VALIDATION REPORT (Rev. 2.0)

"K-water Hydropower Ⅷ" in Korea

REPORT No. : CDM-2011-013C

KSA KOREAN STANDARDS ASSOCIATION

VALIDATION REPORT

KSA

Project No.	Date of first issue :	Revision No.	Revision Date
CDM-2011-013C	25/06/2012	2.0	05/09/2012
Project Title : K-water Hydropower Ⅷ			

Executive Summary

Korean Standards Association (KSA) has performed a validation of "K-water Hydropower Ⅷ" in Republic of Korea. The validation has been performed by document review based on the project design document, follow-up interviews with project stakeholder and resolution of outstanding issues and the issuance of the validation report.

The applied requirements for validation depend on *"the Article 12 of the Kyoto Protocol"*, *"the CDM modalities and procedures"*, *"the simplified modalities and procedures for small-scale CDM project activities"* and *"the subsequent decisions by the CDM Executive Board"*. A risk based approach was taken to conduct the validation and corrective action request and clarifications were raised for relevant actions by the project participants.

In summary, it is KSA's validation opinion that the proposed CDM project activity, as described in the CDM PDD (version 4.0, 07/08/2012), meets all relevant UNFCCC requirements for the small-scale CDM and correctly applied the approved baseline and monitoring methodology AMS-I.D. Hence, KSA requests the registration of the "K-water Hydropower Ⅷ" in Republic of Korea as a CDM project activity.

Project Participant: Korea Water Resources Corporation	**Applied Methodology/Version :** AMS-I.D version 17
	Scope(s) : 1 **Technical Area(s)** : 1.2

Team Leader Kyoo-Il Sohn **Team Member** SeungKeun Choi Chung-Kook Lee **Observer**	**Responsible Certification Body Member :** Jin-Su Chun	**First CDM PDD Version** Date of issuance: 07/11/2011 Version No. :01 **Final CDM PDD Version** Date of issuance: 07/08/2012 Version No. : 04

Table of Contents PAGE

Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CL	Clarification Request
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KEPCO	Korea Electric Power Corporation
KPX	Korea Power Exchange
KSA	Korean Standards Association
K-water	Korea Water Resources Corporation
MKE	Ministry of Knowledge and Economy
MP	Monitoring Plan
MoV	Means of Verification
NGO	Non-Governmental Organization
ODA	Official Development Assistance
OM	Operation Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

0. VALIDATION OPINION

Korean Standards Association (KSA) has carried out validation of the "K-water Hydropower Ⅷ" in Republic of Korea. The validation has performed on the basis of UNFCCC criteria for the Clean Development Mechanism and the Host country criteria.

The validation has been performed by document review based on the project design document, follow-up interviews with project stakeholders and resolution of outstanding issues and the issuance of the validation report.

Total emission reductions from the project are estimated to be on the 38,654 $tCO_{2\text{-}eq}$ per a year over the selected 10 years crediting period without renewal. The estimated emission reduction has been checked and is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Validation team also confirmed that monitoring and maintenance plans are clearly defined and adequate.

In KSA's opinion, the project activity meets all relevant UNFCCC requirements for CDM, is eligible as category I.D small-scale CDM project activity, and correctly applies the approved simplified baseline and monitoring methodology AMS-I.D. (version 17). Hence, KSA requests the registration of the project "K-water Hydropower Ⅷ" in Republic of Korea as a CDM project activity.

September 5th, 2012

Jin-Su Chun

Director
International Certification Division
Korean Standards Association

Kyoo-Il Sohn

Validation Team Leader

1. INTRODUCTION

Korea Water Resources Corporation (hereafter, K-water) has commissioned Korean Standards Association (hereafter, KSA) to carry out the validation of the proposed project "K-water Hydropower Ⅷ" in Korea (hereafter, the project). This report summaries the findings over the validation process that has been performed on the validation requirements of the Clean Development Mechanism (CDM).

1.1 Objective

The purpose of validation is to ensure a thorough, independent assessment of proposed project activities submitted for registration as a proposed CDM project activity against the applicable CDM requirements. In particular, the project's baseline, the monitoring plan and the project's compliance with relevant UNFCCC and host Party 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. The validation is seen as necessary to provide assurance to stakeholders of the quality of the project activity and its intended generation of certified emission reduction (CERs).

1.2 Scope

The scope of the validation is defined as an independent and objective review of the project design document (PDD) and the relevant documents. The information in these documents is reviewed against the criteria stated in Article 12 of Kyoto Protocol (decision 17/CP.7), the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions of the COP/MOP and the CDM Executive Board including the approved baseline and monitoring methodology AMS-I.D. version 17. The KSA validation team follows a risk-based approach in the validation focusing on the identification of significant risks for project implementation and generation of certified emission reductions (CERs). Validation is no meant to provide any consulting toward the project participants. However, the corrective action request (CAR) and clarification request (CL) may have provided input for improvement of the project design.

1.3 Validation Team

The validation team consists of the following personnel:

Role/Qualification	***Name***	*Document Review*	*Site Visit*	*Follow-up Actions*	*Reporting*	*Technical Review*
Team Leader CDM Validator	Mr. Kyoo-Il Sohn	✔	✔	✔	✔	
Team Member CDM Validator	Mr. SeungKeun Choi	✔	✔	✔		

Role/Qualification	*Name*	*Document Review*	*Site Visit*	*Follow-up Actions*	*Reporting*	*Technical Review*
Team Member Technical expert	Mr. Chung-Kook Lee	✔	✔	✔		
Technical Reviewer	Mr. Chan-Sik Yun					✔

1.4 Internal Quality Control

The validation report including the validation findings were reviewed by a technical reviewer (Mr. Chan-Sik Yun) prior to the submission of the validation report to the project participants and prior to requesting registration of the project activity during the period from 06/09/2012 to 10/09/2012. Also the technical reviewer is qualified by KSA's qualification scheme for CDM validation and verification. As a result of the internal technical review process, the validation opinion and the topic specific assessments as prepared by the validation team leader may be confirmed or revised. Furthermore reporting improvement might be achieved.

2. METHODOLOGY

To assess the correctness of the information provided by the project participants, the validation consists of the following three phases;

Ⅰ. Review of Documents, including;

- Review of data and information to verify the correctness, credibility and interpretation of presented information;
- Cross check between information provided in the PDD and information from sources other than that used, if available, and if necessary independent background investigations.

Ⅱ. Follow-up actions, including;

- Interview with relevant stakeholders in the host country, personnel with knowledge of the project design and implementation;
- Cross-check of information provided by interviewed personnel to ensure that no relevant information has been omitted the validation

Ⅲ. The resolution of outstanding issues and the issuance of the final validation report and opinion.

Validation Protocol Table 1: Mandatory Requirements for Clean Development Mechanism Project Activity			
Requirement	Reference	Conclusion	Cross reference/Comment
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or noncompliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent validation process.

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Ref.	Means of Verification (MoV)	Comments	Draft and/or Final Conclusion
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.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to noncompliance with the checklist question (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Description of Corrective Action Requests and Clarification	Ref. to checklist table 2	Comments/Responses from project proponent	Final conclusion
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the validation team should be summarized in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

2.1 Review of Documents

The validation is performed by KSA primarily based on the review of the PDD and the other supporting documents. The PDD version 01, dated 07/11/2011, was initially reviewed and KSA requested the project participants to present the supporting information and documents the related with the project design. Such additional information and documents were also reviewed by KSA. Through the validation process, the PDD and the relevant documents were evaluated to confirm the actions taken by the project participants to the CARs and CLs issued by KSA.

2.2 Follow-up Interviews

Follow-up interviews with the stakeholders and site visits were performed from 15/12/2011 to 19/12/2011 and 05/01/2012. The schedule on site visit and interviewed personnel were as follows;

15/12/2011: Visit the project site (CDM Validator : Mr. SeungKeun Choi & Mr. Chung-Kook Lee)

Site Name	Location (Address)
Nakdan	806, Nakjeong-ri, Danmil-myeon, Uiseong-gun, Gyeongsangbuk-do (GPS Coordinate : 36.359094°N, 128.306820°E)
Gumi	1057-26, Won-ri, Sunsan-eup, Gumi-si, Gyeongsangbuk-do (GPS Coordinate : 36.238665°N, 128.348292°E)

Interview with the representative of the local resident, the operation and maintenance (O&M) service providers

16/12/2011: Visit the project site (CDM Validator : Mr. Kyoo-Il Sohn, Mr. SeungKeun Choi & Mr. Chung-Kook Lee)

Site Name	Location (Address)
Chilgok	627-1, Jungji-ri, Seokjeok-eup, Chilgok-gun, Gyeongsangbuk-do (GPS Coordinate : 36.015443°N, 128.400404°E)
Gangjeong Goryeong	806, Jukgok-ri, Dasa-eup, Dalseong-gun, Daegu City (GPS Coordinate : 35.841659°N, 128.461459°E)

Interview with the representative of the local resident, the operation and maintenance (O&M) service providers

05 Jan 2012: Meeting with the project participants (K-water)

The list of person interviewed is included in the reference. The main topics of the interviews are summarized as belows;

Organization	Interview topics
the representative of the local resident (resident or local official)	- Environmental impacts - Stakeholders' comments
O&M service providers	- Technology applied and operational lifetime - Provisions for training, operation and maintenance - Monitoring and reporting procedures
□ K-water (Project participant) □ EcoNetwork Co., Ltd (Consulting company)	- Clarification on technical details of the project. - Confirmation on non-involvement of ODA. - Monitoring and reporting procedures - Additionality - Baseline methodology. - Estimated emission reduction and emission factors applied - Stakeholder consultation process - Environmental impacts - Legal compliance. - Resources, training needs and procedures for operation and maintenance. - Benefits from CDM registration. - Prior to the CDM consideration.

2.3 Resolution of clarification and corrective action request

As an outcomes of the validation process, the validation team can raise Corrective Action Request (CAR) and Clarification Request (CL) in order to confirm that the proposed project activity meets the CDM requirements and can achieve credible emission reductions. CARs and CLs require the project participants to modify the project design, to rectify the PDD or to provide adequate additional explanations or evidence. Criteria for CARs and CLs are as follows and are based on the "Clean Development Mechanism Validation and Verification Manual"(EB 55 Annex 1) /2-1/

- Corrective Action Request (CAR) shall be raised if one of the followings occurs;
  a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
  b) The CDM requirements have not been met;
  c) There is a risk that emission reduction cannot be monitored or calculated.

- Clarification Request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

The validation by KSA identified 16 CARs and 3 CLs. The resolution of CARs and CLs raised by KSA is to be reflected in the revised PDD and submitted to KSA for validation conclusion.

3 Validation Findings

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

3.1 Approval

A letter of approval <No.2012-22> on 20/07/2012 from the Host country has been received and verified by the validation team. From a letter of approval <No.2012-22>/1-5/, KSA confirms that;

- Republic of Korea is a Party to the Kyoto Protocol
- Participation is voluntary.
- The proposed CDM project activity contributes to the sustainable development of the Host Party.
- It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.

And the letter is unconditional with respect to item (a) to (d) as per paragraph 45 of VVM.

KSA has received the Letter of Approval from the project participant (K-water) of the proposed project activity "K-water Hydropower Ⅷ" in Republic of Korea and checked it by calling DNA of Korea. It does not doubts its authenticity. No Annex I Party has been identified.

3.2 Participation

The project participant has been approved by the corresponding Party which is confirmed by the issued LoA/1-5/. Project participant listed in the PDD/1-1/ was cross-checked by the letter of approval /1-5/. Letter of approval states that the project participant, K-water, is voluntary. The project participants is K-water (Korea Water Resources Corporation) and the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding toward Korea.

3.3 Project Document

PDD used is CDM-SSC-PDD ver. 03 which is the most recent PDD format and complies with relevant form and guidance as provided by UNFCCC EB. Completeness was assessed through the protocol included as Appendix A of this report.

3.4 Project Description

3.4.1 General Information

The proposed project activity is a newly constructed run-of-river type with installed capacity of 12.0MW bundled hydro power plants which are located on Gyeongsangbuk-do and Daegu City respectively.

The electricity generated from hydropower plants will be exported to the KEPCO (Korea Electric Power Corporation) grid and thus displace electricity produced by a thermal power plant which uses a fossil fuel and result in reduced GHG emission.

The proposed project activity is composed of 4 hydropower plants and total installed capacity is 12.00MW and the yearly generation is likely to be 58,170 MWh. The estimated emission reduction attributable to the project activity are 386,540 $tCO_{2\text{-}eq}$ over the selected 10 year crediting period, with annual average reduction of 38,654 $tCO_{2\text{-}eq}$ .The project participants and individual installed capacity of hydropower plant are indicated as Table 3-1;

Table 3-1 Overview of the proposed project activity.

	Nakdan	Gumi	Chilgok	GangjeongGoryeong
Project Location	Gyeongsangbuk-do			Daegu City
Starting date of the project activity /1-6/	27/10/2009	27/10/2009	27/10/2009	23/10/2009
Project type	Run of river type hydropower plant			
Geographic Coordinates	36.359094°N 128.306820°E	36.238665°N 128.348292°E	36.015443°N 128.400404°E	35.841659°N 128.461459°E
Installed capacity	3MW (1.5MW*2units)	3MW (1.5MW*2units)	3MW (1.5MW*2units)	3MW (1.5MW*2units)
Plant load factor	56.00%	56.19%	58.14%	51.02%
Estimated Annual generation to grid (MWh/year)	14,717	14,767	15,279	13,407
	Total : 58,170			
Estimated Emission Reductions (tCO_{2eq}/yr)	9,779	9,813	10,153	8,909
	Total : 38,654			
Lifetime of equipment	30 years			
Crediting Period	10 years fixed crediting period			

The technologies applied to the proposed project are deemed current good practice and are not expected to be replaced within the crediting period. The project have all inherent benefits of a renewable energy project. The starting dates has been identified as the date of construction contract for the proposed hydropower plant /1-6/ which real action of a project activity begin as

table 3-1 above.

The operational lifetime of the proposed project is estimated to be around 30 years and the crediting period without renewable of 10 years starting on 01/12/2012 or the registration date which is late. The project activity will have all inherent benefits of a renewable energy. Moreover, the project activity will contribute to the local economic development and the sustainable development objectives of the Republic of Korea.

The information presented in the PDD on the technical design are consistent with the actual planning and implementation of the project activity as confirmed by;

- Review of data and information was checked at the desk review stage by following documents;
  - PDD /1-1/,
  - Excel Spreadsheets for calculation of the operating margin and build margin emission coefficient (2010) /1-2/
  - Emission reduction calculation sheet /1-3/.
  - Declaration of intent for CDM project activity to DNA of Korea and UNFCCC secretariat /1-4/
  - Construction contract for the proposed hydropower plant /1-6/
  - License for the electric generation business /1-7/
  - K-water's Request for screening investment for hydropower plant /1-8/
  - EIA (Environmental Impacts Assessment) Report on the Nakdong-River conservation work (2nd Zone) /1-9/
  - Project plan attached to Application Letter for Electric Utility License of Hydropower plant /1-10/
  - Technical data for generator and water turbine of hydropower /1-11/
  - Inspection Certificate prior to operation by KESCO /1-12/
  - The relevant law and regulation /1-13/ to /1-19/
  - Opinion by technical professionals (Professor Sohn /1-31/ and Professor Yoon /1-32/)
  - Clarification for SSC 629 (AMS-I.D.) /2-6/
  - Clarification for SSC 159 (AMS-I.D.) - fossil fuel combustion in hydro projects /2-10/
- KSA has on-site visit assessment 15/12/2011 and 16/12/2011 to confirm the context of the PDD/1-1/ and relevant stakeholder and personnel related to operation and maintenance were interviewed. Also checked with design drawing including specification and capacity of generator.
- Finally information related to similar hydropower projects or technologies as a registered CDM project activity have been used to confirm the accuracy and completeness of the project description /1-25/.

In the view of the above, KSA confirms that the project description as included in the PDD is sufficiently accurate and complete in order to comply with the requirements of the CDM.

3.4.2 Eligibility as a Small Scale Project

The proposed project activity is a grid connected hydropower based on renewable power generation. The qualification of the project activity as a small-scale project activity is confirmed during the on-site visit as follows;

- Maximum output capacity.

