. in 30 November 2008.</p>	CAR 6 is closed.

# APPENDIX A. KFQ VALIDATION PROTOCOL

paralle with the implementation of the project activity. provide following CDM related activities.		<table><tr><th>date</th><th>Description of a step</th><th>Facts relevant to CDM</th></tr><tr><td>15/05/2006</td><td>Sinan PV Plant Project CDM report</td><td>CDM income consideration of Sinan PV Plant Project.</td></tr><tr><td>18/05/2006</td><td>Sinan PV Plant Project Plan report</td><td>The project participant ordered that amount of GHG emission reduction.</td></tr><tr><td>23/11/2006</td><td>Board meeting</td><td>CDM income consideration of DONG YANG ENERGY. Co., Ltd</td></tr><tr><td>29/03/2007</td><td>Construction agreement date (set as starting date)</td><td>Construction agreement with DONG YANG ENERGY. Co., Ltd and CORNERGY</td></tr><tr><td>01/05/2007</td><td>Approval of construction work</td><td>A date of construction work approval</td></tr><tr><td>22/11/2007</td><td>CDM consulting agreement</td><td>sand a draft agreement to EPURON</td></tr><tr><td>16/11/2007</td><td>Initial Grid connection</td><td>Electric generation initial grid connection date</td></tr><tr><td>30/11/2008</td><td>Finalization CDM consulting agreement date</td><td>CDM consulting agreement with DONG YANG ENERGY. Co., Ltd and Ecoeye., Co .Ltd</td></tr><tr><td>24/12/2008</td><td>DOE agreement date</td><td>DOE agreement with with DONG YANG ENERGY. Co., Ltd and KFQ(Korea Foundation for Quality.</td></tr></table> <p>PP was seeking DOE to conduct validation and final validation contract was made between PP and KFQ on 24 December 2008. \</p> <p>Thus, KFQ confirmed that the project owner was aware of the CDM prior to the starting date of the project and found the gap between the documented evidence for demonstrating the continuation is satisfied according to the ‘Guidance on the demonstration and assessment of prior consideration of the CDM, Version 03 (EB 49 meeting report, Annex 22).</p>	date	Description of a step	Facts relevant to CDM	15/05/2006	Sinan PV Plant Project CDM report	CDM income consideration of Sinan PV Plant Project.	18/05/2006	Sinan PV Plant Project Plan report	The project participant ordered that amount of GHG emission reduction.	23/11/2006	Board meeting	CDM income consideration of DONG YANG ENERGY. Co., Ltd	29/03/2007	Construction agreement date (set as starting date)	Construction agreement with DONG YANG ENERGY. Co., Ltd and CORNERGY	01/05/2007	Approval of construction work	A date of construction work approval	22/11/2007	CDM consulting agreement	sand a draft agreement to EPURON	16/11/2007	Initial Grid connection	Electric generation initial grid connection date	30/11/2008	Finalization CDM consulting agreement date	CDM consulting agreement with DONG YANG ENERGY. Co., Ltd and Ecoeye., Co .Ltd	24/12/2008	DOE agreement date	DOE agreement with with DONG YANG ENERGY. Co., Ltd and KFQ(Korea Foundation for Quality.	
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<p><b>CAR 7:</b></p> <p>The input figures such as discount rate (4.83%), total investment cost (192,950 million KRW), O&amp;M cost (323 million KRW), SMP (85.92 KRW/KWh) and annual output to the Grid (35,882 MWh/yr, 17.1% of load factor) for financial analysis in the GSP PDD were not demonstrated.</p>	<p>B.5.12</p>	<p>The input values used in the investment analysis esteemed based on the ‘Sinan PV power project plan’ reported on 18 May 2006 which are basic information to make decision of investment to this project activity.</p> <p>The capacity of the project has been changed from 17MW on the ‘Sinan PV power project plan’ to 24 MW by the reason of land utilization and company’s policy and also this change has been confirmed through the feasibility study conducted by the Standard Chartered Bank for loan contract. Based on ‘Sinan</p>	<p>CAR 7 is closed.</p>																														

