VALIDATION OPINION - CREDITING PERIOD RENEWAL

TROJES HYDROELECTRIC PROJECT IN MEXICO

(UNFCCC Registration Ref. No. 0649)

REPORT NO. 2010-9019

REVISION NO. 01

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VALIDATION OPINION - CREDITING PERIOD RENEWAL

Date of first issue: 7 March 2012	ConCert Project No.: PRJC-196718-2009-CCS-ITA
Approved by: Michael Lehmann	Organisational unit: Climate Change & Environmental Services
Client: Enel Trade S.p.A.	Client ref.: Casiopea Ramírez

DNV CLIMATE CHANGE SERVICES AS

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 994 774 352 MVA

Summary:

Project Name: Trojes Hydroelectric Project
Registration Ref. No.: 0649
Country: Mexico
Methodology: AMS-I.D **Version:** 17
GHG reducing Measure/Technology: Hydroelectric generation/ Sectoral Scope 1/ Technical Area 1.2
ER estimate: 15 542 tCO_2e per year (average)
Size

☐ Large Scale ☒ Small Scale

Validation Phases:

☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues

Validation Status

☐ Corrective Actions Requested ☐ Clarifications Requested
☒ Full Approval and request for renewal ☐ Rejected

In summary, it is DNV's opinion that the project activity "Trojes Hydroelectric Project" in Mexico, as described in the PDD, version 06 of 22 February 2012, meets all relevant UNFCCC requirements for the renewal of the crediting period. Hence DNV requests the renewal of the crediting period of the project.
The second crediting period would go from 1 April 2010 to 31 March 2017.

Report No.: 2010-9019	Subject Group: Environment
Report title: Trojes Hydroelectric Project in Mexico	
Work carried out by: Espejo Andres, Covarrubias Elfride, Sandoval Gonzalo, Díaz Ricardo	
Work verified by: Andrea Leiroz; Wong, Yon Sing	

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Table of Content ***Page***

Contents

Abbreviations

AMS	Approved Methodology for Small scale
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CFE	Comisión Federal de Electricidad – Federal Commission of Electricity
CH_4	Methane
CL	Clarification request
CM	Combined Margin
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
DNV	Det Norske Veritas
ENEL	Energía Nueva Energía Limpia (de México S.A. de C.V.)
FAR	Forward Action Request
FEC	Federal Electricity Commission
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
kVA	kilo Volt Ampere
LFC	Luz y Fuerza del Centro – Light and Power Company
LoA	Letter of Approval
MW	Mega Watt
MWh	Mega Watt hour
NGO	Non-governmental Organisation
N/A	Not Applicable
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PPA	Power Purchase Agreement
QA	Quality Assurance
QC	Quality Control
SENER	Secretaría de Energía – Ministry of Energy
SNI	National Interconnected System
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change

1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed an assessment of the request by Enel Trade S.p.A. to renew the crediting period of CDM project activity 0649 "Trojes Hydroelectric Project" in Mexico. The assessment was performed in accordance with the Procedures for renewal of the crediting period of a registered CDM project activity (version 06) and included an assessment of:

(a) An impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period;

(b) The correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the validity of the original baseline and/or its update through an assessment. The project correctly applies the baseline and monitoring methodology AMS-I.D, version 17 "Simplified baseline and monitoring methodology AMS-I.D for Type I – Renewable Energy Projects".

The total emission reductions from the project are estimated to be on the average 15 542 tCO_2e per year over the 2nd renewable crediting period (From 1 April 2010 to 31 March 2017). 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 monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is DNV's opinion that the project participants are able to implement the monitoring plan.

In summary, it is DNV's opinion that the CDM project activity 0649 "Trojes Hydroelectric Project" in Mexico meets all relevant UNFCCC requirements for the renewal of the crediting period. Hence DNV requests the renewal of the crediting period of the project.

