



VALIDATION REPORT

LA VUELTA AND LA HERRADURA HYDROELECTRIC PROJECT IN COLOMBIA

REPORT No. 2005-1429

REVISION No. 02

DET NORSKE VERITAS



VALIDATION REPORT

Date of first issue: 2005-11-15	Project No.: 28624562
Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: MGM International	Client ref.: Fabian Gaioli

DET NORSKE VERITAS AS

DNV Certification

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
<http://www.dnv.com>
Org. No: NO 945 748 931 MVA

Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “La Vuelta and La Herradura Hydroelectric Project” in Colombia on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

The validation consists of the following three phases: i) a desk review of the project design, baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the project, as described in the project design document of 6 September 2006, meets all relevant UNFCCC requirements for the CDM is eligible as category ACM0002 CDM project activity and correctly applies the approved baseline methodology. Hence DNV requests the registration of the “La Vuelta and La Herradura Hydroelectric Project” project as a CDM project activity.

Report No.: 2005-1429		Subject Group: Environment	
Report title: La Vuelta and La Herradura Hydroelectric Project in Colombia.			
Work carried out by: Einar Telnes, Gustavo Godinez, Raman.K.V			
Work verified by: Michael Lehmann			
Date of this revision: 2006-10-23	Rev. No.: 02	Number of pages: 10	

Indexing terms	
Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism	Service Area Verification
	Market Sector
	Energy Industries (renewable/non renewable sources)
<input checked="" type="checkbox"/> No distribution without permission from the client or responsible organisational unit <input type="checkbox"/> free distribution within DNV after 3 years <input type="checkbox"/> Strictly confidential <input type="checkbox"/> Unrestricted distribution	

© 2002 Det Norske Veritas AS
All rights reserved. This publication or parts thereof may not be reproduced or transmitted in any form or by any means, including photocopying or recording, without the prior written consent of Det Norske Veritas AS.



<i>Table of Content</i>	<i>Page</i>
1 INTRODUCTION	1
1.1 Validation Objective	1
1.2 Scope	1
1.3 Description of Proposed CDM Project	1
2 METHODOLOGY	2
2.1 Review of Documents	4
2.2 Follow-up Interviews	4
2.3 Resolution of Clarification and Corrective Action Requests	4
3 VALIDATION FINDINGS	5
3.1 Participation Requirements	5
3.2 Project Design	5
3.3 Baseline Determination	5
3.4 Additionality	6
3.5 Monitoring Plan	7
3.6 Calculation of GHG Emissions	7
3.7 Environmental Impacts	8
3.8 Comments by Local Stakeholder	8
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS	8
5 VALIDATION OPINION	9
REFERENCES.....	10
Appendix A Validation Protocol	

***Abbreviations***

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CM	Combined Margin
CND	National Dispatch Centre of Colombia
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EE.PP.M	Empresas Publicas de Medellin E.S.P.
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NGO	Non-governmental Organisation
OCMCC	Columbian Office for Climate Change Mitigation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
SIN	Colombian Interconnected National System
UPME	Energy and Mining Planning Unit, Ministry of Energy and Mines
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

MGM International has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the “La Vuelta and La Herradura Hydroelectric Project” project (hereafter called “the project”) in Colombia.

The validation team consisted of the following personnel:

Mr Einar Telnes	DNV Certification Norway	Team Leader, Energy sector expert
Mr Gustavo Godínez	DNV Certification Norway	GHG auditor
Mr Raman K.V	DNV Certification India	GHG auditor,
Mr Michael Lehmann	DNV Certification Norway	Technical reviewer.

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002. The validation team has based on the recommendations in the Validation and Verification Manual /4/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 Description of Proposed CDM Project

The La Vuelta and La Herradura Hydroelectric project envisages the construction of two run-of-the-river hydroelectric power plants on La Herradura river for generation of total 31.5 MW electricity. The project construction started in February 2002 and the two sub-projects were commissioned during October and December 2004. The project will reduce GHG emissions by replacing electricity generation from existing fossil fuel power plants. The emission reductions will be accounted from January 2005. The total emission reductions from the project are estimated to be 481 566 tCO₂ during the first seven years crediting period, resulting in annual average emission reductions of 68 795 tCO₂.