## APPENDIX A. KFQ VALIDATION PROTOCOL

		<p>PV power project plan' the input values were adjusted to the value equivalence by the incremented capacity. Then, validation team assessed the validity of adjusted values and confirmed these input values are valid and applicable.</p> <p>Furthermore, the audit team cross-checked the applied values with actual contracts or literatures etc. and compared them with KFQ's internal statistic results of the evaluation of photovoltaic power projects in Korea that are either already registered or currently under validation of CDM.</p> <p>Therefore, KFQ was able to confirm that the input values in the investment analysis are valid and applicable at the time of investment decision and they have been applied consistently.</p> <p>The details on assessment for validity and applicability of each input values are as follows:</p> <p>① Investment cost: 183,529 Million KRW (7,647 Million KRW/MW):</p> <p>The investment cost in 'Sinan Solar power project plan' (130,000 million KRW, 7,647 million KRW/MW) at the time of decision making is smaller than the value in the GSP PDD (192,950 Million KRW, 8,039 Million KRW/MW).</p> <p>The validation team found the investment cost in GSP PDD was overestimated even considering the capacity increase, thus PP adjusted the investment cost to 183,529 Million KRW(7,647 Million KRW/MW) in final PDD by reflecting same unit cost to increased capacity(7MW) as investment decision making timing.</p> <p>Also KFQ crosschecked this value with other 3 similar projects in Korea which shows unit investment cost of PV projects is the range of 5,160~8,500 million KRW/MW in Korea. In addition, according to 'Notification for the investment unit cost of renewable energy in 2007' noticed by Korea Energy Management Corporation, unit investment cost for PV power plant is 11,698 Million KRW/MW(Tracking type). We verified this reference values is higher than the proposed project's investment cost and could find the investment cost estimated as appropriate and valid.</p>	
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		<p>In addition, audit team reviewed actual expenditure for this project activity such as construction, equipment purchasing etc. to confirm its validity. The proposed project has been already completed construction. Validation team checked 188,344 Million RMB was already incurred as investment cost by the time of validation. We confirmed this actual incurred investment cost is slightly higher than the value in final PDD.</p> <p>Thus, the validation team concluded this investment cost, 183,529 million KRW (7,647 million KRW/MW), is valid and appropriate for the project activity.</p> <p>② O&amp;M Cost: 900 million KRW/year (25.1 KRW/KWh): O&amp;M Cost in investment decision was estimated as 900 million KRW/year. However this value was adjusted by PP as 323 million KRW/year in GSP PDD. When compilation of GSP PDD, the PP made a mistake by reflecting only outsourcing cost for operation included O&amp;M cost. Thus, PP adjusted the O&amp;M cost to 900 million KRW reflecting outsourcing cost and other operation cost based on ‘Sinan PV power project plan’. The O&amp;M cost is consists of outsourcing cost(incl. operation cost, maintenance cost, repair cost), labor cost, insurance, supervision cost and other cost.</p> <p>To check validity of O&amp;M cost, validation team reviewed the O&amp;M unit cost for electricity generation with other 3 similar projects in Korea registered as CDM project and found that O&amp;M cost for this proposed project activity(25.1 KRW/kWh) is lower than the average O&amp;M cost (59 KRW/kWh).</p> <p>Also O&amp;M cost per total investment cost is cross-checked with the reference provided by 3rd party institution, Economic Feasibility of photovoltaic power generation source by Korea Energy Economy Institute on 4 May, 2007. The O&amp;M cost per total investment cost is less than 1% for photovoltaic power plant in Korea. According to this reference, the proposed project’s O&amp;M cost per total investment cost is 0.57% which is lower than the reference.</p> <p>As well as above comparison, because the proposed project is under operation, audit team reviewed actual O&amp;M cost for this project activity. The validation team could check as 1,003 million KRW/year for O&amp;M</p>	
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		<p>cost which is higher than the value on final PDD.</p> <p>Thus, KFQ concluded that O&amp;M cost (KRW 900 million, 0.57% of total investment cost) applied is valid.</p> <p>③ SMP : 85.92 KRW/KWh:  PP estimated the SMP in the GSP PDD as 85.92 KRW/KWh from statistical data for photovoltaic power of average value in the year 2007 which is the timing of decision making.  Then KFQ analyzed this value through SMP trend for PV power through the statistics provided by Korea Power Exchange (KPX) (<a href="http://epsis.kpx.or.kr">http://epsis.kpx.or.kr</a>) and found the SMP trend increased by each year. We detected abnormal increase occurred in the year 2008(50%) due to international oil price fluctuation, thus we verified the annual increase rate during the year 2004 ~ 2009 was 15.5%. Even though this is not a common increase case, the increase rate was still lower than sensitivity range(20%).</p> <p>Furthermore, we confirmed the SMP(85.92 KRW/KWh) which adapted in the project is higher than the value of the three years before the decision making and 85.92 KRW/KWh is valid and appropriate at the time of decision making.