

# **VALIDATION REPORT**

## **CONSTRUCTION AND OPERATION OF THE HYDRAULIC POWER PLANT CHICOASÉN II**

**REF: CV-11117-12 MEX**

**CLIENT:**  
**CARBON SOLUTIONS DE MEXICO, S.A.  
DE C.V.**

**DATE: (2012/10/09)**

Reference No.	Date of first issue	Revision No.	Date of this revision
CV-11117-12 MEX	16/07/2012	02	09/10/2012
Client	Carbon Solutions de México, SA de CV		
Project Title	CONSTRUCTION AND OPERATION OF THE HYDRAULIC POWER PLANT CHICOASÉN II		
Project Participants	Comisión Federal de Electricidad (Public Entity) Carbon Solutions de México, SA de CV (Private Entity)		
Project Location	Project activity will be located at the Chicoasén municipality, in the State of Chiapas in Mexico. Coordinates are: CH1 - 16°59'6.65"N, 93° 9'54.49"W CH2 - 16°59'9.57"N, 93° 9'54.16"W		
Contact Person	Alberto Ramos Elorduy – Comisión Federal de Electricidad. Alfonso Lansero Valdés – Carbon Solutions de México, SA de CV.		
Operational Unit	--		
Applied Methodology/Version: ACM0002 version 12.3.0		Sectoral scope: 1 Technical area: 1.2	
First PDD Version: 1.0 Date of Issuance: 23/04/2012 Starting Date of GSP: 09/05/2012		Final PDD Version: 2.0 Date of Issuance: 28/06/2012	
Estimated Annual Emission Reduction:		299,436 tCO <sub>2</sub> e	
<b>Summary:</b> The summary should contain: <ul style="list-style-type: none"><li>- a brief description of the validation project and the GHG project</li><li>- the scope of validation</li><li>- the methodology and criteria used for validation</li><li>- any restrictions or uncertainties related to the validation</li><li>- main conclusions and corrective action requests when relevant</li><li>- summary of the validation opinion</li></ul> Carbon Solutions de México has commissioned Applus+ LGAI to perform a validation of the "Construction and operation of the hydraulic power plant Chicoasén II" in Mexico (hereafter referred to as "the project activity"). The scope of the validation is defined as an independent and objective review of the project design document, against the Kyoto Protocol requirements, UNFCCC rules and applicable CDM requirements. The validation report is finalized based on the assessment of the project design document through seeking for global stakeholder consultation comments, and applying standard auditing techniques including but not limited to document reviews, follow up actions (e.g. site visit, telephone or e-mail interviews) and also the review of the applicable approved methodology and underlying formulae and calculations. The report and the annexed validation protocol describes a total of 9 findings which include: <ul style="list-style-type: none"><li>• 2 Corrective Action Requests (CARs);</li><li>• 7 Clarification Requests (CLs);</li><li>• 0 Forward Action Requests (FARs).</li></ul> The PP has responded these findings by modifying the project design, rectifying the PDD and providing adequate additional explanations and evidences. Applus+ LGAI confirms that all the findings have been "closed out" before submitting the request for registration. As a summary of the validation, the review of the Project Design Documentation and the subsequent follow-up interviews have provided Applus+ LGAI with sufficient evidence for the determination of the project's fulfilment with all stated criteria. In our opinion, the project			

meets all relevant UNFCCC requirements for the CDM. Therefore, Applus+ LGAI recommends the project for registration by the CDM Executive Board if the letters of approval of all Parties involved will be available before the expiring date of the applied methodology or the applied methodology version respectively.

Validation Team	Roles	Organization
Miquel Picas Martínez	Lead Auditor / Team Leader	Applus+ LGAI
Adrián Ruíz Estrella	Trainee Auditor / Local Expert	Applus+ México
Agustín Salas	Trainee Auditor / Local Expert	Applus + México (Subcontracted)
Miquel Sitjes Cabanas	Technical Reviewer	Applus+ LGAI

## **ABBREVIATIONS**

Applus+ LGAI	LGAI Technological Center, S.A. (Applus+)
Applus+ México	Applus+ LGAI, México Branch
ACM	Approved Consolidated Methodology
AM	Approved Methodology
AMS	Approved Methodology Small Scale
BM	Build Margin
CAR	Corrective Action Request
CL	Clarification Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	greenhouse Gas(es)
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
IRR	Internal Rate of Return
KP	Kyoto Protocol
MP	Monitoring Plan
NGO	Non Governmental Organization
OM	Operational Margin
PDD	Project Design Document
PP	Project Participant
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation and Verification Manual

1	INTRODUCTION .....	7
1.1	OBJECTIVE.....	7
1.2	SCOPE.....	7
1.3	GHG PROJECT DESCRIPTION .....	7
2	METHODOLOGY.....	9
2.1	APPOINTMENT OF THE AUDIT TEAM .....	11
2.2	Document Review .....	17
2.3	Follow-up Interviews.....	17
2.4	Resolution of Clarification and Corrective Action Request.....	19
2.5	Internal Quality Control .....	19
3	VALIDATION FINDINGS .....	20
3.1	Approval.....	20
3.2	Participation .....	20
3.3	Project Design .....	21
3.4	Application of selected baseline and monitoring methodology .....	22
3.5	Project boundary .....	22
3.6	Baseline Identification .....	23
3.7	Additionality .....	23
3.7.1	Prior Consideration and continuous action to secure CDM status .....	24
3.7.2	Investment Analysis .....	25
3.7.2.1	Investment Analysis: Choice of approach.....	25
3.7.2.2	Investment Analysis: Input parameters .....	25
3.7.2.3	Investment analysis: Calculation and conclusion .....	26
3.7.2.4	Investment analysis: Sensitivity analysis.....	26
3.7.3	Barrier analysis .....	27
3.7.4	Common practice .....	27
3.8	Monitoring Plan.....	27
3.8.1	Parameters determined ex-ante .....	28
3.8.2	Parameters monitored ex-post .....	29
3.8.3	Management System and QA/QC.....	29
3.9	Calculation of GHG Emissions .....	29
3.9.1	Baseline emissions .....	30
3.9.2	Project emissions .....	31
3.9.3	Leakage emission .....	32
3.10	Environmental Impacts.....	32
3.11	Comments by Local Stakeholders.....	32
4	COMMENTS BY PARTIES, STAKEHOLDERS AND NGO's.....	33
5	FINAL VALIDATION OPINION .....	35
6	REFERENCES .....	36

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6.1	DOCUMENTATION PROVIDED BY THE PROJECT PARTICIPANTS.....	36
6.2	LETTERS OF APPROVAL .....	37
6.3	METHODOLOGIES, TOOLS AND OTHER GUIDANCE BY THE CDM EXECUTIVE BOARD 37	
6.4	LAWS AND REGULATIONS.....	37
7	ANNEX A .....	38

## **1 INTRODUCTION**

Carbon Solutions de México, SA de CV has commissioned Applus+ LGAI to perform a validation of the "Construction and operation of the hydraulic power plant Chicoasén II" in Mexico (hereafter referred to as "the project activity"). This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

### **1.1 OBJECTIVE**

The purpose of a validation is to perform 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 ACM0002 version 12.3.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable-sources" EB/2/. The validation was based on the requirements in the Validation and Verification Manual v01.2. EB/1/.

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.

Once Applus+ LGAI receives the PDD, it has been made publicly available on the UNFCCC website, which initiates a 30 days global stakeholder consultation process (GSC). The comments received has been taken into account and the details of actions taken to take due account of the comments during the validation process have been included Chapter 4 of the report.

### **1.3 GHG PROJECT DESCRIPTION**

The following description of the project as per PDD was verified during the on-site audit:

Project activity consists in the construction and operation of a hydroelectric facility in the bed of the Grijalva River. The hydroelectric facility will be located in the Chicoasén municipality, State of Chiapas, in southern Mexico.

The facility will operate with the water volume realized from the upstream hydroelectric facility Chicoasén I. The project will include the installation of 3 - 80MW Kaplan turbines with a total capacity of 240 MW.

The baseline scenario is the electricity delivered to the grid (National Interconnected System) by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

The project activity will reduce GHG emission by replacing fossil fuel based technologies to produce electricity. The proposed technology will use kinetic energy to move a power generator to produce electricity; this technology does not emit GHG gases.

The project activity will contribute to the sustainable development at the local, regional and global levels in the following ways:

Environmental sustainability:

- Use of renewable energy sources for electricity generation.
- Impulse of the environmental sustainability, diminishing exploitation and exhaustion of natural, finite and non-renewable resources, like oil and natural gas.
- Non generation of any significant negative environmental impact during the construction and implementation of the project.

Economic and social sustainability:

- Creation of new employment opportunities in the area (mainly during the construction but also along the lifetime of the HPP because maintenance and operation phases).
- Some regions in the country do not have energy generation infrastructures, the project activity will contribute to the improvement of the current situation satisfying the growing demand for electricity and making possible the distribution of energy to more isolated zones.

