

Validation Report

K-Water 0.96MW Bundle Small-scale Hydroelectric Power Plants Project

KEMCO


5 Aug 2009


GHG Certification Office


KOREA ENERGY MANAGEMENT CORPORATION


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 KEMCO	<h1>Validation Report</h1>		Contract No. GHGCC(A)08-019	
Validation Methodology	1. Desk Review 2. On-site Assessment 3. Review of Corrective Actions			
Project Participants	Korea Water Resources Corporation(K-Water)	Management Representative	Jae-su, Jung	
Project Title	K-water 0.96MW bundle small-scale hydroelectric power plants project			
Main office	San 6-2, Yeonchuk-dong, Daedeok-gu, Daejeon 306-711 The Republic of Korea	Tel		
		FAX		
Project Location	- Gosan: Nobyeon-dong, Suseong-gu, Daegu - Pangyo: Pangyo-dong, Bundang-gu, Seongnam	Tel		
		Fax		
Contact Person	Mr. Min-Su Kim	Tel	+82-42-629-2967	
		FAX	+82-42-629-2999	
		E-mail	londonsu@kwater.or.kr	
Category	Scope 1: Energy Industries (renewable energy sources)			
Scope	The validation scope for the proposed CDM project includes: <ul style="list-style-type: none"> - Physical and geographical boundaries of the proposed project; - Legal, institutional, financial and technological aspects of the project; - GHG sources and types to be included within the boundaries; - Time periods to be covered by the project design; - Baseline scenario established; - Monitoring plan; - Environmental impacts caused by the proposed project; and, - Stakeholders' comments 			
Objective	The objective of the validation is to assess whether the proposed CDM project conforms to the requirements for CDM projects including Decision 17/CP.7, Modalities and Procedures for a CDM as defined in Article 12 of the Kyoto Protocol and relevant decisions of the CDM executive board by reviewing the project design documentation.			
Validation Criteria	UNFCCC, Kyoto Protocol, Marrakesh Accords, Decision 3, 4/CMP.1, Relevant CDM EB Decisions			
Validation Date	1. Desk Review: 17 Nov 2008 - 16 Dec 2008 2. On-site Assessment: 23 Dec 2008 - 29 Dec 2008 3. Review of Corrective Actions: 2 Mar 2009 - 30 Jun 2009			


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Validation Results	<h2>1 Summary of the project activity</h2> <p>This bundled project consists of 0.56MW Gosan and 0.40MW Pangyo small-scale hydroelectric power plants. The Gosan small-scale hydroelectric power plant involves installation of one 0.56MW hydropower turbine in front of the settling pond in the Gosan Water Purification Plant. The hydro turbine generates electricity using downstream flow from the 28km-away reservoir dam in Mt. Woonmoon, which is to be purified for supply of city water. The rated water head is 25.4m and estimated water flow is 2.6m³/s.</p> <p>The Pangyo small-scale hydroelectric power plant involves installation of two 0.2MW hydropower turbines at the intake of the control reservoir of the Pangyo pressurization plant. The Pangyo pressurization plant stores in the control reservoir, water delivered via pipelines from Han River and supplies the stored water to some distant water purification plants with electric pumps. The hydro turbines generate electricity using waste pressure at the intake of the control reservoir which would be otherwise not used. The rated water head is 13.5m and estimated water flow is 3.54m³/s.</p> <p>The electricity generated by both generators will be exported to the grid and thus displace electricity produced from fossil fuel fired plants and result in reduced GHG emissions. The expected electricity produced by both projects is 5,557MWh/yr and estimated GHG reductions are 2,987tCO₂/yr.</p> <p>Thus, the project is expected to significantly contribute to sustainable development in Korea by utilizing renewable and clean energy sources in respect of:</p> <ul style="list-style-type: none"> - Reduction of consumption of fossil fuels - Reduction of GHG emissions - Reduction of the imported energy bill - Demonstration of replicable clean energy technology 		


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Validation Results	<h2>2 Principles</h2> <p>The project design document (PDD) of the proposed project is assessed based on the following principles</p> <h3>2.1 Completeness</h3> <p>The completeness of the PDD is ensured by assessing whether the project proponent has identified all greenhouse gases (GHG) sources directly attributable to the proposed project within the project boundary and indirect GHG emissions outside the project boundary</p> <h3>2.2 Consistency</h3> <p>The consistency of the PDD is ensured by assessing whether major factors used in the project plan such as data, formulae/algorithm and assumptions have been uniformly applied:</p> <ul style="list-style-type: none"> - Among potential baseline scenarios; - Between the project and baseline scenario; and - Between the baseline and monitoring methodology. <h3>2.3 Accuracy</h3> <p>The accuracy of the PDD is ensured by assessing whether any material errors or omissions made in using data and estimating GHG emissions have been corrected, and uncertainties associated with GHG quantification have been minimized to the extent possible.</p> <h3>2.4 Transparency</h3> <p>The transparency of the PDD is ensured by assessing whether all assumptions, choices and procedures are clearly stated and substantiated such that another party may reach the same conclusions</p>		


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Validation Results	<p>2.5 Relevance</p> <p>The relevancy of the PDD is ensured by assessing whether selection of GHG sources, quantification procedures and potential baselines scenarios have been justified taking into account the requirements for the CDM project and the host country's particular situation.</p> <p>2.6 Conservativeness</p> <p>The conservativeness of the PDD is ensured by assessing whether the baseline has been established choosing values of parameters that generate a lower baseline projection and thereby reducing the possibility of over-estimating GHG emission reductions</p> <p>3 Definitions of non-conformities and observations</p> <p>3.1 Non-conformities</p> <p>Non-conformities refer to validation findings that fail to fulfill the validation criteria such as failure to demonstrate additionality, lack of key information and exclusion of significant leakages. Non-conformities are divided into major and minor ones.</p> <ul style="list-style-type: none"> - Major non-conformity includes, inter alia: <ul style="list-style-type: none"> • failure to comply with the Modalities and Procedures of CDM projects; • occurrence of significant errors in the project baseline and monitoring methodologies - Minor non-conformity includes, inter alia: <ul style="list-style-type: none"> • unclear data sources; • minor miscalculation and misstatements <p>3.2 Observations</p> <p>Observations include validation findings that are likely to be of non-conformity but with few evidences available at the moment and recommendations for improved documentation, data use, etc.</p>		


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Validation Results	<p>4 Desk review</p> <p>The desk review has been made during the period from 13 November to 17 November by reviewing documents submitted by the project participants including the Project Design Document and supporting documentation in respect of completeness, consistency, accuracy, transparency, relevance, and conservativeness. The Validation Criteria, against which the project documentation is assessed, include the CDM modalities and procedures determined by the Marrakech Accords and relevant CDM EB decisions, and are specified in the Validation Checklist. The desk review focused mainly on the three aspects below:</p> <ul style="list-style-type: none"> - Demonstration of the project additionality; - Calculation of baseline and project emissions; and - Local stakeholders' comments. <p>The scope of desk review depends primarily on the information provided by the project participants and could be extended by using additional reliable information which the Validation Team obtained from other sources.</p> <p>4.1 Validation findings</p> <p>Baseline Emissions</p> <p>The proposed project - a 0.96 MW small hydroelectric power project - applied the approved baseline and monitoring methodologies for small-scale projects. As the project generates electricity utilizing renewable sources and supplies it to the grid, Category I.D, Grid-connected renewable electricity generation (version 13) is applied. Given that the electricity system in Korea comprise nuclear power and renewable-based power as well as fuel oil and diesel fuel, the project adopted as a baseline emission factor the average of the Operating Margin and Build Margin emission factors and accordingly performed calculation using data from official documents such as the 2006 IPCC Guidelines and Electric Power Statistics of KEPCO (Korea Electric Power Corporation). The formulae for the emission factors were consistently used in the monitoring plan.</p>		