</p> <p>④ Annual output to the Grid: 35,882 MWh/yr (Load factor : 17.1%):  Annual output was estimated as 25,465MWh(17MW, Load factor: 17.1%) that is based on daylight record (1,875hour/year) which is lower than 5 years of the average daylight record of Mokpo area where is the proposed project's location (2,094hour/year, Mokpo Weather station, <a href="http://mokpo.kma.go.kr/index">http://mokpo.kma.go.kr/index</a>) and also considered module loss, system loss and utility factor at the time of decision making, investigated by PP. Then when the time of capacity change to 24MW, annual output was calculated as 35,882 MWh/yr based on the same daylight record, losses and utility factor described above.  We also confirmed the load factor has been analyzed by 3rd party institution, Meteo Control GmbH, having been involved in the energy and weather sectors for more than 30 years, and the load factor calculated as 15.9% which is lower than the PP's investigation.</p>	
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		<p>The validation team investigated the load factor with other similar PV projects in Korea which registered as CDM projects shows that the range of load factor is 13.5%~19.5% which is higher than proposed project. As a result of investigation, we accepted the load factor(17.1%), estimated by PP regard to the project, through our sectoral expertise and relevant references.</p> <p>The validation team confirmed this load factor(17.1%) and annual output(35,882 MWh/yr) is within the similar project's range and this values are appropriate under comprehensive understanding of additionality.</p> <p>⑤ Residual Value: 0 % Validation team checked it with Regulation of Financing on Electricity Business (Ministry of Commerce Industry and Energy, 6 April 2002) indicates residual value can be less than 5% of fixed asset and should be decided by project owner. KFQ found that 0% of residual value does not have a significant impact on the NPV and therefore does not have an impact on the additionality of the project activity.</p> <p>⑥ Operational lifetime: 20 years In the validation process, the operational lifetime was estimated to 20 years based on the lifetime of module and inverter. The validation team confirmed lifetime of similar photovoltaic power project has its operational lifetime as 20 years and checked the module and inverter warranty is up to 20 years through warranty information by SOLAR POWER Inc. Investment analysis was done for 20 years as expected operational lifetime of the proposed project activity. Referring to other similar project's operational life time, technical literatures and our technical expertise, KFQ concluded that period of assessment is valid.</p> <p>The validation team has checked all sources of the NPV calculation, as presented in B.5 in the PDD. Furthermore the calculation spreadsheet was checked for confirming the correctness of calculation and the consistency of the used figures with the same stated in the PDD verified.</p> <p>Thus, KFQ is able to confirm that the input values in PP's evaluation are valid and appropriate representing the economic situation of the project at the time</p>	
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		of investment decision.	
<p><b>CAR 8:</b></p> <p>PP shall explain whether the range of variations is reasonable and also demonstrate the result of sensitivity analysis.</p>	B.5.14	<p>A sensitivity analysis has been carried out for parameter contributing more than 20% to revenues or costs which are investment cost, O&amp;M cost, SMP and electricity generation. A variation of <math>\pm 20\%</math> has been considered in the critical assumptions by consideration of circumstance of each parameter.</p> <p>① Investment cost in this project is very dependent on exchange rate due to introducing of imported equipments from foreign companies. Thus the variation range of investment cost was assessed by considering the fluctuation of past exchange rate for past 10 years (1998~2007), and EB guidance. The validation team examined the fluctuation of past exchange rate by Korea Bank Economic Statistics System (<a href="http://ecos.bok.or.kr/">http://ecos.bok.or.kr/</a>). According to the statistics, the fluctuation range of exchange rate during last 10 years (1998~2007) was 9.9%. 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. Also considering the fluctuation of inflation rate for past 5 years (2004~2008) in Korea(3.16%), validation team deemed more than + 10% of inflation rate is unlikely to occur. Therefore, KFQ concluded that <math>\pm 20\%</math> of applied variation range for investment cost is suitable for the proposed project activity. Furthermore, as this project activity is under operation, we could confirm the investment cost has been incurred amount as 188,344 million KRW. Thus it is hardly to decrease the investment cost to -20%.</p> <p>② O&amp;M cost is strictly connected with inflation rate. Thus the variation range of O&amp;M cost is decided by considering the fluctuation of inflation rate for past 5 years (2004~2008) in Korea. According to Bank of Korea Economic Statistics System, inflation rate was 3.16%. Thus validation team deemed more than + 10% of inflation rate is unlikely to occur. Therefore, KFQ concluded that <math>\pm 20\%</math> of applied variation range for O&amp;M cost is suitable for the proposed project activity. Furthermore, as this project activity is under operation, we could confirmed the O&amp;M cost has been incurred amount as 1,010 million KRW/year. Thus it is hardly to decrease the investment cost to -20%.</p>	CAR 8 is closed.