Applus+ LGAi confirms that the project activity meets the eligibility criteria for project activities.



## 2 METHODOLOGY

The project assessment is based on the "Clean Development Mechanism Validation and Verification Manual" version 01.2 EB/1/ and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the CDM project activity are appointed. Once the project is made available for the global stakeholder consultation process, the members of the assessment team carried out:

- I. A desk review of the project design documentation;
- II. Follow-up interviews with project stakeholders;
- III. The resolution of outstanding issues and the issuance of the final validation report and opinion.

The prepared validation report and other supporting documents then undergo an internal quality control before being submitted to the CDM-EB.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. Applus+ LGAi has developed a specific protocol customized for the project. The protocol demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating the identified criteria.

The validation protocol consists of three tables. The different columns in these tables are described in the tables below.

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

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organized in seven different sections. Each	Gives reference to documents where the answer to the checklist question or item is found.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further	Conclusions are presented based on the assessment of the first PDD version. 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). Clarification is used when the validation team	Conclusions are presented in the same manner based on the assessment of the final PDD version and further documents including

section is then further sub-divided. The lowest level constitutes a checklist question.		used to explain the conclusions reached.	has identified a need for further clarification. <b>Forward action request</b> to highlight issues related to project implementation that require review during the first verification	assumptions presented in the documentation.
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Validation Protocol Table 3: Resolution of Audit Findings			
<b>Type:</b>	<input type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Number:</b>			
<b>Raised by:</b>		<b>Ref. to checklist in table 1&amp;2:</b>	
<b>Description of the audit finding</b>	<b>Date:</b>		
The description of the audit finding should be clearly included here.			
<b>Project Participant's response</b>	<b>Date:</b>		
The responses given by the project participants during the communications with the validation team should be included here.			
<b>Documentation provided as evidence by Project Participant</b>			
The evidences provided by the project participants should be included here.			
<b>Auditor's assessment comment</b>	<b>Date:</b>		
This section should include how the audit finding is assessed by the assessment team.			
<b>Conclusion by Lead Auditor</b>	<b>Date:</b>		
The conclusion made by the Lead Auditor should be included here.			

### **FINDINGS OVERVIEW**

	CARs	CLs	FARs
<b>Total Number raised</b>	2	7	0

<b>Type:</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR	<b>Number:</b>	1
<b>Raised by:</b>	Miquel Picas	<b>Ref. to checklist in table 1&amp;2:</b>		Table 1 MoC	
<b>Description of the audit finding</b>	<b>Date:</b>			17/07/2012	
Please provide the Modalities of Communication to the DOE.					
<b>Project Participant's response</b>	<b>Date:</b>			30/08/2012	
The Modalities of Communication format was provided to the DOE. This document has been signed by the two PPs of the project.					
<b>Documentation provided as evidence by Project Participant</b>					
Please refer to the documents: MoC under VVM (12/09/2012)					
<b>Auditor's assessment comment</b>	<b>Date:</b>			12/09/2012	
PP has provided the format for the Modalities of Communication which is dated on 29/06/2012 and signed by Mr. Alberto Ramos Elorduy on behalf of Comisión Federal de Electricidad. Although section 2 was signed by the representative of the CFE, it has not been signed by the Carbon Solutions Representative. After the reception of the MoC final version MoC it has been checked that Carbon Solutions Representative has signed the MoC.					

<b>Conclusion by Lead Auditor</b>	<b>Date:</b>	21/09/2012
According to the modifications made the CAR is considered CLOSED OUT.		

Type:	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR	Number:	2
Raised by:	Miquel Picas	Ref. to checklist in table 1&2:			Table 1 GSP
Description of the audit finding				Date:	17/07/2012
Please provide an answer for comments received during the GSP.					
Project Participant's response				Date:	38/08/2012
The comments and questions placed during the global stakeholders consultation have been answered as clearly as possible. To every question a wide and positive response was given.					
Documentation provided as evidence by Project Participant					
Please refer to the following document where the questions/comments have been answered: P124_VAL_130.					
Auditor's assessment comment				Date:	12/09/2012
Comments received during the GSP where included in section 4 of this report.					
Conclusion by Lead Auditor				Date:	12/09/2012
PP has responded correctly to the comments received during the GSP. The CAR is CLOSED OUT.					

Type:	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR	Number:	1
Raised by:	Miquel Picas	Ref. to checklist in table 1&2:			Table 2 A.4.1.1
Description of the audit finding				Date:	17/07/2012
1) Coordinates included in PDD correspond to the affected area identified in the E.I.A., please modify the project activity coordinates indicating those corresponding to the dam.					
2) Also include in PDD where the transmission line will connect to the Mexican National Interconnected System.					
Project Participant's response				Date:	30/08/2012
The coordinates of the project have been updated according to the blueprints provided by CFE. In the new version of the PDD there are included only the coordinates corresponding to the dam. Also in this new version the transmission line where the project will be connected to was included. This information is in the sections A.4.1.4 and A.4.3.					
Documentation provided as evidence by Project Participant					
Please refer to the PDD version 2: P124_VAL_141					
Auditor's assessment comment				Date:	12/09/2012
1) PP has provided a new version of the PDD which includes the coordinates where the dam will be located. Coordinates provided and included in the PDD have been crosschecked with those taken during the on-site visit, and are found correct.					
2) As stated in section A.4.3 of the PDD, the project will be interconnected to the Chicoasén II Substation and therefore it will be connected to the transmission line Manuel Moreno Torres-Ocozocuatla.					
Conclusion by Lead Auditor				Date:	12/09/2012
According to the modifications made on the PDD, the Clarification is considered CLOSED OUT.					

<b>Type:</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR	<b>Number:</b>	2
<b>Raised by:</b>	Miquel Picas	<b>Ref. to checklist in table 1&amp;2:</b>		Table 2 B.4.2	

<b>Description of the audit finding</b>	<b>Date:</b>	17/07/2012
In PDD section B.4 It has to be described how each step of the "Combined tool to identify the baseline scenario and demonstrate additionality" has been applied and transparently document the outcome of each step.		
<b>Project Participant's response</b>	<b>Date:</b>	30/08/2012
<p>Due that the methodology ACM0002 on its 4<sup>th</sup> page states the following:</p> <p><b>"II. BASELINE METHODOLOGY PROCEDURE</b></p> <p><b>Identification of the baseline scenario</b></p> <p>If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:</p> <ul style="list-style-type: none"> <li>Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the .Tool to calculate the emission factor for an electricity system."</li> </ul> <p>We know what the baseline scenario is. As the project activity is the installation of a new grid-connected renewable power/plant unit, it becomes clear that the "Combined tool to identify the base-line scenario and demonstrate additionality" does not have to be used (the baseline scenario is given by the methodology because of the nature of the project activity) and only the additionality has to be demonstrated. For this purposes, the "Tool for demonstration and assessment of additionality" was used. Please refer to PDD's section B.5.</p>		
<b>Documentation provided as evidence by Project Participant</b>		
Please refer to PDD version 2, section B.5 P124_VAL_141		
<b>Auditor's assessment comment</b>	<b>Date:</b>	12/09/2012
As indicated by PP and according to the ACM0002, it has to be used the Tool to calculate the emission factor for an electricity system, also the step by step use of the Tool for demonstration and assessment of additionality is indicated in section B.5.		
<b>Conclusion by Lead Auditor</b>	<b>Date:</b>	12/09/2012
According to the clarifications made the CL can be considered CLOSED OUT.		

Type:	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR	Number:	3
Raised by:	Miquel Picas	Ref. to checklist in table 1&2:		Table 2 B.5.2.7	
Description of the audit finding				Date:	17/07/2012
A. Please provide evidence of the following items: 1) How the investment cost has been determined. 2) How the O&M cost has been determined. 3) It has to be clearly indicated where the present value factor has taken from. 4) How the total cost of water use has been determined. 5) How it has been determined the discount rate. 6) How the self consumption has been determined. 7) How the plant load factor has been determined.					
B. It has to be clarified why O&M total is multiplied by 106 in sheet 2.A LEC Chicoasen II cell F48.					
C. Also it has to be clarified why the total cost of water use is multiplied by 106 in sheet 2.A LEC Chicoasen II cell F58.					
Project Participant's response				Date:	30/08/2012

- 1) How the investment cost has been determined.  
Evidence of the determination of the investment has been provided to the DOE, please refer to document P124\_VAL\_133.
- 2) How the O&M cost has been determined.  
Evidence of the determination of the O&M cost has been provided to the DOE. The determination goes according to what is stated in the COPAR 2011, an official publication of the Mexican government and used to compare energy investment projects. Please refer to document P124\_VAL\_046 pages 5.4 and 5.5 and to the economic model P124\_VAL\_139.
- 3) It has to be clearly indicated where the present value factor has been taken from.  
The present value was calculated according to the COPAR 2011. This document is elaborated by CFE for the Federal Mexican Government when comparing two different energy projects. Please refer to page 186/331 to see calculation. The equation used is also presented in different websites.