2 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design, baseline and monitoring plan
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /4/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the “La Vuelta and La Herradura Hydroelectric Project” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term Clarification may be used where additional information is needed to fully clarify an issue.



Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A request for Clarification (CL) is used when the validation team has identified a need for further clarification.</i>

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

Figure 1 Validation protocol tables



2.1 Review of Documents

The PDD /1/, the first version of July 2003 and the latest version 06 of 6 September 2006 and several version of the PDD between these two versions, submitted by MGM International and additional background documents related to the project design and baseline were assessed during the validation.

2.2 Follow-up Interviews

On 6-9 January 2004, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of EE.PP.M, UPME, OCMCC and CND were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
CND	<ul style="list-style-type: none">➤ Power plant dispatch order➤ Data availability➤ Forecast generation potential
UPME	<ul style="list-style-type: none">➤ National expansion plan➤ Additionality
OCMCC	<ul style="list-style-type: none">➤ National CDM criteria➤ Sustainable development priorities➤ Local stakeholder involvement
EE.PP.M	<ul style="list-style-type: none">➤ Project design➤ Additionality➤ Baseline, monitoring and measurement

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for a positive conclusion on the project design. The requests for clarifications (CL) raised by DNV were presented to the project participant in a draft validation report and were resolved during communications between the project participants and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

Since modification to the project design were necessary to resolve DNV's concerns, the project participants decided to revise the PDD and resubmitted the PDD version 06 of 06 September 2006. After assessing the revised PDD, DNV issued this final validation report.



3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verifications and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The validation findings relate to the project design as documented and described in the revised and resubmitted project design document version 6 of 6 September 2006.

3.1 Participation Requirements

The project participants are the private entities Empresas Publicas De Medellin E.S.P (EE.PP.M) of Colombia and Electric Power Development Co. Ltd. of Japan. The Parties involved, i.e. Colombia as the host Party and Japan as the participating Annex I Party, meet the requirements to participate in the CDM. The DNA of Colombia, Ministry of Environment, Housing and Territorial development approved the project and authorised (EE.PP.M) to participate in this proposed CDM activity /2/, and the DNA of Japan has approved the participation of Electric Power Development Co. Ltd. and provided approval of voluntary participation /3/.

3.2 Project Design

The project activity consisted of the construction of two run-of-river hydroelectric projects on the La Herradura river in the Republic of Colombia. The project activity started in February 2002 and the two sub-projects were commissioned during October and December 2004. The location of the projects is clearly defined and the project uses technology which reflects current good engineering practice. The project developer has experience in the operation, maintenance and monitoring of similar projects and hence no initial training is envisaged.

The project contributes to sustainable development in Colombia through creating job opportunities and providing infrastructure in the remote project areas. The project also aims at providing capacity building to the local community. The DNA of Colombia has provided confirmation that the project assists in achieving sustainable development /2/.

The expected lifetime of the project is 50 years. A renewable crediting period of 7 years starting from 1 January 2005 is selected.

The project does not involve public funding from any Annex-I country.

All the necessary permits are in place.

3.3 Baseline Determination

The project applies the approved consolidated baseline methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (version 06). ACM0002 is applicable as the electricity generated by the project and supplied to the grid would otherwise have been generated by the operation of the existing grid connected power plants or by the addition of new generation sources partly based on fossil fuels as per the prevailing practice in Colombia. Three alternatives to the project activity have been considered (a) continuation of the current capacity addition trend, (b) implementation of the project activity without CDM benefits and (c) no implementation of any project. The selected baseline scenario



that E.E.P.P.M would not have implemented any project and that the electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin, is also justified.

The baseline emissions were calculated as the product of the electricity generation and the grid emission factor estimated by using option (c) for the operating margin (OM), the of dispatch data analysis (DDA) method. Both the OM and the build margin (BM) emission factor will be updated annually ex-post during the first crediting period. For the ex-ante forecast of emission reductions, the OM emission factor was determined based on data of the first seven months of 2005 and was calculated to be 0.5476 t CO₂/MWh. The build margin (BM) emission factor will be updated annually ex-post as per the option 2 of ACM0002 with the sample group of m plants consisting of the capacity addition in the electricity system that comprised 20% of the system generation (in MWh) and that had been built most recently. For the ex-ante forecast of emission reductions, the BM emission factor was calculated to be 0.2780 t CO₂/MWh, using the official data from UPME for the year 2004. The weight used for the calculation of the combined margin (CM) emission factor is 50%, and the combined margin emission factor arrived used to forecast emission reductions is 0.4128 t CO₂/MWh

The project boundaries have been clearly identified as being the two hydroelectric generating stations and the interconnected Colombian electric grid system (SIN).