		<p>③ As for SMP, we analyzed its trend of past 3 years (2004~2006) based on statistics from KPX (<a href="http://epsis.kpx.or.kr">http://epsis.kpx.or.kr</a>). Annual average of increase rate for past 3 years was 15.1%. Also we analyzed the annual average of increase rate during the year 2007~2009 was 16.1%. Even though abnormal increase occurred in the year 2008(50%), the increase trend is still less than +20%. Thus validation team concluded that it is hardly to increase the SMP to +20%. In addition, the SMP is decreasing in the year 2009, so we confirmed the SMP is not expected increase in the future constantly.</p> <p>④ The variation of electricity generation is assessed considering the fluctuation of amount of daylight in Mokpo area(Mokpo Weather station, <a href="http://mokpo.kma.go.kr/index.jsp">http://mokpo.kma.go.kr/index.jsp</a>) near to the project site during past 15 years (1992~2006). According to the statistics, fluctuation of amount of daylight is less than 5.77 %. Thus, validation team deemed <math>\pm 20\%</math> of rising trend for amount of daylight is unlikely to occur. Thus validation team concluded that it is hardly to increase the electricity generation to +20%.</p> <p>To conclude the sensitivity analysis it can be stated that under none of the assumed variation of variables calculated over '0'. Thus, the sensitivity analysis result consistently support the conclusion that proposed project activity is unlikely to be financially attractive.</p>	
<p><b>CAR 9:</b></p> <p>Common practice analysis for the proposed project activity has not been conducted in the PDD.</p>	B.5.15	<p>The common practice analysis has been performed considering the similar projects in Korea as the relevant geographical extension and the basis of capacity limited over 12MW photovoltaic power plant according to the defined range for common practice in methodology ACM 0013. ACM 0013 noticed the comparable size for common practice is from 50% to 150% to the size of project activity. Because the proposed project is the largest photovoltaic power plant in Korea, no project found over than the project's capacity. Thus PP found only two projects such as LG Solar Energy Taean Photovoltaic Power Plant Project (14MW) and Gochang solarpark photovoltaic power plant Project(14.98MW) as complied with above limit, but these projects are under validation for CDM project.</p> <p>The validation team confirmed that the proposed CDM project activity is remarkably large scale in Korea and no comparable project found. Thus the proposed CDM project activity is not common practice through checking official sources applied in common practice analysis.</p>	CAR 9 is closed.