  The project qualifies as small-scale project activity as the maximum output capacity of 12.00MW_e (12,000kW_e) which is less than the 15 MW_e capacity limit stipulated in paragraph 6 (c) of decision 17/CP.7. Therefore the description of project design justifies the applicability criteria of approval small scale methodology AMS-Ⅰ.D. Grid connected renewable electricity generation version 17. /2-7/

- Debundling

  The definition of debundling for SSC project activities is stated in 'Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project activities'/2-4/, and it was confirmed during on-site visits that those items for followings related to debundling do not be applied to the proposed project activity.
  - With the same project participants
  - In the same project category and technology/measure
  - Registered within the previous 2 years
  - Whose project boundary is within 1 km of the project boundary of the proposed small- scale activity at the closest point.

3.4.3 Choice of the Crediting Period

The crediting period for this project activity is considered as fixed crediting period of 10 years starting on 01/12/2012 or the registration date which is late. The expected operational lifetime for hydropower generator and water turbine is estimated to be 30 years. Selection of the fixed crediting period of 10 years is also found acceptable in respect to the expected operation time of 30 years for the project activity, as mentioned in Section C of the PDD/1-1/.

3.5 Baseline and Monitoring Methodology

3.5.1 Applicability of the Selected Methodology to the Project Activity

According to Appendix B of Annex Ⅱ 'Simplified modalities and procedures for small-scale CDM project activities' /2-2/, the selected baseline methodology refers to project type Ⅰ (Renewable

Energy Projects) and project category D (Grid connected renewable electricity generation).

The project activity has been applied baseline as mentioned in the approved methodology AMS-I.D. version 17 /2-7/. The project activity generates renewable electricity from hydropower plant and the generated electricity will be supplied to the KEPCO grid replacing fossil fuel generated electricity. The baseline selected for the project activity is the continuation of generation at current level of emission from the KEPCO grid system.

The hydropower project activity is being implemented through construction of a new weir at river. Based on the on-site visit and interview with technical professionals /1-31/ & /1-32/, as the project activity does not result into a new reservoir or increase the volume of existing reservoir estimating the power density of the hydropower plant would not be required.

The proposed project activity is confirmed at desk review, on-site visit and interview with the technical professionals as follows;

- The project activity is a newly built run-of-river hydropower plant.
- The project activity does not result into a new reservoir or increase the volume of existing reservoir.
- The project activity utilizes water resource to generate electricity, it belongs to renewable energy utilization.
- The installed capacity of the project activity is 12.00MW_e (12,000kW_e), within the thresholds installed capacity for small scale CDM type Ⅰ of 15MW
- The electricity generated by hydropower plant is supplied to the KEPCO grid system.

All the applicability criteria have been checked and confirmed through checking the PDD and via on-site investigation. KSA has concluded that the applied methodology to the proposed project activity is applicable.

KSA confirms that, as a result of the implementation of the project activity, there are no GHG emissions occurring within the project activity boundary, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology AMS-I.D. (version 17)

3.5.2 Project Boundary

As prescribed by the methodology AMS-I.D. (version 17), the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

The project boundary were validated by KSA as belows;

- Locations were assessed by the google earth and on-site visits as belows.

	Nakdan	Gumi	Chilgok	GangjeongGoryeong
Project Location	Gyeongsangbuk-do			Daegu City
GPS Coordinates	36.359094°N 128.306820°E	36.238665°N 128.348292°E	36.015443°N 128.400404°E	35.841659°N 128.461459°E

■ Observation of the physical site and equipment used in the project activity during on-site visit on 15/12/2011 and 16/12/2011. All activities related to hydro turbine with 3-phase synchronous generator, relevant equipment and installation and operation, and control room are located within each of the hydropower plant.

■ The electricity generated by the proposed project activity will be exported to the KEPCO grid system. Therefore the KEPCO grid has been cooperated in the project boundary.

The selected sources and gases are justified for the proposed project activity. The emission sources and gases included in the project boundary are;

Subjects	GHG involved	Remarks
Baseline Emissions	CO_2	The major emission sources. The GHG emission reductions are achieved by replacing the electricity generated by the thermal power plants in the KEPCO grid.
Project Emissions	N/A	As verified during on-site validation, according to the clarification SSC 159 /2-10/, it's confirmed that there are no equipment related to fossil fuel in crediting period, thus the emissions due to fossil fuel consumption is zero. According to Project plan/1-10/, EIA /1-9/ and technical opinion by professionals /1-31/ & /1-32/, the project is run-of-river hydropower station which will not result in reservoir, so the calculation of power density is not applicable for the project activity. The project is a newly constructed run-of-river power plant and according to methodology AMS-I.D. (version 17)/2-7/, the project activity emissions are zero.
Leakage Emissions	N/A	As the hydro turbine with generator is not transferred from or to another activity, leakage is not considered.

The project boundary description is clear in accordance to the project category of the approved methodology AMS-I.D (version 17).

Thus, KSA confirms that the identified boundary and the selected sources and gases as documented in the PDD are justified for the project activity.

3.5.3 Baseline Identification

KSA assesses the baseline scenario of the proposed project as belows;

- According to the para 10 of AMS-I.D./2-7/, the baseline scenario is that the 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 into the grid.
- As the project activity is the installation of a new grid-connected hydropower plant and the total installed capacity of the proposed project activity is less than 15.0MW, the proposed project activity is eligible as type I small-scale CDM project activity and can apply the methodology AMS-I.D.
- This project activity is to generate electricity using hydropower and supplies electricity to the grid that would have been supplied by at least one fossil fuel-fired generating unit.
- The emission factor of the grid is calculated by combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to "Tool to calculate the emission factor for an electricity system (version 2.2.1)/2-8/.
- Emissions reductions are determined by the AMS-I.D version 17 /2-7/ methodology mentioned in the PDD /1-1/. Thus, the baseline is the MWh produced by the renewable generating unit multiplied by an emission factor (measured in tCO_2/MWh).

The information presented in the PDD/1-1/ have been validated by the first desk review of all the data, further confirmation based on the on-site visit and a final step by cross-checking the information with similar hydropower project/1-25/. The sources referenced in the PDD/1-1/ have been correctly quoted. The information was cross-checked based on verifiable and credible source, such as;

1) Documents are provided by PPs
   - License for the electric generation business /1-7/
   - Technical Data for water turbine and generator /1-11/
   - Inspection Certificate prior to operation by KESCO /1-12/
2) Documents for cross checking by KSA
   - Framework Act on Low Carbon Green Growth /1-13/
   - Framework Act on Environmental Policy /1-14/
   - Electric Utility Act /1-15/
   - Rules on the operation of electric utility market /1-16/

- Environmental Impact Assesment Act /1-17/
- Energy Act /1-18/
- Act on the promotion of the development, use and diffusion of new and renewable energy./1-19/
- The status report of generation facility for 2010 by KPX /1-21/
- Feasibility Study Report - Supporting System in Feed-in Tariffs of Electricity generation from New and Renewable Energy Source by MKE (Ministry of Knowledge and Economy) of Korea (http://www.mke.go.kr) /1-22/
- Measures Act /1-35/

Based on the validated assumptions on calculations, KSA considered the identified baseline scenario is reasonable. KSA confirms that all related CDM requirements, including relevant and/or sectoral policies and circumstances, have been correctly identified taken into account in the definition of the baseline scenario. A verifiable description of the baseline scenario has been included in the PDD/1-1/, KSA confirms that;

- All the assumptions and data used by the project participants are listed in the PDD /1-1/, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD /1-1/;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD /1-1/;
- The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

3.5.4 Algorithms and/or formulae used to determine emission reductions

KSA assessed the calculation of the baseline emission, project emissions and leakage and emission reductions. The corresponding calculations, parameters and equations are presented in B.6.3 of the PDD /1-1/. The parameters and equations presented in the PDD/1-1/ and further documentation have been compared with the information and requirements presented in the methodology and respective tools.

The assumptions and data used to determine the emission reduction are listed in the PDD /1-1/ and all sources have been checked and confirmed. Based on the information reviewed it can be confirmed that the sources used are correctly quoted and interpreted in the PDD /1-1/.

The values presented in the PDD /1-1/ are considered reasonable based on the documentation reviewed, further references and the results of the interviews. The baseline methodology has been correctly applied following requirements. The estimated baseline emissions can be confirmed as the same have been replicated by the audit team using the information provided. Detailed information on the verification of the parameters used in the equation can be found in the appendix A. The algorithms for the determination of the baseline, project and leakage are discussed in the following sections.

1) Baseline Emissions (BE_y)

Emissions reductions were calculated according to the methodology, AMS-I.D. version 17 /2-7/ and emission factor was also calculated based on the approved methodology of "Tool to calculate the emission factor for an electricity system (version 2.2.1)" /2-8/.

As a results, the baseline emission (BE_y) of the proposed project activity is calculated as follows;

$$BE_y = EG_{BL,y} * EF_{CO_2,grid,y}$$

Where :

BE_y : Baseline Emissions in year y ($t\,CO_2$)

$EG_{BL,y}$: Quantity of net electricity supplied to the grid as a result of the implmentation of the CDM project activity in year y (MWh)

$EF_{CO_2,grid,y}$: CO_2 emission factor of the grid in year y ($t\,CO_2/MWh$)

The information presented in the PDD/1-1/ has been validated by the first desk review of all the data, further confirmation based on the website (http://www.kepco.co.kr) and a final step by cross-checking the information with similar hydropower projects which are registered as CDM project /1-25/.

The documents and information used to confirm baseline emission factor are as follows;

① Documents are provided by PPs

- Excel Spreadsheets for calculation of operating marin and build margin emission coefficient. /1-2/
- Emission Reduction Calculation (Excel sheet) /1-3/

② Documents for cross checking by KSA

- Energy Act/1-18/
- 5 years (2006 ~ 2010) "Statistics of Electric Power in Korea" /1-20/.

  Those data are available on the website (http://ww.kepco.co.kr) /1-29/. "Statistics of Electric

Power in Korea for 2010" was issued on 30/05/2011. And the initial PDD was prepared on 07/11/2011 and opened for global stakeholders from 11/11/2011 to 10/12/2011.

Thus, "Statistics of Electric Power in Korea for 2010" is the most recent available data sources at the time of PDD submission to DOE for validation as per "Tool to calculate the emission factor for an electricity system" (version 2.2.1, EB 63 Annex 19) /2-8/

- IPCC guideline on greenhouse gas inventories /2-5/
- The status report of generation facility for 2010 by KPX (Korea Power Exchange) /1-21/

Since the project activity is the installation of a new grid-connected renewable power plant, the baseline scenario is correctly identified as an electricity delivered to the grid by the project activity by the combined margin (CM) calculation described in the "Tool to calculate the emission factor for an electricity system" /2-8/, namely "the net electricity amount by the project activity" * "CM factor". For this purpose it has been validated by KSA validation team that the project participant applied all the 6 steps as per the approved baseline methodology.

Step 1: Identify the relevant electric power system

The electricity by the proposed project activity is connected physically to KEPCO grid which is the only one in Korea. And the power plant in islands except Jeju Island are not connected to the national grid, so they are not considered. Thus, the relevant electric power system is KEPCO grid.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

"Option Ⅰ. Only grid power plants are included in the calculation" was chosen.

Step 3: Select an Operation Margin (OM) Method.

As low-cost/must-run resources constitute less than 50% of total grid generation in average of the five most recent years, "Simple OM" method option has been choosen.

During the most recent 5 years (2006 ~ 2010), low-cost/must run resources constitute 37.78% of total grid generation which is less than 50%.

Step 4: Calculate the operating margin emission factor according to the selected method.

According to the selected method, simple OM is calculated as the generation-weighted average emission per electricity unit of all generating power plant within KEPCO grid, not including low-operating cost and must run power plants for the most recent three years (2008 ~ 2010).

Subsequently choosing Option A, the simple OM emission factor is determined as per formular

of tool as OM = 0.6933

Step 5: Calculate the build margin (BM) emission factor.

The project participant has chosen option 1 to estimate the Build Margin (BM) ex-ante for the entire crediting period of the project activity. According to electricity data published by KEPCO, it is found that in year 2010 the electricity generation from the 5 power units (0.28%) that started to supply electricity to the grid most recently, excluding power units registered as CDM project activities, is less than the electricity generation (20.30%) from the set of power unit that started to supply electricity to the grid most recently and comprise 20% of the annual system generation, excluding power units registered as CDM project activities. In addition, none of the power units in the result group started to supply electricity to the grid more than 10 years, therefore the build margin (BM) is calculated from the sample group that started to supply electricity to the grid most recently and comprise 20% of the annual system generation which is deemed as appropriate.

Thus, the build margin (BM) is calculated using data of 2010. BM is calculated as the generation-weighted average emission factor of all generating power plant within KEPCO grid during the most recent year y for which power generation data is available. BM emission factor is determined as per formular 13 of tool as BM = 0.6357.

Step 6: Calculate the combined margin (CM) emission factor.

According to "Tool to calculate the emission factor for an electricity system /2-8/", the weighting factor is set to be respectively W_{OM} = 50% and W_{BM} = 50% for the first crediting period.

The combined margin (CM) of the project activity is calculated as 0.6645 $tCO_{2\text{-}eq}$/MWh. The baseline emission factor determined ex-ante will be used for calculation of emission reductions.

OM	BM	CM
0.6933 $tCO_{2\text{-}eq}$/MWh	0.6357 $tCO_{2\text{-}eq}$/MWh	0.6645 $tCO_{2\text{-}eq}$/MWh

With the expected generation of 58,170 MWh per year to the KEPCO grid, the annual baseline emission will be 38,654 $tCO_{2\text{-}eq}$.

All steps and formula mentioned in the methodology are properly applied in the PDD. There is no transfer of energy generating equipment from another activity or the transfer of exiting equipment to another activity. The emission reduction by the project will be direct function of the net electricity fed to the KEPCO grid.

The power sector data used for the calculation has been cross checked as follows;

- Each power plant of the electric generation amount : "Statistics of Electric Power in Korea" /1-20/ and "The status report of generation facility for 2010 by KPX /1-21/.

  "Statistics of Electric Power in Korea" for 2008, 2009 and 2010 have been verified with KEPCO website (http://www.kepco.co.kr), i.e. those were issued by KEPCO (Korea Electric Power Corporation) May 2009, May 2010 and May 2011 respectively. The "Status Report on the Generation Facility for 2010" by KPX was issued June 2011 and the fixed date is 31 Dec 2010.

  The initial PDD was prepared on 07 Nov 2011 and submitted to the DOE (KSA). The PDD was opened for stakeholders from 11/11/2011 to 10/12/2011.

  Thus, Statistics of Electric Power in Korea" for 2008, 2009 and 2010 were the most recent available data sources at the time of PDD submission to DOE for validation as per "Tool to calculate the emission factor for an electricity system (version 2.2.1, EB 63 Annex 19" /2-8/

- Each Fuel of CGVs and NCVs : "The Energy Act" /1-18/ and IPCC guideline on greenhouse gas inventories /2-5/

As above, KSA confirmed that all data used for the calculation are not excessive and appropriate.

All the equations involved along with the KEPCO grid power sector data used for calculation were found by the validation team to be in line with the "Tool to calculate the emission factor for an electricity system, version 2.2.1" /2-8/. The ex-ante determined grid emission factor will be fixed for the selected crediting period. The grid emission factor value (CM) has been validated as 0.6645 tCO_{2-e}/MWh, the same value has properly been used in the emission reduction calculation as per the requirement of AMS-I.D version 17 /2-7/.

2) Project Emissions (PE_y)

As verified during on-site validation, according to the clarification SSC 159 /2-10/, it's confirmed that there are no fossil fuel available in crediting period, thus the emissions due to fossil fuel consumption is zero.

According to Project plan /1-10/, EIA /1-9/ and comments by technical professionals /1-31/ & /1-32/, the project is run-of-river hydropower station which will not result in reservoir, so the calculation of power density is not applicable for the project activity. The project is a newly constructed run-of-river power plant and according to methodology AMS-I.D. (version 17)/2-7/, the project activity emissions are zero.

KSA confirms that the PDD/1-1/ appropriately interpreted the subject and assumed it to be zero(PE_y=0).