3.4 Additionality

The project activity demonstrates additionality using the “Tools for the demonstration and assessment of additionality”.

Step 0: DNV was able to confirm the starting date of the project activity and was able to confirm the intention of the project participants to set up the project as a CDM activity by the correspondence with the Ministry of Colombia in September 2001. The correspondence with the Ministry of Colombia in September 2001 is evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity.

Step 1: The project identifies three possible scenarios, i.e. continuation of the current capacity addition trend, the implementation of the project without CDM assistance and no implementation of any project. All the scenarios are in line with the legal requirements of Colombia.

Step 2: The investment cost of the project is indicated to be 38.7 million US\$. It has been demonstrated that the NPV of the project activity is -9.1 million US\$ and it improves to 6.4 million US\$ on considering the CDM revenues (@ 20 US\$ per ton of carbon). It is also been demonstrated that the NPV of a thermal plant on simple cycle is 12.6 million US\$ while a combined cycle plant has a NPV of 135.9 million US\$. It is thus demonstrated that the project without CDM assistance is not economically attractive.

Step 3: Several barriers have been identified, amongst which the barriers due to political, sectoral and prevailing practice barrier are justified. The prevailing practice in Colombia is the capacity addition by thermal power plants due to the availability of vast reserves of fossil fuel and this forms a main barrier for implementing hydroelectric projects. Run of the river hydroelectric power projects have an increasing dependency on hydrological conditions. The need to locate the hydro power plants at the water source and the frequent guerrilla attacks on the transmission tower from the hydroelectric projects to the user areas form the social and institutional barriers.



It has been demonstrated that the alternative scenarios do not face these barriers to the same extent as the project does.

Step 4: Common practice since the 1994 electricity sector reform is the addition of thermal power plant capacity, considering the attractive returns and the vast reserves of fossil fuels available in Colombia as well as the current pricing of water resources. The only hydropower plant implemented after the reform started construction already prior the reform and is thus essentially distinct from the project.

Step 5: It has been established that CER revenues will contribute to alleviate the economic and financial hurdles of the project.

In conclusion, it has been sufficiently demonstrated that the project is not a likely baseline scenario and is thus additional to what would have happened in its absence.

3.5 Monitoring Plan

The project applies the monitoring plan as specified in ACM0002. The emission reductions will be directly measured by monitoring of the following parameters,

- hourly electricity generation of all power plants;
- hourly measurement of the electricity supplied to the grid from the project.
- yearly fuel consumption of all power plants (hourly fuel consumption data is not available): For power plants where the specific fuel consumption is not available, the fuel consumption is calculated based on the electricity generated and reported plant specific heat rate of the plant (in TJ/MWh)
- hourly dispatch order/merit order

The grid emission factor is calculated ex-post annually, using the combined margin emission factor as per ACM0002. The operating margin emission factor is calculated using the dispatch data analysis (DDA) method, and the data will be taken from CND and UPME. The collection of this data is included in the monitoring plan. The build margin emission factor is calculated as per the option 2 of the methodology, considering a sample group of plant consisting either of the five power plants built most recently or the power plant capacity additions in the electricity system that comprise 20% of the system generation and that have been built most recently. Official data from UPME will be used. The grid emission factor will be updated ex-post annually during the first crediting period.

Sufficient QA/QC procedures are in place and the data will be archived until two years after the end of the last crediting period. The electricity generation figures will be cross-checked with the sales receipts.

3.6 Calculation of GHG Emissions

All aspects related to direct GHG emissions as relevant to the project activity have been addressed and calculations presented in a transparent manner.

Being a renewable energy generation project, the project activity does not have project emissions. It is demonstrated that the threshold power density of the two sub components is greater than 10 and thus as per the EB23 (annex 5), potential project reservoir emissions need not be considered. The project also does not have any leakage.