Milan and Oslo, 7 March 2012

Andres Espejo
CDM Validator
DNV Milan, Italy

Michael Lehmann
Director of Services and Technologies
DNV Climate Change Services AS

2 INTRODUCTION

DNV Climate Change Services AS (DNV) was commissioned by Enel Trade S.p.A. to perform an assessment of the request by to renew the crediting period of CDM project activity 0649 "Trojes Hydroelectric Project" in Mexico.

The assessment was performed in accordance with the Procedures for renewal of the crediting period of a registered CDM project activity (version 06) and included an assessment of:

(a) An impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period;

(b) The correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period.

Project participants notified to the UNFCCC secretariat by email 11 January 2010 their intention to request a renewal of a crediting period of the registered CDM project activity by submitting an updated CDM-PDD and informing of their selection of a DOE /13/. The receipt confirmation was received 11 January 2010 from the UNFCCC secretariat /14/.

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

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

The following sections outline each step in more detail.

3.1 Desk review of the project design documentation

The following tables list the documentation that was reviewed during the validation.

3.1.1 Documentation provided by the project participants

/1/ ERM – Environmental Resources Management: *CDM-PDD for the "Trojes Hydroelectric Project"*, Version 04 dated 10 November 2009 initially submitted to DNV, and Version 06 dated 22 February 2012 submitted for request of renewal of crediting period which incorporates the updates of Version 04 dated 31 August 2011 which was revised as a result of a Notification of Changes to the PDD, UNFCCC reference number 0649.

Note: The CDM project activity name is "Trojes Hydroelectric Project" which is not consistent with the CDM project activity name in the UNFCCC interface or in the CDM submission form, i.e. "Trojes Hydropower Project". The registered CDM-PDD version 04 dated 31 August 2011, the LoAs and the Final Validation Report uploaded in the UNFCCC refer to "Trojes Hydroelectric Project" which should be the correct name. DNV has notified of this to the UNFCCC secretariat.

/2/ ENEL: *CDM-PDD for the "Trojes Hydroelectric Project",* Version 03, dated 19 April

2006 initially registered and version 04 dated 31 August 2011 revised due to a notification of changes to the PDD accepted by EB 31 October 2011, UNFCCC reference number 0649.
Note: The CDM project activity name is "Trojes Hydroelectric Project" which is not consistent with the CDM project activity name in the UNFCCC interface or in the CDM submission form, i.e. "Trojes Hydropower Project". The registered CDM-PDD version 04 dated 31 August 2011, the LoAs and the Final Validation Report uploaded in the UNFCCC refer to "Trojes Hydroelectric Project" which should be the correct name. DNV has notified of this to the UNFCCC secretariat.

/3/ ENEL: *Emission reduction calculations (Enel mix generation for OM_20120119-20120201),* No version number, 1 January 2012.

/4/ Alstom: *Invoice, No. TRO-01*, 3 August 2001.

/5/ Alstom: *Letter #1 for Request for Payment*, No version number, 3 August 2001.

/6/ Alstom: *Letter #2 for Request for Payment*, No version number, 3 August 2001.

/7/ Third grid connexion agreement of renewable energy source between the Federal Commission of Electricity (FCE) and Hidroelectricidad del Pacífico, S. de R.L. de C.V., 3CIR01-01/06, 1 July 2003

/8/ Secretaría de Medio Ambiente Recursos Naturales y Pesca – Ministry of Environment and Natural Resources: *Carta de Aceptación de Manifestación de Impacto Ambiental – Environmental Impact Assessment Approval Letter*, No version number, 2 August 2001.

/9/ ENEL: *Instruction for registration of plant operational information - "Central Hidroeléctrica Trojes" (daily, monthly, and Historical Annual Operation),* procedure INST-HPA-OP-2009- 01, revision 01, year 2009

/10/ Alstom: Technical specification of generator – C.H. Trojes, May 2011

/11/ Alstom: Technical specification of turbine – C.H. Trojes, May 2011

/12/ Power measurement: User guide of 8000 series electricity meter, Year 2009

/13/ Email from Nicola Melchiotti (Enel Green Power) to UNFCCC Secretariat, informing of their intention to renew the crediting period of 0649 Trojes Hydropower Project, attaching the PDD, and informing that the site visit was already performed and the Validation Report is under final revision by DNV, 11 January 2010