3) Leakage (LE_y)

As the energy generating equipment is not transferred from another activity nor the existing equipment is transferred to another activity, the leakage are not considered as per the guidelines of approved methodology. As per Para 50 of EB 44, the leakage emissions from equipment transfer from within to outside the project boundary may be excluded from consideration from all small scale methodologies. The same is reflected in the PDD.

4) Emission Reductions (ER_y)

According to the approved methodology, emission reductions are calculated as follows;

$$ER_y = BE_y - PE_y - LE_y$$

where, ER_y : Emission reductions in year y (tCO_{2e}/y)

BE_y : Baseline emissions in year y (tCO_{2e}/y)

PE_y : Project emissions in year y (tCO_{2e}/y)

LE_y : Leakage emissions in year y (tCO_{2e}/y)

Baseline emission is calculated as net electricity supplied by the project activity to the Grid ($EG_{BL,y}$ in MWh) multiplied by an emissions factor(EF_{CO_2} in tCO_{2eq}/MWh). No project emissions need to be considered, as the proposed project activity is a renewable energy project.

No leakage has to be considered for the proposed project activity.

As a consequence, the estimated annual average emission reductions of the project are calculated as 38,654 tCO_{2eq} during the crediting period. The emission reduction seems to be in line with the envisioned time schedule for the project's implementation and the indicated crediting period. Based on the above statement, KSA conclude that;

- All assumptions and data used by the project participants are listed in the PDD, including their references and sources.
- All documentation used by project participants as the basis for assumptions and sources of data is correctly quoted and interpreted in the PDD.
- All values used in the PDD are considered reasonable in the context of the proposed CDM project activity.
- The baseline methodology has been applied correctly to calculated project emissions, baseline emission, leakage and emission reductions.
- All estimates of the baseline emissions can be replicated using the data and parameter values

provided in the PDD.

According to the Section C of PDD/1-1/, the proposed project activity is to be commissioned and the start of 10 years crediting period without a renewal has been stated as the effective date at UNFCCC or 01/12/2012 which is later.

3.6 Additionality of a Project Activity

3.6.1 Prior consideration of the Clean Development Mechanism

1) **Starting Date of CDM project activity**

According to Glossary of CDM terms (version 6.0), the starting date of CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins. The earliest dates of construction contracts (turn key base)/1-6/ among four hydro power plants is 23/10/2009. Thus. the start date of the project activity is 23/10/2009 indicated by the earliest date when the construction contract was signed as belows;

	Nakdan	Gumi	Chilgok	GangjeongGoryeong
Starting date of the project activity	27/10/2009	27/10/2009	27/10/2009	23/10/2009

The date of construction contract (turn key base) is the earliest date at which either the implementation or construction or real action of a project activity begins and the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. Thus, the most reasonable start date of project activity is the date on which contracts have been signed for construction contract. Each of the starting date for hydropower plants is described in section C.1.1 of the PDD. KSA has reviewed "the construction contract for the proposed hydropower plant"/1-6/ and verified based on interview with the personnel of K-water.

KSA regarded this "Construction contract for the proposed hydropower plant" /1-6/ as an official consent to the project activity and accepted it as the starting date.

2) Prior Consideration of the CDM

The start date of the project activity is identified as 23/10/2009 indicated by the earliest date when the four hydropower plant construction contract was signed. Through the document check, the validation team hereby confirms that this is the earliest date on which the real action has taken place. Moreover this is the date on which PP has financially committed towards the expense of the project activity and is in compliance with the latest "Glossary of CDM terms (version 6.0)" /2-12/. The start date of the project activity is prior to the date when the project published for global stakeholder comments from 11/11/2011 to 10/12/2011.

The project start date is after 02 Aug 2008, thus this is a new project activity according to the categorization in "Guideline on the demonstration and assessment of prior consideration of the CDM" (version 4.0, EB 62 Report Annex 13) /2-9/ which was available at the time of project decision making. The project participants had informed the DNA of Korea and the UNFCCC secretariat in the writing of commencement of the project activity and of their intention to seek CDM status /1-4/ which was within six months of the project activity start date. as belows;

Date of notice for the prior consideration (Refer to CAR 16)

		Nakdan	Gumi	Chilgok	GangjeongGoryeong
Start date of PA		27/10/2009			23/10/2009
UNFCCC	1st	26/02/2010			05/04/2010
	2nd	24/05/2011			
DNA of Korea	1st	26/02/2010			05/04/2010
	2nd	23/05/2011			

KSA validation team checked the UNFCCC website and verified it with DNA of Korea. Thus, it can be concluded that the project participant has seriously considered the CDM and it meets the required criteria of prior consideration of CDM.

Moreover the description of key event timeline regarding CDM application and project implementation is included in the section B.5 of PDD.

Thus, KSA confirmed that the project participant was aware of the CDM prior to starting date of this project and the benefits of the CDM was a decisive factor in the decision to proceed with the project activity. Also the validation contract was made between PP and KSA on 29/07/2011.

3.6.2 Additionality

Validation team have checked followings documents including PDD /1-1/ to assess the additionality of the proposed project activity ;

- Guidelines for demonstrating additionality of microscale project activities (version 04, EB 68 Annex 26) /2-11/
- Submission and consideration of microscale renewable energy technologies for automatic additionality (version 1.0, EB 65 Annex 33) /2-13/
- F-CDM-PRT-REC ver01 PRT_001 (Submissions by DNA of Korea for recommendation of microscale renewable energy technologies for automatic additionality) /2-14/

■ The paragraph 52 of EB 66 Meeting Report /2-15/

The project activity is the hydropower plant, one of the renewable energy and also the biggest installed capacity among the bundling project activity is 3.00MW which is less than 5MW. Thus, the additionality of the project activity is demonstrated by applying the latest version of the "Guidelines for demonstrating additionality of microscale project activities (version 04, EB 68 Annex 26) /2-11/. The project activity satisfied the paragraph 2 (d) requirements of EB 68 Annex 26 /2-11/ which are required to demonstrate the additionality of the project activity as belows;

- the biggest installed capacity among the bundling project is 3.00MW
- the hydropower are one of the renewable energy which are encouraged and recommended by Korean Government /2-14/ and approved by EB.

As see above, the additionality of the proposed project activity is demonstrated by "Guidelines for demonstrating additionality of Microscale Project Activities" /2-11/.

Thus it has been established that the project activity would not have occurred in the absence of CDM and is hence additional and KSA validation team concluded that the project activity is additional.

3.7 Monitoring Plan

3.7.1 Monitoring Methodology

The monitoring plan is in compliance with the applied methodology, AMS-I.D. (version 17) /2-7/.

3.7.1 Parameters for monitoring during the crediting period

In this project activity, the parameter to be monitored to calculate the emission reductions is described in section B.7.1 "Data and parameters monitored" of the PDD and the parameters to be monitored are 'Net electricity supplied to KEPCO grid by the project activity in year y' ($EG_{BL,y}$) as belows;

(1) The quantity of net electricity supplied to the grid by each hydropower plant ($EG_{BL,y}$ = $EG_{export,y}$ - $EG_{import,y}$).

- □ Nakdan hydropower plant ($EG_{BL,y,Nakdan}$)
- □ Gumi hydropower plant ($EG_{BL,y,Gumi}$)
- □ Chilgok hydropower plant ($EG_{BL,y,Chilgok}$)
- □ GangjeongGoryeong hydropower plant ($EG_{BL,y,GangjeongGoryeong}$)

(2) Annual electricity exported to the grid by each hydropower plant.

- □ Nakdan hydropower plant ($EG_{expoert,y,Nakdan}$)

□ Gumi hydropower plant ($EG_{\text{export},y,Gumi}$)
□ Chilgok hydropower plant ($EG_{\text{expoert},y,Chilgok}$)
□ GangjeongGoryeong hydropower plant ($EG_{\text{export},y,GangjeongGoryeong}$)

(3) Annual electricity imported from the grid by each hydropower plant.
□ Nakdan hydropower plant ($EG_{impoert,y,Nakdan}$)
□ Gumi hydropower plant ($EG_{import,y,Gumi}$)
□ Chilgok hydropower plant ($EG_{impoert,y,Chilgok}$)
□ GangjeongGoryeong hydropower plant ($EG_{import,y,GangjeongGoryeong}$)

The monitoring plan of the proposed project activity has followed the applied methodology, AMS-I.D. (version 17) /2-7/ in context of the parameters to be monitored.

In this project activity, the only parameter to be monitored to calculate emission reduction is the net electricity ($EG_{BL,y}$ = $EG_{export,y}$ - $EG_{import,y}$) supplied to the KEPCO grid. The choice of project GHG indicators is found reasonable and in conformance with the requirements set by the applied methodology. The monitoring plan consists of metering the electricity exported to the KEPCO grid ($EG_{\text{export},y}$) and electricity import from the KEPCO grid($EG_{import,y}$). Export electricity ($EG_{\text{export},y}$) will be continuously measured and hourly recorded and electronically archived and the results are transferred to Korea Power Exchange (KPX)(http://www.kpx.or.kr) and project participant.

Thus it is cross-checked by both entities. Imported electricity for hydropower plant ($EG_{import,y}$) is continuously measured and monthly recorded by KEPCO. Import electricity for hydropower plant ($EG_{import,y}$) is managed by KEPCO and will be checked with the power bills.

All data for exported electricity will be archived electronically for a period of two years after the crediting period. Data for imported electricity will be kept at least for 2 years after the end of the last crediting period.

KSA cross-checks these parameters with the relevant methodology /2-7/ and tool /2-8/.
Thus, KSA confirmed that these parameters are fully comply with the approved methodology (AMS-I.D) /2-7/, applicable tools/2-8/ and guidelines /2-2/ & /2-3/.

3.7.2 Monitoring System

The implementation of the monitoring plan is assessed by the following process.

(1) Documents review.
- relevant regulation of the Host Party; Rules on the operation of electric utility market /1-16/
- approved monitoring methodology /2-7/, tool/2-8/ and guidelines /2-2/&/2-3/
- monitoring plan including operation and maintenance manual /1-34/ which are submitted by PPs

(2) Follow-up action
- interviewed with operation and maintenance personnel
- electric single line diagram including monitoring meters (export watt-hour meter and import watt-hour meter)/1-38/ was compared with actual situation.
- physical inspection of the proposed project activity site dated on 15/12/2011 and 16/12/2011.

To ensure that the emission reductions achieved by the proposed project activity are reported ex-post and verified, the operational management described in the PDD and PP's CDM monitoring manual /1-34/ are properly covered the followings;
- A description of the responsibility and authorities for project management including the proposed project maintenance and operation;
- Procedures for personnel training;
- A description of the installation of metering equipment;
- Procedures for the calibration of metering equipment as per 'Rules on the operation of electric utility market' /1-16/ and Measures Act /1-35/;
- Monitoring of the net electricity delivered to the KEPCO grid;
- Quality assurance and quality control;
- Data management system;

By documents review and on the site interview (15/12/2011, 16/12/2011 and 05/01/2012) with the PP. KSA confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design and can be properly implemented as planned and the project participants have an ability to implement the monitoring plan as described in the PDD.
Thus, KSA concludes that the monitoring plan of the proposed project activity is fully appropriate.

3.8 Sustainable Development

The LoA /1-5/ of the Host Party, the republic of Korea, clearly presents a statement that this project activity contributes to the sustainable development in Korea.

3.9 Comments by Local Stakeholders

Comments by local stakeholders is assessed by the following process.

(1) Documents review.
① Relevant regulation of the Host Party - Environmental Impact Assessment Act /1-17/
② EIA Report /1-9/ (Chapter 6 Gathering the opinion from the stakeholders) covers followings;
- Local stakeholders comments on the EIA report which were collected by local governments (Gumi-si, Dalseong-gun and Andong-si).

- The meeting for local residents.
- Action plan from project participant.

③ Notice on the website (http://www.kwater.or.kr) for inviting public comments /1-33/

(2) Follow-up action

- Interview with local residents
- interview with local government officials.

According to the documents/1-9/, the meeting for local residents was held in Gumi, Dalseong-gun and Andong-si where are located hydropower plant on 14/08/2009 after accessible period to the general public for inspection.
The public hearing for stakeholders was held on 10/09/2009 under attendance of the local government, local residents and stakeholders. The raised Issues during public hearing and from local residents were reflected to their project plan.
For the general public, PP had invited the relevant stakeholders to comment on the proposed CDM project activity from 23/05/2011 to 19/06/2011 through the website (http://www.kwater.or.kr). There are no issues received for the proposed project activity during notice on website.

As a results, KSA concludes that the proposed project activity has been supported by the local residents and their opinions should be considered to construction and operation of the project activity. Thus KSA considers that the local stakeholders consultation carried out adequately.

3.10 Environmental Impacts

'Busan Construction and Management Administration' (BCMA)(http://pcmo.mltm.go.kr), Government of Republic of Korea, carried out the river restoration project while PP (K-water) carried out the small scale hydropower plants as belows;

- Nakdong River restoration project : Busan Construction and Management Administration (BCMA)
- Four hydropower plants (Nakdan, Gumi, Chilgok and GangjeongGoryeong): K-water

The environmental impact assessments had been conducted by BCMA, Government of Republic of Korea. The validation team has reviewed the documentation of the presented information as the following process.

(1) Documents review.

① Relevant law of the Host Party - Environmental Impact Assessment Act /1-17/
② EIA Report /1-9/
  - EIA Report on the Nakdong River (2nd zone)
③ Approval letter for EIA report /1-24/

(2) Follow-up action

- Interview with local residents.
- Interview with local government official.

According to "Environmental Impact Assessment Act, 'BCMA', Government of Republic of Korea had carried out the Environment Impact Assessment (EIA) including river restoration work and small scale hydro power plant. The issues discussed in EIA including the raised Issues during public hearing and from local residents were reflected to their project plan.
KSA confirms that EIA report have been authorized by Ministry of Environment, Government of Republic of Korea (the 'Daegu Regional Environmental Office' (http://www.me.go.kr/daegu) /1-24/.

There are no transboundary environmental impacts and the identified negative environmental impacts related to the proposed project activity. The proposed project activity complies with environmental legislation in the Republic of Korea, Host country. As a result, KSA confirms that the environmental impacts are complied with the CDM requirements /VVM 87/.

Thus, KSA concludes that the environmental impacts of the proposed project are under control at a minimum level and PP has followed the requirements of the host country with regards to addressing environmental impacts.

4. COMMENTS BY PARTIES, STAKEHOLDERS AND NGOs

The Project Design Document for this project was made available on the UNFCCC website and was open for comments from Parties, stakeholders and NGOs from 11-11-2011 until 10-12-2011. The received comments /1-36/ & /1-37/ and PP's response were summarized as belows .

No.	Issues raised.		PP's and DOE's response
1	Negative comments /1-36/	The project is joint investment scheme of the Korean government and KOWACO (K-water). PDD insist that no public funding will need to finance the project activity.	Please refer to CAR 03, CAR 15, section 3.2 of this report and A.4.4 of PDD.
2		The project activity poses a prospect of inflicting devastating damage to environment.	Please refer to CAR 09, CAR 15 and section 3.10 of this report.
3		sustainable development	Please refer to CAR 15 and section 3.8 of this report.
4		EIAs were not appropriately conducted. - brief span of an mere 30 to 50 days. - shrinking wetlands. - massive waste material buried in landfill.	Please refer to CAR 09, CAR 15 and section 3.10 of this report.
5		debundling	Debundling is not applied to the proposed project activity. Please refer to section 3.4.2 of this report and A.4.5 of PDD..
6	positive comments /1-37/	favorable comments	N/A

5. REFERENCES

Category 1 Documents:

Documents provided by the Client that relate directly to the project.

/1-1/ Project Design Document (PDD) for Small-Scale CDM Activity

- □ Webhosted PDD of the project is version 01 dated on 07/11/2011
- □ The final version of the PDD of the project is version 04 on 07/08/2012

/1-2/ Excel Spreadsheets for calculation of the operating margin and build margin emission coefficient (2010).

/1-3/ Emission Reduction Calculation (Excel sheet)

/1-4/ Declaration of Intent for CDM project activity to DNA of Korea and UNFCCC secretariat.