The actual emission reductions will be measured ex-post. The project on implementation is expected to result in emission reduction to the extent of 68 795 t of CO₂ per year during the crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

3.7 Environmental Impacts

The project developer has commissioned an independent agency to perform the EIA study, complying with the requirements of the Colombian government. Environmental parameters like water quality and air quality are periodically monitored. The project also has in place an Environmental Management Plan for periodic monitoring of the main environmental parameters.

3.8 Comments by Local Stakeholder

A local stakeholder process has been performed by inviting the relevant stakeholders via adequate communication channels to comment on the project design. A summary of the comments received has been provided in the project document. No negative comments were received.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 30 September 2005 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 3 November 2005 to 2 December 2005.

No comments were received.



5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “La Vuelta and La Herradura Hydroelectric Project” in Colombia. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is Colombia and the Annex I Party is Japan. Both Colombia and Japan fulfil the participation criteria and approved the project and authorized the project participants. The DNA of Colombia confirms that the project assists in achieving sustainable development.

The project correctly applies ACM0002 (version 06) “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

By implementing the run-of -river hydroelectric power plant project, the project reduces electricity generation from fossil fuel based power plants in the Colombian electricity grid. Hence, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 68795 tCO₂e per year over the selected 7 year crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The project proponent has vast experience in the operation and maintenance of hydroelectric power plants and has quality management systems in place, which covers the training and monitoring procedures.

In summary, it is DNV’s opinion that the “La Vuelta and La Herradura Hydroelectric Project” in Colombia, as described in the PDD of 06 September 2006, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 (version 06). DNV thus requests the registration of the project as a CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ MGM, *La Vuelta and La Herradura Hydroelectric Project*, PDD, Version of July 2003, April 2004, Version 5 of 30 September 2005 and version 06 dated 06 September 2006
- /2/ DNA of Colombia, *Letter of Approval* dated 20 August 2004.
- /3/ DNA of Japan, *Letter of Approval* dated 11 August 2006.

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

- /4/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /5/ CDM EB, *ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources*, version 06 of 19 May 2006..
- /6/ CDM-EB, *Tool for the demonstration and assessment of additionality*, version 02 of 28 November 2005.

- o0o -

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	The project will assist Annex 1 Party Japan in achieving compliance.
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, CDM Modalities and Procedures §40a	OK	Table 2, 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.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK.	DNA of Colombia, Letter of Approval dated 20 August 2004. DNA of Japan, Letter of Approval dated 11 August 2006.
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	OK	Table 2, Section E
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, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	Project does not have any funding from Annex I Party.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	Colombia: Ministerio de Ambiente, Vivienda y Desarrollo Territorial

Requirement	Reference	Conclusion	Cross Reference / Comment
			Japan: Liaison Committee for the Utilization of the Kyoto Mechanism
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	Colombia ratified the Kyoto Protocol on 30 November 2001. Japan ratified the Kyoto protocol on 4 June 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	The assigned amount for Japan have been calculated and recorded.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	Japan has in place national system for estimating GHG emissions and a national registry.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. 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.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
16. 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	CDM Modalities and Procedures §40	OK	The PDD Version 5 was made publicly available on DNV's climate change website (www.dnv.com/certification/climate change) and Parties, stakeholders