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Validation Results	<p>In addition, it was noted that the project proponent used three-year data from 2005 to 2007 in calculating baseline emission factors. The Validation Team confirmed by cross-check with the KEPCO (Korea Electric Power Corporation) webpage that those data were most recently available at the time of submission of PDD for validation.</p> <p>Additionality</p> <p>In order to demonstrate the project's additionality, the PDD analyzed investment barriers and showed that the project is not financially attractive under the baseline scenario. The operational lifetime of the project is estimated to be around 30 years.</p> <p>Environmental Impacts and Stakeholders Comments</p> <p>As for its environmental impacts on the local area, the host country legislation does not require an analysis of the environmental impacts of the project activity because of the small-scale nature of the hydro power projects. The project participant has made plans to publicize and to receive comments from relevant stakeholders.</p> <p>However, the validation team identified several items as follows that need to be further checked:</p> <ul style="list-style-type: none"> - Selection of a capacity factor for the proposed project should be further evidenced by reliable documents; - Descriptions about national policies on the use of renewable energies are not provided in the PDD; - The input values used in the investment analysis should be confirmed by cross checking the Feasibility Study Report; - The benchmark value applied in the investment analysis should be substantiated by reliable documents; - The start date of the project activity should be evidenced by reliable documents including the equipment purchase contract; - Documentary evidences on environmental impacts by the hydroelectric power plants and the receipt of stakeholder comments will be further checked during the onsite assessment. 		


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Validation Results	<p>Based on the results of the desk review, the validation team requests the project proponents to provide more documentary evidences and justification in order to ensure the compliance of the PDD with the validation criteria. Additional documents and revised sections of PDD to be submitted prior to on-site assessment are:</p> <ol style="list-style-type: none"> 1) Supplementary documents to justify selection of a capacity factor for the proposed project; 2) Detailed descriptions about national policies on use of renewable energy; 3) Supplementary documents on the justification of input values used in the investment analysis; 4) Documentary evidences for justification of the benchmark value applied in the investment analysis; 5) Supplementary documents demonstrating that the start date is determined as the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity; 6) Documentary evidences on environmental impacts by the hydroelectric power plants; 7) Clarification on how to compile and invite comments of local stakeholders. 		


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Validation Results	<p>5 On-site assessment and interview</p> <p>On-site assessment has been performed during the period from 23 December 2008 to 29 December 2008 by making on-site visits and interviewing relevant persons particularly for the purpose of checking the remaining issues identified at the desk review. The on-site assessment focused mainly on the three aspects below:</p> <ol style="list-style-type: none"> 1) Capacity factor of the proposed project; 2) Demonstration of investment barriers to implementation of the proposed project; and 3) Invitation of local stakeholders' comments <p>The major means of validation is by cross-check between documents and interviews with relevant persons. The key persons interviewed at the on-site assessment are as below:</p> <ol style="list-style-type: none"> 1) Lee, Hyeong-Seok, Assistant Manager, Energy Business Dept, Korea Water Resources Corporation 2) Chung, Nam Hyeon, Staff, Gosan Water Purificatio Plant, Daegu Metropolitan City; and 3) Oh, Se Ki, Assistant Manager, Korea Water Resources Corporation <p>As a result of the on-site assessment, the Validation Team requests the project participants to take corrective actions against six non-conformities i.e. three Major non-conformities (CARs) and three Minor non-conformities (CLs) identified within the deadline, 16 February 2009, as agreed in the Validation Contract.</p> <p>5.1 On-site assessment findings</p> <p>Installed capacity of the project activity</p> <p>The project participant changed the generation capacity of its project from 0.91MW to 0.96MW due to change of wheel and generator for Gosan project from 0.51MW into 0.56MW and changed the project's title accordingly. But, estimated power generation remains the same in accordance with the Feasibility Study Reports for the project activity.</p>		


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Validation Results	<p>Debundling of a larger project activity</p> <p>During the site visit, the Validation Team confirmed that the proposed project is not a debundled component of a larger project activity.</p> <p>Legal aspects</p> <p>First, the Validation Team examined whether Gosan and Pangyo projects are in compliance with relevant legislation in the country. The team reviewed authorization documents such as the Power Generation Permission issued by local governments to check whether the project is in compliance with local legislation.</p> <p>Power generation</p> <p>The Validation Team checked the Feasibility Study Reports of Gosan and Pangyo projects and conducted site-inspection, and confirmed that both projects involved installation of the proposed hydropower turbines using downstream water flow and waste water pressure in water pipelines respectively. In addition, it was validated that the annual power generation for Gosan project had been properly estimated by a third party, engineering company contracted by the project participant. On the other hand, the annual power generation for Pangyo project was confirmed by cross-check with Power Generation Permit issued by the government and application documentation submitted by the project proponent. The team concluded that estimation of power generation is reasonable considering average water flow, net head, and turbine efficiency.</p> <p>Additionality</p> <p>In regards to verification of project additionality, the validation team checked the documents for determination of investment costs and other financial data such as IRR rate and benchmark rate by recalculating data in excel files submitted by project participant. The PDD showed that the project is not financially attractive under the baseline scenario by performing investment barrier analysis.</p>		


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Validation Results	<ul style="list-style-type: none"> Investment costs: the investment costs for Gosan and Pangyo projects were confirmed by cross-check with the Feasibility Study Reports (FSRs) respectively. It was further noted that the FSRs are prepared on Feb 2008 and June 2008 respectively, at the time of investment decision, i.e. equipment purchase. In addition the Validation Team further validated the appropriateness of the investment costs by collating the costs presented in the FSRs with the ones presented in the actual contracts on equipment purchase, construction, etc. for the proposed project. O&M costs: O&M costs both projects are assumed to be 3% of the total investment costs. Cross-checking the government-published report on new and renewable energy feed-in tariff and RPS (publishing date: 31 Mar 2006), the assumed percentage is deemed reasonable. It is further confirmed that the input values for economic analysis of hydropower projects in the published report is still valid by cross-check with the Government Notice No. 2009-96. Electricity price: the electricity price used in IRR calculation, i.e. three-year average electricity price for small-scale hydropower plants was validated by cross-check with data down-loaded at the KPX (Korea Power Exchange) statistics webpage. It was further confirmed that those value are most recently available at the point of the project start. Benchmark value: An accounting firm's expected investment return report was suggested as a source of suggested benchmark rate. But its rate is based on photovoltaic projects, not on small hydro projects. The validation team concluded that "photovoltaic projects" cannot be "comparable projects" under provision of "Tool for the demonstration and assessment of additionality (ver. 05.2)" Sub-step 2b (6). The validation team requested the project participants to submit another reliable benchmark rate which can be applied to the small hydro projects or substantiate their justification for the use of the report. 	

