Validation Report

Rehabilitation of six HPPs in the Republic of Macedonia

10 March 2008

Korea CDM Certification Office

KOREA ENERGY MANAGEMENT CORPORATION

Contents

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Project Title	Rehabilitation of six HPPs in the Republic of Macedonia		
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Category	Energy Industries (renewable energy sources)		
Scope	The validation scope for the proposed CDM project includes: - 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 EB Decisions		
Validation Date	1. Desk Review: 15 June 2007 ~ 25 June 2007 2. On-site Assessment: 2 July 2007 ~ 18 July 2007 3. Review of Corrective Actions: 8 August 2007 ~ 20 August 2007		

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1 Summary of the project activity

The Rehabilitation of six HPPs in the Republic of Macedonia is a large scale grid-connected renewable energy project aiming to retrofit six hydro power plants with an increase in renewable electricity generation by 200 GWh annually. To rehabilitate the hydro power plants this project caries out plant-wide replacement of turbines, generators, control systems, substations, etc. Its GHG emission reductions are estimated at 200,132 tCO_2eq/yr by displacing electricity that would otherwise be generated by fossil fuel-based power plants.

The project is expected to significantly contribute to sustainable development in Macedonia by utilizing renewable and clean energy sources in respect of:

- Increase in the renewable electricity generation capacity of the Macedonian grid;
- Reduction in the emission of SO_2, NOx, and CO_2 from fossil fuel-based power plants;
- Increased reliability of power supply by enhancing the ability of existing hydropower plants to meet peak-time demands;
- Reduced dependence of Macedonia on imported fossil fuels;
- Generation of significant foreign currency inflow and thus alleviated Macedonia's exposure to exchange rate fluctuations; and,
- Creation of a lot of new jobs both for highly skilled engineers and construction workers.

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Validation Results	## 2 Principles The project design document (PDD) of [the Rehabilitation of six HPPs in the Republic of Macedonia] is assessed based on the following principles **2.1 Completeness** 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 **2.2 Consistency** 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: - Among potential baseline scenarios; - Between the project and baseline scenario; and - Between the baseline and monitoring methodology. **2.3 Accuracy** 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. **2.4 Transparency** 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	

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2.5 Relevance

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.

2.6 Conservativeness

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

3 Definitions of non-conformities and observations

3.1 Non-conformities

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.

- Major non-conformity includes, inter alia:
  - 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:
  - unclear data sources and descriptions;
  - minor miscalculation and misstatements

3.2 Observations

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.

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4 Desk review

The desk review has been made during the period from 15 to 25 June 2007 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:

- Demonstration of the project additionality;
- Calculation of baseline and project emissions; and
- Coverage of significant factors in the monitoring plan.

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.

4.1 Desk review findings

The proposed project appropriately applied the ACM0002 version 06, consolidated baseline and monitoring methodologies for grid-connected electricity generation from renewable sources. Given that the electricity grid system in Macedonia coal-fired power plants and hydropower plants as well as some imports from neighboring countries, the project adopted as a baseline emission factor the weighted 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 Annual Report of Electric Power Company of Macedonia. The formulae for the emission factors were correctly applied and consistently reflected in the monitoring plan.

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Validation Results	In order to demonstrate that the project would not occur under the baseline scenario, the project design document described investment barriers as well as barriers due to the prevailing practice facing implementation of the proposed project. Investment barriers to the proposed project activity include little availability of private capital from domestic and international capital market. The project proponents also insisted that the proposed project activity was faced with some barriers since it is the first case in overall plant-wise rehabilitation of hydropower plants in Macedonia. Since the starting date of the project activity is before the date of validation, the project proponents has provided a documented evidence that the financial benefits from the CDM had been seriously considered officially since 1999 prior to the start date of the project activity, January 2001. As for its environmental impacts on the local area, the project design document concluded that the proposed project would have no negative impacts. In addition, a stakeholders' consultation process had been carried out in the period of May 14th to June 13th. Project description was then posted on the ELEM's website as well as the bulletin boards in the seven municipalities located closest to the project sites, and stakeholders were invited to submit their comments by e-mail, fax, or mail. As a result of the stakeholder's consultation three positive and supportive comments were received.	

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Validation Results	However, the several items to be further checked or provided with more rationale have been identified by the desk review as follows: - It should be checked whether the proposed project conforms to relevant legislations and receive any permits from the local authorities (see Appendix B. A.2.2); - Documented evidences representing that ODA from Annex I parties is not included in the project investment, should be provided (see Appendix B. A.4.7); - There is little description about relevant national and sectoral policies that will affect promotion of hydropower projects. For example, there could be some incentives or support provided by the government of Macedonia for renewable electricity generation (see Appendix B. B.2.5); - The technical lifetime of the pre-existing equipment to be replaced is not sufficiently justified by taking into consideration common practices in the power sector of Macedonia as well as referring to related industry surveys, statistics, technical literature, etc. (see Appendix B. B.2.7);, - Investment barriers and barriers due to the prevailing practice facing the project should be more substantiated by documented evidences (see Appendix B. B.3.2); - Country-specific net calorific value for lignite should be verified by documented evidences (see Appendix B. E.4.3); and, - Electricity generation and fuel consumption data should be cross-checked with the reference (see Appendix B. E.4.4).	

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Validation Results	Based on the results of the desk review, the validation team requests the project proponents to provide more documented evidences and justification in order to ensure the compliance of the project design document with the validation criteria. Additional documents and revised sections of the project design document to be submitted prior to on-site assessment (deadline: 3 July 2007) are: 1) 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 (see Appendix B. A.3.3~4); 2) Written approval or permits from the authorities concerned that the proposed project conforms to relevant legislations (see Appendix B. A.2.2) 3) Documented evidences representing that ODA from Annex I parties is not included in the project investment (see Appendix B. A.4.7); 4) Additional descriptions about relevant national and sectoral policies that will affect promotion of hydropower projects. (see Appendix B. B.2.5); 5) Documented evidences for the technical lifetime of the pre-existing equipment to be replaced, including reports on common practices in the power sector of Macedonia, or related industry surveys, statistics, technical literature, etc. (see Appendix B. B.2.7); 6) Documented evidences for additionality test, i.e. investment barriers and barriers due to the prevailing practice including studies, surveys, statistics, etc. (see Appendix B. B.3.2); 7) Clarifications on data sources for country-specific net calorific value for lignite (see Appendix B. E.4.3); 8) Relevant annual reports of the Electric Power Company of Macedonia (see Appendix B. E.4.4); and, 9) Written documentation on detailed answers that were sent to the participants who had raised questions during the stakeholders' consultation (see Appendix B. G.3.1).	

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5 On-site assessment and interview

The on-site assessment has been performed in the period from 1 July to 18 July 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 focuses mainly on the following aspects:

1) Relevant legislations relevant national and sectoral policies that will affect promotion of hydropower projects;
2) Technical lifetime of the pre-existing hydropower equipment;
3) Demonstration of investment barriers and barriers due to the prevailing practice;
4) Data sources for electricity generation, fuel consumption, and net calorific value; and
5) Monitoring plan for emission reductions.