Requirement	Reference	Conclusion	Cross Reference / Comment
			and NGOs were through the CDM website invited to provide comments during a 30 days period from 3 November to 2 December 2005. No comments were received.
17. 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	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	The project design document conforms to the UNFCCC-CDM-PDD format.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The subprojects of La Herradura and La Vuelta are located on the La Herradura river, under the municipalities of Canasgordas, Frontino and Abriaqui jurisdiction of Republic of Colombia.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The project's system boundary includes the 2 hydroelectric power projects (consisting of Francis turbines, generators). The grid electricity system considered for the determination of the OM and BM is the power plants connected physically to the electricity system of Colombia.		OK
A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR	The PDD envisages establishing two run-of-river power plants using Francis, horizontal axis hydraulic turbines. The type of turbines		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			selected for the projects are used in many hydroelectric projects around the world.		
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	The project uses environmentally safe and sound technology, used in many projects all over the world.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The project technology is widely in use in most of the hydroelectric power plants and is not likely to be superseded by efficient technology during the first 7 year crediting period.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR	No, EEPP.M has extensive experience in the operation of hydroelectric power plants. Hence, the project does not envisage any special training and maintenance efforts. This is deemed justified.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	No. However this is accepted for reasons stated in A.2.4, and considering the fact that the two projects would be operated under EE.PP.M's supervision.		OK
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	Yes, the project complies with the applicable sectoral legal framework and has received necessary environmental clearances. The project is also in line with the national policies and programmes by promoting the use of renewable energy sources (Law 697/2001).		OK
A.3.2. Is the project in line with host-country specific	/1/	DR	Yes. The project complies with the CDM		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
CDM requirements?			criteria of Colombia.		
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	Yes. The project is in line with the sustainable development criteria of the host country.		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes. In addition to the generation of electricity, the project will contribute to jobs creation.		OK
B. Project Baseline					
<i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology					
<i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/	DR	Yes. Approved methodology - ACM0002 titled "Consolidated baseline methodology for grid connected electricity generation from renewable sources" has been applied.		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	The project involves electricity capacity additions through two run of the river hydroelectricity projects and hence the baseline methodology is applicable for the proposed project and has been appropriately justified.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
B.2. Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR	<p>The methodology uses the approach - “existing actual or historical emissions”. This is applicable as the proposed project :</p> <ul style="list-style-type: none"> - was executed at a time when there were more of thermal plants additions to the Colombian grid, and - displaces fossil fuel based electricity that would otherwise be provided by the operation and expansion of the Colombian grid with thermal plants utilising the vast reserves of coal and Gas in the country. <p>The baseline has been determined using the combined margin (operating & build margin) as per the approved methodology ACM0002</p> <p>For calculating the operating margin emission factor the dispatch data analysis has been considered as the first methodical choice, as called-for in ACM0002.</p> <p>For the build margin, option 2 has been chosen i.e. the ex-post calculation of the emissions of the 20% most recent additions.</p> <p>The application of the baseline methodology, discussions and</p>		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			determination is transparent.		
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	The baseline scenario considered is the Colombian electricity grid power generation. The conservativeness of the baseline has been clearly presented.		OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	Yes, the baseline has been established on a project specific basis.		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	The Colombian national grid is dominated by hydro generation (65%). However, recent policies and the availability of the vast reserves of thermal resources presently favour power generation with fossil fuels.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	The baseline has been determined using data from reliable sources i.e. the CND. The method of calculating fuel consumption data for individual plant is from the electricity generated and the heat rate / specific consumption is to be explained. The availability of individual plant fuel consumption data in accordance with ACM0002 is to be verified. The worksheets for the calculation of the operating margin and Build margin are to be provided	GL1 GL2	OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	Yes. The baseline scenario is the same capacity addition by fossil fuel power plants. Given the vast resources of coal and natural gas in the country, this scenario is reasonable.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR	Yes, The project applies the additionality tools to demonstrate that the project activity itself is not a likely baseline scenario.	GL3 GL4	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>Step 0: The starting date is 1 February 2002. The project was considered as CDM project in September 2001. The letter is to be evidenced.</p> <p>Step 1: Three alternative scenarios have been identified i.e. (a) the installation of fossil-fuel power plant, (b) the project scenario with out considering CDM contributions and (c) no implementation of any project..</p> <p>All the baseline scenarios are in line with national legislation.</p> <p>Sept 2: The investment comparison analysis is applied: It is stated that in Colombia, IRR for a thermal power project on simple cycle is 10.36 % and that for combined cycle power plant 19 %. IRR of the project activity without the CDM benefits has been calculated. The NPV of the project is – 9.6 million US\$ without CDM benefits and improves to 9.4 million US\$ on considering the CDM revenues (20 US \$ per ton of carbon). The worksheets of the NPV and IRR calculations are to be provided.</p> <p>Step 3: A barrier analysis has been presented: The prevailing practice barrier is the addition of fossil fuel power plants, rather than hydro projects. The frequent guerrilla attacks on the transmission lines</p>		