Please refer to the following:

- [http://en.wikipedia.org/wiki/Present\\_value](http://en.wikipedia.org/wiki/Present_value)
- <http://www.accountingcoach.com/online-accounting-course/80Xpg03.html>

Evidence of the former is contained in the document P124\_VAL\_046, first section page 21/331

- 4) How the total cost of water has been determined  
The evidence of how the total cost was determined is contained on document P124\_VAL\_142 "Ley Federal de Derechos 2010". Please refer to page 234 where the cost of the water for hydroelectric uses appears. In such document it is to be seen how the total cost of water was determined according to official prices and laws of the Mexican government.
- 5) How it has been determined the discount rate.  
The document P124\_VAL\_140, on page 6/8 Section V contains an explanation of why this discount rate was used. As stated in the document, that is the official discount rate for projects and services of public federal administration and is determined by the Mexican Ministry of Finance (SHCP). Also please refer to P124\_VAL\_046, first section page 1.1
- 6) How the self consumption has been determined.  
The self consumption of energy was also obtained from the COPAR 2011, an official Federal document. The document presents the energy generation facilities 'self consumption of energy according to their generation technology. Please refer to page 3.7 of the mentioned document (Table 3.3). For more information please refer to the document P124\_VAL\_046.
- 7) How the plant load factor has been determined.  
Please refer to the document P124\_VAL\_134 for more information. Also please refer to the documents P124\_VAL\_135 and P124\_VAL\_136 for a summary of the calculation methodology, equations used and a spreadsheet of the hydrologic study.

- B. It has to be clarified why O&M total is multiplied by 106 in sheet 2.A LEC Chicoasén II cell F48.

The cell was multiplied by  $10^6$  because in the calculation of the "220.01\$USD/MW" in the "2.Parameters" tab the figures needed were also divided by  $10^6$ . As an example of this, please refer to the cells B23-R23, B26-R26, B352-R32, B41-R41, B44-R44 and B50-R50 (see division by  $10^6$ ), which are needed to calculate the final O&M total in cell S68 (this is the calculation of the 220.01, which is later multiplied by  $10^6$ , this procedure was followed to keep the figures smaller and more easy to read).

- C. Also it has to be clarified why the total cost of water use is multiplied by 106 in sheet 2.A LEC Chicoasén II cell F58.

The cell was multiplied by  $10^6$  because in the calculation of the "841.50 \$USD/MW" in the "2.Parameters" tab the figures needed were also divided by  $10^6$ . As an example of this, please refer to the cells B20-R20, B38-R38, B56-R56 (see division by  $10^6$ ), which are needed to calculate the final Water Use Total in cell S56 (this is the calculation of the 841.50, which is later multiplied by  $10^6$ , this procedure was followed to keep the figures smaller and more easy to read).

Documentation provided as evidence by Project Participant		
Please refer to the economic model: P124_VAL_139		
<b>Auditor's assessment comment</b>	<b>Date:</b>	12/09/2012
<p>A. Evidence of the following items:</p> <ol style="list-style-type: none"> <li>1) PP has provided the Construction budget (P124_VAL_133), the total amount of investment for the construction it is estimated in 395,095,000 USD.</li> <li>2) The determination of the O&amp;M cost is made using the COPAR 2011</li> <li>3) As indicated before, PP uses the O&amp;M cost that is taken from COPAR 2011, which is used by the Mexican Government in order to compare two different energy projects.</li> <li>4) According to the clarification made, the total cost of water is determined using official prices included in P124_VAL_142 on page 234.</li> <li>5) As stated by PP the discount rate is 12%, which is taken from P124_VAL_140 and P124_VAL_046.</li> <li>6) According to the information provided by PP, the consumption</li> <li>7) The self consumption has been determined according to the COPAR 2011.</li> <li>8) The plant load factor is calculated as it is indicated in P124_VAL_134.</li> </ol> <p>B. As indicated by PP, data in 2.Parameters sheet is first divided by <math>10^6</math>, then cell F48 in sheet 2.A LEC Chicoasén II is correctly multiplied by <math>10^6</math>.</p> <p>C. As indicated by PP, data it is firstly divided by <math>10^6</math> and then multiplied by <math>10^6</math>.</p>		
<b>Conclusion by Lead Auditor</b>	<b>Date:</b>	12/09/2012
As from the clarifications made by PP, the CL can be considered CLOSED OUT.		

Type:	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR	Number:	4
Raised by:	Miquel Picas	Ref. to checklist in table 1&2:			Table 2 B.5.2.9
Description of the audit finding				Date:	17/07/2012
Please clarify why the expected lifetime in calculations and PDD is 50 years, when in the authorization for construction and operation emitted by SEMARNAT it is stated to be 30 years.					
Project Participant's response				Date:	30/08/2012
The permit given by SEMARNAT, the life time of the equipment and the operational life of the project are different things. SEMARNAT does not base the lifetime of the permits on the lifetime of the equipment or project. SEMARNAT has its own time frames on permits and CFE has to assure the energy provision in the future. Also 50 years of operational life is normal for a hydroelectric facility, please refer to the following link: <a href="http://en.wikipedia.org/wiki/Hydroelectricity">http://en.wikipedia.org/wiki/Hydroelectricity</a>					
Also such lifespan for hydroelectric projects is to be seen in the COPAR 2011, please refer to P124_VAL_046 page 3.7, table 3.3.					
Documentation provided as evidence by Project Participant					
COPAR 2011 P124_VAL_046					
Auditor's assessment comment				Date:	12/09/2012
Expected lifetime as indicated by PP is 50 years, according to the information provided in P124_VAL_046.					
Conclusion by Lead Auditor				Date:	12/09/2012
According to the information provided, the clarification can be considered CLOSED OUT.					

<b>Type:</b>	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR	<b>Number:</b>	5
<b>Raised by:</b>	Miquel Picas	<b>Ref. to checklist in table 1&amp;2:</b>		Table 2 B.5.2.12	



<b>Description of the audit finding</b>	<b>Date:</b>	17/07/2012
According to the Guidelines for the reporting and validation of plant load factors (v.01), please provided evidences on how the Plant Load Factor for the HPP Ing. Manuel Moreno Torres is determined.		
<b>Project Participant's response</b>	<b>Date:</b>	30/08/2012
A summary of the hydrologic study of the project is to be seen on the document P124_VAL_136. Also the basic equation used is to be seen on the document P124_VAL_134. Also on the document P124_VAL_135 an explanation of the project specific subjects of the hydroelectric project Ing. Manuel Moreno Torres is given. Among these are to be seen: <ul style="list-style-type: none"> <li>• Hydroenergetic</li> <li>• Historical generation of Chicoasén</li> <li>• Annual mean generation of the project</li> <li>• Ecological water intake and miniturbine</li> <li>• Conclusions</li> </ul>		
<b>Documentation provided as evidence by Project Participant</b>		
The evidences provided by the project participants should be included here.		
<b>Auditor's assessment comment</b>	<b>Date:</b>	12/09/2012
The Plant Load Factor is determined according to the formulae included in P124_VAL_134, in document P124_VAL_135 it is indicated that the plant load factor was 0,27.		
<b>Conclusion by Lead Auditor</b>	<b>Date:</b>	12/09/2012
According to the evidences provided by PP, the clarification is considered CLOSED OUT.		

Type:	<input type="checkbox"/> CAR	<input checked="" type="checkbox"/> CL	<input type="checkbox"/> FAR	Number:	6
Raised by:	Miquel Picas	Ref. to checklist in table 1&2:			Table 2 B.8.2
Description of the audit finding				Date:	17/07/2012
Please modify the PDD in order to include in the timeline of events of the project activity the validation that is going on, and other events such as the contract between C.F.E. and Carbons Solutions de México, SA de CV. Also, please provide copy of the e-mails sent by PP to the UNFCCC and the Mexican DNA for prior consideration.					
Project Participant's response				Date:	30/08/2012
The Table 6. Timeline of events of the project activity was changed and the following dates were included: <ul style="list-style-type: none"><li>• Site validation visit.</li><li>• Contract between Carbon solutions de México SA de CV and CFE celebration date.</li></ul> The e mails corresponding to the PRIOR CONSIDERATION were also sent to the DOE.					
Documentation provided as evidence by Project Participant					
Please refer to PDD version 2 P124_VAL_141 Carbon Solutions de México SA de CV to SEMARNAT Prior Consideration sending date P124_VAL_105 Carbon Solutions de México SA de CV to UNFCCC Prior Consideration sending date P124_VAL_070					
Auditor's assessment comment				Date:	12/09/2012
PDD version 2 has been modified, including intention letter between C.F.E and Carbon Solutions de México, SA de CV dated on 31/01/2012, also it has been included the reception of the prior CDM consideration (31/01/12), the on-site validation (26/06/2012 – 28/06/2012).					
Conclusion by Lead Auditor				Date:	12/09/2012
With the modifications included in the PDD version 2, the clarification can be considered CLOSED OUT.					