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:

1) Magdalena Manuseva. Head, Energy Investments Unit, Department of Energy, Ministry of Economy, Republic of Macedonia;
2) Vlatko Cingoski, General Manager, ELEM (Macedonian Power Plants);
3) Ivan Kukovski, Technical Manager, HPP Mavrovo (Vrtok, Raven, Vrven), ELEM;
4) Ljupcho Angeloski, Manager, HPP Spilje, ELEM;
5) Jauleski Gligor, Technical Manager, HPP Globocica, ELEM; and,
6) Gligorce Kocev, Technical Manager, HPP Tikves, ElEM.

As a result of the on-site assessment, the Validation Team requests the project entity to take corrective actions against five non-conformities, i.e. two Major non-conformities and three Minor non-conformities identified within the deadline, 18 August 2007, as agreed in the Validation Contract.

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Validation Results	**5.1 On-site assessment findings** The Validation Team had site visits to the six project hydropower plants for observation of project activities as well as to Matka hydropower plant, one of the oldest hydropower plants in Macedonia, for the purpose of assessment of technical lifetime of hydropower facilities in Macedonia. Operation and maintenance records in the past few years before the start of the project activity were reviewed at each plant to make sure that the hydropower plants had been in normal operation and have been undergoing regular annual maintenance. It was verified that each plant covered by the project had developed and was carrying out regular maintenance measures, which would have allowed the project plants to operate even without any thorough rehabilitation and would have guaranteed proper plant operation. As per technical lifetime of hydropower facilities in the country, the Validation Team came to conclusions that the pre-existing six hydropower plants would have continued to operate with the old equipment and control systems in the absence of the proposed CDM project activity. In addition to the fact that each of the project plants had been undergoing regular maintenance, that would have allowed continuation of their uninterrupted operation, it was noted that the Matka hydropower plant, one of the oldest hydropower plants in Macedonia commissioned in 1938, was operating normally up to the present time with much older equipment and control systems. Moreover, it was confirmed that in Macedonia there are no examples of decommissioning of hydropower facilities due to the end of their technical lifetime. On the other hand, the Validation Team interviewed a responsible official in the Department of Energy, Ministry of Energy in Macedonia, who confirmed that the power sector in the country had been suffering continued loss due to unpaid utility bills.	

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Further it was discussed that Kosovo crisis that started in 1998 and the ethnic conflict in Macedonia in 2001 worsened the political and economic stability of Macedonia and made investments in the Macedonia, including the pre-existing hydropower plants rehabilitation, less attractive. Particularly, the Validation Team noted that Macedonia did not have any international credit rating until the middle of 2004, making any foreign investments in the proposed project much more uncertain.

As for environmental impacts and stakeholders' comments, the Validation Team confirmed that the proposed project included replacement of equipment only without any construction works that might affect the environment, and the project participant conducted an environmental impact study as per the requirements of the Macedonian DNA and received an official approval of that study. In addition, it was verified by checking reply e-mails to stakeholders who had raised questions during the stakeholders' consultation that due account had been taken of the comments received.

However, the Validation Team has issued two Major non-conformity and three Minor non-conformities regarding some significant points as weakly substantiated:

1) Major non-conformity 1: the typical average technical lifetime for the pre-existing hydropower facilities is not explicitly determined in the PDD. The country-specific or sector-specific technical lifetime should therefore be determined taking into account common practices in the sector and country. (see Appendix B. Checklist B.2.7);
2) Major non-conformity 2: demonstration of investment barriers and barriers due to prevailing practices is weakly substantiated. For example, the IMF report, one of key documented evidences, is not properly referenced, and it is not transparent why the project is the first of its kind in the country (see Appendix B. Checklist B.3.1~2);
3) Minor non-conformity 1: there is lack of explanation about what type of measures are undertaken for each hydropower plant as part of the project activity in the PDD (see Appendix B. Checklist A.4.3);

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4) Minor non-conformity 2: some of sources of data used for calculation of emission reductions, for example, electricity generation of year 2006, are unclear in the PDD (see Appendix B. Checklist B.2.8);
5) Minor non-conformity 3: the monitoring plan does not include measurement of auxiliary electricity consumption within the hydropower plants (see Appendix B. Checklist D.2.3).

Observations: the project participants 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. These issues should be further checked prior to preparation of the preliminary Validation Report.

6 Review of corrective actions

In response to the request for corrective actions against non-conformities identified, the project proponents submitted the revised project documentation to the Validation Team, of which the Validation Team made an in-depth review during the period from 8 August to 20 August 2007. Corrective actions of the project proponents and conclusions of the Validation Team are as follows:

1) Major non-conformity 1

A. Corrective Actions: in its Section B.4 the revised PDD provides justifications for a conservative approach to determination of the typical technical lifetime of a hydropower plant in Macedonia as 70 years.

B. Conclusions: the determination of the typical technical lifetime of a hydropower plant in Macedonia deemed conservative and well substantiated.

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Validation Results	**2) Major non-conformity 2** **A. Corrective Actions: i**n its Section B.5 the revised PDD demonstrates that the project is the first of its kind project in Macedonia for overall and comprehensive plant-wide rehabilitation of the hydropower generation system, and financing the project was not viable due to the vulnerability of the banking system and continuing deficit. **B. Conclusions:** the revised PDD sufficiently addresses the demonstration of investment barriers and barriers due to prevailing practices to implementation of the proposed project. **3) Minor non-conformity 1** **A. Corrective Actions: i**n its Section A.2 the revised PDD provides brief history and details of rehabilitation measures for each hydropower plant. **B. Conclusions:** full descriptions about rehabilitation activities taken for each hydropower plant are provided for sufficient understanding of the purpose and additionality of the project activity. **4) Minor non-conformity 2** **A. Corrective Actions:** in its Annex 3 the revised PDD specifies data sources for baseline information. **B. Conclusions:** data sources for baseline information deemed clear and reliable. **5) Minor non-conformity 3** **A. Corrective Actions:** in its Section B.7 the revised PDD includes monitoring of electricity imported and exported as well. **B. Conclusions:** the revised monitoring plan sufficiently addresses monitoring of auxiliary electricity consumption of the project activity	

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7 Receipt of public comments

In accordance with Paragraph 40(c) of the CDM Modalities and Procedures, the project design document of the proposed project had been posted on the UNFCCC CDM website for public comments from 28 June 2007 to 27 July 2007. As a result, no comments have been received during that period.

8 Issuance of written approvals

The KEMCO validation team has received the written approvals from the designated national authorities of the Parties involved in the Rehabilitation of six HPPs in the Republic of Macedonia, Japan (issued on 19 October 2007) and Republic of Macedonia (issued on 3 October 2007), which states the following:

1) The Parties, Japan and Republic of Macedonia approves that their participation in the Rehabilitation of six HPPs in the Republic of Macedonia is voluntary
2) The Macedonian government, the host Party of the Rehabilitation of six HPPs in the Republic of Macedonia, confirms the project activity contributes significantly to sustainable development in Republic of Macedonia.
3) The Parties, Japan and Republic of Macedonia authorize the project participants indicated in the PDD to participate in the Rehabilitation of six HPPs in the Republic of Macedonia.