- Prior consideration of CDM form on 26/02/2010
  (Nakdan ; K-water small scale hydroelectric power plants Ⅵ CDM project)
- Prior consideration of CDM form on 26/02/2010
  (Gumi ; K-water small scale hydroelectric power plants Ⅵ CDM project)
- Prior consideration of CDM form on 26/02/2010
  (Chilgok ; K-water small scale hydroelectric power plants Ⅵ CDM project)
- Prior consideration of CDM form on 05/04/2010
  (GangjeongGoryeong ; K-water small scale hydroelectric power plants Ⅷ CDM project)
- Prior consideration of CDM form on 24/05/2011
- E-mail between UNFCCC and K-water
- 'Project promotion letter of intent' to DNA of Korea.
- UNFCCC website

/1-5/ Approval of CDM (2012-22) - DNA of Republic of Korea (English and Korean)

/1-6/ Construction Contract for the proposed hydropower plant

- □ Nakdan Hydropower plant on 27/10/2009
- □ Gumi Hydropower plant dated on 27/10/2009
- □ Chilgok Hydropower plant dated on 27/10/2009
- □ GangjeongGoryeong Hydropower plant dated on 23/10/2009

/1-7/ License for the Electric Generation Business (Article 7 of Electric Business Act)

- □ Nakdan Hydropower plant dated on 05/04/2010 (No.: 2010-19)
- □ Gumi Hydropower plant dated on 05/04/2010 (No.: 2010-21)
- □ Chilgok Hydropower plant dated on 05/04/2010 (No.: 2010-20)
- □ GangjeongGoryeong Hydropower plant dated on 10/03/2010 (No.: 2009-6270000-81-00015)

/1-8/ K-water's 'Request for screening investment' for hydropower plant.

/1-9/ Environmental Impacts Assessment Report
- EIA Report on the Nakdong River (2nd zone)

/1-10/ 'Project plan' attached to 'Application Letter for Electric Utility License of Hydropower plant'
- □ Nakdan Hydropower plant on Jan 2010
- □ Gumi Hydropower plant on Jan 2010
- □ Chilgok Hydropower plant on Jan 2010
- □ GangjeongGoryeong Hydropower plant on Jan 2010

/1-11/ Technical Data for water turbine and generator of hydropower plant
- □ Nakdan Hydropower plant (3,000kW)
- □ Gumi Hydropower plant (3,000kW)
- □ Chilgok Hydropower plant (3,000kW)
- □ GangjeongGoryeong Hydropower plant (3,000kW)

1-12/ Inspection Certificate prior to operation by KESCO (http://www.kese.or.kr)
- □ Nakdan Hydropower plant on 13/05/2012
- □ Gumi Hydropower plant on 16/05/2012
- □ Chilgok Hydropower plant on 27/05/2012
- □ GangjeongGoryeong Hydropower plant on 03/06/2011

/1-13/ Framework Act on Low Carbon Green Growth

/1-14/ Framework Act on Environmental Policy

/1-15/ Electric Utility Act

/1-16/ Rules on the operation of electric utility market by KPX

/1-17/ Environmental Impact Assessment Act

/1-18/ Energy Act

/1-19 Act on the promotion of the development, use and diffusion of new and renewable energy

/1-20/ Statistic of Electric Power in Korea (Sources; http://www.kepco.co.kr)

/1-21/ The Status Report of generation facility for 2010 by KPX.

/1-22/ Supporting System in Feed-in Tariffs of Electricity Generation from New & Renewable Energy Sources by MKE (Ministry of Knowledge and Economy)

/1-23/ A five year national strategy for green growth in Korea by the committee of Green Growth Korea

/1-24/ Approval letter for EIA report by Daegu Regional Environmental Office (http://www.me.go.kr/daegu)

/1-25/ Benchmark project - Shaanxi Didonghe 8MW Hydro Power Project (Ref. No. 5922, Registered date : 25 April 2012)

/1-26/ Korea Power Exchange (http://www.kpx.or.kr)

/1-27/ Ministry of Knowledge Economy (http://www.mke.go.kr)

/1-28/ Ministry of Environment (http://www.me.go.kr)

/1-29/ KEPCO (http://www.kepco.co.kr)

/1-30/ Framework Plan on the Geum River conservation work

/1-31/ Opinion by technical professional (Professor Kwang-Ik Sohn)

/1-32/ Opinion by technical professional (Professor Byung-Man Yoon)

/1-33/ Korea Water Resources Corporation (http://www.kwater.or.kr)

/1-34/ Maintenance and Operational Manual for hydropower plant by Kwater.

/1-35/ Measures Act

/1-36/ GSC Comments submitted by Cho, Seung-Soo.

/1-37/ GSC Comments submitted by Kim, Jong-Gyeoum

/1-38/ Electric single line diagram including monitoring meters

- Nakdan Hydropower plant.
- Gumi Hydropower plant.
- Chilgok Hydropower plant.
- GangjeongGoryeong Hydropower plant.

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

/2-1/ Clean Development Mechanism Validation and Verification Manual (version 01.2 EB 55 Annex 1)

/2-2/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

/2-3/ General guidelines to SSC methodologies. (version 17 EB 61 Annex 21)

/2-4/ Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project activities

/2-5/ IPCC guideline on national greenhouse gas inventories (1996 & 2006)

/2-6/ Clarification for SSC 629 (AMS-I.D.)

/2-7/ AMS-I.D Grid connected renewable electricity generation (Version 17)

/2-8/ Tool to calculate the emission factor for an electricity system (Version 2.2.1, EB 63 Annex 19)

/2-9/ Guidelines on the demonstration and assessment prior consideration of the CDM. (version 4.0, EB 62 Annex 13)

/2-10/ Clarification for SSC 159 (AMS-I.D.) - Fossil fuel combustion in hydro projects

/2-11/ Guidelines for demonstrating additionality of microscale project activities (version 04, EB 68 Annex 26)

/2-12/ Glossary of CDM terms (version 06)

/2-13/ Submission and consideration of microscale renewable energy technologies for automatic additionality (version 01, EB 65 Annex 33)

/2-14/ F-CDM-PRT-REC ver. 01 PRT_001

/2-15/ EB 66 Meeting Report

/2-16/ Guidelines for the reporting and validation of plant load factors (Version 1.0, EB48 Annex11)

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above.

/1/ Interview on 15/12/2011 and 16/12/2011. Visit the project site : Nakdan, Gumi, Chilgok and GangjeongGoryeong Hydropower plants

Name	*Organization*	*Position*
Tak Lim	Uiseong-gun, Gyeongsangbuk-do	Local Resident
Hong-Dae Kim	Gumi-si, Gyeongsangbuk-do	Local Resident
Chan-Eok Kim	Chilgok-gun, Gyeongsangbuk-do	Local Resident
Sun-Hui Baek	Dalseong-gun, Daegu City	Local Resident
Jae-Han Lee	County office	Public servant
Gi-Hun Lee	County office	Public servant
Hyeon-Mo Gu	County office	Public servant
Kyeong-Mok Seok	County office	Public servant Chief of myeon (township)
Cheol-Ho Lyu	K-water Co., Ltd	Operator Nakdan hydropower plant
Gang-Hak Lee	K-water Co., Ltd	Operator Nakdan hydropower plant
In-Gyu Song	K-water Co., Ltd	Operator Gumi hydropower plant
Hoi-Gil Jeong	K-water Co., Ltd	Operator Gumi hydropower plant
Yeon-Gil Choo	K-water Co., Ltd	Operator Chilgok hydropower plant
Moon-Sung Park	K-water Co., Ltd	Operator Chilgok hydropower plant
Hyuk Namkung	K-water Co., Ltd	Operator GangjeongGoryeong hydropower plant
Sung-Eun Lim	K-water Co., Ltd	Operator GangjeongGoryeong hydropower plant

/2/ Interview on 05 Jan 2012. visit the head office of K-water

Name	*Organization*	*Position*
Deok-Je Kim	K-water Co., Ltd	Manager
Hyeong-Muk Lee	K-water Co., Ltd	Manager
Min-Su Park	K-water Co., Ltd	Assistant Manager
Sang-Hyeok Park	EcoNetwork Co., Ltd. CDM Development Team	Director
Seon-Yeong Moon	EcoNetwork Co., Ltd. CDM Development Team	Team Leader

/3/ Telephone Interview with the technical professional on 25 Jun 2012.

Name	*Organization*	*Position*
Gwang-Ik Sohn	Yeungnam University (http://www.yu.ac.kr)	Professor
Byeong-Man Yoon	Myongji University (http://www.mju.ac.kr)	Professor

APPENDIX A

VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITY

Table 1. Mandatory Requirements for SSC CDM Project Activities

Table 2. Requirements Checklist

Table 3. Resolution of Corrective Action Request and Clarification Requests

Table 1. Mandatory Requirements for Small Scale Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention	Kyoto Protocol Art. 12.2 Decision 17/CP.7 CDM Modalities and Procedures §40a	OK	Table 2 Section A.2.3 and C.1 The copy of LoA by host Party, Republic of Korea was submitted at 20/07/2012.
2. The project shall assist Parties included in Annex I in achieving compliance with part of their quantified emission reduction commitment under Art. 3 of Kyoto Protocol.	Kyoto Protocol Art. 12.2,	OK	Table 2 Section A.3.1. ~ A.3.3 This project activity is a unilateral project. So, no Annex Ⅰ Party has been identified.
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved, including confirmation by the host Parties that the project activities assists its in achieving sustainable development.	Kyoto Protocol Art.12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Table 2 Section A.2.1 ~ A.2.6 The project participant has submitted the written approvals of voluntary participation to KSA..
4. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art.12.5b	OK	Table 2 Section B.4
5. Reduction in GHG emissions must be additional to any that would occur in absence of the project activity., i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art.12.5c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2 Section B.5
6. The project activity should lead to the transfer of	Decision 17/CP.7	OK	Table 2 Section E

Requirement	Reference	Conclusion	Cross Reference / Comment
environmental safe and sound technology and knowhow.			
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	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, §2(f)	OK	No public funding from Parties in Annex Ⅰ involved. Table 2 Section A.6.5.
8. Parties participating in the CDM shall designate a national authority for the CDM.	Decision 17/CP.7, CDM Modalities and Procedures § 29	OK	The CDM Review Committee of Prime Minister's Office is DNA in Korea for CDM. Table 2 Section A.2.3
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities and Procedures § 30, 31b	OK	Republic of Korea is ratified the Kyoto Protocol on 08 Nov 2002. No Annex Ⅰ Party has been identified. Table 2 Section A.2.3
10. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b,c,d	Not applicable	No Annex Ⅰ Party has been identified. Table 2 Section A.3
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 Modalities and Procedures §31b	Not applicable	No Annex Ⅰ Party has been identified. Table 2 Section A.3
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in §6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2 Section B.1.2 and Section B.1.8

Requirement	Reference	Conclusion	Cross Reference / Comment
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	The most recent PDD format version 3 is correctly applied. Table 2 Section A.4
14. The proposed project activity shall confirm one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2 Section A.6.2 and B.1
15. Comments by local stakeholders are invited, and a summary of these has been provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2 Section D
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2 Section E
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD has been made publicly available from 11/11/2011 until 10/12/2011 and comments were invited through the UNFCCC website. Received Comments are summarized in section 4.0 of this report.
18. The proposed activity conforms to all other requirements for CDM project activity in the CDM modalities and procedures that are not replaced by these simplified modalities and procedures.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22 f	OK	

Requirement	Reference	Conclusion	Cross Reference / Comment
19. The emission reduction attributable to the proposed project activity shall be adjusted for leakage.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §30	OK	Table 2 Section B.6
20. The proposed project boundary shall encompass all anthropogenic emissions by sources of greenhouse gases under the control of the project participants that are significant and reasonably attributable to the CDM	Simplified Modalities and Procedures for Small Scale CDM Project Activities §31	OK	Table 2 Section B.2

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
A. General Description of Project Activity					
A.1. Title of the Project Activity					
A.1.1. Does the project title enable to identify the unique CDM project activity ?	/EB 41/ Annex 12	DR	The project title is "K-water hydropower project Ⅷ". The project title was reflected the entity's name and the energy source of the project activity. Thus, it was clearly identified.	OK	OK
A.1.2. Are there any identification concerning the revision number and the date of the revision ?	/EB 41/ Annex 12	DR	Yes, it was properly mentioned in A.1 The first version is version 01 on 07/11/2011 The current version is version 04 dated 07/08/2012	OK ~~Pending~~	OK
A.2. Approval					
A.2.1. Have all parties involved approved the project activity ?	/VVM/ 44	DR, I	Yes, The host Party : Republic of Korea This proposed project activity is developed as unilateral CDM. So, there is no Annex I Party.	OK ~~Pending~~	OK
A.2.2. Has the DNA of each Party indicated as being involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval ?	/VVM/ 45	DR	Yes, The copy of LoA by host Party, Republic of Korea was submitted.	OK ~~Pending~~	OK
A.2.3. Does each letter confirms that ; a) The party is a party to the Kyoto Protocol. b) Participation is voluntary.	/VVM/ 45 /M&P	DR	LoA/1-5/ confirms the followings; - The government of Republic of Korea has ratified the Kyoto Protocol in November 2002 - This is approval of voluntary participation in the		

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country. d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.	40(a)		proposed CDM project activity. - This project contributes to sustainable development in Korea LoA refers to the precise proposed CDM project activity title in the PDD. - Project title : K-water hydropower Ⅷ.	OK ~~Pending~~	OK
A.2.4 Is the letter(s) of approval unconditional with respect to (a) to (d) above A.1.3 ?	/VVM/ 46	DR	Yes, LoA is unconditional with respect to (a) to (d) above A.2.3.	OK ~~Pending~~	OK
A.2.5 Has the letter(s) of approval been issued by the respective Party's DNA ?	/VVM/ 47	DR	Yes, Please refer to A.2.1	OK ~~Pending~~	OK
A.2.6 Has the letter(s) of approval been issued by the respective Party's DNA ? If in doubt, verify with the DNA that letter(s) of approval are valid for the proposed projects activity, project participants and authentic.	/VVM/ 48, 49	DR	KSA checked the detailed information of the LoA /1-5/ from Republic of Korea for followings; - Logo, Project title - Project participant's name - Address, Signature - etc KSA confirmed that all information in the LoA are consistent with the PDD. KSA called the manager of DNA for confirming the authenticity of LoA.	OK ~~Pending~~	OK
A.3 Participation					
	/VVM/	DR	Yes, the information the project participant is listed in the		

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
A.3.1 Is the information the project participants listed in section A.3 and Annex 1 of the PDD internally consistent to each other and exactly the same as in the LoA from each Party involved.	52		table under section A.3 and Annex 1 of the PDD and is in consistency throughout the PDD. □ Project participant : Korea Water Resources Corporation (K-water) □ Host Party : Republic of Korea □ No Annex I Party has been identified. CAR 01 Section A.3 of PDD states that project participant is public entity; Korea Water Resources Corporation - main agent of this project. Please clarify that it means that there are the other project participants in the proposed project activity. CL 01 Project participant listed in the table in section A.2 is not exactly same as in the Annex 1 of the PDD.	OK ~~CAR 01~~ OK ~~CL 01~~	OK
A.3.2. Has the participation of each project participants has been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation ?	/VVM/ 51, 52	DR	Refer to above A.2.3.	OK ~~Pending~~	OK
A.3.3 Are there no entities other than those approved as project participants as project participants included in these sections of the PDD.	/VVM/ 51, 53	DR	The public entities involved in the project activity are listed at the section A.3 of the PDD. □ Host Party : Republic of Korea	OK	OK