<b>Type:</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR	<b>Number:</b>	7
<b>Raised by:</b>	Miquel Picas	<b>Ref. to checklist in table 1&amp;2:</b>	Table 2 D.1
<b>Description of the audit finding</b>		<b>Date:</b>	17/07/2012
Please provide Chapter IV of the EIA to the DOE.			
<b>Project Participant's response</b>		<b>Date:</b>	30/08/2012
The requested chapter of the environmental impact study was provided to the DOE.			
<b>Documentation provided as evidence by Project Participant</b>			
Please refer to document P124_VAL_146			
<b>Auditor's assessment comment</b>		<b>Date:</b>	12/09/2012
After the revision of the documentation provided, the audit team has requested PP to provided full version of the Chapter IV as the document provided corresponds to Chapter V of the EIA. On 13/09/2012 PP has submitted the documented requested.			
<b>Conclusion by Lead Auditor</b>		<b>Date:</b>	21/09/2012
After the revision of the EIA, the clarification is considered CLOSED OUT.			

## 2.1 APPOINTMENT OF THE AUDIT TEAM

According to the sectoral scopes / technical area and experiences in the sectoral or national business environment, Applus+ LGAI has composed a project validation team in accordance with the appointment rules in Applus+ LGAI. The composition of audit team has to be approved by the Applus+ LGAI ensuring that the required skills are covered by the team. The four qualification levels for team members that are assigned by formal appointment rules as below:

- Leader Auditor (LA)
- Auditor (A)
- Auditor Trainee (T)
- Technical Experts (E)

It is required that the sectoral scope / technical area linked to the methodology has to be covered by the assessment team.

Name	Qualification	Scope coverage	Technical Area coverage	Financial aspect	Host Country experience
Miquel Picas	LA	Y	Y (1.2)	Y	Y
Adrián Ruíz	T	Y	Y (1.2)	N	Y
Agustín Salas	T	Y	Y (1.2)	N	Y

### Technical Reviewer:

- Miquel SITJES CABANAS

The curricula vitae of the DOE's validation team members are provided below:

**Miquel Picas Martinez** (B. Sc. Degree in Environmental Science, Farleigh Dickinson University, NJ, USA) He has 10 of work experience in quality and environmental management systems consultancy and auditing, since he joined Applus+ LGAI he has performed quality and environmental audits and CDM, VCS, greenhouse gases verifications and others. He also worked in the Spanish Construction industry for 3 years as Quality, Environmental and Health and Safety Manager.

**Adrián Ruíz Estrella** (Degree in Environmental Technology Engineering, Technological University of Nezahualcóyotl – México). He has 13 years of experience in conformity assessment in both voluntary and mandatory standards in different industrial and service sectors both public and private organizations. Is a Lead Auditor appointed by Applus+ México,



verifier of ISO 9001/ISO14001/OSHAS 18000. Before he joined Applus+ México, he had been worked in assessments of Corporate Social Responsibility and for certification bodies Calmecac, ANCE, GL, IQS as Lead Auditor for 10 years.

**Agustín Salas Martínez** (Industrial Engineering in Chemistry – Instituto Politécnico Nacional – Mexico). He has over 15 years of work experience in quality and environmental management systems consultancy and auditing enrolled in different certification bodies such as Calidad Mexicana Certicada, AC and AENOR de México, SA de CV. During his stage at AENOR hi had participated in various validations of project activities under the CDM requirements. Since the second half of 2011 he works as Free-lance and collaborates with Applus + LGAI among other certification bodies.

**Miquel Sitjes Cabanas** (B. Sc. degree in Chemistry 1975, Universidad de Barcelona – Spain). He has 15 years of experience in a Spanish chemical group company specialized in the manufacturing of raw chemical products, where he worked as the Manager of Quality Control, Production Manager and Environmental Manager. He also worked in the Spanish pharmaceutical industry for 7 years as Quality, Manufacturing and Environmental Manager. He has been working in the Applus+ LGAI Technological Centre since 1999: he started working there as an auditor (quality, environment, CDM, VCS, greenhouse gas verification and others) and since 2006 he has been the Systems Certification Technical Manager.

## 2.2 DOCUMENT REVIEW

The Project Design Document submitted by the Client was reviewed against the approved methodology and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in Chapter 6 to this report.

## 2.3 FOLLOW-UP INTERVIEWS

During the period of 27-28 June 2012, Applus+ LGAI performed interviews, telephone conferences, and physical site inspection with project stakeholders to confirm selected information and to resolve issues identified in the document review. The main topics of interviews are summarized in following table.

INTERVIEWED ORGANIZATION/PERSONNEL		INTERVIEW TOPICS
COMISIÓN FEDERAL DE ELECTRICIDAD	Oscar Armendariz	Project background information. Project Technology, operation, maintenance and monitoring. Stakeholder consultation process. Project status.
	Fco. Javier Hernández	
	Federico López de Alba	
	Juan José Mendoza	
	Hugo A. Guerrero	
	A. Barbara Pérez	
	J. Manual Covo	
	Sergio Palafox	
	Oscar Calahorra	
	Lidia Vázquez	
	Javier Mendoza	
	Rafael Garcia	
	Julio César Espinosa	
	Ricardo Armas	
	Alejandro Armendariz	

INTERVIEWED ORGANIZATION/PERSONNEL		INTERVIEW TOPICS
Carbon Solutions de México, SA de CV	Fernando Lappe Ivonne Alejandra Sanchez	Project Description, CDM consideration, Baseline identification, Project Boundary. Additionality, Baseline Calculation, prior CDM consideration and monitoring.
Local Stakeholders	Marín I. Ramírez	Stakeholders survey opinion about the project activity.
	Ernestino Pérez	
	Federico López	
	Parmeno Pérez	
	Santiago Hernández	
	José Pérez	
	Samuel Muñoz	
	Lauro Rodas	
	José Juan Velasco	
	Ulises Collazo	
	Gregorio Hernández	
	Isabel Castellanos	
	José Esteban Pérez	
	Rosauyo H. Pérez	
	Carmelino Gutiérrez	
	Antonio Hernández	
	Fermin Muñoz	
	Ramón López	
	Jorge Hernández	
	Marisela López	
	Asunción Núñez	
	Carmen Pérez	
	Bersain Gutiérrez	
	Hugo A. Nañez	
	Refugio Herrera	
	Apolonio Hernández	
	Guillermo Montoya	
	Elsa Hernández	
	Celín Saraoz	
	José D. Juárez	
	Heraclio Juárez	
	Bernardo Villa	
	Jorge Cuesta	

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## **2.4 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUEST**

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which needs to be clarified for Applus+ LGAI's positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by Applus+ LGAI were resolved during communications between the Client and Applus+ LGAI to guarantee the transparency of the validation process, the concerns raised and responses given are summarized in chapter 3 below and documented in more detail in the validation protocol as attached.

The final PDD (PP/38/) version submitted in September 2012 serves as the basis for the final assessment presented. Additional changes to the project during the validation process are not considered to be significant with respect to the main CDM objectives. The two CDM main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

## **2.5 INTERNAL QUALITY CONTROL**

As final step of a validation the final documentation including the validation report and the protocol have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the audit team approval can only be given by the other one.

After confirmation of the PP the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

### **3 VALIDATION FINDINGS**

In the following sections the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the original project design document and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Validation Protocol in Annex A.
- 2) Where Applus+ LGAI had identified issues that need clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Annex A.
- 3) Where Clarification or Corrective Action Requests have been issued, the exchanges between the Client and Applus+ LGAI to resolve these Clarification or Corrective Action Requests are summarized.
- 4) The conclusions for validation subject are presented.
- 5) The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

#### **3.1 APPROVAL**

The project participants are Comisión Federal de Electricidad (CFE) and Carbon Solutions de México, SA de CV both of Mexico. Mexico meets the requirements to participate in the CDM.

The DNA of the Mexico issued a LoA (LoA/1/) on 15/06/2012 authorizing Comisión Federal de Electricidad (CFE) and Carbon Solutions de México, SA de CV as project participants. Applus+ LGAI received this letter from the project participants directly and considers the provided letters as authentic.

The Mexican LoA has been checked against the UNFCCC CDM website, which confirms the approval of this CDM project.

Furthermore, after checking the provided LoA, Applus+ LGAI confirms that the letter refer to the precise proposed CDM project activity title in line with the title in the PDD "Construction and operation of the Hydraulic Power Plant Chicoasén II".

LoA also indicates that Mexico is a Party to the Kyoto Protocol, and that the participation in the "Construction and operation of the Hydraulic Power Plant Chicoasén II" is voluntary. The LoA also confirms that the proposed CDM project activity contributes to the sustainable development of Mexico (host country). Based on the information given in this letter, Applus+ LGAI considers the approval as unconditional with respect to these items.

The LoA has been issued by the Party DNA – Comisión Intersecretarial de Cambio Climático of (Interministerial Commission on Climate Change) Mexico. The LoA does not refer to a specific version of the PDD or validation report.

Applus+ LGAI confirms that the requirements of VVM v01.2 §§ 45-48 have been met.