## APPENDIX A. KFQ VALIDATION PROTOCOL

<p><b>CAR 10:</b></p> <p>It is not clear for the data source of <math>EF_{CO_2}</math>. And basis of converting coefficient of NCV from GCV shall be definitely explained.</p>	<p>B.6.2</p>	<p>The applied values of <math>EF_{CO_2,i}</math> are based on using conversion factor suggested in the 2006 IPCC Guidelines. It was reflected on PDD.</p> <p>The calorific values indicated in country-specific data, gross calorific value (GCV), and it was recalculated for applying this project as net calorific value (NCV) using conversion factor suggested in the 2006 revised IPCC Guidelines.</p> <p>The Net Calorific Values Conversion Factor as follows</p> <ul style="list-style-type: none"> <li>- Solid/liquid fuel : 0.95</li> <li>- Gaseous fuel : 0.90</li> </ul> <p>Validation team concluded all value and factor applied correctly by confirming the revised PDD.</p>	<p>CAR 10 is closed.</p>
<p><b>CAR 11:</b></p> <p>Operational and management structure in the PDD was not consistent with project implementation. It should be described in practical way to implement during crediting period.</p>	<p>B.7.2.1</p>	<p>PP revised the operational and management structure (figure B-4) in the PDD.</p>	<p>CAR 11 is closed</p>
<p><b>CAR 12:</b></p> <p>Validation team found that there are 14 meters to monitor delivered electricity to the Grid (7 meters) and imported electricity from the Grid (7 meters). However it was not correctly described in the PDD. Also responsibility of data collecting and data archiving was not clear as well as calibration and exchange cycle of measuring meter</p>	<p>B.7.2.3</p>	<p>Monitoring plan is revised by reflecting project activity implementation. Validation team found that there are 2 kinds of meters. One of them is for monitor delivered electricity by this project activity and there are 7 meters for it. The other meter is for monitor imported electricity from the Grid to the project site and it also consisted with 7 meters. This is confirmed by site visiting and it is well described in the revised PDD.</p> <p>Also monitoring plan is updated including below:</p> <ul style="list-style-type: none"> <li>- DONG YANG ENERGY Co., Ltd. has a responsibility of data collecting and archiving.</li> <li>- The metering instruments will be calibrated in accordance with the national standard but at least once in every 3 years and accuracy level of the meter is <math>\pm 0.5\%</math> for transmission meter and <math>\pm 1.0\%</math> for receiving meter.</li> <li>- The exchange cycle of meter is set as 7 years in accordance with the Rules on Electricity Market Management.</li> </ul>	<p>CAR 12 is closed</p>