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Validation Results	<p>It was further validated that the sensitivity analysis for the project activity was properly carried out considering both negative and positive variations in major variables such as total investment costs and electricity tariff. Results of the sensitivity analysis were confirmed by assessing the appropriateness of the assumed variations in the cash flow and noting that the IRR remains below the benchmark value under the favorable conditions assumed. Finally it is concluded that the statement that the proposed project activity under baseline scenario is not considered a financially attractive course of action was properly justified.</p> <p>Project start date and prior consideration of CDM benefits</p> <p>The Validation Team checked the Equipment Purchase Contracts for both projects and confirmed the stated project start date is in line with the Glossary of CDM Terms. Since the start date of the project is after 02 August 2008, the project participant must inform a Host Party DNA and/or the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status within six months of the project activity start date. But the relevant documents have not been submitted to the DOE.</p> <p>Monitoring Plan</p> <p>During the site visit, the Validation Team witnessed the places in Gosan and Pangyo projects where the said hydropower turbines are to be installed and confirmed that there would be no significant problems with grid connection and monitoring of electricity supplied to the grid.</p> <p>Environmental Impacts</p> <p>As for its environmental impacts on the local area, the Validation Team confirmed on the site visit that hydropower turbines will be installed inside the Gosan Water Purification Plant and Pangyo Pressurization Plant and thus cause no significant environmental impacts to the local area.</p>		


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Validation Results	<p>Stakeholders Comments</p> <p>As for stakeholders' comments, the project participants excluded local residents from stakeholders on the grounds that the project activities take place within water purification plants that are owned and operated by project participants and there is no factor to affect municipal water supply. Daegu Metropolitan City posted a notice on Gosan project to invite comments from relevant stakeholders but for Pangyo project, there was no action seeking stakeholders' comments. The validation team recommended to implement a comparable action to invite stakeholders' comments for Pangyo project. K-water pledged to post a notice on Pangyo project at its website to invite comments from relevant stakeholders.</p>		
	<p>5.2 Conclusions of on-site assessment</p> <p>First, the benchmark value for the proposed project is not sufficiently substantiated and thus should be evidenced by reliable sources. The process of receipt of local stakeholders' comments was not been sufficiently implemented and therefore should be transparently presented. In addition, the PDD needs to include detailed description of each project's technological aspects for reviewers to get clear understanding of the project activities. But the PDD does not clearly describe how the proposed project will generate electricity and reduce GHG emissions using water resources. And documented evidences representing that ODA from Annex I parties is not included in the project investment, has not been provided. In addition, the PDD does not specify description on national policies on the use of renewable energy. Major and minor non-conformities identified during the assessment is summarized as follows:</p> <ol style="list-style-type: none"> 1. Major Non-conformity (CAR) 1: The benchmark value for the proposed project is not sufficiently substantiated. (see Appendix B.5.9) 2. Major Non-conformity (CAR) 2: The process of receipt of local stakeholders' comments was not been sufficiently implemented. (see Appendix E.1.1, E1.2, E.1.3) 		


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Validation Results	<ol style="list-style-type: none"> 3. Major Non-conformity (CAR) 3: The project participant must inform a Host Party DNA and/or the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status since its start date is after 02 August 2008, But, the relevant documents have not been submitted to the DOE (see Appendix B.5.1) 4. Minor Non-conformity (CL) 1: It is not clearly described how the proposed project will generate electricity and reduce GHG emissions using water resources. (see Appendix A.2.1, A.4.3) 5. Minor Non-conformity (CL) 2: Documented evidences representing that ODA from Annex I parties is not included in the project investment, should be provided. (see Appendix A.4.5) 6. Minor Non-conformity (CL) 3: National policies favoring the proposed project are not described (see Appendix B.4) <p>Observations: the project participant have not yet submitted the written approval of voluntary participation from the designated national authorities of each Party involved, including confirmation by the host Party that the project activity assists it in achieving sustainable development and private entities participating in the project have not been authorized by the designated national authorities of the Parties.</p>		


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Validation Results	<p>6 Review of corrective actions</p> <p>In response to the request for corrective actions against non-conformities identified, the project participant submitted the revised project documentation to the validation team, of which the validation team made a thorough review during the period from 2 March 2009 to 6 March 2009. Corrective actions of the project participant and conclusions of the validation team are as follows (also refer to the table for key input vales):</p> <p>1) Major non-conformity (CAR) 1</p> <p>A. Corrective Actions: The project participant submitted a new benchmark rate of 7%, based on the discount rate of small hydroelectric power project in the Ministry of Knowledge Economy report (Mar 2006).</p> <p>B. Conclusions: The benchmark rate is sufficiently justified. The validity of the quoted report is confirmed by cross-check with the Government Notice No. 2009-96.</p> <p>2) Major non-conformity (CAR) 2</p> <p>A. Corrective Actions: The project participant put up a notice of its projects to the public on its website and includes a captured image of the notice in revised PDD.</p> <p>B. Conclusions: The invitation process of local stakeholders' comments is sufficiently implemented.</p> <p>3) Major non-conformity(CAR) 3</p> <p>A. Corrective Actions: The project participant sent a letter informing the commencement of its project to the UNFCCC secretariat and submitted a copy of its letter to the DOE.</p> <p>B. Conclusions: The notification of the project's commencement and its intention to seek CDM status by the project participant has been duly implemented.</p>		


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Validation Results	<p>4) Minor non-conformity (CL) 1</p> <p>A. Corrective Actions: The revised PDD describes the basic principles of power generation using water resources: water elevation difference for Gosan and recovery of waste energy in water flow for Pangyo.</p> <p>B. Conclusions: The principles of power generation using water resources are clearly described.</p> <p>5) Minor non-conformity (CL) 2</p> <p>A. Corrective Actions: The project participant submitted captured image of its electronic budget system showing that Gosan and Pangyo projects are fully covered by its own budget.</p> <p>B. Conclusions: The captured image of electronic budget system clearly shows that Gosan and Pangyo projects are fully covered by K-Water's own budget and thus proves that ODA from Annex I parties is not included in the project.</p> <p>6) Minor non-conformity (CL) 3</p> <p>A. Corrective Actions: The revised PDD describes feed-in tariff policy which took effect on 26 Sep 2002 as E- policy.</p> <p>B. Conclusions: The contents of feed-in tariff policy are described in the revised PDD as a national policy favoring the project.</p>		





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Electricity Generation	<ul style="list-style-type: none"> K-Water, Feasibility Study Report on Gosan project, dated February 2008 K-Water, Feasibility Study Report on Pangyo project, dated June 2008 	<ul style="list-style-type: none"> Gosan: estimated by a third party, engineering company contracted by the project participant. Pangyo: confirmed by the government 																								

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Validation Results	<p>7 Receipt of public comments</p> <p>In accordance with Paragraph 40(c) of the CDM Modalities and Procedures, the project design document of the proposed project had been posted for 30 days on the UNFCCC CDM website for public comments from 8 Nov. 2008 to 7 Dec. 2008. No comments have been received during that period.</p> <p>8 Issuance of written approvals</p> <p>The KEMCO validation team has received the written approvals from the designated national authorities of the Party involved in K-Water 0.96MW bundle small-scale hydroelectric power plants project (issued on 27 May 2009), which states the following:</p> <ol style="list-style-type: none"> 1) The Party, Republic of Korea has ratified the Kyoto Protocol in November 2002. 2) The Korean government approves the voluntary participation in the proposed CDM project activity. 3) The Korean government confirms the project contributes to sustainable development in Korea. 4) The Party, Republic of Korea authorizes the project participants indicated in the PDD to participate in the proposed project. <p>9 Internal quality control</p> <p>The final validation report has been reviewed by the Review Member qualified in the relevant sectoral scopes in accordance with KEMCO's Committee Operation Procedure mainly in terms of validation procedures and results, and approved by Director of KEMCO CDM Certification Office, Mr. Lee, Jae-Hoon.</p>		
	<p>10 Validation opinion</p> <p>The KEMCO Validation Team has undertaken validation of the proposed project which claimed approximately 2,987 CO₂eq ton annually by installing small hydroelectric power plants in Gosan Water Purification Plant and Pangyo Pressurization Plant.</p>		