/14/ Email from UNFCCC Secretariat confirming the receipt of the PDD and the project participant's email, 11 January 2010

The main changes between the PDD version 04 /2/ initially submitted to DNV and the PDD version 06 /1/ submitted with the request for renewal of the crediting period are:

- The description of the project boundary was updated as a result of a CL;
- The methodology version was updated from AMS-I.D Version 15 to AMS-I.D Version 17;
- The combined margin was corrected as a result of various CARs and CL;
- Section B.6.2 was corrected in order to include parameters that were available at validation;
- The monitoring plan was completed in order to include a description of monitoring procedures, QA/QC measures and responsibilities.

3.1.2 Methodologies, tools and other guidance by the CDM Executive Board

/15/ CDM Executive Board: 'Procedures for renewal of the crediting period of a registered CDM project activity' (version 06)

/16/ CDM Executive Board: 'Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period' (version 03.0.0)

/17/ CDM Executive Board: Validation and Verification Manual (version 01.2)

/18/ CDM Executive Board: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" ACM0002, version 12.1.0

/19/ CDM EB: *Simplified baseline and monitoring methodology AMS-I.D* for Type I – Renewable Energy Projects version 8.

/20/ CDM EB: *Simplified baseline and monitoring methodology AMS-I.D* for Type I – Renewable Energy Projects version 17

/21/ CDM EB: 'Tool to calculate the emission factor for an electricity system' (version 2) . *Annex 14 of EB 50 report.*

3.1.3 Documentation used by DNV to validate / cross-check the information provided by the project participants

/22/ IPCC: *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Volume 2 (Energy), No version number, April 2007.

/23/ Diario Oficial: *Decreto por el que se extingue el organismo descentralizado Luz y Fuerza del Centro (the Official Decree for elimination of LFC)*, No version number, 11 October 2009.

/24/ Diario Oficial: *Ley para el Aprovechamiento de Energías Renovables y el Financiamiento de la Transición Energética (law for the use of renewable energy sources)*, No version number, approved 28 October 2008 and published 28 November 2008.

/25/ Diario Oficial: *Reglamento de la Ley para el Aprovechamiento de Energías Renovables y el Financiamiento de la Transición Energética (Law for Renewable Energy)*, No version number, 2 September 2009.

/26/ SENER: *Prospectiva del Sector Eléctrico 2007-2016, 2008–2017 & 2009–2024*
No version numbers, years 2006, 2007, 2008.
http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20Sector%20Electrico%20FINAS.pdf
http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf
http://www.energia.gob.mx/res/PE_y_DT/pub/Prospectiva_electricidad%20_2009-2024.pdf

/27/ SENER: *Prospectiva del Sector Electrico 2003-2012, 2004-2013 & 2005-2014,*
No version numbers, 2003, 2004, 2005,
http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/prospectiva_elect.pdf,
http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/prospec_elec_04_13.pdf,
http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/Electrico_2005_2014.pdf

/28/ DNV: *Validation Report, Trojes Hydroelectric Project in Mexico*. Report No. 2004-0050, revision 03, 13 September 2006.

/29/ DNV: *"Trojes Hydroelectric Project in Mexico" Verification/Certification Report (01 Apr 2003 – 30 Nov 2006)*, Version 01, 08 January 2007.

/30/ Impulsora Nacional de Electricidad: *"Trojes 01/06" Monitoring Report (01 Apr 2003 – 30 Nov 2006)*, Version 01, 08 December 2006.