#### **3.2 PARTICIPATION**

The participants on the project activity have been approved by the corresponding Party, which is confirmed by the issued LoA.

The means of validation used are similar to the ones described in Section 3.1, specifically in regard to the approval process of the project activity.

### 3.3 PROJECT DESIGN

The following description of the project as per PDD (PP/38/) was verified during the on-site audit:

The project activity consists in the construction and operation of a hydro power plant located in the Chicoasén municipality, State of Chiapas in Mexico.

The hydro power plant will operate the water volume released from the upstream hydro power plant Chicoasén I, also known as Ing. Manuel Moreno Torres and the Grijalva River flow. The construction of the facility includes the installation of 3 – 80 MW Kaplan turbines, with a total installed capacity of 240MW.

The electricity produced in the facility will be sent to the Mexican National Interconnected System (SIN).

Prior to the start of the construction of the project activity, no other facilities exist in the area where the hydro power plant is going to be installed.

The project activity complies with all host country regulations and permits and contributes to sustainable development at local, regional and global levels by:

- The use of renewable energy sources for electricity generation which otherwise would have been generated through fossil fuel power plants.
- Creating new employment opportunities in the area, main jobs will be created during the construction phase, but also along the lifetime of the hydro power plant because of maintenance and operation stages.

During the on-site assessment, the validation team has reviewed the following documents in order to verify the information contained in the PDD (PP/1/) and mentioned above:

- As indicated in section 3.1, the Letter of Approval emitted from Mexican DNA (LoA /1/).
- Gaceta Ecológica (Ecological Gazette) # DGIRA/037/11 edited by SEMARNAT on 07/07/2011, which informs about the request for a resolution on the EIA for the construction and operation of the HPP Chicoasén II. (LR/2/).
- Authorization for the construction and operation of the HPP Chicoasén II, with reference number SGPA/DGIRA/DG/6907, and dated on 08/09/2011 emitted by SEMARNAT. (PP/7/).
- Resolution about the Geological Exploration Studies, with reference number D.F.CHIS.SGPAU/UGA/2900/11 and dated on 08/07/2011 emitted by SEMARNAT. (PP/3/).
- Acknowledge Receipt of the Environmental Monitoring Plan, with reference number DF/SGPA/UGA/DIRA/4593/11 and dated on 07/11/2011. (PP/4/).
- Authorization in land use for the access roads construction, with reference number SGPA/DGGFS/712/1816/12 and dated on 20/06/2012 emitted by SEMARNAT (PP/5/).
- No involvement in cultural heritage, with reference number 401.F(4)90.2012/DCICH-252 and dated on 14/03/2012 emitted by National Institute of Anthropology and History. (PP/6/).
- Application for surface water exploitation, presented to CONAGUA (National Water Commission) on 07/09/2011 (PP/8/).
- Application for the extraction of materials, presented to CONAGUA (National Water Commission) on 11/10/2011. (PP/9/)
- Application for Federal land occupancy, presented to CONAGUA (National Water Commission) on 11/10/2011. (PP/10/)
- Application for hydraulic infrastructure, presented to CONAGUA (National Water Commission) on 07/09/2011. (PP/11/).
- Environmental Impact Assessment for Hydroelectric Project Chicoasén II, performed by University of Science and Arts of Chiapas (7 chapters) Coded as P124\_VAL\_024, P124\_VAL\_025, P124\_VAL\_026, P124\_VAL\_027, P124\_VAL\_028 and P124\_VAL\_029 and its Executive Summary coded and P124\_VAL\_030. (PP/12/).

Applus+ LGAI confirms that the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant forms and guidance for completing the PDD.

### 3.4 APPLICATION OF SELECTED BASELINE AND MONITORING METHODOLOGY

The project correctly applies the simplified baseline methodology for selected Approved consolidated baseline and monitoring methodology ACM0002 version 12.3.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable-sources"(EB/2/).

The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:

- The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs, or
- The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4W/m<sup>2</sup> after the implementation of the project activity, or
- The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m<sup>2</sup> after the implementation of the project activity

As indicated in PDD, the project consists in the installation of a new power plant for renewable electricity generation that will be connected to the National Interconnected System (SIN). Then the project consists of in the installation of a new hydropower plant.

A new water reservoir will be constructed and the power density of the power plant is greater than 4W/m<sup>2</sup> as the power density is 127.25W/m<sup>2</sup>.

Applus+ LGAI confirms that the emission sources, not addressed by the applied methodology and expected to contribute more than 1% of the overall expected average annual emission reductions, have not been identified.

Applus+ LGAI confirms that the application of the baseline methodology is transparent and conservative, and confirms that the chosen baseline and monitoring methodology i.e. ACM0002 version 12.3.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable-sources"(EB/2/)is applicable to the project activity.

### 3.5 PROJECT BOUNDARY

The project boundary is clearly defined as the physical and geographical site of the project boundary and includes the project power plant and all power plants connected physically to the electricity system that the CDM project activity is connected to.

Relevant documents assessed to confirm the project boundary are the following:

- Environmental Impact Assessment (PP/12/).
- Gaceta Ecológica (Ecological Gazette) # DGIRA/037/11 edited by SEMARNAT on 07/07/2011, which informs about the request for a resolution on the EIA for the construction and operation of the HPP Chicoasén II. (LR/2/).
- Authorization for the construction and operation of the HPP Chicoasén II, with reference number SGPA/DGIRA/DG/6907, and dated on 08/09/2011 emitted by SEMARNAT. (PP/7/).

Details and/or observations, if applicable, are listed in Annex A.

Applus+ LGAI confirms that the identified boundary is justified for the project activity.

Applus+ LGAi confirms that the identified boundary, the selected sources, and gases as documented in the PDD are justified for the project activity and are fully in line with the requirements set by the applied methodology.

### 3.6 BASELINE IDENTIFICATION

The determination of baseline scenario has been selected in accordance with the baseline Approved consolidated baseline and monitoring methodology ACM0002 version 12.3.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable-sources" (EB/2/).

The information presented in the PDD has been validated by an initial document review of all data. Further confirmation has been made based on the on-site visit and a review of information from similar projects and/or technologies. The sources referenced in the PDD have been quoted correctly. The information was verified against credible sources, such as the following:

- Energy Sector Outlook 2011-2025. Mexican Energy Ministry, SENER. (PP/13/).

Applus+ LGAi considers the baseline scenario is realistic and credible, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

In regard to item 87 of VVM 01.2, Applus+ LGAi confirms the following statements:

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

### 3.7 ADDITIONALITY

To demonstrate its additionality, PP has used the approved "Tool for demonstration and assessment of additionality" / version 06.0.0 (EB/3/) following all the steps defined on it:

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations.

Sub-step 1a. Definition of alternatives to the project activity.

As stated "Tool for demonstration and assessment of additionality ver 06.0.0" project activities that apply this tool in context of consolidated baseline methodology for grid-connected electricity generation from renewable sources ACM0002 version 12.3.0, only need to identify that there is at least one credible and feasible alternative that would be more attractive than the proposed project activity.

PP has identified as credible and feasible the following alternative:

1. The construction and operation of a fossil fuel power plant. In this case a natural gas combined cycle power plant has been chosen.  
PP chooses this kind of power plant because is the most efficient way to produce energy, and also because the facility chosen has the most expensive unitary electricity production cost among the natural gas combined cycle options.



2. Continuation of the current situation. CFE does not implement the project activity, then costumers will continue purchasing electricity from the Mexican grid, and more fossil fuels will be consumed. This scenario consists in the continuation of the current practices, which is the use of carbon intensive electricity sources in the National Interconnected System (SIN).

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

As indicated in PDD and in section 3.3 of this report, the project activity complies with all laws and regulations and especially with the Electric Public Services Law (LR/3/).

Step 2. Investment analysis.

See comments on section 3.7.2 Investment Analysis.

Step 3. Barrier analysis.

See comments on section 3.7.3 Barrier Analysis.

Step 4. Common practice analysis.

See comments on section 3.7.4 Common practice analysis.

**3.7.1 Prior Consideration and continuous action to secure CDM status**

The starting date of the project activity is expected on 31/10/2012 which determined by signing the tender contract of the construction. In order to corroborate this information, the assessment team has reviewed the Budget for bidding for the construction (PP/34/), and has verified this information with Comisión Federal de Electricidad personel during the on-site visit.

The starting date is determined to be 31/10/2012, which is after the GSC; therefore, it is confirmed that the project complies with the requirement.