 KEMCO	<h1 style="text-align: center;">Validation Report</h1>		Contract No. GHGCC(A)08-019
Validation Results	<p>To ensure the transparency and integrity of the validation, the Validation Team first had established the validation checklist taking into account UNFCCC, Kyoto Protocol, Marrakesh Accords, Decision 3, 4/CMP.1 and relevant decisions of the CDM executive board. Based on the checklist the validation of the project activity was undertaken in three stages, i.e. desk review (17 Nov 2008 - 16 Dec 2008), on-site assessment (23 Dec 2008 - 29 Dec 2008) and review of corrective actions (2 Mar 2009 - 24 Jun 2009).</p> <p>As a result of the desk review and on-site assessment, the validation team identified three Major non-conformities and three Minor non-conformities and then requested the project proponents to take corrective actions against them. In response to the request, the project proponents submitted the revised project documentation to the Validation Team, of which the Validation Team made a thorough review. Then the team fully agreed that all the significant non-conformities issued had been cleared.</p> <p>The Validation Team noted that the title of the project was changed from “K-water 0.91MW bundle small-scale hydroelectric power plants project” at the time of UNFCCC CDM website posting for public comments to “K-water 0.96MW bundle small-scale hydroelectric power plants project” according to the change of installed capacity of Gosan project. The Validation Team also noted there is no change in expected electricity produced by the project (Gosan: 3,562 MWh/yr, Pangyo: 1,995 MWh/yr, Total: 5,557 MWh/yr) since the produced electricity is calculated, using the amount of water supplied to Gosan water purification plant over the last 7 years (January 2000~December 2006) as input data.</p> <p>In conclusion, the Validation Team is of the opinion that the “K-water 0.96MW bundle small-scale hydroelectric power plants project” is in full compliance with all applicable requirements for the CDM by leading to emission reductions additional to what would have otherwise occurred, providing for reliable and measurable emission reductions with the well-established monitoring plan and contributing to sustainable development in Korea through reduction of GHG emissions and other air pollutants, energy saving by using renewable energy in place of fossil fuel as well as being consistent with national policies on renewable energy promotion.</p>		

 KEMCO	<h1 style="text-align: center;">Validation Report</h1>		Contract No. GHGCC(A)08-019
Validation Results	<h2>11 References</h2>		
	<p>Documents and electronic files submitted by the Project Participants</p> <ul style="list-style-type: none"> [1] Ecoeye Co., Ltd. Project Design Document, version 03.2 dated 19 June 2009 [2] Ecoeye Co., Ltd. Baseline Emissions Factor Excel Sheet, dated 24 December 2008 [3] Ecoeye Co., Ltd. Investment Analysis Excel Sheet, dated 20 February 2009 [4] K-Water, Feasibility Study Report on Gosan project, dated February 2008 [5] K-Water, Feasibility Study Report on Pangyo project, dated June 2008 [6] Power Generation Permit on Gosan project, dated 20 March 2008 [7] Power Generation Permit on Pangyo project, dated 10 September 2008 [8] Generator Purchase Contract on Gosan project, dated 18 August 2008 [9] Generator Purchase Contract on Pangyo project, dated 30 January 2009 [10] Captured image of electronic budget system clearly showing that Gosan and Pangyo projects are fully covered by K-Water's own budget [11] Ministry of Knowledge Economy report on New and Renewable Energy Feed-in Tariff and RPS, dated 31 March 2006 [12] K-Water, Official Letter to UNFCCC Secretariat, dated 2 February 2009 [13] Ministry of Knowledge Economy and Ministry of Land, Transport and Maritime Affairs, Approval of CDM Project(No. 2009-7), dated 27 May 2009 		

 KEMCO	<h1 style="text-align: center;">Validation Report</h1>		Contract No. GHGCC(A)08-019
Validation Results	<p>Documents and websites referred to by KEMCO</p> <p>[14] http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf</p> <p>[15] http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html</p> <p>[16] http://cdm.unfccc.int/Reference/glossary.html</p> <p>[17] http://cdm.unfccc.int/EB/041/eb41_repan46.pdf</p> <p>[18] http://www.moleg.go.kr (Ministry of Government Legislation, in Korean only)</p> <p>[19] http://www.kpx.or.kr/epsis (Korea Power Exchange's Electric Power Statistics Information System, in Korean only)</p> <p>[20] http://ecos.bok.or.kr (Bank of Korea's Economic Statistics System)</p> <p>[21] http://www.pointcarbon.com</p> <p>[22] IPCC, Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</p> <p>[23] IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories</p>		

 KEMCO	<h1 style="text-align: center;">Validation Report</h1>				Contract No.
					GHGCC(A)08-019
Validation Team	Role	Name	Organization /position	Scope of Validation	Signature
	Team Leader, Validator	Lee, Jae Hoon	KEMCO	Baseline methodology, Monitoring methodology, Estimation of GHG emissions	
	Validator	Han, Seung Ho	KEMCO	Sustainable Development, Environmental impacts, Stakeholder comments	
	On-the-job trainee	Hwang, In Chul	KEMCO		
Appendix	A. Validation Criteria B. Validation Checklist C. Review of Corrective Actions D. CVs of Validators				

Appendix A

Validation Criteria


REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	Checked	See Appendix B, Section B.6
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	Checked	See Appendix B, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	Checked	See Appendix B, Section B.6
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	Checked	See Appendix B, Section A.3.2
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	Checked	See Appendix B, Section B.6
6. Reduction in GHG emissions shall 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, Marrakesh Accords, CDM Modalities §43	Checked	See Appendix B, Section B.5
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords	Checked	The project is fully covered by K-Water's own budget.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	Checked	See Appendix B, Section A.3.4
9. The host country shall be a Party to the Kyoto Protocol	Marrakech	Checked	See Appendix B,


REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
	Accords, CDM Modalities §30		Section A.3.1
10. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	Checked	See Appendix B, Section E
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, CDM Modalities §37c	Checked	See Appendix B, Section D
12. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	Checked	See Appendix B, Section B.1.1, B.7.1
13. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	Marrakech Accords, CDM Modalities §37f	Checked	See Appendix B, Section B.7
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	Checked	The PDD of the project had been posted on the UNFCCC CDM website for public comments during 30 days period from 08 Nov 2008 to 07 Dec 2008. No comments was received during the period.
15. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, CDM Modalities, §45c,d	Checked	See Appendix B, Section B.4


REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
16.The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	Checked	See Appendix B, Section B.4
17.The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	Checked	The PDD is in line with UNFCCC CDM-PDD format. See Appendix B, Section A.1.1


Appendix B


Validation Checklist


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
A. General Description of Project Activity <i>In this section, the project design is assessed including the project purpose, how technology will be transferred and whether public funding from Annex I Parties results in a diversion of official development assistance.</i>						
A.1. Project Design Document <i>Note:</i>						
A.1.1. Is the Project Design Document (PDD) in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website?		[1]	Document Review	Checked. The PDD is in accordance with the latest template and guidance.		OK
A.2. Description of the project activity <i>Note:</i>						
A.2.1. Does the description of the proposed CDM project activity provide a clear understanding of the nature of the proposed CDM project activity?		[1]	Document Review	CL1. The PDD needs to provide further technical aspects of the project including the principles of small hydro generation.	CL1	OK
A.2.2. Does the project contribute to sustainable development of the host country from environmental, social and economic perspectives?		[1]	Document Review	Checked: the proposed project is expected to bring the host country social and environmental benefits including diversification of energy sources, and reduction of air pollutants		OK
A.3. Project Participants <i>Note:</i>						


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	A.3.1. Are participating Parties including the host country a Party to the Kyoto Protocol?	[14]	Document Review	Checked: Republic of Korea ratified the Kyoto Protocol in 2002.		OK
	A.3.2. Have the project received the written approval of voluntary participation from the designated national authorities (DNA) of each Party involved, including confirmation by the host Party that the project activity assists it in achieving sustainable development?	[13]	Document Review	To be checked: the project participants have not submitted the written approvals of voluntary participation. Korean DNA issues Letter of Approval after project participants submit validation report.	To be checked	OK
	A.3.3. Does each DNA's letter refer to the precise proposed CDM project activity title in the PDD being submitted for registration?	[13]	Document Review	Ditto.		OK
	A.3.4. Have a private and/or public entity participating in the project been authorized by the designated national authorities (DNA) of the Parties?	[13]	Document Review	Ditto.		OK
	A.3.5. Are the project participants listed in tabular form in section A.3 of the PDD consistent with the contact details provided in annex 1 of the PDD?	[1]	Document Review	Checked. The information about the project participant (K-Water) in section A.3 is consistent with that in Annex 1.		OK