/31/ CONCAWE: Heavy Fuel Oils - Prepared by CONCAWE's Petroleum Products and Health Management Groups, May 1998

/32/ PEMEX: Safety data sheet for chemicals – Natural Gas, July 2000

/33/ PEMEX: Safety data sheet for chemicals – Heavy Fuel Oil, 28 December 1998

/34/ National Water Commission (Comisión Nacional del Agua): *Atlas del agua en México 2011*, September 2011 http://www.conagua.gob.mx/CONAGUA07/Publicaciones/Publicaciones/SGP-18-11.pdf

/35/ UNFCCC: CDM Project database, accessed 2 February 2012 http://cdm.unfccc.int/Projects/projsearch.html

/36/ National Water Commission in Mexico: "Statistics on Water in Mexico, 2010", T4.1, pag. 84

/37/ SENER: *Estrategia nacional para la transición energética y el aprovechamiento sustentable de la energía (National strategy for energy transition and sustainable use of energy), year 2011*

/38/ Secretaría de Energía – Govenrment of Mexico: *Estrategia nacional de la energía (National energy strategy), February 2010*

/39/ SENER: *Programa especial para le aprovechamiento de energías renovables* (Special programme for the development of renewable energies), August 2009

3.2 Follow-up interviews with project stakeholders

On 25 Nov 2009, DNV performed follow-up interviews with stakeholders in Mexico D.F. to confirm selected information and to resolve issues identified during the desk review. The site visit was conducted by Gonzalo Sandoval, Validator from DNV. Representatives of ENEL were interviewed during the site visit.

	Date	Name	Organization	Topic
/40/	25 November 2009	Casiopea Ramírez	ENEL	- Monitoring plan. - Emission reductions estimation. - Project implementation

3.3 Resolution of outstanding issues

The objective of this phase of the assessment was to resolve any outstanding issues which needed to be clarified prior to DNV's positive conclusion on the project design.

In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the 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 the figure below. The completed validation protocol for the project activity "Trojes Hydroelectric Project" in Mexico is enclosed in Appendix A to this report.

Table 1 of the validation protocol documents the findings of the desk review of the project design documentation and follow-up interviews with project stakeholders. Any findings raised in Table 1 are listed in Table 2 of the protocol, and changes to the description of the project design as a result of these findings will be addressed in Table 2. Table 1 thus may not reflect all aspects of the project as described in the final PDD submitted for registration.

A corrective action request (CAR) is raised if one of the following occurs:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

(b) The CDM requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

Validation Protocol Table 1: Requirement Checklist				
Checklist question	***Reference***	***Means of verification (MoV)***	***Assessment by DNV***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the CDM-PDD	*Gives reference to documents where the answer to the checklist question or item is found.*	*Means of verification (MoV) are **document review (DR)**, **interview (I)** or any other follow-up actions (e.g., on site visit and telephone or email interviews) and **cross-checking (CC)** with available information relating to projects or technologies similar to the proposed CDM project activity under validation.*	*The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.*	*OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A **corrective action request (CAR)** is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A **clarification request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A **forward action request (FAR)** during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.*

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Corrective action and/ or clarification requests	***Ref. to checklist question in table 2***	***Response by project participants***	***Validation conclusion***
*The **CARs** and/ or **CLs** raised in Table 2 are repeated here.*	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants to address the CARs and/or CLs.*	*The validation team's assessment and final conclusions of the CARs and/or CLs.*

Validation Protocol Table 3: Forward Action Requests		
Forward action request	***Ref. to checklist question in table 2***	***Response by project participants***
The FARs raised in Table 2 are repeated here.	*Reference to the checklist question number in Table 2 where the FAR is explained.*	*Response by project participants on how forward action request will be addressed prior to first verification.*

Figure 1 Validation protocol tables

3.4 Internal quality control

This validation opinon underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation team

				Type of involvement					
Role	***Last Name***	***First Name***	***Country***	Desk review	Interviews/Site Visit	Reporting	Supervision of work	Technical review	TA 1.2 competence
Team Leader* (Validator)	Espejo	Andres	Italy	✓		✓			✓
Validator*	Covarrubias	Elfride	Italy	✓		✓	✓		✓
Validator	Espejo	Andres	Italy	✓		✓			✓
Validator	Sandoval	Gonzalo	Mexico	✓	✓	✓			
Expert	Diaz	Ricardo	Mexico	✓		✓			✓
Technical reviewer**	Leiroz	Andrea	Brazil					✓	✓
Technical reviewer***	Wong	Simon Yon-Sing	Malaysia					✓	✓

* Elfride Covarrubias participated as Team Leader until 1 December 2011 date in which she was replaced by Andres Espejo as Team Leader, who conducted a new desk review and completed the reporting;

**First round of TR conducted in year 2010 based on a previous version of the PDD before the Notification of Changes to the PDD.