The original documents presented have been reviewed and verified based on interviews with Oscar Armendariz, Fco. Javier Hernández, Federico López de Alba, Juan José Mendoza, Hugo A. Guerrero, A. Barbara Pérez, J. Manual Covo, Sergio Palafox, Oscar Calahorra, Lidia Vázquez, Javier Mendoza, Rafael Garcia, Julio César Espinosa, Ricardo Armas, Alejandro Armendariz, all of them representing Comisión Federal de Electricidad. Therefore, the documents are considered appropriate to confirm the prior consideration of CDM. Additionally, in order to confirm that the PPs have taken real actions to continue the activity as CDM, activities have been reviewed against the documents provided to the DOE and a timeline of events is shown in the table bellow

DATE	ACTIVITY	DOCUMENT	AUDITOR CONCLUSION
2006	The Energy Ministry's Electricity Sector Outlook 2005-2014 considers the additional income from the carbon market for those projects reducing GHG in order to make them economically feasible.	PP/15/	C.F.E is a company created and owned by the Mexican government. Then the indications made by the Mexican Energy Ministry have to be considered.
07/2011	The feasibility study of the project activity was carried out by CFE. In order to verify all the particular inputs of the project.	PP/16/	The Feasibility Report provided analyzes all requirements and specifications that the project activity has to comply with.
08/10/2011	Date that the project obtained the environmental approval from Ministry of	PP/7/	The authorization is issued by SEMARNAT and is for the construction and operation



DATE	ACTIVITY	DOCUMENT	AUDITOR CONCLUSION
	Environment and Natural Resources, SEMARNAT.		of the HPP Chicoasén II.
31/01/2012	Date that the Prior CDM Consideration was sent to UNFCCC and the Mexican DNA.	--	Prior consideration has been checked through the UNFCCC prior consideration <a href="#">website</a> . And it is registered on 31/01/2012.
31/01/2012	Date that the UNFCCC Secretariat confirms the reception of the Prior CDM Consideration.		
31/10/2012	Date that Comisión Federal de Electricidad, CFE estimates to sign the tender contract of the construction of the "Construction and operation of the Hydraulic Power Plant Chicoasén II"	--	On site interviews with CFE personnel.

By verifying the evidences mentioned above, Applus+ LGAI was able to confirm that these evidences are reliable and the benefits of the CDM were necessary in the project participant's decision to undertake the project activity as a CDM project activity. The continuing and real actions were taken to secure CDM status for the project activity in parallel with its implementation is sufficient.

Applus+ LGAI's confirms that the project activity complies with the requirements of the latest version of guidelines on the demonstration and assessment of prior consideration of the CDM.

### **3.7.2 Investment Analysis**

The PP uses the investment analysis to demonstrate the additionality.

The project is less economically or financially attractive than the baseline.

The financial returns of the proposed project are insufficient to justify the investment.

The parameters used in the financial calculations have been validated based on a review of the sources presented in the PDD (PP/38/), inter alia: Economic Model for Project Activity (PP/39/); O&M (Electricity Sector outlook 2009-2024(PP/18/); 2010-2025(PP/17/); 2011-2025(PP/13/)) and have been confirmed verbally on-site. Additionally, confirmation with Mexican Energy Ministry SENER and Economic Model for Project Activity (PP/39/), demonstrates that the parameters are plausible and acceptable under the project situation.

#### **3.7.2.1 Investment Analysis: Choice of approach**

PP has chosen the Investment Comparison Analysis (Option II), the financial indicator selected is the levelized cost of electricity production in \$/kWh, as stated in the COPAR (PP/14/). This indicator is used by Mexican government when comparing two electricity generation projects.

#### **3.7.2.2 Investment Analysis: Input parameters**

Applus+ LGAI has verified and crosschecked all the input values used for the levelized cost of electricity production calculations in the PDD submitted for registration. Applus+ LGAI compared the values stated in the PDD with values determined in the Economic Model for Project Activity (PP/39/), in the Costs and Parameters for the Formulation of Investment Projects in the Electricity Sector. COPAR (PP/14/) and was able to confirm that the input values are applied correctly in the PDD.

PARAMETERS	UNIT	VALUE	DATA SOURCE
Installed Capacity	MW	240.00	Feasibility Report (PP/16/), Authorization for the Construction and Operation of the HPP Chicoasén II (PP/5/).
Investment	USD \$	395,095,000	Budget for bidding for the construction (PP/34/)
Plant Load Factor	%	27	Feasibility Report (PP/16/)
Project economic life	Years	50	Feasibility Report (PP/16/)
Discount rate	%	12	Feasibility Report (PP/16/)
Self-consumption	%	0.5	Feasibility Report (PP/16/),
O&M Total	USD\$/MW	220.01	Economic Model for Project Activity (PP/39/)
Present Value Factor	-	0.18240	Economic Model for Project Activity (PP/39/)
Water use cost	USD\$/MW	841,50	Economic Model for Project Activity (PP/39/)

Further assumptions presented in the financial analysis have also been crosschecked and found appropriate based on evidences.

All parameters included in the spread sheet have been crosschecked to the sources of information. Sources include: Electricity Sector Outlook, Mexican Laws and regulations, etc.

### **Conclusion**

Based on the information verified, Applus+ LGAI confirms that all the compared parameters are in reasonable ranges. In addition, by applying our sectoral competence, Applus+ LGAI was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

### **3.7.2.3 Investment analysis: Calculation and conclusion**

The levelized cost of electricity production calculation was provided in a spread sheet. The project levelized cost of electricity production is demonstrated to be 108.57 \$USD/MWh without CDM involvement and for the Gas Combined Cycle is 60.68 \$USD/MWh, which confirms that the project is unattractive without the CDM revenue by comparing with benchmark value. Therefore the project levelized cost of electricity production analysis is considered correct.

### **3.7.2.4 Investment analysis: Sensitivity analysis**

Further sensitivity analysis was performed in order to check influence of the following sensitive factors used during the levelized cost of electricity production calculations, which contributed more than 20% to revenues or costs in order to check the robustness of the financial analysis

which is in line with the requirement of last version of "Guidance on the Assessment of Investment Analysis"(EB/4/):

PP has performed the sensitivity analysis using the investment and the Plant Load Factor. The departure variations cover a range of +10% and -10% of both investment and plant load factor.

After reviewing the results, the validation team concludes that the project is not the most economically attractive alternative taking into account the business as usual in Mexico, as the Mexican electricity market is dominated by thermal power plants.

### **3.7.3 Barrier analysis**

According to the "Tool for demonstration and assessment of additionality" version 06.0.0 (EB/3/) as the project activity is not economically / financially attractive, the barrier analysis (Step 3 of the tool) it is not necessary to perform the Barrier Analysis.

### **3.7.4 Common practice**

According to the Guidelines on Common Practice v.01.0 (EB/5/), PP follows the stepwise as indicated in the Guidelines on Common Practice v.01.0 (EB/5/):

Step1: Calculate applicable output range as  $\pm 50\%$  of the design output or capacity of the proposed project activity

The output range is 120-360MW.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project

PP has included in table 10 of the PDD, the list of power plants connected to the National Interconnected System, also it is indicated the type of process that each power plant uses.

$N_{all} = 34$ .

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity

$N_{diff} = 28$ .

Step 4: Calculate factor  $F = 1 - N_{diff}/N_{all}$  representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity

$F = 1 - N_{diff}/N_{all} = 1 - (28/34) = 0.17$ .

As F factor is less than 0.2 and  $N_{all} - N_{diff}$  is 6, therefore, it is confirmed that the proposed CDM activity is not a common practice in the defined region.

## **3.8 MONITORING PLAN**

The project applies the approved monitoring methodology Approved consolidated baseline and monitoring methodology ACM0002 version 12.3.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable-sources".(EB/2/). The selected monitoring methodology is applicable for the project.

The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions and contains principles and concepts on which it is based, operational and monitoring obligations of the project owner like resources involved in the monitoring process, training, support activities,

calibration and collection data, quality assurance procedures, data management, electronic support tools. It is Applus+ LGAI's opinion that the project participants are able to implement the monitoring plan.

### 3.8.1 Parameters determined ex-ante

According to the methodology ACM0002 version 12.3.0, it is determined that there are no leakage and project emissions and it was checked and confirmed by Applus+ LGAI during the site visit that there is no diesel generator on site.

The main parameters are listed in below table:

Data and Parameters	Unit	Value	Source	Auditor's conclusion
$EF_{grid, CM, y}$	tCO <sub>2</sub> /MWh	0.524	PDD	See section 3.9 Calculation of GHG Emissions below.
$EF_{CO_2, j, y}$	tCO <sub>2</sub> /GJ	Fuel Oil 75.5 kg/TJ	IPCC 2006.	It has been crosschecked that PP has applied the values included in the IPCC 2006 correctly.
		Natural Gas 54.3 kg/TJ		
		Diesel 72.6 kg/TJ		
		Coal 89.5 kg/TJ		
$A_{BL}$	m <sup>2</sup>	0	PP/12/	It has been checked out that PP applies correctly the value. As in the site there is no any reservoir before the project implementation.
$Cap_{BL}$	W	0	PP/12/	It has been checked out that PP applies correctly the value. As in the site there is no any reservoir before the project implementation.
$\eta_{m,y}$	%	Turbine Gas 40.67	PP/13/	It has been checked out that PP applies the correct values.
		Combined Cycle 52.86		
		Geothermal 100		
		Hydropower 100		
		Internal combustion 45.07		
$Cap_{PJ}$	W	240 x 10 <sup>6</sup>	PP/12/	It has been checked out that PP uses correct value.