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
A.4. Technical description of the project activity <i>Note:</i>						
A.4.1.	Is the location of the project activity clearly described?	[1]	Document Review	Checked: the locations of the hydroelectric power plant have been clearly described		OK
A.4.2.	Are the type and category and technology/measure of the small-scale project activity clearly identified and described?	[1]	Document Review	Checked: the project belongs to Type I (renewable energy projects), category I.D (grid connected renewable electricity generation). The total capacity of the projects is 0.96MW, less than 15MW.		OK
A.4.3.	Does the description of the proposed CDM project activity sufficiently cover all relevant elements and provide the technical aspects of its implementation	[1]	Document Review	CL1. It is not clearly described how the proposed project will generate electricity and reduce GHG emissions using water resources.	CL1	OK
A.4.4.	Does the project design clearly and consistently indicate the chosen crediting period, the total estimation of emission reductions as well as annual estimate for the chosen crediting period?	[1]	Document Review	Checked: The annual emission reductions are estimated at 2,987 tonnes of CO ₂ eq over the first crediting period (7 years).		OK
A.4.5.	In case public funding from Annex I Parties is involved, does the project provide an affirmation that such funding does not result in a diversion of official development assistance?	[1]	Document Review	CL2. The ODA affirmation has not been provided	CL2	OK


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	A.4.6. If the proposed CDM project activity involves the alteration of an existing installation or process, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation?			N.A.		
	A.4.7. Has the confirmation been provided that the small-scale project activity is not a debundled component of a larger project activity?	[1]	Document Review, Site Inspection	Checked. During the site visit, the Validation Team confirmed that the proposed project is not a debundled component of a larger project activity.		OK
	B. Baseline and monitoring methodology <i>In this section it is assessed whether the baseline methodology is appropriately applied in terms of project additionality in a transparent and conservative manner and whether the monitoring plan is properly established in accordance with the baseline methodology ensuring reliable emission reductions</i>					
	B.1. Title and reference of the approved baseline methodology applied to the project activity <i>Note:</i>					
	B.1.1. Are the title and the details (number and version) of the approved baseline and monitoring methodologies in the CDM web site properly referred to?	[1]	Document Review	Checked. The title and the details of the methodologies are properly referred.		OK


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.2. Justification of the choice of the project category <i>Note:</i>						
B.2.1. Has the choice of project type and category for the proposed small-scale project activity been transparently justified?		[1]	Document Review	Checked. The choice has been transparently justified.		OK
B.2.2. Does the small-scale project activity qualify as a small-scale project activity and will it remain under the limits of small-scale project activity types during every year of the crediting period?		[1]	Document Review	Checked. The capacity of the project is 0.96MW and thus qualifies as a small-scale project and will remain under the limits of small-scale project during every year of the crediting period.		OK
B.3. Description of the project boundary <i>Note:</i>						
B.3.1. Is the project boundary correctly described and does it meet the requirements of the selected baseline methodology?		[1]	Document Review	Checked. The project boundary includes the project sites and all the power plants connected to KEPCO grid.		OK
B.3.2. Have all sources and GHGs required by the methodology been included within the project boundary?		[1]	Document Review	Checked. All sources and GHGs have been included within the project boundary.		OK
B.3.3. If the methodology allows project participants to choose whether a source or gas is to be included within the project boundary, have the project participants justified that choice?				N.A.		


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.4. Details of the baseline and its development <i>Note:</i>						
B.4.1. 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 CDM project activity?	[1]	Document Review	Checked. The baseline scenario is the kWh produced by the renewable generating unit multiplied by an emission coefficient and is reasonable in the context of the project.			OK
B.4.2. Is the baseline scenario identified reasonable in terms of the assumptions, calculations and rationales used, as described in the PDD?	[1]	Document Review	Checked. The baseline scenario is reasonable in terms of the assumptions, calculations, and rationales.			OK
B.4.3. Does the PDD provide 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?	[1]	Document Review	Checked. The PDD needs to provide clearer description of the technology employed. It is not clearly described how the proposed project will generate electricity and reduce GHG emissions using water resources.			OK


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	B.4.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans and the economic situation in the project sector?	[1] [16]	Document Review	CL3. the government program to provide favorable feed-in tariff for renewable energy generation facilities has not been described in the PDD.	CL3	OK
	B.4.5. Are all documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD?	[1]	Document Review	Checked. All documentation is relevant, correctly quoted and interpreted.		OK
	B.4.6. Has the approved baseline methodology been correctly applied to identify the most reasonable baseline scenario and does the identified baseline scenario reasonably represent what would occur in the absence of the proposed CDM project activity?	[1]	Document Review	Checked: Operating Margin and Build Margin are correctly calculated.		OK
	B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity <i>Note:</i>					
	B.5.1. For a new project activity with a start date on or after 2 August 2008, for which PDD has not been published for global stakeholder	[1]	Document Review	CAR3. One of the bundled projects, Gosan project started on Aug 18, 2008 but the project participant had not informed DNA or UNFCCC Secretariat of the start	CAR3	OK


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	consultation or a new methodology proposed to the Executive Board before the project activity start date, had the Project Participants informed the Host Party DNA and/or the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status?			of the project activity.		
	B.5.2. For an existing project activity with a start date before 2 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, has the Project Participant's prior consideration of the CDM been sufficiently evidenced?			N.A.		
	B.5.3. Does the list of alternatives include as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity?			N.A.		
	B.5.4. Does the list of alternatives contain all plausible alternatives considered to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity?			N.A.		
	B.5.5. Do the alternatives comply with all applicable and enforced legislation?			N.A.		


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	B.5.6. (Investment Analysis) Are all parameters and assumptions used in calculating the relevant financial indicator accurate and suitable in light of relevant accounting practices?	[1][3] [17]	Document Review	Checked. All parameters and assumptions accurate and suitable in light of relevant accounting practices		OK
	B.5.7. (Investment Analysis) Are computations in the investment analysis correctly carried out and sufficiently documented?	[1][3] [17]	Document Review	Checked. Computations are correctly carried out and sufficiently documented		OK
	B.5.8. (Investment Analysis) Are the sensitivity analysis properly carried considering under what conditions variations in the result of investment analysis would occur, and the likelihood of these conditions?	[1][3]	Document Review	Checked. The sensitivity analysis are carried out appropriately		OK
	B.5.9. (Investment Analysis) Is the type of benchmark applied suitable for the type of financial indicator presented?	[1][3]	Document Review Interview	CAR1. Justification for the choice of benchmark rate (7.57%) based on investment report on renewable energy project	CAR1	OK
	B.5.10. (Investment Analysis) Has the Feasibility Study Report (FSR) been the basis of the decision to proceed with the investment in the project? i.e. is the period of time between the finalization of the FSR and the investment decision is sufficiently short and is it unlikely in the context of the underlying project activity that the input values	[1][3] [4][5]	Document Review	Checked. FSR for Gosan project was finalized in February 2008, and for Pangyo, June 2008. It can be concluded that FSR has been the basis of the investment decision.		OK


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	would have materially changed?					
	B.5.11. (Barrier Analysis) Is existence of barriers substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics?			N.A.		
	B.5.12. (Barrier Analysis) Is a barrier or set of barriers likely to prevent the implementation of the proposed CDM project activity and unlikely to equally prevent implementation of at least one of the possible alternatives, in particular the identified baseline scenario?			N.A.		
	B.5.13. (Common Practice Analysis) Is the geographical scope of the common practice analysis appropriate for the assessment of common practice related to the project activity's technology or industry type?			N.A.		
	B.5.14. (Common Practice Analysis) Is existence of similar projects substantiated by official sources and local and industry expertise?			N.A.		
	B.5.15. (Common Practice Analysis) Are essential distinctions sufficiently provided between the proposed CDM project activity and any			N.A.		