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9 Special Review

In accordance with the clarifications to implement the review process (version 07, adopted by EB29), in response to the request for review raised by the CDM Executive Board, the KEMCO Validation Team has conducted a special review on the Rehabilitation of six HPPs in the Republic of Macedonia from 3 March 2008 to 10 March 2008 as follows:

1) Reasons for Request 1: further clarification is required on how the start date of the project activity has been defined in accordance with the CDM glossary of terms

A. Comments from Validation Team: The validation team checked the project implementation schedule which had been submitted by the Project Participants. Based on the schedule it has been confirmed that the proposed project had been implemented since 2001. Thus the start date of the project in the PDD, i.e. 8 Jan 2001 is the starting date of project implementation and is in accordance with the definition of the CDM glossary of terms.

2) Reasons for Request 2: further clarification is required on how the DOE has validated that the CDM was seriously considered prior to the start date.

A. Comments from Validation Team:

i. The validation team carried out several interviews during the site visit, including interviews with the Deputy General Manager for Investment of ESM, project manager of this project and current General Manager of ELEM Mr. Vlatko Cingoski, and reviewed the documentary evidence provided by ELEM and attached in Appendix 1 of the PDD. ESM (the predecessor of ELEM) could not finance the project on its own or obtain domestic financing for the project. This made them look for opportunities for international financing and the support from the CDM was considered an extremely important form of additional financing. In order to obtain such support ESM organized investment promotion missions in the period 1999-2000.

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i. (Continued) The presentation in Figure AN-1 was made at an official meeting between the management of ESM (the predecessor of ELEM) and UK's National Grid as part of an investment promotion campaign in July 1999. On two slides it was specified that a) Kyoto Protocol Applicability is seriously considered; and b) Kyoto Protocol financing is seriously considered as a financing source for this and other ESM's projects. As this presentation was made at an official meeting in 1999 (before the start of the project in 2001), we are of the opinion that this presentation constituted official corporate documentation available prior to the start of the project activity and satisfies the requirements for Section B.5., described in Guidelines for completing the Project Design Document (CDM-PDD), and the proposed new baseline and monitoring methodologies (CDM-NM).

ii. In its validation decision the validation team also took into consideration the specific political and economic conditions in Macedonia, which are described on p. 10 – p.12 of the PDD, and concluded that ELEM, although it consider seriously the CDM prior to the start of the project, was not in a position to proceed earlier with the project registration.

iii. The efforts of ELEM to register their project in the period 1999 – 2007 were also illustrated in a presentation made at a UNIDO seminar in Vienna in 2004, a copy of which was included in Figure AN-2 of the PDD. The presentation is available on the internet and is considered part of the official corporate evidence.

iv. As a supplementary document, ELEM has also submitted a letter expla ining the way CDM was considered prior to the start of the project.

3) Reasons for Request 3: the DOE shall further clarify how they have validated that the project activity does not involve an increase in the volume of the existing reservoir or the construction of new reservoirs

A. Comments from Validation Team: as mentioned in Section D.1 of the PDD, the proposed project activity does not involve any civil works but refurbishment of existing facilities only.

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A. (Continued) This fact has been confirmed by the Description of Environmental Impact (DEI) for each of the plants covered by the project. DEIs are official documents and were approved by the Ministry of Environment and Physical Planning (MoEPP) of the Republic of Macedonia. The validation team noted that the DEIs for the proposed project in section "Land Use" (in Macedonian: Zafakane na povrsina) clearly states that none of the plants rehabilitation involves construction of new facilities or infrastructure, which means that that there is no new dam construction or expansion of existing reservoirs.

4) Reasons for Request 4: the full generation-weighted average for the most recent 3 years is not used to calculate the Operating Margin emission factor, and the DOE should also provide a more detailed validation opinion regarding how the simple OM method is considered appropriate in the context of the Macedonian electricity grid

A. Comments from Validation Team:

i. The corrected excel file has been submitted by the Project Participants re-calculating the Operating Margin emission factor by taking into account the full generation-weighted average for the most recent 3 years. It has been confirmed that the re-calculated Operation Margin emission factor is correct.

ii. The validation team noted that the Macedonian national grid is constituted by coal-fired power plants and hydropower plants as well as imports from neighboring countries. It was further confirmed that dispatch data is not available to the Project Participants (ELEM is only responsible for power generation, but not for distribution and transmission of electricity) and low-cost/must run resources, i.e. hydropower generation, constitute less than 50% of the total grid generation as described by Annex 3 of the PDD, Share of Low cost/Must Run generation in total power generation in the project (2002-2006). It was therefore concluded that Simple OM was selected appropriately for the proposed project in the context of the Macedonian electricity grid.

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10 Validation opinion

The KEMCO Validation Team has undertaken validation of [the Rehabilitation of six HPPs in the Republic of Macedonia] which claimed approximately 200,132 CO_2eq ton annually by more efficiently utilizing water resources. 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 (15 June 2007 ~ 25 June 2007), on-site assessment (2 July 2007 ~ 18 July 2007) and review of corrective actions (8 August 2007 ~ 20 August 2007).

As a result of the desk review and on-site assessment, the validation team identified two 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 full review. Then the team fully agreed that all the significant non-conformities issued had been cleared.

In conclusion, the Validation Team is of the opinion that [the Rehabilitation of six HPPs in the Republic of Macedonia] 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 Macedonia through improvement of environmental condition, promotion of renewable energy usage, minimization of dependence on energy imports, upgrade of hydropower plants to meet peak-time demands, and attraction of significant foreign currency inflow to the country.

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11 References

Documents and electronic files submitted by the Project Participants

[1] Mitsubishi UFJ Securities. Project Design Document (Version 1.0, 04/06/2007)

[2] Mitsubishi UFJ Securities. Emission Reductions Calculation Excel Files (Version 1.0). June 2007

[3] IMF (International Monetary Fund). Former Yugoslav Republic of Macedonia Banking Soundness and Recent Lessons. August 2000.