Data and Parameters	Unit	Value	Source	Auditor's conclusion
$A_{PJ}$	$m^2$	1,886,000	PP/12/	It has been checked out that PP uses correct value.
$FC_{i,y}$	$m^3$	Various	PP/13/ PP/17/ PP/18/	It has been checked out that PP has taken and applies the correct data for each fossil fuel type and year.
$NCV_{i,y}$	TJ/t	Various	PP/13/ PP/17/ PP/18/	It has been checked out that PP has taken and applies the correct data for each fossil fuel type and year.

### 3.8.2 Parameters monitored ex-post

The parameters which will be monitored during crediting period are listed as below:

Data and Parameters	Unit	Measurement method	Auditor's conclusion
$EG_{\text{facility}, y}$	MWh	Continuous measurement and at least monthly recording	PP has applied the default measurement method that is established in the ACM0002 v.12.3.0

### 3.8.3 Management System and QA/QC

Quality assurance and quality control procedures for recording, maintaining and archiving data shall be assured according to CDM EB rules. A monitoring manual will be prepared as guideline for the monitoring staff. The purpose of the monitoring manual is to ensure the monitoring staff can conduct the monitoring activities in line with the methodology and relevant CDM rules.

## 3.9 CALCULATION OF GHG EMISSIONS

Applus+ LGAi has assessed the calculations of project emissions, baseline emissions, leakage, and emission reductions. Corresponding calculations have been carried out based on calculation spreadsheet. The parameters and equations presented in the PDD, as well as other applicable documents, have been compared with the information and requirements presented in the methodology and respective tools. An equation comparison has been made to ensure consistency between all the formulae presented in the calculation files and in the PDD, methodology, and tools.

The assumptions and data used to determine the emission reductions are listed in the PDD and all the sources have been checked.

Based on the information reviewed it is confirmed that the sources used are correctly quoted and interpreted in the PDD.

The values presented in the PDD are considered reasonable based on the documentation and references reviewed and the results of the interviews.

The baseline methodology has been applied correctly according to requirements.

The estimate of the baseline emissions are considered correct as the calculations have been reproduced by the assessment team with the attainment of the same results.

Detailed information on the verification of the parameters used in the equations is found in Annex A. The algorithms for the determination of the baseline, project, and leakage are discussed in the following sections.

According to the Approved consolidated baseline and monitoring methodology ACM0002 (version 12.3.0), PP uses the following equation.

Emission Reductions  $ER_y = BE_y - PE_y$ .

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average ex-ante estimation of emission reduction conservatively calculated to be 299,436 tCO<sub>2</sub>e per year for the selected 10 years crediting period. Total emission reductions during the crediting period are estimated to be 2,994,360 tCO<sub>2</sub>e. All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, and leakage emissions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

### **3.9.1 Baseline emissions**

The PDD was published on 23/04/2012 with the data for calculation of the grid emission factor at the time the PDD was received for validation.

According to the ACM0002 version 12.3.0 (EB/2/), PP calculates baseline emissions that only include CO<sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that will be displaced due to the project activity. The baseline emissions are calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid, CM, y}$$

As project activity is the installation of a new grid-connected renewable power plant  
 $EG_{PJ,y} = EG_{facility, y}$

Therefore  $EG_{facility, y}$  for the project activity is 571,852.8 MWh. This is calculated taking into account the installed capacity (240MW) multiplied by (8,760 hours/year) and by the Plant Load Factor (27.20%)

In order to calculate  $EF_{grid, CM}$ , PP uses the "Tool to calculate the emission factor for an electricity system" Version 02.2.1 (EB/6/).

#### Step 1: Identify the relevant electricity systems

PP has identified the Mexican National Interconnected System as the relevant electricity system as indicated in PDD.

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

PP has chosen Option I, only grid power plants are included in the calculation.

#### Step 3: Select a method to determine the operating margin (OM)

PP has chosen Simple OM. The justification and calculations for the selection of this method, has been validated and it is found appropriate to the project activity.

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

As indicated before, PP has chosen simple OM, following the tool (EB/6/), PP has chosen Option B, also the justification is transparent and has been validated by the validation team.

Then PP uses the following formulae (Option A1):

$$EF_{grid,OM,simple,y} = \frac{\sum_i FC_{i,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{EG_y}$$

PP takes data from 2008, 2009 and 2010 from the respective Energy Sector Outlook (PP/18/, PP/17/ and PP/13/).

The weighted OM is 0.6027 tCO<sub>2</sub>/MWh.

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

PP has chosen Option 1 using the following equation:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \cdot EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

PP takes data from 2004, 2005, 2006, 2007, 2008, 2009 and 2010 from the respective Energy Sector Outlook (PP/23/, PP/22/, PP/21/, PP/20/, PP/19/, PP/18/, PP/17/ and PP/13/).

The Build Margin is 0.4446 tCO<sub>2</sub>/MWh.

Step 6: Calculate the combined margin emissions factor

PP calculates the weighted average CM using the equation as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$$

Resulting on a Emission Factor Ex-ante of 0.524 tCO<sub>2</sub>/MWh.

After all, Baseline result in

$$BE_y = EG_{PJ,y} \times EF_{grid, CM, y}$$

$$BE_y = 571,852.8 \text{ MWh} \times 0.524 \text{ tCO}_2/\text{MWh}$$

$$BE_y = 299,436 \text{ as PP rounds the formula.}$$

All data, parameters and formula have been crosschecked from the spreadsheet provided during the validation, through its sources.

### **3.9.2 Project emissions**

According to the Approved consolidated baseline and monitoring methodology ACM0002 (version 12.3.0), PP uses the following equations:

Project Emissions;

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

PE<sub>FF,y</sub> does not apply as the project activity will not be any use of fossil fuels for electricity generation.

PE<sub>GP,y</sub> does not apply as the project activity does not involve the development of a geothermal electricity facility.

As indicated in PDD PE<sub>HP,y</sub> = 0 as project activity power density is 127.27 W/m<sup>2</sup>. Then PE<sub>y</sub>=0.

### **3.9.3 Leakage emission**

No leakage emissions are considered according to the ACM0002.

## **3.10 ENVIRONMENTAL IMPACTS**

An environmental impact assessment has been conducted by the project participants. The assessment team has reviewed the documentation of the presented information. The Environmental Impact Assessment for Hydroelectric Project Chicoasén II (PP/12/) confirms the correctness of the approach used by the PPs. In conclusion, the PPs have followed the requirements of the host country with regards to addressing environmental impacts.

## **3.11 COMMENTS BY LOCAL STAKEHOLDERS**

The relevant local stakeholders have been invited via invitation letters and e-mail (PP/24/). The evidence of these invitations is given by the invitation Letters and e-mails (PP/24/) to local stakeholders, Local stakeholders' meeting agenda (PP/25/); Local stakeholders' photographic report (PP/26/); Local stakeholders Attendance List (PP/27/); Local stakeholders' presentation (PP/28/); Local stakeholders' surveys (PP/29/) and the Local stakeholders' event act (PP/30/). The assessment team has reviewed the documentation in order to validate the inclusion of relevant stakeholders. Team local expertise has confirmed that the communication method used to invite the stakeholders is appropriate. The summary of comments presented in the PDD has been verified with the documentation of the stakeholder consultation and has been found to be complete.

Comments presented by the local stakeholders have been taken into account by the PP and has been verified with information obtained during interviews.

Hence, Applus+ LGAI considers the local stakeholder consultation carried out adequately.



#### 4 **COMMENTS BY PARTIES, STAKEHOLDERS AND NGO's**

Applus+ LGAi published the project documents on the UNFCCC website and invited comments by affected Parties, stakeholders, and non-governmental organisations during a 30 day period.

All key information gathered is presented in the table below.