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>connecting the hydro electric project is a major social and institutional barrier. Since the run-of the river project lacks a dam, the dependency on the hydrological conditions is very high and forms a barrier. The arguments presented on the barriers faced by the project activity are deemed as justified.</p> <p>Step 4: Through common practice analysis it has been sufficiently substantiated that the project is not common practise. Although more than 60% of the installed capacity is hydro power, the change in laws in 1994 has favoured the investment in fossil fuelled power plants.</p> <p>Step 5: The impact of the CER contributes to alleviate the hurdles identified in step 2 and 3.</p> <p>In conclusion, the project scenario is not a likely baseline scenario.</p>		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	The only risk to the baseline is related to a more renewable electricity generation mix at the margin. This is however not a problem because the actual baseline emission factor is calculated ex-post.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR, I	The project started construction on 1 February 2002 and the operational lifetime is 50 years, which is reasonable for a hydro power plant.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A renewable crediting period has been chosen, with the first crediting period of 7 years starting from 1 January 2005.		OK
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies the approved monitoring methodology – ACM0002, titled “Consolidated monitoring methodology for grid connected electricity generation from renewable sources”		OK
D.1.2. Is the monitoring methodology applicable for	/1/	DR	Yes, the application of the monitoring		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
this project and is the appropriateness justified?			methodology is appropriately justified.		
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	PDD D	DR	Though project monitoring activities and responsibility have been adequately addressed the following clarifications are required in Table D.2.1.3: The fuel consumption in power plants has been calculated based on the electricity generated and the heat rate (in TJ/MWh) or specific consumption (in tonnes fuel / MWh) whereas ACM0002 asks to measure the specific fuel consumption for each power plant. It is unclear whether this data is available in Colombia.	CL-4	OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	PDD D	DR	Yes, except for the above comments in D.1.3		OK
D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/I/	DR	As per the ACM0002 monitoring methodology, monitoring of project emissions are not applicable for run-of-river hydro electricity projects.		OK
D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data	/I/	DR	No leakage is expected to occur. The project sites do not have regulation dams		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
necessary for determining leakage?			and therefore, methane emissions from temporarily submerged areas do not occur.		
D.4. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	<p>The following needs to be monitored:</p> <ul style="list-style-type: none"> - hourly electricity generation of all power plants - yearly fuel consumption of all power plants - dispatch order/merit order - changes of power plants' specific consumption <p>The grid emission factor is calculated ex-post by the combined margin method. The operating margin will be calculated by the dispatch data analysis method, while the build margin is calculated using the option 2.</p>		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	IPCC values have been applied. It needs to be verified whether local values are available	CL-5	OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes, electricity generation as well as merit order is measured. As for fuel consumption, see B.2.5	CL-4	OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	<p>The project has an environmental management plan under which environmental parameters (water quality and air quality testing for Particular Matters is undertaken.</p> <p>However, there is no need to monitor specific sustainable development indicators as per Colombian law.</p>		OK
D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	EE.PP.M is responsible for the project management.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	EE.PP.M is responsible for the registration, monitoring, measurement and reporting.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	EE.PP.M have many years of experience in the field of power generation and have in place ISO 9001 certification with the training needs identified.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Yes, A contingency plan has been established, also since this is a run of the river hydro electric project no emergencies		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			are likely to occur.		
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Calibration of equipment will be as per the national standards (NTC 4856). EE.PP.M has its own accredited laboratory which will be used to establish the necessary metering accuracy.		OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Same as in D.6.3.		OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Yes, EE.PP.M will monitor the data of the electricity generated by the project and CND will provide data on the power generated by all the other power plants in the system. Electricity generation will be cross-checked with the sales receipts.	CL-1	OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Procedures are in place.		OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Uncertainty level of the data measured is expected to be low and standard QA/QC procedures have been established to take care of these.		OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	EE.PP.M through its ISO 9001 management systems has procedures for review of reported data. Also, review of data is done by third party audits and validated by the Colombian Regulation entity.		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	Yes, review of data is done by third party audits and validated by the Colombian Regulation entity.		OK
D.6.12. Are procedures identified for project performance reviews before data is submitted	/1/	DR	Procedures are in place. Performance		OK