Documents and websites referred to by KEMCO

[4] http://cdm.unfccc.int/DNA

[5] http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf

[6] http://cdm.unfccc.int/methodologies/index.html

[7] World Bank. Building Market Institutions in South Eastern Europe. 2004

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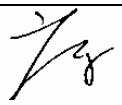
	Role	Name	Organization /position	Scope of Validation	Signature
Validation Team	Lead Validator	Woo, Jae-hak	KEMCO	Sustainable Development, Environmental impacts, Stakeholder comments	
	Validator	Han, Seung-ho	KEMCO	Baseline methodology, Monitoring methodology, Estimation of GHG emissions	

Appendix

A. Validation Criteria
B. Validation Checklist
C. Review of Corrective Actions
D. CVs of Validators

Appendix A

Validation Criteria

REQUIREMENT	Reference	Conclusion	Comments
1. The project shall assist non-Annex I Parties in achieving sustainable development, which shall be confirmed by the host Party in the form of a written approval of voluntary participation.	Kyoto Protocol (KP) Article 12.2, Decision 17/CP.7	To be checked	See Checklist. A.3.3
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC and lead to real, measurable and give long-term benefits related to the mitigation of climate change.	KP Article 12.2, 5(b)	Checked	See Checklist A.4.6
3. The project shall assist Annex I Parties in achieving compliance with their emission reduction commitment under Article 3 of the Kyoto Protocol.	KP Article 12.2	Checked	See Checklist A.4.6
4. Emission reductions attributable to the project shall be additional to any that would occur in the absence of the project activity.	KP Article 12.5(c), Decision 3/CMP.1 CDM Modalities and Procedures (CDM M&P) paragraph 37(d), 43	Major non-conformity 2	See Review of Corrective Actions No. 2
5. The project activity should lead to the transfer of environmentally safe and sound technology and know-how.	Decision 17/CP.7	Checked	See Checklist A.4.4
6. Public funding for the project from Annex I Parties shall not result in a diversion of official development assistance	Decision 17/CP.7	Checked	See Checklist A.4.7
7. Participation in the CDM shall be voluntary, which shall be approved by each party involved	KP Article 12.5(a), CDM M&P paragraph 28, 40(a)	To be checked	See Checklist. A.3.3~4
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM M&P paragraph 29	Checked	See Checklist A.3.1
9. Parties participating in the CDM shll be a Party to the Kyoto Protocol	CDM M&P paragraph 30, 31	Checked	See Checklist A.3.2
10. Comments by local stakeholders shall be invited and a summary of the comments and how due account was taken of any comments shall be provided	CDM M&P paragraph 37(b)	Checked	See Checklist G.1~3

REQUIREMENT	Reference	Conclusion	Comments
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 undertaken.	CDM M&P paragraph 37(c)	Checked	See Checklist F.1~2
12. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM M&P paragraph 37(e)	Checked	See Checklist B.1.1, D.1.1
13. Provisions for monitoring, verification and reporting shall be in accordance with decision 17/CP.7, CDM modalities and procedures under the Marrakech Accords and relevant decisions of the COP/MOP.	CDM M&P paragraph 37(f)	Major non-conformity 2 Minor non-conformity 3	See Review of Corrective Actions No. 4 and 5
14. The project design document shall be in accordance with Appendix B to the CDM modalities and procedures, the UNFCCC CDM-PDD format, and made publicly available	CDM M&P paragraph 40(b), Appendix B, relevant decisions of the CDM Executive Board	Checked	The PDD of the proposed project is pursuant to the CDM modalities and procedures and UNFCCC CDM-PDD Format Version 03
15. Comments on the validation requirements shall be received, within 30 days, from Parties, stakeholders and UNFCCC accredited NGOs, and thereafter made publicly available.	CDM M&P paragraph 40(c)	To be checked	The PDD of the proposed project will be posted for 30 days on the CDM website for public comments from 28 June 2007 to 27 July 2007. As a result no comments have been received in the above period.
16. A baseline shall cover emissions from all gases, sectors and source categories listed in Annex A of the Kyoto Protocol within the project boundary	CDM M&P paragraph 44	Checked	See Checklist B.4.1

REQUIREMENT	Reference	Conclusion	Comments
17. The baseline shall be established in a transparent and conservative manner, on a project-specific basis and taking into account relevant national and/or sectoral policies and circumstances.	CDM M&P paragraph 45(b), (c), (d)	Major non-conformity 1 Minor non-conformity 2	See Review of Corrective Actions No. 1 and 3
18. The baseline shall be defined in a way that CERs cannot be earned for decreases in activity levels outside the project activity or due to force majeure.	CDM M&P paragraph 47	Checked	The baseline scenario shows that the proposed project claims emission reductions achieved only by more electricity generation with water resources.
19. The baseline methodology shall select from among the approaches described in paragraph 48 of the CDM modalities and procedures the one deemed most appropriate for the project activity	CDM M&P paragraph 48	Checked	See Checklist B.1.1~4
20. The project shall select a crediting period from among the approaches described in paragraph 49 of the CDM modalities and procedures	CDM M&P paragraph 49	Checked	See Checklist C.2.2~4
21. Emission reductions attributable to the project shall be adjusted for leakage	CDM M&P paragraph 50	Checked	See Checklist E.2.1
22. The 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 project activity	CDM M&P paragraph 52	Checked	See Checklist B.4.1

Appendix B

Validation Checklist

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
A. General Description of Project Activity *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.*						
A.1. Title of the project activity *Note:*						
A.1.1. Does the title characterize the project activity clearly and properly?		[1]	Document Review	1. Checked: The project title, Rehabilitation of six HPPs in the Republic of Macedonia is clearly described	OK	OK
A.2. Description of the project activity *Note:*						
A.2.1. Is the purpose of the project activity clearly described?		[1]	Document Review	1. Checked: the proposed project aims to generate more renewable-based electricity by rehabilitating six hydropower plants.	OK	OK
A.2.2. Is the project in compliance with relevant legislation in the host country?		[1]	Document Review	1. Checked: it is confirmed that the proposed project plants received written permissions from the Energy Regulatory Commission (ERC) in Macedonia.	OK	OK
A.2.3. Does the project contribute to sustainable development of the host country from environmental, social and economic perspectives?		[1]	Document Review,	1. Checked: the proposed project is expected to bring the host country and local areas social and environmental benefits including diversification of energy sources, reduction of air pollutants, and creation of new jobs.	OK	OK
A.3. Project Participants *Note:*						