<table>
<tr><th>Checklist Question</th><th>Ref.</th><th>MoV</th><th>Comments</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td></td><td></td><td></td><td>□ Project participants : Korea Water Resources Corporation.
Please refer to A.3.1</td><td></td><td></td></tr>
<tr><td colspan="6">A.4. Project Design Document</td></tr>
<tr><td>A.4.1. Was the PDD prepared in accordance with the latest template from the EB ?</td><td>./VVM/ 55</td><td>DR</td><td>Yes, the webhosted PDD applies the latest template available on the UNFCCC web site.
It was checked before webhosting the PDD.</td><td>OK</td><td>OK</td></tr>
<tr><td>A.4.2. Is the PDD in accordance with the applicable CDM requirements for completing PDD's and is the PDD duly completed ?</td><td>/VVM/ 55</td><td>DR</td><td>Yes, all the latest guidelines are applied in the project activity.
Validation team have checked this during the desk review.</td><td>OK</td><td>OK</td></tr>
<tr><td colspan="6">A.5. Project Description</td></tr>
<tr><td>A.5.1 Does the information in section A.2 and A.4 of the PDD provides the reader with a clear understanding of the precise nature of the project activity ?</td><td>/VVM/ 58, 59</td><td>DR, I</td><td>Yes, the information provides the reader with a clear understanding of the proposed CDM project activity.
The proposed project is composed of 4 small scale hydroelectric power plants in Korea.
- The total installed capacity of the project is 12.00 MW
- The project activity is expected an average annual power generation of 58,170 MWh
<table>
<tr><th>Power plant</th><th>Installed Capacity</th><th>Estimated Electricity Amount</th></tr>
<tr><td>Nakdan</td><td>3.00MW$_e$</td><td>14,717 MWh/year</td></tr>
<tr><td>Gumi</td><td>3.00MW$_e$</td><td>14,767 MWh/year</td></tr>
<tr><td>Chilgok</td><td>3.00MW$_e$</td><td>15,279 MWh/year</td></tr>
</table></td><td>OK
<s>Pending</s></td><td>OK</td></tr>
</table>

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			<table><tr><td>GangjeongGoryeong</td><td>3.00MW$_e$</td><td>13,407 MWh/year</td></tr><tr><td>Total</td><td>12.00MW$_e$</td><td>58,170 MWh/year</td></tr></table> - This project is connected to the KEPCO grid of Korea. - The expected emission reductions are 38,654tCO_{2e} per year for over 10 years. During the on-site visit, KSA confirmed that .the project activity is the same as described in the PDD. CAR 07 The name of Ganhjeong hydropower plant is differently written at the revised PDD. PP is required to clarify the amendment reason.	OK ~~CAR 07~~	
A.5.2 Does the information in section A.2 and A.4 of the PDD provides the reader with a clear understanding of the technical aspects of its implementation ?	/VVM/ 58	DR, I	Yes, The proposed project activity can diversity source of energy. □ Nakdan hydro power plant (3,000 kW) - Generator : 1,500 kW × 2 EA = 3,000 kW - Water turbine : 1,626 kW × 2 EA - Transformer : 2,000 kVA × 2 EA □ Gumi hydro power plant (3,000 kW) - Generator : 1,500 kW × 2 EA = 3,000 kW - Water turbine : 1,693 kW × 2 EA - Transformer : 2,000 kVA × 2 EA	OK ~~Pending~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			□ Chilgok hydro power plant (3,000 kW) - Generator : 1,500 kW × 2 EA = 3,000 kW - Water turbine : 1,582 kW × 2 EA - Transformer : 1,750 kVA × 2 EA □ GangjeongGoryeong hydro power plant (3,000 kW) - Generator : 1,500 kW × 2 EA = 3,000 kW - Water turbine : 1,649 kW × 2 EA - Transformer : 2,000 kVA × 2 EA		
A.5.3 Is the proposed project activities in existing or utilizing existing equipments ? If so, does the description in the PDD reflect the project activity for the followings types of CDM project activities unless other means are specified in the methodology. (a) Large scale projects (b) Non-bundled small scale projects (c) Bundled small scale projects	/VVM/ 60	DR, I	No, The project activity is a newly built bundling hydro power project with 12.00 MW. The validation team confirmed that the proposed project is a small scale project applied AMS-I.D version 17 and the project is bundled small scale project. The validation team confirmed it through the reviewing documents as well as physical site inspection.	OK ~~Pending~~	OK
A.5.4 In case a site inspection has been concluded, does the description in PDD reflect the proposed CDM project activity ?	/VVM/ 60	DR, I	Yes, Validation team has conducted a site visit to check whether the design reflects the description provided in the PDD and confirms that the project description provided in the PDD reflects the actual implementation.	OK ~~Pending~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			Site visit was conducted on 15/12/2011 and 16/12/2011.		
A.5.5 Were designs, feasibility study reports (FSR) or comparisons to equivalent projects available for review ? Is the project description consistent with them ?	/VVM/ 62	DR, I	Yes. The project is a small scale hydro power which involves the installation of 12.00 MW using water energy. The following documents submitted by PPs are reviewed □ Construction Contract for the proposed hydropower plant /1-6/ □ License for the Electric Generation Business (Article 7 of Electric Business Act/1-15/) /1-7/ □ Project plan /1-10/ □ Technical data for water turbine and generator /1-11/ □ Inspection Certificate prior to operation by KESCO /1-12/ Relevant laws and regulations are reviewed □ Framework Act on Environmental Policy /1-14/ □ 'Rules on the operation of electric utility market' by KPX /1-16/ □ Environmental Impact Assessment Act /1-17/ □ Act on the promotion of the development, use and diffusion of new and renewable energy /1-19/	OK ~~Pending~~	OK
A.5.6 In case no physical site inspection was undertaken, how the project description was assessed for appropriateness and what is the outcome ?	/VVM/ 62	DR	N/A Refer A.5.4 of this checklist.	OK	OK
A.5.7 Does the project activity involve the alternation of an existing installation or process ?	/VVM/ 63	DR, i	No, the project activity is newly built hydropower plant.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
If so, does the project description clearly sate the difference resulting from the activity compared to the pre-project situation ?					
A.6. Technical Description of the Small-scale Project Activity.					
A.6.1 Location of the Small-scale Project Activity.					
A.6.1.1 Does the information on the location of the project activity allow for a clear identification of the site ?	EB 41 Annex 12	DR, I	Yes, The information on the location of the project are clearly described at the section A.4.1.4 of the PDD. <Nakdan hydro power plant> Address : 806, Nakjeong-ri, Danmil-myeon, Uiseong-gun, Gyeongsangbuk-do, Korea Latitude : 36.359094°N Longitude : 128.306820°E <Gumi hydro power plant> Address : 1057-26, Won-ri, Sunsan-eup, Gumi-si, Gyeongsangbuk-do, Korea Latitude : 36.238665°N Longitude : 128.348292°E <Chilgok hydro power plant> Address : 627-1, Jungji-ri, Seokjeok-eup, Chilgok-gun, Gyeongsangbuk-do, Korea Latitude : 36.015443°N Longitude : 128.400404°E <GangjeongGoryeong hydro power plant>		OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			Address : 806, Jukgok-ri, Dasa-eup, Dalseong-gun, Daegu City, Korea Latitude : 35.841659°N Longitude : 128.461459°E CAR 11 Validation team looked at the GPS coordinates by Google Earth and found that the GPS coordinates are different with actual location. To increase the transparency, the coordinates shall be provided for the power house site. And also geographical locations shall be addressed by decimal points.	OK ~~CAR 11~~	
A.6.2 Type and category and technology/measure of of the Small-scale Project Activity.					
A.6.2.1 Is the category correctly identified and indicated ?	EB 41 Annex 12	DR, I	The project activity generates the electricity utilizing renewable energy (water energy) and the generated electricity by water sources is supplied to grid. The capacity of the project is 12.00 MW. So, the project activity is belongs to Sectoral scope 1 for renewable energy. Thus, the project activity meets the following type and category. Type : I - Renewable Energy Projects Category: I.D. - Grid connected renewable electricity generation. CAR 02 The PP is requested to provide the data sources of the	OK ~~CAR 02~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			turbine, generator and transformer on the hydro power stations described in the table 4.2 to check the capacity of equipment.		
A.6.2.2 Does the project qualify as a small-scale CDM project activity as described in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM ?	PDD A.4	DR	Yes, the project is a hydropower plants with a maximum output capacity of 12.00 MW which is less than the 15MW capacity limit specified for type Ⅰ.D small-scale CDM project activities.	OK	OK
A.6.2.3 Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	PDD A.4	DR	Yes, the components of each hydro power plant include the generator, water turbine and transformer. For calculation of the baseline grid emission factor the power plants generating and exporting to the KEPCO grid are selected as the electricity system boundary.	OK	OK
A.6.3 Estimated amount of emission reduction over the chosen crediting period.					
A.6.3.1.Does the project design clearly and consistently indicate the chosen crediting period, the total estimation of emission reductions for the chosen crediting period ?	PDD A.4	DR	Yes, the length of the crediting period is 10 years without renewal and the total estimated reductions is 38,654 tones of CO_2eq per year throughout the crediting period.	OK	OK
A.6.4 Public Funding of the small-scale project activity.					
A.6.4.1 Does the information on public funding provided conform to the actual situation or planning as presented by the project participants ?	PDD A.4.4	DR, I	No indication that any public funding is involved. Documented evidences representing that ODA from Annex Ⅰ Parties is not included in the project investment should be provided. It is confirmed through each PP's project plan/1-10/ and K-water's request for screening investment for hydropower	OK ~~CAR 03~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			plant /1-8/. CAR 03 Please submit the investment plan for the proposed project activity to prove that ODA is not involved in the project activity.		
A.6.5 Debundling					
A.6.5.1 Is the small-scale project activity a debundled component of a large scale project activity ?	/VVM/ 136 (c)	DR, I	No. The proposed project is not a debundled component of a larger project activity. Because there is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity within 1 km of the project boundary.	OK ~~Pending~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B. Baseline and monitoring methodology					
B.1 Applicability of selected methodology to the project activity.					
B.1.1 Is the methodology correctly quoted and applied by comparing it with the actual text of the applicable version of the methodology available on the UNFCCC CDM web site ?	/VVM/ 70	DR	Yes, ■ Version 17 of "AMS.I.D" (Grid connected renewable electricity generation) /2-7/ ■ Version 2.2.1 of "Tool to calculate the emission factor for an electricity system" /2-8/	OK	OK
B.1.2 Does the project activity meet the applicability criteria conditions of the approved methodology or any other tool or other methodology component referred to therein ?	/VVM/ 71	DR	Yes, the selected baseline methodology refers to project type Ⅰ (Renewable Energy Projects) and project category D (Grid connected renewable electricity generation) according to Appendix B of Annex Ⅱ 'Simplified modalities and procedures for small-scale CDM project activities'. The proposed project activity is as follows : - generates about 12.00 MW of electricity by water energy, one of renewable energies. - supplies grid with the electricity produced. - the project is run-of-river hydropower station which will not result in reservoir. Thus, the methodology of AMS-I.D is applicable to the proposed project.	OK	OK
B.1.3 Is comparable information available from other sources and cross check with the PDD in order to	/VVM/ 71	DR, I	As this project activity is a new small scale hydro power plant which is less than 15MW, it is quite clear	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
assess the applicability ?			that it meets the applicability conditions as above.		
B.1.4 Is the project activity expected to result in emission other than those allowed by the methodology ?	/VVM/ 71	DR, I	No. The project will not exceed the expected threshold limit of the methodology. Refer B.1.2 and B.1.3.	OK	OK
B.1.5 Is the project activity a small scale project activity ? (If yes, assess the specific small-scale activity)		DR	Yes.	OK	OK
B.1.6 Does the project activity qualify within the thresholds of the three possible types of small scale project activities ?	/VVM/ 136 a)	DR, I	Yes. As discussed in section B.1.2, the capacity of the project activity is 12.00 MW which is less than the threshold limit 15MW.	OK	OK
B.1.7 Does the project activity conforms to one of the approved small-scale categories and applies the relevant tool or methodology ?	/VVM/ 136 (b)	DR	Refer section B.1.2 - B.1.4	OK	OK
B.1.8 Is the project activity not a debundled component of a large-scale project, in accordance with the rules defined in appendix C of the simplified modalities and procedures for small scale CDM project activities ?	/VVM/ 135 (c)	DR, I	To be confirmed during on-site assessment. The proposed project is not a debundled component of a larger project activity. Because there is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity within 1 km of the project boundary.	OK ~~Pending~~	OK
B.1.9 Is an assessment of the environmental impacts of the proposed CDM project activity required by the Host Party ?	/VVM/ 135 (d)	DR	No., Validation team have checked the local regulation and as per the local regulation, the size of the project does not required any EIA. But main project activity of	OK ~~Pending~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			these, namely "weir construction" have conducted the EIA. The information on the EIA of the project are clearly described at the section D.1 of the PDD. The reviewed local regulations are as belows; - Framework Act on Environmental Policy/1-14/ - Environmental Assessment Act /1-17/		
B.2 Project Boundary					
B.2.1 Is the delineation of the project boundary in the PDD correct and does it meet the requirements of the selected baseline methodology ?	/VVM/ 79	DR, I	Yes., As per the methodology para 7 of AMS I.D, (ver 17) "The physical, geographical site of the renewable generation source delineates the project boundary". CAR 04 The PP is requested to define the project boundary of the project activity based on the guidance of the applicable project category considering the physical delineation for readers' understanding.	OK ~~CAR 04~~	OK
B.2.2 Have all sources and GHG's required by the methodology been included within the project boundary ?	/VVM/ 79	DR, I	Yes, all sources and GHG's required by the methodology have been included within the project boundary. Baseline emissions; - the major emission sources ; CO_2 - The GHG emissions reductions are achieved by		OK OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			replacing the electricity generated by the thermal power plants in the KEPCO grid. Project emissions ; - There are no fossil fuel available in crediting period, thus the emissions due to fossil consumption is zero. - The project is run-of-river hydropower station which will not result in reservoir, thus the calculation of power density is not applicable for the project activity. Please refer to Project plan /1-10/, EIAR/1-9/ and the comments by technical professional /1-31/ & /1-32/ - The project is a newly constructed run-of-river power plant. As see above, according to the AMS-I.D., the project activity emissions are zero. Leakage emissions; As the hydro turbine with generator is not transferred from or to another activity, leakage is no considered. CAR 13 There is an emergency generator using fossil fuel at each hydro power plant which is not stated in the PDD to use in emergency situation.	OK ~~CAR 13~~	
B.2.3 Does the methodology allow PP's to choose whether a source or gas is to be included within the project boundary ?	/VVM/ 79	DR, I	No, the applied methodology does not allow the PP to choose a source or gas to be included in the project boundary.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			Refer B2.1 - B.2.2		
B.3 Baseline Identification					
B.3.1 Does the PDD identify the baseline for the proposed CDM project activity ?	/VVM/ 81	DR, I	Yes, the baseline scenario has been determined according to AMS-I.D (version 17) Baseline emissions are determined according to AMS I.D. para 11. Refer to checklist B.3.3 below	OK	OK
B.3.2 Has any procedure contained in the methodology to identify the most reasonable baseline scenario been correctly applied?	/VVM/ 82 & 87(d)	DR, I	Yes, Applied methodology : AMS-I.D. Grid connected renewable electricity generation (Version 17) As the methodology, AMS-I.D, prescribes the baseline and no further analysis is required, so there is no need to take steps to identify the baseline scenarios. Refer to checklist B.3.1 above.	OK	OK
B.3.3 Does the selected methodology require use of tools to establish the baseline scenario?	/VVM/ 82	DR, I	No, As per the selected methodology, AMS-I.D.(version 17), the baseline scenario is described as belows; Baseline scenario is that the 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 into grid.	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.3.4 Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario?	/VVM/ 83	DR, I	No, refer to checklist B.3.3 above.	OK	OK
B.3.5 If yes, are all scenarios that are considered by the project participants and are supplementary to those required by the methodology reasonable in the context of the proposed project activity ?	/VVM/ 83	DR, I	Not applicable No, refer to checklist B.3.3 above.	OK	OK
B.3.6 Does PDD provide all the assumptions and data including reference and sources ?	/VVM/ 84 & 87(a)	DR, I	Yes. All the assumptions and data used by the PP including reference and sources are provided in the PDD.	OK	OK
B.3.7 Are all the documentation used for establishing the baseline scenario correctly quoted and interpreted in the PDD ?	/VVM/ 84 & 87(b)		Yes, all the documentation is used for establishing the baseline scenario and correctly quoted and interpreted in the PDD.	OK	OK
B.3.8 Are the information provided in the PDD cross-checked with other credible sources, such as local expert opinion, if available ?	/VVM/ 84	DR, I	Yes. cross-checked with national regulations and sectoral information that publically available as belows; - Framework Act on Low Carbon Green Growth/1-13/ - Statics of Electric Power in Korea /1-20/ (Chapter 1, Section 5 Power generating results by plants) - The status report of generation facility for 2010 by KPX /1-21/ - Supporting system in feed-in tariffs of electric	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			generation from new & renewable energy sources by MKE (http://www.mke.go.kr)/1-22/ - A five year National Strategy for Green Growth in Korea by the Committee of Green Growth Korea/1-23/		
B.3.9 Are all the assumptions and data used by the project participants justified appropriately and supported by evidence ?. Are those deemed reasonable?	/VVM/ 87(c)	DR, I	Yes. The assumptions and data used by the PP are checked by KSA. It is justified appropriately and supported by evidence. And it is deemed reasonable.	OK	OK
B.3.10 Have all applicable CDM requirements been taken into account in the identification of the baseline scenario for the proposed CDM project activity?	VVM 85	DR, I	Yes, it is confirmed.	OK	OK
B.3.11 Have all relevant policies and circumstances been identified and correctly considered in the PDD, in accordance with the guidance by the CDM EB?	VVM 85 & 87(d)		Yes, it is confirmed.	OK	OK
B.3.12.Does the PDD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity?	/VVM/ 86		Yes. It is defined at the PDD B.5 The baseline of the proposed project activity is the renewable energy to the grid system. There is no GHG emission in the hydro power plant. Thus the emission reductions are equal to the baseline emissions.	OK	OK
B.4 Algorithms and/or formulae used to determine emission reductions					
B.4.1 Have the equations and parameters in th PDD	/VVM/	DR	As per para 11 of the applied methodology AMS-I.D.,	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
been correctly applied as required by the selected approved methodology ?	90		the baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor. Yes, all the ex-ante parameters are included in section B.6.2 of the PDD.		
B.4.2 In case the methodology provides the selection of different options for equations or parameters, has an adequate justification been provided and were the correct equations and parameter used in accordance with the methodology ?	/VVM/ 90	DR	The applied methodology AMS.I.D (version 17) refers to "Tool to calculate the emission factor for an electricity system /2-8/." This tool provides option to calculate the operating margin and build margin values. Refer Section B.3.3.	OK	OK
B.4.3 Is the choice of data and parameters used in the equations appropriate ?	/VVM/ 91	DR	Yes, refer to checklist B.3.3 above.	OK	OK
B.4.4 In case of ex-ante data and parameters, are all data sources and assumptions appropriate ? And Are calculations correct, applicable to the proposed project activity ?	/VVM/ 91	DR, I	Yes, refer to checklist B.3.3 above. CAR 14 According to 'Tool to calculate the emission factor for an electricity system', BM (Build Margin) factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which electricity generation data is available. But there are a few power units missing including Shin-gori nuclear power plant which was started to supply electricity to the grid in 2010.	OK ~~CAR 14~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.4.5 In case of ex-post data and parameters, are the estimates provided in the PDD for these data and parameters reasonable ?	/VVM/ 91	DR, I	Yes, refer to checklist B.3.3 above.	OK	OK
B.5 Additionality of a project activity					
B.5.0.1 Describe how the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by the project participant to support the demonstration of additionality is assessed and validated using local knowledge, sectoral and financial expertise and considering other sources of information for cross checks.	/VVM/ 95		Following documents are assessed and validated to demonstrate the additionality of the proposed project activity ; □ Documents provided by the PP - License for the electric generation business /1-7/ - Technical data for water turbine and generator/1-11/ - Inspection Certificate prior to operation by KESCO /1-12/ □ Additional documents by DOE's investigation - Act on the promotion of the development, use and diffusion of new and renewable energy./1-19/ - Statistics of electric power in Korea /1-20/ - The status report of generation facility for 2010 by KPX /1-21/ The validation team confirmed it through the reviewing documents as well as physical site inspection.	OK	OK
B.5.0.2 Are any tools and documents provided by the EB to demonstrate the addtionality of the proposed CDM project activities relevant and have they been correctly considered and applied ?	/VVM/ 96		Refer Section B.5.0.1	OK	OK