 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	similar projects that are widely observed and commonly carried out?					
	B.6. Emissions reductions <i>Note:</i>					
	B.6.1. Are all assumptions and data used by the project participants listed in the PDD, including their references and sources?	[1][2]	Document Review	Checked.		OK
	B.6.2. Is all documentation used by project participants as the basis for assumptions and source of data correctly quoted and interpreted in the PDD?	[1][2]	Document Review	Checked. All documentation is correctly quoted and interpreted.		OK
	B.6.3. Are all values used in the PDD considered reasonable in the context of the proposed CDM project activity?	[1][2]	Document Review	Checked. All values used in the PDD are reasonable.		OK
	B.6.4. Has been the baseline methodology been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions?	[1][2]	Document Review	Checked. The application of the baseline methodology has been correct.		OK
	B.6.5. Can all estimates of the baseline emissions be replicated using the data and parameter values provided in the PDD?	[1][2]	Document Review	Checked. All estimates of the baseline emissions are replicable.		OK

 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
B.7. Application of the monitoring methodology and description of the monitoring plan <i>Note:</i>						
B.7.1.	Does the monitoring plan contain all necessary parameters and the means of monitoring described in the plan comply with the requirements of the methodology?	[1]	Document Review	Checked. The monitoring plan contains all necessary parameters and the means of monitoring complies with the requirements of AMS I.D.		OK
B.7.2.	Are monitoring arrangements described in the monitoring plan feasible within the project design?	[1]	Document Review	Checked. Monitoring arrangements are feasible with the project design.		OK
B.7.3.	Are procedures for monitoring, taking measurements and reporting sufficient to ensure the accuracy and completeness of emission reductions achieved by the proposed CDM project activity?	[1]	Document Review Interview	Checked. The monitoring and reporting procedures are sufficient to ensure the accuracy and completeness of emission reductions.		OK
B.7.4.	Are procedures for emergency preparedness appropriately established?	[1]	Document Review Interview	Checked. The procedures are established.		OK
B.7.5.	Are procedures for calibration of equipment appropriately established?	[1]	Document Review	Checked. The meters shall be calibrated at the time of installation and recalibrated every 3 years afterwards.		OK
B.7.6.	Are procedures for review or checks of reported results/data appropriately established?	[1]	Document Review Interview	Checked. The procedures are established.		OK
B.7.7.	Is the authority and responsibility for monitoring, measurement and reporting project emission,	[1]	Document Review	Checked. It is clearly described who is responsible for which monitoring activities.		OK

 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	baseline emission and leakage data over time clearly described?		Interview			
	B.8. Details of baseline information, including the date of completion of the baseline study and the name of person(s)/entity(ies) determining the baseline <i>Note:</i>					
	B.8.1. Is the detailed baseline information sufficiently provided in Annex 3 to the PDD?	[1]	Document Review	Checked. Fuel consumption, net calorific value, generated electricity, Build Margin emission factor of power plants in 2005~2007 are provided.		OK
	B.8.2. Are the date of completion of the baseline study and the name of person(s)/entity(ies) determining the baseline clearly stated?	[1]	Document Review	Checked. The completion date and the responsible persons of baseline study are clearly stated.		OK
	B.8.3. Is the contact information clearly provided and is it indicated that the person/entity is a project participant listed in Annex I?	[1]	Document Review	Checked.		OK
	C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporal boundaries of the project are clearly defined.</i>					
	C.1. Duration of the project activity <i>Note:</i>					
	C.1.1. Is the start date of the project activity, reported in the PDD, in accordance with the "Glossary of CDM terms" and sufficiently evidenced?	[1][8] [9]	Document Review Interview	Checked. The Validation Team checked the Equipment Purchase Contracts for both projects and confirmed the stated project start date is in line with the Glossary of CDM Terms.		OK

 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	C.1.2. Is the operational lifetime of the project activity clearly defined and reasonable?	[1]	Document Review	Checked.		OK
	C.2. Choice of the crediting period and related information <i>Note:</i>					
	C.2.1. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two times 7 years or fixed crediting period of max. 10 years)?	[1]	Document Review	Checked.		OK
	C.2.2. Is the assumed crediting time chosen as below the operational lifetime of the project activity?	[1]	Document Review	Checked.		OK
	C.2.3. Are the starting date and length of the crediting period clearly and properly stated?	[1]	Document Review	Checked.		OK
	D. Environmental Impacts <i>In this section, it is assessed the analysis of the environmental impacts is properly undertaken.</i>					
	D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity <i>Note:</i>					
	D.1.1. Does the project comply with environmental legislation in the host country?	[1]	Document Review	Checked. In accordance with the Act on Assessment of Impacts of Works on Environment, Traffic, and Disasters, the proposed project is not required to		OK

 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
				undertake an Environmental Impact Assessment. The project obtained the operational permission by Daegu metropolitan city government and Gyeonggi province government.		
	D.1.2. Is the project activity likely to create any adverse environmental effects?	[1]		Not relevant as the project does not need to take an Environmental Impact Assessment.		OK
	D.1.3. Have the environmental impacts identified been properly addressed in the PDD?	[1]		Ditto		OK
	E. Stakeholder Comments <i>In this section, it is assessed whether comments from local stakeholders have been invited and due account has been taken of any comments received.</i>					
	E.1. Brief description how comments by local stakeholders have been invited and compiled <i>Note:</i>					
	E.1.1. Is the process clearly described by which comments by local stakeholders have been invited and compiled?	[1]	Document Review Interview	CAR2. The process of inviting local stakeholders' comments was not sufficiently implemented. K-Water invited comments and requests from local government through procedure seeking electricity business permit. And it excluded local residents from the stakeholders on the grounds that the project occurs only within its property. K-Water pledged to post a notice on the proposed project on its own website to invite local stakeholder' comments.	CAR2	OK
	E.1.2. Has an invitation for comments by local stakeholders made in an	[1]	Document Review	Ditto		OK

 KEMCO	Small Scale Projects Validation Checklist	Ref.	MoV	Comments	Draft Concl.	Final Concl.
	open transparent manner, in a way that facilitates comments to be received from local stakeholders and allow for a reasonable time for comments to be submitted?		Interview			
	E.1.3. Has detailed description of the project activity been provided in a manner which allows the local stakeholders to understand project activity?	[1]	Document Review Interview	Ditto		OK
	E.2. Summary of the comments received <i>Note:</i>					
	E.2.1. Have relevant stakeholders been consulted?	[1]	Document Review Interview	Checked. Relevant local authorities have been consulted but local residents were excluded from the stakeholders by the reason described in E.1.1		OK
	E.2.2. Is a summary of the comments received provided?	[1]	Document Review	Checked. The comments from local governments are provided.		OK
	E.3. Report on how due account was taken of any comments received <i>Note:</i>					
	E.3.1. Has due account been taken of any comments received?	[1]	Document Review	To be checked. There have been no special comments from local government. The comments from K-Water website will be checked later when K-Water submits the results.	To be checked	OK

Appendix C

Review of Corrective Actions

Non-conformities	Reference	Corrective Actions	Comments
1. The benchmark value for the proposed project is not sufficiently substantiated.	Page 17, Section B.5 of PDD	The project participant submitted a new benchmark rate of 7%, based on the discount rate of small hydroelectric power project in the Ministry of Knowledge Economy report (Mar 2006).	The benchmark rate is sufficiently justified. The validity of the quoted report is confirmed by cross-check with the Government Notice No. 2009-96.
2. The process of receipt of local stakeholders' comments was not been sufficiently implemented.	Page 31, Section E.1 of PDD	The project participant put up a notice of its projects to the public on its website and includes a captured image of the notice in revised PDD.	The invitation process of local stakeholders' comments is sufficiently implemented.
3. The project participant must inform a Host Party DNA and/or the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status since its start date is after 02 August 2008, But, the relevant documents have not been submitted to the DOE.	Page 28, Section C.1 of PDD	The project participant sent a letter informing the commencement of its project to the UNFCCC secretariat and submitted a copy of its letter to the DOE.	The notification of the project's commencement and its intention to seek CDM status by the project participant has been duly implemented.
4. It is not clearly described how the proposed project will generate electricity and reduce GHG emissions using water resources.	Page 3, Section A.2 of PDD	The revised PDD describes the basic principles of power generation using water resources: water elevation difference for Gosan and recovery of waste energy in water flow for Pangyo.	The principles of power generation using water resources are clearly described.
5. Documented evidences representing that ODA from Annex I parties is not included in the project investment, should be provided	Page 7, Section A.4.4 of PDD	The project participant submitted captured image of its electronic budget system showing that Gosan and Pangyo projects are fully covered by its own budget.	The captured image of electronic budget system clearly shows that Gosan and Pangyo projects are fully covered by K-Water's own budget and thus proves that ODA from Annex I parties is not included in the project.