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
A.3.1.	Have Parties participating in the project designated a national authority for the CDM?	[4]	Document Review	1. Checked: the Former Yugoslav Republic of Macedonia has designated the Ministry of Environment and Physical Planning as a national authority for the CDM.	OK	OK
A.3.2.	Are participating Parties including the host country a Party to the Kyoto Protocol?	[5]	Document Review	1. Checked: after its Parliament ratified the Kyoto Protocol in July 2004 the Former Yugoslav Republic of Macedonia officially joined the Kyoto Protocol on November 18, 2004.	OK	OK
A.3.3.	Have the project received 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?			1. To be checked: The project participants have not submitted the written approvals of voluntary participation. But the date of its submission could depend on each country's own procedure.		
A.3.4.	Have a private and/or public entity participating in the project been authorized by the designated national authorities of the Parties?			Ditto		
A.4.	**Technical description of the project activity** *Note:*					
A.4.1.	Is the location of the project activity clearly described?	[1]	Document Review	1. Checked: six hydropower plants to be rehabilitated are located across several areas, which are represented in the project site map.	OK	OK
A.4.2.	Is the category of the project activity clearly identified and described?	[1]	Document Review	1. Checked: the expected annual electricity generation by rehabilitated hydro power plants is 1,329 GWh and accordingly reduced GHG emissions are	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
				estimated at 200,132 tonnes of CO_2e annually.		
A.4.3.	Does the project design engineering reflect current good practices?	[1]	Document Review	1. Minor Non-conformity 1: a variety of proven technologies applied to the proposed project to maximize efficiency from new turbines, generators, control systems, substations, etc. But, there is lack of explanation about what type of measures are undertaken for each hydropower plant as part of the project activity in the PDD.	Minor NC	OK
A.4.4.	Are the environmentally safe and sound technology and know how transferred to the host Party through the project?	[1]	Document Review,	1. Checked: the new equipment meets the highest international standards for environmentally safe and sound technology. In addition, special training will provided for operation of the equipment.	OK	OK
A.4.5.	Are the GHGs emissions reductions additional to what would occur in the absence of the project?	[1]	Document Review	1. Major Non-conformity 2: see Section B.	Major NC	OK
A.4.6.	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	1. Checked: the annual emission reductions are estimated at 200,132 metric tonnes of CO_2eq over the first crediting period.	OK	OK
A.4.7.	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	1. Checked: It is confirmed that the proposed project was financed by a loan from the World Bank for Reconstruction and Development and ELEM (project participant)'s own funds.	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
B. Application of a baseline methodology *In this section it is assessed whether the baseline methodology is appropriately applied in terms of project additionality in a transparent and conservative manner*						
B.1. Title and reference of the approved baseline methodology applied to the project activity *Note:*						
B.1.1.	Has the baseline methodology been previously approved by the CDM Executive Board?	[1][6]	Document Review	1. Checked: the ACM0002 (ver 06) has been applied	OK	OK
B.1.2.	Are the title and reference lists as well as the details of the approved baseline methodologies in the CDM web site properly referred to?	[1][6]	Document Review	1. Checked: the CDM website has been properly referred to	OK	OK
B.1.3.	Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	[1][6]	Document Review	1. Checked: the ACM0002 (ver 06) relates to renewable electricity generation for a grid.	OK	OK
B.1.4.	Is it transparently showed that the project activity meet the applicability conditions under which the methodology is applicable?	[1][6]	Document Review	1. Checked: it is shown transparently in Section B.2 that the proposed project meet the applicability conditions	OK	OK
B.2. Description of how the methodology is applied in the context of the project activity *Note:*						
B.2.1.	Is the basic assumption of the	[1][6]	Document	1. Checked: the baseline scenario assumes that the	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
	baseline methodology appropriate in the context of the project activity?		Review	proposed project displaces electricity that would be otherwise generated by coal-based power plants and electricity imports from abroad.		
B.2.2.	Are the key information and data used to determine the baseline scenario such as variables, parameters and data sources properly described?	[1][2] [6]	Document Review	1. Checked: in accordance with ACM0002 (version 06) the Operating Margin and Build Margin are estimated using ex ante data including electricity supplied to the grid, fuel consumption, and 2006 IPCC emission factors.	OK	OK
B.2.3.	Has the baseline been determined in a transparent and conservative manner?	[1][2] [6]	Document Review	1. Checked: it is transparently and clearly described how to select the Simple OM method to calculate the baseline emission factor for the proposed project.	OK	OK
B.2.4.	Has the baseline been established on a project-specific basis?	[1][6]	Document Review	1. Checked: the baseline scenario is determined based on project-specific data and information.	OK	OK
B.2.5.	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][6]	Document Review Interview	1. Checked: currently preferential tariffs apply to renewable electricity generation in Macedonia. But, large HPPs like the proposed project are not eligible to such preferential treatment under the established policies.	OK	OK
B.2.6.	Is the baseline determination compatible with the available data?	[1][6]	Document Review	1. Checked: key data for determination of baseline are available and based on reliable sources.	OK	OK
B.2.7.	Have the major risks to the baseline been identified?	[1][6]	Document Review Interview	1. Major Non-conformity 1: the typical average technical lifetime for the pre-existing hydropower facilities is not explicitly determined in the PDD. The country-specific or sector-specific technical lifetime should therefore be determined taking into account common practices in the sector and country.	Major NC	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
B.2.8.	Are all literature and sources clearly referenced?	[1][6]	Document Review	1. Minor Non-conformity 2: official statistics and documents such as the 2006 IPCC Guidelines and 2003 Annual Report of Electric Power Company of Macedonia are appropriately used in calculating the baseline emission factor. However, some of sources of data used for calculation of emission reductions, for example, electricity generation of year 2006, are unclear in the PDD.	Minor NC	OK
B.3.	**Description of how the anthropogenic emissions of GHG by sources are reduced below that would have occurred in the absence of the registered CDM project activity** *Note:*					
B.3.1.	Are the discussion and demonstration of the addtionality of the project activity transparent?	[1][3]	Document Review	1. Major Non-conformity 2: refer to Checklist Question B.3.2 below.	Major NC	OK
B.3.2.	Is it demonstrated/justified that the project activity itself is not a likely baseline scenario, as applicable, using the additionality demonstration tool proposed by the CDM Executive Board?	[1][3] [7]	Document Review	1. Major Non-conformity 2: demonstration of investment barriers and barriers due to prevailing practices is weakly substantiated. For example, the IMF report, one of key documented evidences, is not properly referenced, and it is not transparent why the project is the first of its kind in the country.	Major NC	OK
B.3.3.	Is it showed why the emissions in the baseline scenario would likely exceed emissions in the project scenario by analyzing both scenarios?	[1]	Document Review	1. Checked: in accordance with the ACM0002 methodology the proposed project is to make renewable-based electricity capacity additions and thereby reduce GHG emissions that would otherwise occur by fossil-fueled electricity generation.	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity *Note:*						
B.4.1.	Is the project boundary clearly defined?	[1]	Document Review	1. Checked: The geographic and system boundaries of the project are clearly described.	OK	OK
B.4.2.	Is the project boundary consistent with the baseline methodology selected?	[1]	Document Review	1. Checked: the project boundary is consistent with application of the ACM 0002 version 06.	OK	OK
B.5. Details of baseline information, including the date of completion of the baseline study and the name of person(s)/entity(ies) determining the baseline *Note:*						
B.5.1.	Is the detailed baseline information sufficiently provided in Annex 3 to the PDD?	[1]	Document Review	1. Checked: Annex 3 includes key information for determination of the baseline	OK	OK
B.5.2.	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	1. Checked: The date of completion of the baseline study is July 2007 and the entity determining the baseline scenario is Mitsubishi UFJ Securities Co., Ltd.	OK	OK
B.5.3.	Is the contact information clearly provided and is it indicated that the person/entity is a project participant listed in Annex 1?	[1]	Document Review	1. Checked: The entity determining the baseline methodology is indicated in Annex 1 to the PDD	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
C. Duration of the Project/ Crediting Period *It is assessed whether the temporal boundaries of the project are clearly defined.*						
C.1. Duration of the project activity *Note:*						
C.1.1.	Has the project's starting date been chosen as the date on which the implementation or construction or real action of the project activity begins?	[1]	Document Review	1. Checked: the starting date of the proposed project activity is 8 January 2001	OK	OK
C.1.2.	Is the operational lifetime of the project activity clearly defined and reasonable?	[1]	Document Review	1. Checked:	OK	OK
C.2. Choice of the crediting period and related information *Note:*						