***Second round of TR conducted in year 2012 based on an updated version of the PDD after the Notification of Changes to the PDD

The qualification of each individual validation team member is detailed in Appendix B to this report.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The final validation findings relate to the project design as documented and described in the PDD, version 06 dated 22 February 2012.

4.1 Validity of selected baseline and monitoring methodology

The project activity was registered as a CDM project applying the methodology AMS-I.D, version 8, Grid connected renewable electricity generation /19/. For the renewal of crediting period, the project applies version 17 of AMS-I.D, which is the latest version currently available /20/.

4.2 Applicability of selected baseline and monitoring methodology

The project correctly applies the approved baseline methodology AMS-I.D (version 17):

Applicability condition AMS-I.D (version 17)	Rationale
This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The purpose of the project activity is to generate electricity via a hydro power plant and sell it to several consumer partners, mainly municipalities and industrial consumers, using the transmission system of the FEC for energy delivery /2//28/. DNV confirmed that the project is connected to the grid through the grid connection agreement with the FEC /7/. Therefore, the project would comply with applicability condition (b) as the project comprises renewable energy generation units supplying electricity to a facility via national/regional grid through a contractual arrangement.
Illustration of respective situations under which each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A) applies is included in Table 2.	Following Table 2 of AMS-I.D (version 17) the methodology would be applicable as the: • Project supplies electricity to an identified consumer facility via national/regional grid (c.f. assessment of first applicability condition above). Therefore, DNV confirmed that project would comply with this applicability condition.
This methodology is applicable to project activities that (a) install a new power plant at	The proposed project activity consists in the installation of a new power plant at a site

Applicability condition AMS-I.D (version 17)	Rationale
a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition1; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant) as confirmed during the site visit conducted as part of the project's validation /28/. This was also further confirmed by the EIA approval issued 2 August 2001 /8/, which states that the proposed project activity consists in the installation of new equipment in the existing reservoir of Trojes. Therefore, DNV confirmed that project would comply with this applicability condition.
Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir; b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.	The proposed project activity was implemented in an existing reservoir built for irrigation purposes as evidenced by the EIA approval issued 2 August 2001 /8/, which states that the proposed project activity consists in the installation of new equipment in the existing reservoir of Trojes. Following the provisions of AMS-I.D (version 17) a reservoir is to be considered as an existing reservoir "*if it has been in operation for at least three years before the implementation of the project activity*". DNV checked the 'Atlas del agua en México 2011' /34/ and the 'Statistics on Water in Mexico, 2010' /36/ both published by the National Water Commission and confirmed that the entry in operation of the Trojes reservoir dates back 1980 which would confirm that the reservoir is an existing reservoir. Furthermore, the project would not cause a change in the volume of the reservoir as evidenced by the EIA approval issued 2 August 2001 /8/ which states that as part of the project activity no alteration of the dam and the reservoir volume will occur. The proposed project activity will not affect the dam as this has been built downstream the point where the water intake tunnel for irrigation exits the dam and uses an existing penstock to feed the turbine /2/.

Applicability condition AMS-I.D (version 17)	Rationale
	Hence, the proposed project activity has been implemented in an existing reservoir and it has not caused any variation in the in the volume of reservoir.
If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW	The proposed project activity has only renewable components on-site /2/ as evidenced by the EIA approval issued 2 August 2001 /8/, which states that the proposed project activity consists in the installation of new equipment in the existing reservoir of Trojes. Therefore, this condition is not applicable to the proposed project activity.
Combined heat and power (co-generation) systems are not eligible under this category	The proposed project activity is a hydroelectric project as evidenced by the EIA approval issued 2 August 2001 /8/ and by the validation report /28/, therefore no co-generation can occur /2/. Therefore, this condition is not applicable to the proposed project activity.
In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units	The proposed project activity consists in the installation of a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant) as confirmed during the site visit conducted as part of the project's validation /28/ and as evidenced by the EIA approval issued 2 August 2001 /8/, which states that the proposed project activity consists in the installation of new equipment in the existing reservoir of Trojes. Therefore, this condition is not applicable to the proposed project activity.
In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW	The proposed project activity consists in the installation of a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant) as confirmed during the site visit conducted as part of the project's validation /28/ and as evidenced by the EIA approval issued 2 August 2001 /8/, which states that the