<table>
<tr><th>Checklist Question</th><th>Ref.</th><th>MoV</th><th>Comments</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td>B.5.0.3 Are any specific complementary or alternative requirements included in the approved CDM methodology and have they been correctly considered and applied ?</td><td>/VVM/ 96</td><td></td><td>No. Refer Section B.5.0.1</td><td>OK</td><td>OK</td></tr>
<tr><td colspan="6">B.5.1 Prior Consideration of the clean development mechanism.</td></tr>
<tr><td>B.5.1.1 Is the start date of the project activity, reported in the PDD, in accordance with the latest version of the "Glossary of CDM terms" ?</td><td>/VVM/ 99</td><td>DR</td><td>The start dates of the project are identified as date of construction contract as belows;
<table><tr><th>Power plants</th><th>Date of construction contract</th></tr><tr><td>Nakdan</td><td>27/10/2009</td></tr><tr><td>Gumi</td><td>27/10/2009</td></tr><tr><td>Chilgok</td><td>27/10/2009</td></tr><tr><td>GangjeongGoryeong</td><td>23/10/2009</td></tr></table>The date of construction contract is the earliest date at which either the implementation or construction or real action of a project activity begins.
Thus, the start date of the project activity reported in PDD is in accordance with "Glossary of CDM terms" /2-12/.</td><td>OK</td><td>OK</td></tr>
<tr><td>B.5.1.2 Is the project activity, in accordance with the guidance from the EB, a new project activity (project activities with start date at or after 02 Aug 2008) or an existing project activity (project activities with starting date before 02 Aug 2008) ?</td><td>/VVM/ 100</td><td>DR</td><td>As per the guidance, the start date of project activity is an new project activity as the project start dates are the 23 Oct 2009 which are after 02 Aug 2008.</td><td>OK</td><td>OK</td></tr>
</table>

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.5.1.3 Is the proposed project appropriate for the prior consideration of the CDM	/VVM/ 102	DR	Yes, Please refer this checklist 5.1.2	OK	OK
B.5.1.4 In case there is a new project activity (start date at or after 02 Aug 2008) and for which PDD has not been published for global stakeholder consultation or a new methodology is proposed to the EB before the project activity start date, please ensure by means of confirmation from the UNFCCC secretariat that the PP had informed the Host Party DNA and the UNFCCC secretariat by submitting the standardized from F-CDM prior consideration within 6 months of project start date ?	/VVM/ 101 & EB 49 Annex 22	DR	PP had informed the UNFCCC secretariat and DNA of Korea as belows; ■ 1st Submission to UNFCCC secretariat and DNA of Korea are as belows; - Nakdan: UNFCCC : 26/02/2010 DNA : 26/02/2010 Project start date for Nakdan is on 27/10/2009. - Gumi: UNFCCC : 26/02/2010 DNA : 26/02/2010 Project start date for Gumi is on 27/10/2009. - Chilgok: UNFCCC : 26/02/2010 DNA : 26/02/2010 Project start date for Chilgok is on 27/10/2009. - GangjeongGoryeong: UNFCCC : 05/04/2010 DNA : 05/04/2010 Project start date for GangjeongGoryeong is on 23/10/2009. ■ 2nd submission to UNFCCC secretariat and DNA of Korea PP had re-informed the UNFCCC secretariat to adjust the components of bundled hydropower on 24/05/2011 and DNA of Korea on 23/05/2011.	OK ~~Pending~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			Validation team has reviewed the following to check the prior consideration; - Prior consideration of CDM form ① Nakdan ; Prior consideration of CDM form dated 26/02/2010 (K-water small scale hydroelectric power plants Ⅵ CDM project). ② Gumi ; Prior consideration of CDM form dated 26/02/2010 (K-water small scale hydroelectric power plants Ⅵ CDM project). ③ Chilgok ; Prior consideration of CDM form dated 26/02/2010 (K-water small scale hydroelectric power plants Ⅵ CDM project). ④ GangjeongGoryeong ; Prior consideration of CDM form dated 05/04/2010 (K-water small scale hydroelectric power plants Ⅷ CDM project). ※ Power plant name was changed Gangjeong to GangjeongGoryeong. (Refer to CAR 07) - E-mail between UNFCCC and K-water - 'Project promotion letter of intent' to DNA of Korea. ① Nakdan on 26/02/2010 (Ⅵ) ② Gumi on 26/02/2010 (Ⅵ)	OK ~~Pending~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			③ Chilgok on 26/02/2010 (Ⅵ) ④ GangjeongGoryeong on 05/04/2010 (Ⅷ) - UNFCCC website http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html K-water (PP) had informed the Host Party DNA and the UNFCCC secretariat by submitting the standardized from F-CDM prior consideration within 6 months of project start date. CAR 16 PDD states that PP had submitted the notification of prior consideration for GangjeongGoryeong hydropower plant on 2 Apr 2010. But the submitted documents to UNFCCC are differently stated. PP is required to clarify the difference between date in PDD and actual date. CL 03 PP is required to state the dates in the DD/MM/YYYY to clarify.	OK ~~CAR 16~~ OK ~~CL 03~~	OK OK
B.5.1.5 If there is an existing project activity (project activities with start date before 02 Aug 2008) for which the start date is prior to the date of	/VVM/ 102		N/A As per EB guidelines/2-9/, the project activity is a new project activity as the project start dates are the	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
publication of the PDD for global stakeholder consultation, please verify through documents review that PP's prior consideration ;			23/10/2009 which are after 02 Aug 2008.		
(a) Evidence that must indicate that awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project. Evidence to support this would include, inter alia, minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, other project participant, to undertake the project as a proposed CDM project activity.	/VVM/ 102 (a)		N/A	OK	OK
(b) Reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. Evidence to support this should include, inter alia, contracts with consultants for CDM/PDD/methodology services, Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), evidence of agreements or negotiations with a DOE for	/VVM/ 102 (b)		N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
validation services, submission of a new methodology to the CDM Executive Board, publication in newspaper, interviews with DNA, earlier correspondence on the project with the DNA or the UNFCCC secretariat.					
B.5.2 Identification of Alternation					
B.5.2.1 Does the PDD identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the applied approved methodology prescribes the baseline scenario and no further analysis is required?	/VVM/ 105	DR	N/A	OK	OK
B.5.2 Does the list of alternatives given in the PDD ensures that:	/VVM/ 106	DR	N/A	OK	OK
(a) The list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity?	/VVM/ 106 (a)	DR	N/A	OK	OK
(b) The list contains all plausible alternatives which can be considered to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity?	/VVM/ 106 (b)		N/A	OK	OK
(c) The alternatives comply with all applicable and	/VVM/		N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
enforced legislation?	106 (c)		There are no local law that enforce the installation of hydro power plant in the host country. Validation team have reviewed the local regulations and confirms that same.		
B.5.3 Investment Analysis					
B.5.3.1 Has the investment analysis been used to demonstrate the additionality of the proposed CDM project?	/VVM/ 108	DR	No, PPs have not used the investment analysis to demonstrate the additionality. ※ PPs have demonstrated the addtionality of the project activity using "Guidelines for demonstrating additionality of microscale project activities (version 04, EB 68 Annex 26) /2-11/.	OK	OK
B.5.3.2 Which approach is chosen for investment analysis of the proposed CDM project activity and is it appropriate? (a) The proposed CDM project activity would produce no financial or economic benefits other than CDM-related income, and there is at least one alternative which is less costly than the proposed CDM project activity (simple cost analysis); (b) The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative (comparison analysis);	/VVM/ 109	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
(c) The financial returns of the proposed CDM project activity would be insufficient to justify the required investment (benchmark analysis).					
B.5.3.3 Please describe how the accuracy of financial calculations carried out for any investment analysis is validated . (a) Conduct a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices. (b) Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices. (c) Review feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants. (d) Assess the correctness of computations carried out and documented by the project participants.	/VVM/ 111	DR	N/A	OK	OK
(e) Assess the sensitivity analysis by the project participants to determine under what conditions			N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
variations in the result would occur, and the likelihood of these conditions.					
B.5.3.4 Is benchmark applied in the investment analysis suitable ?	/VVM/ 112	DR	N/A	OK	OK
(a) Is the type of benchmark applied suitable for the type of financial indicator presented ?	/VVM/ 112 (a)	DR	N/A	OK	OK
(b) Does any risk premium applied in determining the benchmark reflect the risks associated with the project type or activity ?	/VVM/ 112 (b) EB 51 Annex 58 para 15	DR	N/A	OK	OK
(c) Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants involved and determining whether the same benchmark has been applied or if there are verifiable circumstances that have led to a change in the benchmark ?	/VVM/ 112 (c)	DR	N/A	OK	OK
B.5.3.5 In case where the PP's rely on values from Feasibility Study Reports (FSR) that are approved	/VVM/ 113	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
by national authorities for proposed project activities, describe the means to validate the following requirements:					
(a) Has the FSR been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed;	/VVM/ 113 (a)	DR	N/A	OK	OK
(b) Are the values used in the PDD and associated annexes fully consistent with the FSR, and where inconsistencies occur the DOE should validate the appropriateness of the values;	/VVM/ 113 (b)	DR	N/A	OK	OK
(c) On the basis of its specific local and sectoral expertise, is confirmation provided, by crosschecking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.	/VVM/ 113 (c)	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.5.3.6 If a fair value for the project assets in the end of the assessment period is included, assess whether it is calculated in accordance with the local accounting regulation where available or international best practice ?	EB 51 Annex 58 para 4	DR	N/A	OK	OK
B.5.3.7 Does the financial indicator calculation include adding back of the depreciation and other non-cash related items to taxable profits ?	EB 51 Annex 58 para 5	DR	N/A	OK	OK
B.5.3.8 Are input values used in all investment analysis valid and applicable at the time of the investment decision taken by the project participant.	EB 51 Annex 58 para 6	DR	N/A	OK	OK
B.5.3.9 In case of the project activities for which implementation ceases after commencement and where implementation is recommenced due to consideration of the CDM, does the investment analysis reflect the economic decision making context at point of the decision to recommence the project ?	EB 51 Annex 58 para 7	DR	N/A	OK	OK
B.5.3.10 Does the project participant supply spreadsheet versions of all investment analysis ?	EB 51 Annex 58	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	para 8				
B.5.3.11 If project IRR is chosen, are the costs of financing expenditures (loan repayment and interests) excluded from the calculation of the project IRR ?	EB 51 Annex 58 para 9	DR	N/A	OK	OK
B.5.3.12 If equity IRR is chosen, is the part of the investment costs which is financed by equity considered as net cash outflow ? Is the part of the investment costs which is financed by debt excluded in net cash outflow ?	EB 51 Annex 58 para 10	DR	N/A	OK	OK
B.5.3.13 If project IRR is chosen and a post-tax benchmark is applied, is the actual interest payable taken into account in the calculation of income tax, with an reasonable interest rate ?	EB 51 Annex 58 para 11	DR	N/A	OK	OK
B.5.3.14 In case a benchmark is used, is the applied benchmark appropriate to the type or IRR calculated ?	EB 51 Annex 58 para 12	DR	N/A	OK	OK
B.5.3.6 In case the project activity could also be developed by an entity other than the project participant, is the benchmark based on publicly available data sources which can be clearly validated ?	EB 51 Annex 58 para 13	DR	N/A	OK	OK
B.5.3.7 In cases that internal company benchmarks/ expected returns are applied, is it verified that	EB 51 Annex 58	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
there is only one possible project developer and, either the internal company benchmarks/expected returns have been used for similar project with similar risks developed by the same company or, if the company is brand new, have been used for similar projects in the same sector in the country/region ?	para 14				
B.5.3.16 Are the results of variation of variable that constitute more than 20% of either total project costs or total project revenues clearly presented in PDD and reproducible with spreadsheet ? Are the ranges of variation deemed appropriate in the context of the specific project circumstances ?	EB 51 Annex 58 para 17 & 18	DR	N/A	OK	OK
B.5.4 Barrier Analysis					
B.5.4.1 Has the barrier analysis been used to demonstrate the additionality of the proposed CDM project?	/VVM/ 115	DR	N/A PPs did not apply to the barrier analysis to demonstrate the additionality.	OK	OK
B.5.4.2 What barriers are identified and described in PDD to demonstrate additionality?	/VVM/ 115	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.5.4.3 Does any issue considered in the barrier analysis have a clear direct impact on the financial returns of the project activity and thus shall be assessed by investment analysis?	/VVM/ 116	DR	N/A	OK	OK
(a) Risk related barriers, for example risk of technical failure, that could have negative effects on financial performance, or	/VVM/ 116 (a)	DR	N/A	OK	OK
(b) Barriers related to the unavailability of sources of finance for the project activity.)	/VVM/ 116 (b)	DR	N/A	OK	OK
B.5.4.4 To asses the barrier analysis apply the following two-step process:	/VVM/ 117	DR	N/A	OK	OK
(a). Please assess whether the barriers are real: Please assess the available evidence and/or undertake interviews with relevant individuals (including members of industry associations, governmen officials or local experts if necessary) to determine whether the barriers listed in the PDD exist. (Review that existence of barriers is substantiated by independent sources of data	/VVM/ 117 (a)	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
such as relevant national legislation, surveys of local conditions and national or international statistics. If existence of a barrier is substantiated only by the opinions of the project participants, this shall not be considered to be adequately substantiated. To demonstrate that a barrier is real it has to be supported by sufficient evidence on the basis of sectoral or local expertise)					
(b) Do the barriers prevent the implementation of the project activity but not the implementation of at least one of the possible alternatives? *(Please note, that not all barriers present an insurmountable hurdle to a project activity being implemented. By applying local and sectoral expertise to judge whether a barrier or set of barriers would prevent the implementation of the proposed CDM project activity and would not equally prevent implementation of at least one of the possible alternatives, in particular the identified baseline scenario*	/VVM/ 117 (b)	DR	N/A	OK	OK
B.5.4.5 Is it sufficiently demonstrated that CDM alleviates the identified barriers that prevent the proposed project activity from occurring ?	/VVM/ 115	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.5.4.5 Overall, is the barrier analysis in compliance with the latest version of *"Guidelines for objective demonstration and assessment of barriers (EB50, Annex 13)"*?	/VVM/ 115	DR	N/A	OK	OK
B.5.5 Common Practice Analysis					
B.5.5.1 Is common practice required by the methodology applied by the proposed project activity to demonstrate additionality?	/VVM/ 119	DR	N/A PPs did not apply to the common practice analysis to demonstrate the additionality.	OK	OK
B.5.5.2 Is the proposed project activity first-of-its-kind? If so, please specify how this statement is substantiated	/VVM/ 119	DR	N/A	OK	OK
B.5.5.3 In case the project activity is not first of its kind, is the geographical scope (e.g. the defined region) of the common practice analysis appropriate for the assessment of common practise related to the project activity's technology or industry type? Please consider that for certain technologies the relevant region for assessment will be local and for others it may be	/VVM/ 120 (a)	DR	N/A	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
transnational / global. If a region other than the entire host country is chosen, please assess the explanation why this region is more appropriate.					
B.5.5.4 Was an assessment concerning the existence of other similar projects undertaken? Does this include official sources and was local and industry expertise used to determine to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM project activities, exist in the defined region?	/VVM/ 120 (b)	DR	N/A	OK	OK
B.5.5.5 If similar and operational projects, other than CDM project activities, are already “widely observed and commonly carried out” in the defined region, what are essential distinctions between the proposed CDM project activity and the other similar activities?	/VVM/ 120 (c)	DR	N/A	OK	OK
B.5.5.6 Final Conclusion: Based on the assessment of questions B.5.5.1. to B.5.5.5 is the proposed project activity additional ?	/VVM/ 119	DR	N/A	OK	OK
B.5.6 Additionality of Microscale Project Activities (EB 68 Annex 28)					
B.5.6.1 Is the project size ≤5MW of installed capacity of	EB 54	DR	Yes,	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
renewable energy ?	Report Annex 15		The total installed capacity of the project activity is 12.00MW. But individual project size within the bundling is less than 5.0MW. Please refer to section B.5.6.5.		
B.5.6.2 Is the geographic location of the project in LDCs/ SIDs or a special underdeveloped zone of the host country identified by the Government before 28 May 2010 ?	EB 54 Report Annex 15 (a)	DR	No.	OK	OK
B.5.6.3 Is the project an off grid (<12 hrs grid availability per 24 hrs day is also considered off grid for this assessment) project supplying to households/ communities ?	EB 54 Report Annex 15 (b)	DR	No.	OK	OK
B.5.6.4 Are the following two conditions satisfied ? ▫ Project is for distributed renewable energy generation with each of the independent subsystems/ measures in the project ≤750kW. ▫ End users of the subsystems or measures are households/ communities/SMEs.	EB 54 Report Annex 15 (c)	DR	No	OK	OK
B.5.6.5 Specific renewable energy technologies recommended by the host country DNA and approved by the Board (Conditions apply ; The installed capacity of technology/measure contributes ≤ to national electricity generation)	EB 54 Report Annex 15 (d)	DR	Yes, the project activity satisfied the followings; □ The individual installed capacity of the project is 3.00MW which is less than 5.0 MW. □ The hydropower is one of the renewable energy which are encouraged and recommended by the Korean Government (DNA).	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			□ The paragraph 52 of EB 66 Meeting Report /2-15/ Please refer to F-CDN\M-PRT ver01 PRT_001 /2-14/ which are submitted by DNA of Republic of Korea for recommendation of microscale renewable energy technologies for automatic additionality. Thus KSA validation team confirmed that the project activity is additional.		
B.6 Monitoring Plan					
B.6.1 Does the PDD include a monitoring plan ?	/VVM/ 122	DR	Yes, the PDD includes the monitoring plan. The monitoring plan is defined at the Section B.7 of the PDD	OK	OK
B.6.2 Does the monitoring plan comply with the approved methodology ?	/VVM/ 123	DR, I	Yes, the monitoring plan in the PDD comply with the approved methodology, AMS-ID. version 17	OK	OK
(a) Does the list of parameters identify required by the selected approved methodology. ?	/VVM/ 123 (a) (i)	DR, I	Yes, all data and parameters are listed in the section "B.7.1 Data and parameters monitored" of the PDD.	OK ~~Pending~~	OK
Does the monitoring plan contain all necessary parameters ? Does the means of monitoring described in the plan comply with the requirements of the methodology ?	/VVM/ 123 (a) (ii)	DR, I	Refer section B.6.1. CAR 05 PP is request to add a diagram which could clearly show the location of all the related meters and the accuracy of meters into the revised PDD. And also auxiliary power consumption are not considered in	OK ~~CAR 05~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			monitoring plan. CAR 06 Relevant regulation in the project activity shall be identified and addressed in the relevant section of the revised PDD.	OK ~~CAR 06~~	
(b) Are the monitoring arrangements described in the monitoring plan feasible within the project design ?	/VVM/ 123 (b) (i)	DR, I	Refer section B.6.1.	OK ~~Pending~~	OK
- Are the means of implementation of the monitoring plan, including the data arrangement and qualify assurance and quality control procedures, sufficient to ensure that the emission reductions achieved by requesting from the proposed CDM project can be reported ex post and verified ?	/VVM/ 123 (b) (ii)	DR, I	CAR 08 PP is required to explain how the expected electricity generation for each hydropower plant mentioned in B.7.1 were calculated and also submit the relevant document to prove the plant load factor in accordance with the para 3 of "Guidelines for the reporting and validation of plant load factor"/2-16/. CAR 12 Monitoring plan described in section B.7.2 does not have any information that shows completeness of monitoring plan(points) and measurement, archiving, and recording frequency for each plant/meter. CL 02 Please state what appropriate training is for the monitoring personnel.	OK ~~CAR 08~~ OK ~~CAR 12~~ OK ~~CL 02~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
C. Sustainable development					
C.1 Does the letter approval by the DNA of the host Party confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party ?	/VVM/ 126	DR	Yes, the LoA /1-5/ of the host Party, Republic of Korea, clearly presents a statement that the proposed project activity contributes to the sustainable development in Korea.	OK ~~Pending~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
D. Local Stakeholder Consultation					
D.1 Were relevant stakeholders invited by the PP's to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website?	/VVM/ 128 & 129 (a)	DR, I	▪ Reviewed documents are as belows; - EIA Report on the Nakdong River (2nd zone) ▪ According to EIA Report, the meeting for local residents was held in Gumi-si, Dalseong-gun and Andong-si which were located the hydropower plants on 14/08/2009. ▪ The public hearing for stakeholders was held on 10/09/2009 under attendance of the local government, local residents and others. ▪ For the general public, PP had invited the relevant stakeholders to comment on the proposed CDM project activity from 23/05/2011 to 19/06/2011 through the website (http://www.kwater.or.kr) ▪ GSC was carried out from 11/11/2011 to 10/12/2011. CAR 10 In accordance with the simplified modalities and procedures for small-scale CDM project activities and CDM modalities and procedures, the working language of CDM is English. Therefore Figure E.1 is completed or translated in English language.	OK ~~CAR 10~~	OK
D.2 If a stakeholder consultation process is required by	/VVM/ 128	DR	There are no regulation in the Republic of Korea which requires stakeholder consultation for the installation of	OK	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?			hydro power plants. But as the proposed project activities were installed as a part of large weir project activity, the stakedholders consultation process had been carried out in accordance with the 'Environmental Impact Assessment Act'/1-17/.		
D.3 Have appropriate media been used to invite comments by local stakeholders?	/VVM/ 128	DR, I	There are no negative comments for hydropower plants received from stakeholders. The raised issues were resolved by PP.	OK	OK
D.4 Is the summary of the received comments complete?	/VVM/ 128(b)	DR	Refer Section D.2	OK	OK
D.5 Have the PP's taken due account of any comments received and have they described this process in the PDD?	/VVM/ 128 (c)	DR	CAR 15 Through global stakeholder's consultation process, stakeholders raised issues are summarized as belows; 1. The project is joint investment scheme of the Korean government and KOWACO (K-water). PDD insists that no public funding will be needed to finance the project activity. DOE requests: PP is requested to provide an objective evidence to clarify this stakedholders' opinion. 2. The project activity poses a prospect of inflicting devastating damage to environment. DOE's requests: PP is requested to reply the stakehloders'	OK ~~CAR 15~~	OK