C.2.1.	If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	[1]	Document Review	1. Checked: since the starting date of the project activity is before the date of validation, the project proponents has provided a documented evidence that the financial benefits from the CDM had been seriously considered officially since 1999 prior to the start date of the project activity, January 2001.	OK	OK
C.2.2.	Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting	[1]	Document Review	1. Checked: the crediting period for the proposed project activity is seven years with renewal	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
	period of max. 10 years)?					
C.2.3.	Is the assumed crediting time chosen as below the operational lifetime of the project activity?	[1]	Document Review	1. Checked.	OK	OK
C.2.4.	Are the starting date and length of the crediting period clearly and properly stated?	[1]	Document Review	1. Checked: the first crediting period starts in 1 October 2007 and lasts over seven years	OK	OK
D. Application of a monitoring methodology and plan	*In this section it is assessed whether the monitoring plan is properly established in accordance with the baseline methodology ensuring reliable emission reductions*					
D.1.	**Name and reference of approved monitoring methodology applied to the project activity** *Note:*					
D.1.1.	Has the monitoring methodology been previously approved by the CDM Methodology Panel?	[1][6]	Document Review	1. Checked: The ACM0002 (version 06) has been applied	OK	OK
D.1.2.	Are the title and reference lists as well as the details of the approved monitoring methodologies in the CDM web site properly referred to?	[1][6]	Document Review	1. Checked: the CDM website has been properly referred to	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
D.2. Justification of the choice of the methodology and why it is applicable to the project activity *Note:*						
D.2.1.	Is the monitoring methodology the one deemed most applicable for this project and is the appropriateness justified?	[1][6]	Document Review	1. Checked: the ACM0002 (version 06) relates to renewable electricity generation for a grid.	OK	OK
D.2.2.	Is it transparently showed that the project activity meet the applicability conditions under which the methodology is applicable?	[1][6]	Document Review	1. Checked: The project design document shows transparently that the proposed project meet the applicability conditions	OK	OK
D.2.3.	Does the monitoring methodology reflect good monitoring and reporting practices?	[1][6]	Document Review	1. Minor Non-conformity 3: electricity supplied to the grid will be directly measured by electric meters and double- checked with receipt for sales. But, the monitoring plan does not include measurement of auxiliary electricity consumption within the hydropower plants	Minor NC	OK
D.2.4.	Does the methodology address possible monitoring errors or uncertainties addressed?	[1][6]	Document Review	1. Checked: monitoring equipment will be calibrated to the highest international standards and regularly maintained by the project staff.	OK	OK
D.2.5.	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the **greenhouse gas emissions within the project boundary** during the crediting period?	[1][6]	Document Review	1. Checked: hydropower plant projects are regarded as emitting almost zero greenhouse gases (GHGs).	OK	OK
D.2.6.	Have the formulae used to	[1][6]	Document	1. Ditto	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
	estimate project emissions been clearly described?		Review			
D.2.7.	Are the formulae consistent with the formulae outlined in the description of the baseline methodology?	[1][6]	Document Review	1. Ditto	OK	OK
D.2.8.	Will it be possible to monitor / measure project emissions as described in the monitoring plan?	[1][6]	Document Review	1. Ditto	OK	OK
D.2.9.	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining the **baseline emissions** during the crediting period?	[1][6]	Document Review	1. Checked: the baseline emissions will be estimated by calculating Combined Margin, weighted average of Operating Margin and Build Margin.	OK	OK
D.2.10.	Have the formulae used to estimate baseline emissions been clearly described?	[1][6]	Document Review	1. Checked: the formulae used to estimate OM and BM are clearly described.	OK	OK
D.2.11.	Are the formulae consistent with the formulae outlined in the description of the baseline methodology?	[1][6]	Document Review	1. Checked:	OK	OK
D.2.12.	Will it be possible to monitor / measure baseline emissions as described in the monitoring plan?	[1][6]	Document Review	1. Checked: baseline emissions are estimated on an ex-ante basis.	OK	OK
D.2.13.	Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining **leakage**?	[1][6]	Document Review	1. Checked: there are no increased emissions identified that would occur outside the project boundary.	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
D.2.14.	Have the formulae used to estimate leakage emissions been clearly described?	[1][6]	Document Review	1. Ditto	OK	OK
D.2.15.	Are the formulae consistent with the formulae outlined in the description of the baseline methodology?	[1][6]	Document Review	1. Ditto	OK	OK
D.2.16.	Will it be possible to monitor / measure leakage as described in the monitoring plan?	[1][6]	Document Review	1. Ditto	OK	OK
D.2.17.	Have the formulae used to estimate **emission reductions** been clearly described?	[1][6]	Document Review	1. Checked: The formulae for estimation of emission reductions are clearly described	OK	OK
D.2.18.	Are the formulae consistent with the formulae outlined in the description of the baseline methodology?	[1][6]	Document Review	1. Checked: The formulae are described consistently between the sections of baseline methodology, and monitoring methodology and plan	OK	OK
D.3.	**Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored** *Note:*					
D.3.1.	Have procedures for monitoring, taking measurements and reporting been identified or planned?	[1]	Document Review	1. Checked: electricity supplied to the grid will be taken by electric meters hourly and recorded monthly. This data will be used for calculation of emission reductions. In addition, ISO 9001 and ISO 14001 are adopted by ELEM, the project participant and will guarantee precision of monitoring.	OK	OK
D.3.2.	Have procedures for training of monitoring personnel been	[1]	Document Review	1. Checked: the power plant personnel will be trained in the operation of all monitoring equipments	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
	identified or planned??					
D.3.3.	Have procedures for emergency preparedness been identified or planned??	[1]	Document Review	1. Checked: any irregularities or problems with equipment will be reported to the Technical Department and rectified as soon as possible.	OK	OK
D.3.4.	Have procedures for calibration of equipment been identified or planned?	[1]	Document Review	1. Checked: monitoring equipment will be calibrated to the highest international standards and regularly maintained by the project staff.	OK	OK
D.3.5.	Have procedures for review or checks of reported results/data been identified or planned?	[1]	Document Review	1. Checked: the CDM Center Coordinator as appointed by ELEM, the project participant will ensure that data has been collected as per the requirements of the PDD and contains no errors	OK	OK
D.3.6.	Have procedures for internal audits to confirm that the project has been monitored as planned, been identified or planned?	[1]	Document Review	1. Checked: ISO 9001 and ISO 14001 are adopted by ELEM, the project participant and will guarantee precision of monitoring.	OK	OK
D.4.	**Operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity** *Note:*					
D.4.1.	Are the authority and responsibility of project management clearly described?	[1]	Document Review	1. Checked: ELEM, the project participant will appoint the CDM Coordinator at each plant in order to supervise all the project management.	OK	OK
D.4.2.	Are the authority and responsibility for monitoring, measurement and reporting project emission,	[1]	Document Review	1. Checked: data collection and instrument calibration will be undertaken by the ELEM's Technical Department and consolidation of results from various	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
	baseline emission and leakage data over time clearly described?			plants on a monthly basis by the ELEM's Production Department, preparation of emission reduction and monitoring reports by the ELEM's Investment and Development Department		
	D.5. Name of person/entity determining the monitoring methodology *Note:*					
	D.5.1. 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	1. Checked: the entity determining the monitoring methodology is indicated in Annex 1 to the PDD	OK	OK
	E. Estimation of GHG emissions by sources *In this section, it is assessed whether the project design address all relevant formulae and data with regard to emission reductions*					
	E.1. Estimate of GHG emissions by sources *Note:*					
	E.1.1. Are all significant direct and indirect GHG emissions within the project boundary estimated for each gas, source, formulae/algorithm, emissions in units of CO_2 equivalent?	[1]	Document Review	1. Checked: hydro power projects are regarded as emitting almost zero greenhouse gases (GHGs)	OK	OK
	E.1.2. In the case of direct monitoring of emission reductions, are directly estimated emission reductions provided?	[1]	Document Review	1. Ditto.	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
E.1.3.	Are the project emissions calculations documented in a complete and transparent manner?	[1]	Document Review	1. Ditto	OK	OK
E.1.4.	Have conservative assumptions been used to calculate project emissions?	[1]	Document Review	1. Ditto.	OK	OK
E.1.5.	Are uncertainties in the project emissions estimates properly addressed in the documentation?	[1]	Document Review	1. Ditto	OK	OK
E.2. Estimated leakage *Note:*						
E.2.1.	Have the leakage effects been properly accounted for in calculations, for each gas, source, formulae/algorithm, emissions in units of CO_2 equivalent?	[1]	Document Review	1. Checked: there are no increased emissions identified that occur outside the project boundary.	OK	OK
E.2.2.	Are the leakage calculations documented in a complete and transparent manner?	[1]	Document Review	1. Ditto	OK	OK
E.2.3.	Have conservative assumptions been used when calculating leakage?	[1]	Document Review	1. Ditto	OK	OK
E.2.4.	Are uncertainties in the leakage estimates properly addressed?	[1]	Document Review	1. Ditto	OK	OK
E.3. The sum of E.1 and E.2 representing the project activity emissions *Note:*						