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

Page A-15

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
for verification, internally or externally?			review is done by EE.PP.M.		
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Yes.		OK
E. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
E.1.Predicted Project GHG Emissions <i>The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	Yes, as per the ACM0002, run of the river hydroelectric projects there will be no project emissions.		OK
E.2.Leakage <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	As per the ACM0002, run of the river hydroelectric projects do not need to account for leakage.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.3. Baseline Emissions <i>The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	Yes. The Combined Margin is calculated based on the ex-post assessment of both OM and BM.		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes.		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	All the formulas are sufficiently described. However, instead of using fuel quantities from direct measurement as stated in the ACM0002 these are being calculated. IPCC default values of (OXID and EF) are used. The availability of country specific data as referred in ACM0002 is to be verified.	CL-1 CL-5	OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	Yes. The assumptions are in line with the methodology.		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	Yes, all the estimates have been derived from accepted international sources and the National Dispatch Centre of Colombia.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	There are no project emissions.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.4.Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	The project is expected to result in 481 566 tCO ₂ during the first seven years crediting period, resulting in annual average emission reductions of 68 795 tCO ₂		OK
F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	An EIA has been done for the project, and no significant negative impacts are noted.		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	Yes. The EIA has been approved.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	No, even though there is no regulation reservoir, the main impacts are on fish and the relocation of three households. These issues have been addressed.		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	There are no trans-boundary impacts from the project.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	Yes		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Yes. This is a pre-requisite for the host country DNA's approval.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
G. Stakeholder Comments <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	The authorities of the three surrounding municipalities have been surveyed.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR, I	Yes. Authorities of the three surrounding municipalities have been surveyed. This is deemed sufficient as there are no close-by residents. This has been clarified with the DNA of Colombia.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Yes.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Yes. A synthesis of the comments received has been summarised in the PDD. The comments were positive.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	Yes.		OK

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

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 1: The method of calculating fuel consumption data for individual plant is from the electricity generated and the heat rate / specific consumption is to be explained. The availability of individual plant fuel consumption data in accordance with ACM0002 is to be verified.	B.2.5, D.1.3, D.4.3, D.6.7, E.3.3	I think it was solved taking into account your comment about footnote 3, pg. 5, of ACM0002 and your recent e-mail. EEPPM has used heat rates since hourly fuel consumption of thermal plants serving the system is not available.	Since the hourly fuel consumption data are not available, heat rates and specific consumptions can be used. This is reasonable. Also the figures would give a conservative estimate. The CL is closed.
CL 2 The worksheets for the calculation of the operating margin and Build margin are to be provided	B.2.5	These worksheets are attached in a separate e-mail. One of them includes data on imports and exports that were used following methodological steps of ACM0002.	These have been provided and the CL is closed.
CL 3: EE.PP.M had expressed intention of developing this project as a CDM and had written to the Colombian ministry in September 2001. The copy of this letter may be evidenced.	B.2.7	These letters are attached in a separate e-mail	The letter has been evidenced. The CL is closed.
CL4: Worksheets of the NPV and IRR calculations have not been attached These are to be provided.	B.2.7	This worksheet only includes the analysis of LV&LH project, without any comparison to other alternatives for the company. It was decided to eliminate any comment to other alternatives for EEPPM since the specific financial analysis for that case is confidential. Taking into account that documents used to demonstrate additionality can not be considered confidential EEPPM has preferred to	The information is received and assessed and found satisfactory. CL is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		avoid entering in a new loop during registration. As a consequence the application of Step 2 of the additionality tool was slightly changed, deleting any reference to other investment options for EEPPM. The worksheet is attached.	
CL 5: IPCC values for oxidation factor and CO2 emission factor have been used instead of country specific values. It needs to be clarified whether local values are available	D.4.2, E.3.3	The fuel emission factors have been taken from IPCC values since country specific emission factors have not standard values due to they depend on the fields where the fuels are taken, e.g. there is not a unique emission factor for natural gas since thermal plants are receiving this gas from different distribution companies that use a combination of sources (different gas wells with very different gas properties - specific gravity, heating value, molecular weight, composition) not allowing to have a fixed national or regional value. Thus it is considered that the most conservative approach is to use IPCC values.	As the country specific emission factors do not have standard values due to the different sources of fields, the use of IPCC default values is justified. The CL is closed.

- o0o -