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
			opinion. 3. The project's rationale is not aligned to sustainable development. DOE's requests: PP is requested to reply to the stakehloders' opinion. 4. EIAs were not appropriately conducted. - brief span of a mere 30 to 45 days - shrinking wetlands, - massive waste material buried in landfill. DOE's requests: PP is required to reply to the stakehloders' opinion with the objective evidence..		

Checklist Question	Ref.	MoV	Comments	Draft Concl.	Final Concl.
E. Environmental Impacts					
E.1 Have the PP's submitted an analysis of environmental impacts of the project activity? If those impacts are considered significant by the project participants or the host Party is an Environmental Impact Assessment (EIA) generated?	/VVM/ 132	DR, I	CAR 09 This bundled project activity was installed as a part of the river restoration project which are implemented by 'Construction and Management Administrator', Government of Republic of Korea. Validation team find out that 'Government of Republic of Korea' had carried out the EIA including the weir construction and the hydro power plants as per 'Environmental Impact Assessment Act'. PP is required to reflect the EIA at the revised PDD and submit DOE the EIA Report.	OK ~~CAR 09~~	OK
E.2 Were transboundary environmental impacts identified in the analysis?		DR, I	No, there are no transboundary environmental impacts due to the project activity.	OK	OK
E.3 Will the project create any adverse environmental effects?		DR, I	No., The project activity will not create any adverse environmental effects.	OK	OK
E.4 Have the identified environmental impacts been addressed in the project design sufficiently?		DR, I	Refer section E.1	OK	OK
E.5 Does the project comply with environmental legislation in the host country?		DR, I	Refer section E.1	OK	OK

Table 3 Resolution of Corrective Action and Clarification Requests

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
CAR 01	Section A.3 of PDD states that project participant is public entity; Korea Water Resources Corporation - main agent of this project. Please clarify that it means that there are the other project participants in the proposed project activity.	A.3.1	The word of “main agent” has been deleted in order to clarify and prevent from unnecessary misunderstanding. A.3 of PDD has been corrected.	Acceptable. PP has revised the PDD. K-water (Korea Water resources Corporation) is the only project participant. The results are reflected in section A.3 of PDD. Thus CAR 01 is checked and satisfied. CAR 01 is closed.
CAR 02	The PP is requested to provide the data sources of the turbine, generator and transformer on the hydro power stations described in the table 4.2 to check the capacity of equipments.	A.6.2.1	Specifications of generator including technical data for each hydropower plant were submitted to DOE.	Acceptable. PP has submitted the specification of generator /1-11/ to check the capacity. These data and information were appropriate to confirm the capacity. The capacity stated in the PDD is appropriate. Thus CAR 02 is checked and satisfied. CAR 02 is closed.
CAR 03	Please submit the investment plan for the proposed project activity to prove that ODA is not involved in the project activity.	A.6.4.1	Neither ODA nor investment of government was provided. The document of investment plan signed by K-water has been submitted to DOE.	Acceptable. PP has submitted the K-water's 'request for screening investment' /1-08/. The proposed project is implemented by K-water's budget. Republic of Korea is no longer subject to ODA. These are reflected in section A.4.4 of PDD. Thus CAR 03 is checked and satisfied. CAR 03 is closed.

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
CAR 04	The PP is requested to define the project boundary of the project activity based on the guidance of the applicable project category considering the physical delineation for readers' understanding.	B.2.1	The spatial extent of the project boundary are corrected to include the project's power plant and all power plants connected physically to the electricity system that the project's power plant is connected to. These were described at section B.3 of the revised PDD.	Acceptable. PP has revised the spatial extent of the project boundary. The project boundary are appropriately identified including proposed project activity and KEPCO grid. The results are reflected in section B.3 of the revised PDD. Thus CAR 04 is checked and satisfied. CAR 04 is closed.
CAR 05	The PP is requested to add a diagram which could clearly show the location of all the related meters and the accuracy of meters into the revised PDD. And also auxiliary power consumption are not considered in monitoring plan.	B.6.2.(a)	K-water has added the diagram including export and import watt-hour meter with accuracy in section B.7.2 of the revised PDD. And PP has considered the auxiliary power consumption to calculate the net electricity generation.	Acceptable. The diagram including export and import watt-hour meter with accuracy are added to understand the completeness of the project boundary. And also the auxiliary power consumption were considered. The results are reflected in section B.7.2 of the revised PDD. Thus CAR 05 is checked and satisfied. CAR 05 is closed.
CAR 06	Relevant regulation in the project activity shall be identified and addressed in the relevant section of the revised PDD.	B.6.2.(a)	Relevant regulation are 'Measures Act' and 'Rules on the Operation of Electric Utility Market' and 'General guidelines to SSC CDM methodology' which are related to the calibration of meters. These regulation are addressed in section B.7.1 of	Acceptable. PP has addressed specifically the relevant regulation in B.7.1 of revised PDD. The results are reflected in section B.7.1 of the revised PDD.