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
E.3.1.	Does the sum of estimated GHG emissions within project boundary and estimated leakage clearly represent the emissions attributable to project activity?	[1]	Document Review	1. Ditto	OK	OK
E.4.	**Estimated anthropogenic emissions by sources of greenhouse gases of the baseline** *Note:*					
E.4.1.	Are all baseline emissions identified in the baseline methodology estimated for each gas, source, formulae/algorithm, emissions in units of CO_2 equivalent?	[1][2]	Document Review	1. Checked: the baseline emissions for the proposed project have been estimated mainly using three-year electricity generation and fuel consumption data for each generation type.	OK	OK
E.4.2.	Are the baseline emissions calculations documented in a complete and transparent manner?	[1][2]	Document Review	1. Checked: the calculation process for the Simple OM and BM is transparently described in Section B.6.3.	OK	OK
E.4.3.	Have conservative assumptions been used when calculating baseline emissions?	[1][2]	Document Review	1. Checked: emission factor of imported electricity is assumed to be zero from the conservative viewpoint. In addition, country-specific net calorific value for lignite is used for calculation of baseline emissions.	OK	OK
E.4.4.	Are uncertainties in the baseline emission estimates properly addressed in the documentation?	[1][2]	Document Review	1. Minor Non-conformity 2: some of sources of data used for calculation of emission reductions, for example, electricity generation of year 2006, are unclear in the PDD.	Minor NC	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity *Note:*						
E.5.1. Does difference between the project emissions and baseline emissions clearly represent the emission reductions due to the project activity?		[1]	Document Review	1. Checked: since it is assumed that the proposed project releases almost zero greenhouse gases (GHGs), additional electricity generation by the proposed project relative to the pre-existing plants is equal to the emission reductions attributable to the project.	OK	OK
E.6. Table providing values obtained when applying formulae above *Note:*						
E.6.1. Are all significant values obtained form calculation provided in the Table?		[1]	Document Review	1. Checked: the table in the Section B.6.2 of the project design document provides key values for estimating emission reductions.	OK	OK
E.6.2. In the case of ex post calculation of baseline emission rates, has proper justification been provided?		[1]	Document Review	1. Checked: the baseline emission rate has been fixed on an ex ante basis.	OK	OK
F. Environmental Impacts *In this section, it is assessed whether documentation on the analysis of the environmental impacts is properly assessed.*						
F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts *Note:*						
F.1.1. Is the project likely to create any adverse environmental effects?		[1]	Document Review	1. Checked: the proposed project includes replacement of equipment only without any construction works	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
				that can affect the environment.		
F.1.2.	Has an analysis of the environmental impacts of the project activity been sufficiently described?	[1]	Document Review	1. Ditto	OK	OK
F.1.3.	Are transboundary environmental impacts considered in the analysis?	[1]	Document Review	1. Ditto	OK	OK
F.2.	**Provision of conclusions and all references to support documentation of an EIA undertaken in accordance with the procedures as required by the Host Party (if environmental impacts are considered significant by the project participants or the Host Party)** *Note:*					
F.2.1.	Does the project comply with environmental legislation in the host country including requirements for an Environmental Impact Assessment?	[1]	Document Review	1. Checked: in accordance with Art. 56 of the Energy Law of Macedonia, no environmental impact assessment is required for rehabilitation projects.	OK	OK
F.2.2.	Have identified environmental impacts been addressed in the project design?	[1]	Document Review	1. Ditto	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
G. Stakeholder Comments *In this section, it is assessed whether comments from local stakeholders have been invited and due account has been taken of any comments received.*						
G.1. Brief description how comments by local stakeholders have been invited and compiled *Note:*						
G.1.1.	Is the process clearly described by which comments by local stakeholders have been invited and compiled?	[1]	Document Review	1. Checked: a stakeholders' consultation process had been carried out in the period of May 14th to June 13th.	OK	OK
G.1.2.	Has an invitation for comments by local stakeholders made in an 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?	[1]	Document Review	1. Checked: project description was posted on the ELEM's website as well as the bulletin boards in the seven municipalities located closest to the project sites, and stakeholders were invited to submit their comments by e-mail, fax, or mail.	OK	OK
G.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	1. Checked: project description that was provided to the stakeholders includes purposes, scopes, and benefits of the project.	OK	OK
G.2. Summary of the comments received *Note:*						
G.2.1.	Have relevant stakeholders been consulted?	[1]	Document Review	1. Checked: three positive and supportive comments were received as a result of the stakeholder's	OK	OK