Non-conformities	Reference	Corrective Actions	Comments
6. National policies favoring the proposed project are not described.	Page 17, Section B.5 of PDD	The revised PDD describes feed-in tariff policy which took effect on 26 Sep 2002 as E- policy.	The contents of feed-in tariff policy are described in the revised PDD as a national policy favoring the project.

Appendix D

CVs of Validators



KEMCO

Personal History

Family name	LEE	Date of Birth	Aug. 09, 1959
Given name	JAE HOON	Sex	Male
* Please write your name in English			
Organization	Korea Energy Management Corporation	Phone No.	+82-31-260-4887
Position	General Manager	Fax No.	+82-31-260-4886
Address	1157, Pungdukchun 2, Suji, Yongin	E-mail	jhlee@kemco.or.kr
* Please describe your present contact information			
Proposed Title	Title		Qualification
	<input type="checkbox"/> Full-time Validator/verifier		<input type="checkbox"/>
	<input type="checkbox"/> Part-time Validator/verifier		<input type="checkbox"/>
	<input checked="" type="checkbox"/> Full-time Lead Validator/verifier		<input checked="" type="checkbox"/>
	<input type="checkbox"/> Part-time Lead Validator/verifier		<input type="checkbox"/>
	<input type="checkbox"/> Committee Member()		<input type="checkbox"/>
	<input type="checkbox"/> Technical Expert		<input type="checkbox"/>
	<input type="checkbox"/> Others ()		<input type="checkbox"/>
* Please tick off (<input checked="" type="checkbox"/>) the title which you wish to apply for			*Qualification shall be determined by the authorized person
Proposed Sectoral Scope	Sectoral Scope		Qualification
	<input checked="" type="checkbox"/> 1. Energy industries (renewable - / non-renewable sources)		<input checked="" type="checkbox"/>
	<input type="checkbox"/> 2. Energy distribution		<input type="checkbox"/>
	<input checked="" type="checkbox"/> 3. Energy demand		<input checked="" type="checkbox"/>
	<input type="checkbox"/> 4. Manufacturing industries		<input type="checkbox"/>
	<input checked="" type="checkbox"/> 5. Chemical industries		<input checked="" type="checkbox"/>
	<input type="checkbox"/> 6. Construction		<input type="checkbox"/>
	<input checked="" type="checkbox"/> 7. Transport		<input checked="" type="checkbox"/>
	<input type="checkbox"/> 8. Mining/mineral production		<input type="checkbox"/>
	<input type="checkbox"/> 9. Metal production		<input type="checkbox"/>
	<input type="checkbox"/> 10. Fugitive emissions from fuels (solid, oil and gas)		<input type="checkbox"/>
	<input type="checkbox"/> 11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride		<input type="checkbox"/>
	<input type="checkbox"/> 12. Solvent use		<input type="checkbox"/>
	<input type="checkbox"/> 13. Waste handling and disposal		<input type="checkbox"/>
	<input type="checkbox"/> 14. Afforestation and reforestation		<input type="checkbox"/>
	<input type="checkbox"/> 15. Agriculture		<input type="checkbox"/>
* Please tick off (<input checked="" type="checkbox"/>) the sectoral scope which you wish to apply for			*Qualification shall be determined by the authorized person



KEMCO

Personal History

Work experience

Sectoral Scope No.	Period (Month/Year)	Description
1	2000~2001,	1) General Manager, Renewable Energy Dissemination Dept., Korea Energy Management Corporation(KEMCO), Kyounggi-do, Korea - Managed Loan & Subsidy programs for Renewable Energy Dissemination
	2005~2006	2) General Manager, Kyoungnam Branch, KEMCO - Managed Local Energy Program for Renewable Energy and Installation inspection for Residential PV systems
	2007~2008	3) General Manager, Renewable Energy Dissemination Dept., KEMCO - Managed 100,000 Roof-top PV Program
3	1994~1996	1) Manager, Energy Assessment Dept., KEMCO - Managed assessment for energy utilization in industrial complex, residential complex, power plants, airports, railways, sea ports, and large buildings
	1997~2000	2) General Manager, Energy Conservation R&D Dept., KEMCO - Managed R&D Projects in the areas of Drying process, Air conditioning, Combustion process, Building technology, Heat pump, etc
5	1990~1992	1) Research Associate, Clean Fuels and Chemicals, Center for Applied Energy Research, Lexington, KY, U.S.A. - Research in Oxide and Nitride catalysis in Organic reactions
	1993~1993	2) Researcher, Air Pollution Control Div., National Institute of Environmental Research, Seoul, Korea - Research in Flue gas Desulfurization process
	1997~2000	3) General Manager, Energy Conservation R&D Dept., KEMCO - Managed R&D Projects in the areas of Chemical separation, Chemical reaction and Process control
7	2002~2005	1) General Manager, Transportation Energy Dept., KEMCO - Managed policies for Fuel economy & Labeling System and Dissemination of high-efficient cars
	2006~2007	2) General Manager, Policy Development Dept., KEMCO - Policy development for Introduction of Motor vehicle tax in relation to Fuel Economy - Policy development for introduction of Green Train Mark System

* Full-time work experience of 4 years or more in relation to the relevant sectoral scope is required for qualification as a CDM auditor in the sectoral scope. But, For the applicants with the master's degree or Ph.D. in the areas relating to the sectoral scope, 2 years can be waived:



KEMCO

Personal History

Educational background

Years attended	University or Institution	Title of degrees	Main course of study
1979 ~ 1983	Yonsei University, Seoul, Korea	B.S.	Chemical Engineering
1988 ~ 1992	University of Kentucky, Lexington, KY, U.S.A.	Ph.D.	Chemical Engineering

Training

No.	Description
1	Training Course for GHG Auditors Date: Apr. 21, 2008 ~ Apr. 25, 2008 (44 hrs.) Training organization: Korea Energy Management Corporation
2	Training Course for Korea Laboratory Accreditation Scheme (KSA17020) Date: Mar. 22, 2005 ~ Mar. 24, 2005 (16 hrs.) Training organization: Korea Testing & Research Institute
3	On-the-job training for candidate GHG Auditors - BRT System in Seoul: May 2008 - KHNP Renewable Energy Project: May ~ June 2008

Certificate

No.	Description
1	National Technical Certificate of Engineer, Chemical Industry (1 st grade)
2	

Publications

No.	Description
1	Approximately 50 papers, books and reports in the area of catalysis, chemical reaction, separation process, materials science, and energy policy (energy efficiency & renewable energy)
2	Ph.D. Dissertation : " Catalytic Conversion of Alcohol, Amine, and Cyclohexene Using Transition Metal Nitrides", University of Kentucky (1992)

Linguistic abilities

Language	Read	Write	Speak	Understand
English	A	A	A	A

I declare that the information given in this Personal History form is correct to the best of my knowledge and belief.