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
			the revised PDD.	Thus CAR 06 is checked and satisfied. CAR 06 is closed.
CAR 07	The name of Gangjeong hydropower plant is differently written at the revised PDD. PP is required to clarify the amendment reason.	D.5	Based on the publication of Ministry of Land, Transport and Maritime Affairs (hereinafter referred to as MLTM) on 9 Aug 2011, the name of Gangjeong where the river restoration project has been performed in addition to the hydropower project was altered as below. Gangjeong → GangjeongGoryeong K-water didn't realize the alteration of it earlier than the period for comments on UNFCCC web-site (11 Nov 2011- 10 Dec 2011) because the publication of MLTM was not shared with K-water. The publication of MLTM has been submitted to DOE.	Acceptable. PP has corrected the Name of hydropower plant at the revised PDD. Name of hydropower plant is changed from Gangjeong to GangjeongGoryeong Thus CAR 07 is checked and satisfied. CAR 07 is closed.
CAR 08	PP is required to explain how the expected electricity generation for each hydropower plant mentioned in B.7.1 were calculated and also submit the load factor in accordance with the para 3 of "Guidelines for the reporting and validation of plant load factors".	B.6.2.(b)	The calculation basis for the expected electricity generation including the load factor is indicated in the project plan for getting the 'License for the electric generation business' which were submitted to a local government. The project plan has been submitted to DOE. These are addressed in section B.6.1 of the revised PDD.	Acceptable. PP has submitted the basis for the expected electricity generation with the proposed Project plan attached to "Application Letter for Electric Utility License of Hydropower plant' /1-10/. It meets the para 3 of "Guidelines for the reporting and validation of plant load factors". The load factors were as belows; - Nakdan hydropower plant: 56.00%

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
				- Gumi hydropower plant: 56.19% - Chilgok hydropower plant: 58.14% - GangjeongGoryeong hydropower plant: 51.02% The results are reflected in section B.6.1 of the revised PDD. Thus CAR 08 is checked and satisfied. CAR 08 is closed.
CAR 09	This bundled project activity was installed as a part of the river restoration project which are implemented by 'Construction and Management Administration', Government of Republic of Korea. Validation team find out that Government of Republic of Korea had carried out the EIA including the weir construction and the hydro power plants as per "Environmental Impact Assessment Act". PP is required to reflect the EIA at the revised PDD and submit DOE the EIA Report.	E.1	In compliance with Article 3 of enforcement decree of "Environmental Impact Assessment Act" and its annex 3, the Environmental Impact Assessment(EIA) of the river conservation work which is related to the river restoration project was carried out by the government including the hydropower project. K-water has been performed the proposed project with reflection on the result of EIA. These are addressed in PDD D.1. Environmental Impact Assessment Report (hereinafter referred to as EIA Report) has been submitted to DOE.	Acceptable. Busan Construction and Management Administration (BCMA), Government of Republic of Korea had carried out the EIA including river conservation work and small scale hydro power plant. PP has submitted the EIA Report. KSA checked the EIA Report and EIA Report included the small scale hydro power plant. PP has reflected the result of EIA in section D.1 of PDD. Thus CAR 09 is checked and satisfied. CAR 09 is closed.
CAR 10	In accordance with the simplified modalities and procedures for small-scale CDM project activities and CDM modalities and procedures, the working language of CDM	D.1	The brief translated explanations in English have been added on Figure E.1 in section E.1 of the revised PDD.	Acceptable. PP has added the brief explanations in English on the Figure E.1 .of PDD. The results are reflected in section E.1

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
	is English. Therefore Figure E.1 is completed or translated in English language.			of PDD. Thus CAR 10 is checked and satisfied. CAR 10 is closed.
CAR 11	Validation team looked at the GPS coordinates by Google Earth and found that the GPS coordinates are different with actual location. To increase the transparency, the coordinates shall be provided for the power house site. And also geographical locations shall be addressed by decimal points.	A.6.1.1.	The GPS coordinates have been revised by decimal points based on geographical location for the power house site. These are addressed in Table A.1 of the revised PDD.	Acceptable. The GPS coordinates are revised by PP as belows; Nakdan : 36°21'N 128°18'E → 36.359094°N, 128.306820° Gumi : 36°13'N 128°20'E → 36.238665°N, 128.348292° Chilgok : 36°1'N 128°23'E → 36.015443°N, 128.400404° GangjeongGoryeong : 35°50'N 128°27'E → 35.841659°N, 128.461459° The results are reflected in section A.4.1.3 of PDD. Thus CAR 11 is checked and satisfied. CAR 11 is closed.
CAR 12	Monitoring plan described in section B.7.2 does not have any information that shows completeness of monitoring plan(points) and measurement, archiving, and recording frequency for each plant/meter	B.6.2(b)	The monitoring plan has been supplemented in section B.7.2 of the revised PDD based on the single-line diagram of each hydropower plant including the generator and the watt-hour meter.	Acceptable. PP has added a single-line diagram including generator and the watt-hour meter with accuracy. And also the monitoring plan was revised reflecting the measurement method, archiving and recording frequency for each plant

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
				considering the actual situation. The results are reflected in section E.1 of PDD. Thus CAR 12 is checked and satisfied. CAR 12 is closed.
CAR 13	There is an emergency generator using fossil fuel at each hydro power plant which is not stated in the PDD to use in emergency situation.	B.6.2 (a)	With reference to the Clarification 'SSC-159', AMS-I.D does not specify monitoring of electricity generation from diesel generator to be used in emergency situation. Accordingly, an emergency generator is not considered in PDD.	Acceptable. According to the SSC-159 /2-10/, AMS I. D does not specify monitoring of electricity generation from diesel generator used as a stand-by/ emergency source exclusively for the operation of gates at the intake site of hydropower project. Thus fossil fuel used by an emergency was not considered as a project emission. Thus CAR 13 is checked and satisfied. CAR 13 is closed.
CAR 14	According to 'Tool to calculate the emission factor for an electricity system', BM (Build Margin) factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which electricity generation data is available. But there are a few power units missing including Shin-gori nuclear power plant which was started to supply electricity		(1) Calculation errors of BM factor on 2010 in the excel-sheet for calculating the emission factor were corrected. As the results, the BM factor was revised as below. BM : 0.6258 → 0.6428 tCO_2/MWh (2) After that, missing power units were added. - Shin-gori nuclear power plant, - Ilsan fuel cell power plant, - Boryeong fuel cell power plant,	Acceptable. The emission factor for an electricity system has been properly re-calculated by the PP. The emission factor was checked and found satisfied. As the results, emission factor was revised as belows; BM : 0.6258 → 0.6357 tCO_2/MWh OM : 0.6933 → 0.6933 tCO_2/MWh

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
	to the grid in 2010.		- POSCO fuel cell power plant, - Bundang fuel cell power plant. Accordingly, the BM factor was revised as below. BM : 0.6428 → 0.6357 tCO_2/MWh The revised excel-sheet has been submitted to DOE.	CM : 0.6595 → 0.6645 CO_2/MWh And also the estimated emission reduction for the project activity was re-calculated using the revised emission factor. The results are reflected throughout the PDD. Thus, CAR 14 is checked and satisfied. CAR 14 is closed.
CAR 15	CAR 15 Through global stakeholder's consultation process, stakeholders raised issues are summarized as belows; 1. The project is joint investment scheme of the Korean government and KOWACO (K-water, PP).. PDD insists that no public funding will be needed to finance the project activity. DOE requests: PP is requested to provide an objective evidence to clarify this stakedholders' opinion. 2. The project activity poses a prospect of inflicting devastating damage to environment. DOE's requests:	PDD D.1	Through global stakeholder's consultation process, 1. Issues of public funding The river restoration project initiated by Korean government is mainly composed of the river conservation work and the weir construction. On the other hand, the hydropower project associated with the river restoration project was initiated voluntarily, attendantly by K-water. The budget of the river restoration project and the hydropower project was separately financed by Korean government and K-water. Accordingly, Neither ODA nor investment of government was provided with the proposed project. The document of investment plan signed by K-water has been submitted to DOE.	Acceptable. 1. Issues of public funding While Busan Construction and Management Administration (BCMA), Government of Republic of Korea has carried out the river conservation work, K-water has implemented the small scale hydro power plant with each budget. KSA checked the k-water's 'request for screening investment' /1-08/ and found satisfied. With regard to ODA, please refer to CAR 03. 2. Issues of environmental impact. According to "Environmental Impact Assessment Act", 'Busan Construction

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
	PP is requested to reply the stakehloders' opinion. 3. The project's rationale is not aligned to sustainable development. DOE's requests: PP is requested to reply to the stakehloders' opinion. 4. EIAs were not appropriately conducted. - brief span of a mere 30 to 45 days - shrinking wetlands, - massive waste material buried in landfill. DOE's requests: PP is required to reply to the stakehloders' opinion with the objective evidence..		2. Issues of environmental impact In compliance with Article 3 of enforcement decree of "Environmental Impact Assessment Act" and its annex 3, Korean government has carried out the Environmental Impact Assessment(hereinafter referred to as EIA) of the river restoration project including the hydropower project. EIA has been performed clearly and the proper actions to minimize the environmental impacts were planned in addition to holding a public hearing and collecting comments from local stakeholders. The procedural performance of EIA was approved by the Ministry of Environment(ME) and legally proved to be available. 3. Issues of sustainable development LOA(Letter of Approval) to prove the contribution to sustainable development was issued by DNA of republic of Korea on 20 Jul 2012. 4. Issues of EIA The EIA's system of 'River Restoration Project' consists of 'Prior Environmental Review System (hereinafter referred to as PERS)' based on "Framework Act on Environmental Policy" and EIA	and Management Administration (BCMA)' has carried out the EIA including river restoration work and small scale hydro power plant. KSA confirms that EIA report have been authorized by Ministry of Environment, Government of Republic of Korea(ME). Please refer to section 3.10 of this report. 3. Issues of sustainable development The LoA /1-5/ of the Host Party, Republic of Korea, clearly presents a statements that this project activity contributes to the sustainable development in Korea. 4. Issuess of EIA (1) EIA period 'Busan Construction and Management Administration' (BCMA), Government of Republic of Korea appropriately carried out the EIA including River restoration project and small scale hydropower plants. And the EIA report was

<table>
<tr><th>No. of CAR/CL</th><th>Description of Corrective Action Requests and Clarification</th><th>Ref. to Checklist Table 2</th><th>Comments/Response from project proponent</th><th>Final Conclusion</th></tr>
<tr><td></td><td></td><td></td><td>based on "Environmental Impact Assessment Act". Prior to performance of EIA, PERS for 'River Master Plan' associated with the river restoration project had been already started by Korean government. With reflection on PERS, the discussion of EIA with the Ministry of Environment (ME) was completed on Nov 2009 including the public inspection of local stakeholders (3 Aug 2009 ~ 26 Aug 2009). The specific procedures of EIA for the river restoration project are shown as below.
<table><tr><td colspan="2">Prior Environmental Review</td><td>Dec,2003 - Jun,2009</td></tr><tr><td rowspan="2">EIA</td><td>Report write (Public Inspection)</td><td>Jul,2009 - Sep,2009 (Aug 2009)</td></tr><tr><td>Discussion with ME</td><td>Sep,2009 - Nov,2009</td></tr></table>As the brief span of a mere 30 to 45 days to conduct EIA simply means the period of discussion with the Ministry of Environment(ME), it took about 4 months on average to conduct EIA. The period of discussing EIA with ME is not particularly regulated by "Environmental Impact Assessment Act". Due to implementation of the river restoration project, a part of wetlands are expected to be affected. Accordingly, the government made hard efforts to preserve the</td><td>approved by Ministry of Environment (ME). In the EIA process, BCMA, Government of Republic of Korea has complied with all applicable laws and regulations.

(2) Wetland
Issue of wetland was discussed in the EIA report and the project are taken into account all issues that can occur as per "Wetlands Conservation Act" of the Host Party.

(3) Waste
BCMA and K-water disposed of waste from the construction site in compliance with the 'Waste Control Act' of Korean law.

Both issues of wetland and waste were discussed in the EIA report and BCMA and K-water have reflected to their project plan.

All issues raised by global stakeholders</td></tr>
</table>

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
			ecologically valuable wetlands through appointing it to the protected area or transplanting it to the nearby region in compliance with "Wetlands Conservation Act". Moreover, the unavoidably arisen waste material resulting from implementation of the river restoration project would be taken care of legally according to "wastes Control Act". The actions related to 'Wetlands' and 'Waste material' are clearly indicated in Environmental Impact Assessment Report (hereinafter referred to as EIAR). EIAR has been submitted to DOE.	were discussed and clarified as above. Thus, CAR 15 is checked and satisfied. CAR 15 is closed.
CAR 16	PDD states that PP had submitted the notification of prior consideration for GangjeongGoryeong hydropower plant on 02/04/2010. But the submitted documents to UNFCCC are differently stated. PP is required to clarify the difference between date in PDD and actual date.		On 5 Apr 2010, the prior consideration form of GangjeongGoryeong hydropower as a component of bundled hydropower VIII project was initially submitted to DNA and UNFCCC. Since there was a mistake in process of filling the date of submission into PDD Ver.1, K-water has corrected it in PDD Ver.4. 2 Apr 2010 -> 5 Apr 2010 After that, according to re-bundling of GangjeongGoryeong hydropower plant in a hydropower VIII project, the prior consideration form was re-submitted to DNA on 23 May 2011 and UNFCCC on 24 May 2011 respectively in sequence.	Acceptable. Validation team has checked UNFCCC website, prior consideration form and mail between UNFCCC and K-water /1-4/. As a result of check, date of first submission of the prior consideration for GangjeongGoryeong hydropower plant is 05/04/2010(start date: 23 Oct 2009). GangjeongGoryeong hydropower plant is notified to UNFCCC within six months from the project activity start date. Thus CAR 16 is checked and satisfied. CAR 16 is closed.

No. of CAR/CL	Description of Corrective Action Requests and Clarification	Ref. to Checklist Table 2	Comments/Response from project proponent	Final Conclusion
			These are indicated in section B.5 of the revised PDD and the related prior consideration form submitted to DNA are also handed in to DOE.	
CL 01	Project participant listed in the table in section A.3 is not exactly same as in the Annex 1 of the PDD.	A.3.1	K-water has adjusted it consistently in section A.3 and Annex 1 of the revised PDD.	Acceptable. Project participant listed in the table in section A.3 is consistent with Annex 1 of PDD. Thus CL 01 is checked and satisfied. CL 01 is closed.
CL 02	Please state what appropriate training is for the monitoring personnel.	B.6.2 (b)	The training for the personnel related to monitoring is composed of how to measure the meters, being aware of the related regulations, managing and writing data, and operating the equipment safely based on 'Electric utility law'. These are addressed in section B.7.2 in of the revised PDD.	Acceptable. PP has identified the training for the monitoring personnel. These are reflected section B.7.2 of PDD. Thus CL 01 is checked and satisfied. CL 01 is closed.
CL 03	PP is required to state the dates in the DD/MM/YYYY to clarify.	B.5.1.4	K-water has restated it consistently all over the section of PDD.	Acceptable. PP has revised the date format as DD/MM/YYYY all over the sectoin of PDD. Thus CL 03 is checked and satisfied. CL 03 is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE

KSA

GHG Validator/Verifier Certificate

Kyoo-Il Sohn

Certificate No. : CDM-001

Technical Area : 13.1

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements to conduct validation and verification for CDM and GHG project.

VALID FROM	VALID UNTIL
2011.1.21	2014.1.20

PRESIDENT OF KSA

KOREAN STANDARDS ASSOCIATION

13F, Ace High-end Tower 3, 371-50, Gasan-dong, Gwumcheon-gu, Seoul, Korea

KSA

CDM Validator/Verifier Certificate

Seung-Keun Choi

Certificate No. : CDM-015

Technical Area : -

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements to conduct validation and verification for CDM and GHG project.

VALID FROM	VALID UNTIL
2011.01.21	2014.01.20

PRESIDENT OF KSA

Kaphong Choi

KOREAN STANDARDS ASSOCIATION

13F, Ace High-end Tower 3, 371-50, Gasan-dong, Gwumcheon-gu, Seoul, Korea

KSA

Technical Expert Certificate

Chung-kook Lee

Certificate No. : CDM-013

Technical Area : 1.2, 2.1, 2.2, 3.1

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements as a technical expert for CDM validation and verification activities.

VALID FROM	VALID UNTIL
2010.09.20	2013.09.19

PRESIDENT OF KSA

Kaphong Choi

KOREAN STANDARDS ASSOCIATION

13F, Ace High-end Tower 3, 371-50, Gasan-dong, Gwumcheon-gu, Seoul, Korea

KSA

CDM Validator/Verifier Certificate

Chan-Sik Yun

Certificate No. : CDM-006

Technical Area : 1.2, 2.1, 2.2, 3.1

Korean Standards Association hereby certifies that the above person is qualified by KSA's Qualification requirements to conduct validation and verification for CDM and GHG project.

VALID FROM	VALID UNTIL
2010.09.20	2013.09.19

PRESIDENT OF KSA

Kaphong Choi

KOREAN STANDARDS ASSOCIATION

13F, Ace High-end Tower 3, 371-50, Gasan-dong, Gwumcheon-gu, Seoul, Korea