KEMCO	Validation Checklist	Reference	Assessment Methods	Comments	Draft Conclusion	Final Conclusion.
				consultation.		
G.2.2.	Is a summary of the comments received provided?	[1]	Document Review	1. Checked: the comments received are summarized in Section G..2.	OK	OK
G.3.	**Report on how due account was taken of any comments received** *Note:*					
G.3.1.	Has due account been taken of any comments received?	[1]	Document Review	1. Checked: detailed answers were sent to the participants who had raised questions during the stakeholders' consultation.	OK	OK

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Appendix C

Review of Corrective Action

Non-conformities	Reference	Corrective Actions	Comments
1. Major non-conformity 1: the typical average technical lifetime for the pre-existing hydropower facilities is not explicitly determined in the PDD. The country-specific or sector-specific technical lifetime should therefore be determined taking into account common practices in the sector and country.	Checklist B.2.7	In its Section B.4 the revised PDD provides justifications for a conservative approach to determination of the typical technical lifetime of a hydropower plant in Macedonia as 70 years.	The determination of the typical technical lifetime of a hydropower plant in Macedonia deemed conservative and well substantiated.
2. Major non-conformity 2: demonstration of investment barriers and barriers due to prevailing practices is weakly substantiated. For example, the IMF report, one of key documented evidences, is not properly referenced, and it is not transparent why the project is the first of its kind in the country.	Checklist B.3.1~2	In its Section B.5 the revised PDD demonstrates that the project is the first of its kind project in Macedonia for overall and comprehensive plant-wide rehabilitation of the hydropower generation system, and financing the project was not viable due to the vulnerability of the banking system and a continuing loss.	The revised PDD sufficiently addresses the demonstration of investment barriers and barriers due to prevailing practices to implementation of the proposed project.
3. Minor non-conformity 1: there is lack of explanation about what type of measures are undertaken for each hydropower plant as part of the project activity in the PDD.	Checklist A.4.3	In its Section A.2 the revised PDD provides brief history and details of rehabilitation measures for each hydropower plant.	Full descriptions about rehabilitation activities taken for each hydropower plant are provided for sufficient understanding of the purpose and additionality of the project activity.
4. Minor non-conformity 2: some of sources of data used for calculation of emission reductions, for example, electricity generation of year 2006, are unclear in the PDD.	Checklist B.2.8	In its Annex 3 the revised PDD specifies data sources for baseline information.	Data sources for baseline information deemed clear and reliable.

Non-conformities	Reference	Corrective Actions	Comments
5. Minor non-conformity 3: the monitoring plan does not include measurement of auxiliary electricity consumption within the hydropower plants.	Checklist D.2.3	In its Section B.7 the revised PDD includes monitoring of electricity imported from and exported to the grid as well.	The revised monitoring plan sufficiently addresses monitoring of auxiliary electricity consumption of the project activity

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Appendix D

CVs of Validators

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Personal History

Name	Woo, Jaehak (Mr.)		
ID No.	-	Phone No.	(031) 260 – 4831
Date of employment/ Contract date	4 JAN 1990	Scope of Qualification	Sectoral Scope 1
Classification	☐ Full-time Validator/verifier ■ Full-time Lead Validator/verifier ☐ Part-time Validator/verifier ☐ Part-time Lead Validator/verifier ☐ Technical Expert ☐ Committee member( ) ☐ Others( )		
Organization	Korea Energy Management Corporation	Position	Team Leader, Korea CDM Certification Office

	Description
Educational background	1) 1982-1986 Seoul National University, College of Engineering, Mining and Petroleum Engineering (Bachelor of Science) 2) 1986-1988 Seoul National University, College of Engineering, Mining and Petroleum Engineering (Candidate Master of Science)
Work experience	1) 2006: Undertook validation of Yangyang Renewable Energy Project (3MW Wind power and 1.4MW Hydroelectric power), KOSEP hydroelectric projects, and LG Chem Fuel Switching Project 2) 2006–Present: Carrying out Corporate GHG Inventory Verification Prototype Project (LG Chem and SK corp.) 3) 2005-Present: Providing support in implementation of national policies for climate change mitigation 4) 2004: Engaged in establishing the plan on national sustainable development in the energy sector as an expert in the National Sustainable Development Committee 5) 1999-2003: Managed resources technology R&D projects 6) 1993-1998: Managed energy efficient technology R&D projects 7) 1990-1992: Managed new and renewable energy technology R&D projects
Certificate	
Training	Completed training course for GHG auditors - Date: 2 Jan. 2006 ~ 6 Jan. 2006 (44 hours) - Training organization: Korea Energy Management Corporation
Publications	
Linguistic abilities	1) Korean: A 2) English: A

Date of preparation : 28 November 2006

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Personal History

Name	Han, Seung-Ho (Mr.)		
ID No.	-	Phone No.	(031) 260 – 4883
Date of employment/ Contract date	March 1, 2000	Scope of Qualification	Sectoral Scope 1
Classification	■ Full-time Validator/verifier ☐ Full-time Lead Validator/verifier ☐ Part-time Validator/verifier ☐ Part-time Lead Validator/verifier ☐ Technical Expert ☐ Committee member( ) ☐ Others( )		
Organization	Korea Energy Management Corporation	Position	GHG Auditor, Korea CDM Certification Office

	Description
Educational background	1) 1990-1994 Yonsei University, Department of Science, Physics (Bachelor's degree) 2) 1995-2000 Seoul National University, Environmental Studies, Urban Planning major(Mater's degree)
Work experience	March 2000 – present: Project Coordinator, GHG Auditor, Korea CDM Certification Office, Korea Energy Management Corporation 1. 2006: Conducted validation of several CDM projects: - Yangyang Renewable Energy Project; - LG Chem Fuel Switching Project; - Taishir Hydro Power Project in Mongolia; - Durgun Hydro Power Project in Mongolia; - Hangyeong second phase hydroelectric power plant 2. 2005: Conducted validation of the Gangwon Wind Park Project 2002～2004: Developed the manual and procedures for a CDM certification. 3. 2001～2004: Performed analysis of GHG reduction potentials for a heat pump project, refinery waste recovery project, wind power project and landfill gas utilization project. 4. 2000～2001: Produced reports on Climate Change and renewable energy policies of developed countries
Certificate	1) Certificate of Environmental Engineer(1st) 2) Environmental Auditor (ISO 14001)
Training	Completion of the training course for environmental auditors (ISO 14001) - Date: 21 Jan. 2002 ～ 25 Jan. 2002 (44 hours) - Training organization: Korean Standards Organization
Publications	1) Master's thesis "A study on GHGs mitigation options through forestry projects"(2000) 2) General Approaches to Validation of CDM Projects (2005) 3) Analysis on Leakage Effects Attributable to CDM Projects (2006) 4) Application of Approved Baseline Methodologies for CDM Projects in Korea-Case Study: Landfill Gas-to-Electricity Projects (2006) 5) Assessment of Data Uncertainty in Verifying Corporate GHG Emissions(2006) 6) Clean Development Mechanism, an Innovative Tool for Combating Climate Change Under the UNFCCC (2006)
Linguistic abilities	1) Korean: A 2) English: A
Date of preparation : 5 March 2007	