Date of preparation: May 6, 2008

Signature:



KEMCO

Personal History

Family name	HAN	Date of Birth	23/06/1971
Given name	Seung-Ho	Sex	Male
* Please write your name in English			
Organization	KEMCO	Phone No.	+82-31-260-4883
Position	Assistant Manager	Fax No.	+82-31-260-4886
Address	1157, Pungdukchun 2, Suji, Yongin	E-mail	shhan@kemco.or.kr
* Please describe your present contact information			
Proposed Title	Title		Qualification
	<input type="checkbox"/> Full-time Validator/verifier		<input type="checkbox"/>
	<input type="checkbox"/> Part-time Validator/verifier		<input type="checkbox"/>
	<input checked="" type="checkbox"/> Full-time Lead Validator/verifier		<input checked="" type="checkbox"/>
	<input type="checkbox"/> Part-time Lead Validator/verifier		<input type="checkbox"/>
	<input type="checkbox"/> Committee Member()		<input type="checkbox"/>
	<input type="checkbox"/> Technical Expert		<input type="checkbox"/>
	<input type="checkbox"/> Others ()		<input type="checkbox"/>
* Please tick off (☑) the title which you wish to apply for			*Qualification shall be determined by the authorized person
Proposed Sectoral Scope	Sectoral Scope		Qualification
	<input checked="" type="checkbox"/> 1. Energy industries (renewable - / non-renewable sources)		<input checked="" type="checkbox"/>
	<input type="checkbox"/> 2. Energy distribution		<input type="checkbox"/>
	<input checked="" type="checkbox"/> 3. Energy demand		<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/> 4. Manufacturing industries		<input checked="" type="checkbox"/>
	<input type="checkbox"/> 5. Chemical industries		<input type="checkbox"/>
	<input type="checkbox"/> 6. Construction		<input type="checkbox"/>
	<input type="checkbox"/> 7. Transport		<input type="checkbox"/>
	<input type="checkbox"/> 8. Mining/mineral production		<input type="checkbox"/>
	<input type="checkbox"/> 9. Metal production		<input type="checkbox"/>
	<input type="checkbox"/> 10. Fugitive emissions from fuels (solid, oil and gas)		<input type="checkbox"/>
	<input type="checkbox"/> 11. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride		<input type="checkbox"/>
	<input type="checkbox"/> 12. Solvent use		<input type="checkbox"/>
	<input type="checkbox"/> 13. Waste handling and disposal		<input type="checkbox"/>
	<input checked="" type="checkbox"/> 14. Afforestation and reforestation		<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/> 15. Agriculture		<input checked="" type="checkbox"/>
* Please tick off (☑) the sectoral scope which you wish to apply for			*Qualification shall be determined by the authorized person



KEMCO

Personal History

Work experience

Sectoral Scope No.	Period (Month/Year)	Description
1	2005 ~	1) Performed validation of: <ul style="list-style-type: none"> - Gangwon Wind Park Project (2005); - Yangyang Renewable Energy Project (2006); - Taishir Hydro Power Project in Mongolia (2006); - Durgun Hydro Power Project in Mongolia (2006); - Hangyeong second phase hydroelectric power plant (2006); - Hydropower rehabilitation project in Macedonia (2007). 2) Performed validation and verification of GHG reduction projects in Korea: <ul style="list-style-type: none"> - Moorim Powertech Waste Heat Recovery Project (Verification)
3	2001 ~	1) Performed analysis of GHG reduction potentials for: <ul style="list-style-type: none"> - Waste heat recovery using heat pump project: Geumho Yeocheon Chemical Plant (2001); - Waste heat recovery from refinery project: SK Ulsan Complex (2003); 2) Performed validation and verification of GHG reduction projects in Korea: <ul style="list-style-type: none"> - LS Nikko Copper Incorporation Waste Heat Recovery Project(Verification) - Hanwha Chemical Plant Waste Heat Recovery Project(Verification) - Yongin Suji Incineration Plant Waste Heat Recovery Project (Validation) - Haewundae Incineration Plant Waste Heat Recovery Project (Validation)
4	2006 ~	1) Performed validation of: <ul style="list-style-type: none"> - LG Chem Fuel Switching CDM Project (2006); 2) Performed validation and verification of GHG reduction projects in Korea: <ul style="list-style-type: none"> - Geumho Chemical Waste Gas Utilization Project (Verification) 3) Performed verification of corporate GHG inventory for: <ul style="list-style-type: none"> - LG Chem Cheongju Plant (2006) - SK Ulsan Complex (2006)
14	1998 ~	1) Did research on GHGs mitigation options through forestry projects –case study: Vietnam (1998~1999) 2) Attended international workshops on CDM forestry projects: <ul style="list-style-type: none"> - “Agroforestry, Biodiversity, Forest Restoration and CDM in ASEAN Region”, ITTO (24~25, May 2005, Seoul) - “Climate Change and Forest Sector”, ITTO (21~23, SEP 2004, Seoul)



KEMCO

Personal History

15	1996 ~	1) Did research on organic farming in Hongseong County (1996) 2) Did research on application of baseline methodologies for agricultural projects in Korea, sponsored by the Korea Rural Economic Institute (2007)
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* Full-time work experience of 4 years or more in relation to the relevant sectoral scope is required for qualification as a CDM auditor in the sectoral scope. But, For the applicants with the master's degree or Ph.D. in the areas relating to the sectoral scope, 2 years can be waived:

Educational background

Years attended	University or Institution	Title of degrees	Main course of study
1990 ~ 1994	Yonsei University, Department of Science,	Bachelor of Science	Physics
1995 ~ 2000	Seoul National University	Master of Science	Environmental Studies, Urban Planning major

Training

No.	Description
1	Training course for environmental auditors (ISO 14001) Date: 21 Jan. 2002 ~ 25 Jan. 2002 (44 hours) Training organization: Korean Standards Organization
2	Training course for CDM auditors Date: 5 Feb. 2003 ~ 6 Feb. 2003 (16 hours) Training organization: Korea Energy Management Corporation
3	Training course for CDM auditors Date: 8 Jan. 2004 ~ 10 Jan. 2004 (16 hours) Training organization: Korea Energy Management Corporation
4	Training course for CDM auditors Date: 13 May 2005 ~ 14 May 2005 (16 hours) Training organization: Korea Energy Management Corporation
5	Training course for CDM auditors Date: 31 Mar. 2006 ~ 1 Apr. 2006 (16 hours) Training organization: Korea Energy Management Corporation
6	Training course for GHG auditors Date: 16 Apr. 2007 ~ 20 Apr. 2007 (44 hours) Training organization: Korea Energy Management Corporation

Certificate

No.	Description
1	Certificate of Environmental Engineer(1 st grade)
2	Environmental Auditor (ISO 14001)



KEMCO

Personal History

Publications

No.	Description
1	Master's thesis "A study on GHGs mitigation options through forestry projects"(2000)
2	Clean Development Mechanism, an Innovative Tool for Combating Climate Change Under the UNFCCC, Hanul Publication (2006)
3	General Approaches to Validation of CDM Projects (2005)
4	Analysis on Leakage Effects Attributable to CDM Projects (2006)
5	Application of Approved Baseline Methodologies for CDM Projects in Korea-Case Study: Landfill Gas-to-Electricity Projects (2006)
6	Assessment of Data Uncertainty in Verifying Corporate GHG Emissions(2006)
7	Preparation of Monitoring Reports for CDM Projects-Case study: CDM wind power projects (2007)

Linguistic abilities

Language	Read	Write	Speak	Understand
English	A	A	A	A

* Please rate your knowledge of languages by A,B, and C (A: High, B: Middle, C: Low)

** Please note that at least "B" rating in all aspects is required for qualification as a CDM auditor

*** Please specify here your efforts in improving linguistic abilities: _____

I declare that the information given in this Personal History form is correct to the best of my knowledge and belief.

Date of preparation: 26 MAY 2008

Signature: 