## APPENDIX A. KFQ VALIDATION PROTOCOL

<b>CAR 13:</b>  The starting date of the crediting period described in PDD A.4.4 (1 January 2009) and C.2.1.1 (1 July 2009) is inconsistent.	C.2.2	Starting date of crediting period for proposed project activity is defined as 1 March 2010 and this date is presented consistently in entire PDD.	CAR 13 is closed
<b>CAR 14:</b>  Summary of the environmental impact from PER, such as environmental impacts and its measures were not reflected in PDD but it was checked through PER during on-site assessment.	D.1.1	The environmental impacts such as natural environment, living environment and social/economic environmental in the PER was well described in the PDD and validation team crosschecked this impacts through PER.	CAR 14 is closed
<b>CAR 15:</b>  Summary of the stakeholder comments received from the meeting held on 2 February 2007 is not provided in the PDD.	E.4	Summary of the stakeholder comments received from the meeting held on 2 February 2007 is well described in the PDD. Comments were related to benefit to be impact to local residents and a road to be used by local residents in farming season.	CAR 15 is closed
<b>CAR 16:</b>  Due account taken for the comment received is not described in the PDD.	E.5	The town hall was constructed and the entrance of plants changed to maintain the agricultural road by PP	CAR 16 is closed
<b>CL 1:</b>  The PDD form has not been used as required from CLEAN DEVELOPMENT MECHANISM PROJECT DESIGN DOCUMENT FORM (CDM-PDD) Version 03-in effect as of : 28July 2006. e.g : PDD letterhead omitted	-	PP revised the PDD form as CLEAN DEVELOPMENT MECHANISM PROJECT DESIGN DOUMENT FORM(CDM-PDD) Version 03-in effect as of : 28July 2006. The validation team confirmed.	CL 1 is closed.

## APPENDIX A. KFQ VALIDATION PROTOCOL

<p><b>CL 2:</b></p> <p>It is recommended that contribution to local society from implementing the project should be described on PDD A.2</p>	<p>A.2</p>	<p>PP provided that the project contributes to local society as follows.</p> <ul style="list-style-type: none"> <li>- Creating employment opportunities during both construction and operation periods.</li> <li>- Accelerate local economic development.</li> </ul>	<p>CL 2 is closed</p>
<p><b>CL 3:</b></p> <p>GSP coordinates of the project site is not well described in the section A.4.1.4 of the PDD.</p>	<p>A.4.1.4</p>	<p>The information provided in the final PDD section A.4.1.4 on the location of the project activity allows for an identification of the site.</p> <p>The location of the project activity is Techon-ri in Jeollanamdo, Republic of Korea. The geographical coordinates of the proposed project is latitude of 35° 01' 40.84" North and longitude 126° 14' 20.82" East.</p>	<p>CL 3 is closed</p>

Appendix B  
Qualification of Validation Team

## APPENDIX B. QUALIFICATION OF VALIDATION TEAM

<div data-bbox="862 223 1019 279"></div> <div data-bbox="324 351 963 399"><h3>GHG Validator/Verifier Certificate</h3></div> <div data-bbox="515 454 772 502"><h4>Mi Jung LEE</h4></div> <div data-bbox="448 510 840 550"><p>Certificate number: GHG 08001</p></div> <div data-bbox="492 566 795 598"><p>Sectoral Scope: 01, 02, 03</p></div> <div data-bbox="526 670 761 702"><p>Date: 30 June 2008</p></div> <div data-bbox="324 774 974 965"><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="504 1005 795 1045"><p>Valid until: 26 Dec 2010</p></div> <div data-bbox="369 1061 918 1093"><p>Authorized by Korean Foundation for Quality</p></div> <div data-bbox="268 1181 593 1260"><p><b>kfq 한국품질재단</b> Korean Foundation for Quality</p></div> <div data-bbox="672 1157 996 1268"><p>재단법인 한국품질재단 이사장 김우</p></div> <div data-bbox="593 1268 1019 1300"><p><small>12FL, Woomin 1st's Valley, 0-310, 371-28, Gyeon-Dong, Gyeoncheon-Gu, Seoul 152-803, Korea</small></p></div>
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### GHG Validator/Verifier Certificate

#### Yu-Shim Jeong

Certificate number: GHG 04006

Sectoral Scope: 01,02,03,04,05,10,11,12

Expert Scope: 04,05,11,12

Date: 9 MAY 2007

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.

Valid until: 8 May 2010

Authorized by Korean Foundation for Quality



**kfq 한국품질재단**  
Korean Foundation for Quality

재단법인 한국품질재단 한국품질인증센터  
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