<b>website:</b> <a href="http://cdm.unfccc.int/Projects/Validation/DB/HQ6S7F3QHI2KCWA2C2A25ZO5HTIOEK/view.html">cdm.unfccc.int/Projects/Validation/DB/HQ6S7F3QHI2KCWA2C2A25ZO5HTIOEK/view.html</a>	
<b>Starting date of the global stakeholder consultation process:</b> 09/05/2012	
<b>Comment submitted by:</b> CDM_America	<b>Issues raised:</b> Methodology has not been correctly applied in the PDD, Methodology states: If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: • Electricity delivered to the grid by the Project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system"; Methodology does not consider the installation of a fossil fuel power plant as an alternative. Additionality is not demonstrated in accordance with the applied methodology, which requires the use of the "Tool for the demonstration and assessment of additionality;" (e.g. Common practice analysis shall be revised).
<b>Response by PP:</b> First comment: Please refer to the ACM0002 methodology's page 5/20 which states the following: Step 1: Identify realistic and credible alternative baseline scenarios for power generation Apply Step 1 of the Combined tool to identify the baseline scenario and demonstrate additionality. The options considered should include: -P1: The project activity not implemented as a CDM project; -P2: The continuation of the current situation, i.e. to use all power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance. The additional power generated under the project would be generated in existing and new grid-connected power plants in the electricity system; and -P3: All other plausible and credible alternatives to the project activity that provide an increase in the power generated at the site, which are technically feasible to implement. This includes, inter alia, different levels of replacement and/or retrofit at the power plant/unit(s). Only alternatives available to project participants should be taken into account. As it could be seen, in any case the methodology restricts or limits the PP to include more alternatives. The document only makes reference to the alternatives that should be included but giving freedom to the PP to include any other alternative that applies to the project's reality. As evidence of the former, please refer to the latest registered projects in Mexico, which include other alternatives that those stated in the methodology (including the alternative of electricity generation through fossil fuel power plants, minihydro, biomass powered plants). <ul style="list-style-type: none"> <li>• 4361 Istmeño Wind Farm, registered on 26/03/12.</li> <li>• 5676 Oaxaca III Wind Energy Project, registered on 09/03/12</li> </ul>	

- 4634 Piedra Larga Wind Farm, registered on 19/04/11

Second comment:

The common practice analysis was made according to the list of plants which are under CFE's management, operation and maintenance. Such plants constitute the National Interconnected System, SIN in Mexico due that Comisión Federal de Electricidad (CFE) is the Mexican government's body for generation, distribution, administration, etc. of electricity. Evidence of this was provided to the DOE. The evidence consisted on a CFE plant maintenance schedule sent by CFE personnel to carry out the analysis. The equations and criteria used are stated on the "Tool for the demonstration and assessment of additionality" as it can be seen from the spreadsheet provided to the DOE.

**Conclusion by Applus+ LGAi**

First comment:

The construction and operation of a fossil fuel power plant has been considered as an alternative to the implementation of the CDM Project Activity, see PDD v2.0 section B.5 page 15.

Second comment:

As indicated by PP, common practice has been made using the list of plants which constitute National Interconnected System in Mexico.

## **5 FINAL VALIDATION OPINION**

Applus+ LGAI has performed a validation of the Construction and Operation of the Hydraulic Power Plant Chicoasén II in Mexico. The validation was performed on the basis of UNFCCC criteria 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 Applus+ LGAI with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by Applus+ LGAI for registration with the UNFCCC.

Applus+ LGAI has received a confirmation from the host Party that the project activity assists it in achieving sustainable development.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment and technological barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of annual emission reductions of 299,436 tCO<sub>2</sub>e and a total estimated of 2,994,360 tCO<sub>2</sub>e as specified within the final PDD version.

The validation has been performed following the requirements of the latest version of the CDM VVM and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the CDM project cycle.

Audit Team

04/10/2012

Miquel Picas Martínez

04/10/2012

Adrián Ruíz Estrella

04/10/2012

Agustín Salas Martínez

Technical Reviewer:

Miquel Sitjes Cabanas

Signature



B.U. Certification Systems General Manager:

Juan Sendín Caballero

Signature



## **6 REFERENCES**

### **6.1 DOCUMENTATION PROVIDED BY THE PROJECT PARTICIPANTS**

- PP/1/ CDM-PDD version 1.0 dated on 23/04/2012.
- PP/2/ Intention Letter between Comisión Federal de Electricidad and Carbon Solutions de México, SA de CV dated on 31/01/2012.
- PP/3/ Resolution about the Geological Exploration Studies, with reference number D.F.CHIS.SGPAU/UGA/2900/11 and dated on 08/07/2011 emitted by SEMARNAT.
- PP/4/ Acknowledge Receipt of the Environmental Monitoring Plan, with reference number DF/SGPA/UGA/DIRA/4593/11 and dated on 07/11/2011, emitted by SEMARNAT.
- PP/5/ Authorization in land use for the access roads construction, with reference number SGPA/DGGFS/712/1816/12 and dated on 20/06/2012 emitted by SEMARNAT.
- PP/6/ No involvement in cultural heritage, with reference number 401.F(4)90.2012/DCICH-252 and dated on 14/03/2012 emitted by National Institute of Anthropology and History.
- PP/7/ Authorization for the construction and operation of the HPP Chicoasén II, with reference number SGPA/DGIRA/DG/6907, and dated on 08/09/2011 emitted by SEMARNAT.
- PP/8/ Application for surface water exploitation, presented to CONAGUA (National Water Commission) on 07/09/2011.
- PP/9/ Application for the extraction of materials, presented to CONAGUA (National Water Commission) on 11/10/2011.
- PP/10/ Application for Federal land occupancy, presented to CONAGUA (National Water Commission) on 11/10/2011.
- PP/11/ Application for hydraulic infrastructure, presented to CONAGUA (National Water Commission) on 07/09/2011.
- PP/12/ Environmental Impact Assessment for Hydroelectric Project Chicoasén II, performed by University of Science and Arts of Chiapas (7 chapters) Coded as P124\_VAL\_024, P124\_VAL\_025, P124\_VAL\_026, P124\_VAL\_027, P124\_VAL\_028, P124\_VAL\_029 and P124\_VAL\_146 and its Executive Summary coded and P124\_VAL\_030.
- PP/13/ Energy Sector Outlook 2011-2025. Mexican Energy Ministry, SENER.
- PP/14/ Costs and Parameters for the Formulation of Investment Projects in the Electricity Sector. COPAR, Comisión Federal de Electricidad, CFE. Coded as P124\_VAL\_046.
- PP/15/ Energy Sector Outlook 2005-2014. Mexican Energy Ministry, SENER.
- PP/16/ CH Chicoasén II y LT Red de transmisión asociada a la CH Chicoasén II (Feasibility Report), July 2011 coded as P124\_VAL\_066.
- PP/17/ Energy Sector Outlook 2010-2025. Mexican Energy Ministry, SENER.
- PP/18/ Energy Sector Outlook 2009-2024. Mexican Energy Ministry, SENER.
- PP/19/ Energy Sector Outlook 2008-2017. Mexican Energy Ministry, SENER.
- PP/20/ Energy Sector Outlook 2007-2016. Mexican Energy Ministry, SENER.
- PP/21/ Energy Sector Outlook 2006-2015. Mexican Energy Ministry, SENER.
- PP/22/ Energy Sector Outlook 2005-2014. Mexican Energy Ministry, SENER.
- PP/23/ Energy Sector Outlook 2004-2013. Mexican Energy Ministry, SENER.
- PP/24/ Invitation Letters and e-mails to local stakeholders.
- PP/25/ Local stakeholders' agenda.
- PP/26/ Local stakeholders' photographic report.
- PP/27/ Local stakeholders Attendance List.
- PP/28/ Local stakeholders' presentation.
- PP/29/ Local stakeholders' surveys.
- PP/30/ Local stakeholders' event act.
- PP/31/ Prior Consideration of CDM e-mail (P124\_VAL\_070) to UNFCCC
- PP/32/ Prior Consideration of CDM e-mail (P124\_VAL\_105) to SEMARNAT Mexico.
- PP/33/ Response to the GSP (P124\_VAL\_130).
- PP/34/ Budget for bidding for the construction (P124\_VAL\_133).

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PP/35/	Explanation for the determination of the Plant Load Factor (P124_VAL_134).
PP/36/	Explanation for the determination of the Plant Load Factor II (P124_VAL_135).
PP/37/	Economic Model for Project Activity (P124_VAL_139).
PP/38/	CDM-PDD version 2.0 dated on 28/06/2012 (P124_VAL_141).
PP/39/	Economic Model for Project Activity dated on 29/08/2012 (P124_VAL_143).
PP/40/	Modalities of Communication Form (P124_VAL_144).
PP/41/	Modalities of Communication Form (P124_VAL_145).

## **6.2 LETTERS OF APPROVAL**

LoA/1/	Letter of Approval emitted from the Mexican DNA with reference #304/2012 and dated on 15/06/2012.
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## **6.3 METHODOLOGIES, TOOLS AND OTHER GUIDANCE BY THE CDM EXECUTIVE BOARD**

EB/1/	Validation and Verification Manual v.01.2.
EB/2/	Approved consolidated baseline and monitoring methodology ACM0002 version 12.3.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable-sources".
EB/3/	"Tool for demonstration and assessment of additionality" version 06.0.0.
EB/4/	"Guidance on the Assessment of Investment Analysis" version 05.
EB/5/	"Guidelines on Common Practice" version 01.0
EB/6/	"Tool to calculate the emission factor for an electricity system" version 02.2.1.

## **6.4 LAWS AND REGULATIONS**

LR/1/	LGEEPA (General Law of Ecological Balance and Environmental Protection)
LR/2/	Gaceta Ecológica (Ecological Gazette) # DGIRA/037/11 edited by SEMARNAT on 07/07/2011, which informs about the request for a resolution on the EIA for the construction and operation of the HPP Chicoasén II
LR/3/	Electric Public Services Law. Deputies Chamber of the Mexican Union Congress.

## **7 ANNEX A**