Applicability condition AMS-I.D (version 17)	Rationale
	proposed project activity consists in the installation of new equipment in the existing reservoir of Trojes. Therefore, this is not applicable to the proposed project activity.

Small Scale definition	Rationale
If output capacity is less than 15 MW, the project qualifies as a small-scale CDM project activity according to category (i) defined in paragraph 6, subparagraph (c) of decision 17/CP.7 on the modalities and procedures for the CDM.	The output power of the hydro turbine is 10.576 MW as evidenced by the turbine technical specifications /11/. The rated output apparent power of the generator is 8 760 kVA and its rated output active power is 8.0 MW /10/. As the output capacity is less than 15 MW, the project qualifies as a small-scale CDM project activity according to category (i) defined in paragraph 6, subparagraph (c) of decision 17/CP.7 on the modalities and procedures for the CDM.

The assessment of the project's compliance with the applicability criteria of AMS-I.D (version 17) are documented in detail in section B.2 of Table 1 in the validation protocol in Appendix A to this report.

DNV has concluded that the application of the baseline methodology is transparent and conservative.

4.3 Validity of baseline

DNV performed the assessment of the validity of the original/current baseline and to update the baseline at the renewal of the crediting period based in the stepwise procedure 'Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period' (version 03.0.0) /16/.

Step 1: Assess the validity of the current baseline for the next crediting period

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

There are two relevant mandatory national and/or sectoral policies which have been recently issued, yet they would not affect the baseline scenario in the second crediting period: a) the official decree for elimination of LFC dated 11 October 2009 /23/; b) the law for renewable energy approved on 28 October 2008 and published 28 November 2008 /24/.

On 11 October 2009, the state owned utility 'Luz y Fuerza del Centro' (LFC) was closed down due to an official decree released by the Mexican Government /23/. All the facilities owned and handled by 'Luz y Fuerza del Centro' were transferred to the state owned utility 'Federal Electricity Commission' (FEC - Comision Federal de Electricidad in Spanish) /24/.

The official decree for closing down LFC does not affect the baseline considered for the first crediting period, since this decree transfers the facilities owned by LFC to CFE (power plants, transmission and distribution lines, distribution and transformation substations) and there are no changes in the operation of the facilities owned by LFC such as changes capacity or retirement of any plant /23/.

The law for renewable energy approved on 28 October 2008 /24/ and its regulation issued on 2 September 2009 /25/ regulates the use of renewable energy sources and clean technologies to generate electricity for purposes other than the provision of the public service of electricity and establishes the national strategy and instruments to finance the energy transition. As DNV confirmed, the law /24/ and its regulation /25/ do not establish prohibitions or additional regulations that could affect the electricity generation in the country, but seeks to introduce the regulatory environment and strategy to enhance the electricity generation with renewables and with efficient cogeneration systems. Thus, it is concluded that the current baseline (i.e. generation of an equivalent amount of electricity by the grid) of the project activity remains the same and is in line with the above law and regulation /24//25/.

Hence the baseline for the project which is the electricity supplied by the project activity to the grid in MWh multiplied by an emission factor (measured in tCO_2e/MWh) calculated in accordance with 'Tool to calculate the emission factor for an electricity system' (version 2) as a combined margin would be in compliance with mandatory national and sectoral policies. Hence, the baseline emissions are not affected by above described changes in the national and sectoral policies. The operating margin (OM) and build margin (BM) emission coefficient for the project will be determined *ex-ante*.

Step 1.2: Assess the impact of circumstances

DNV's assessment did not identify any circumstances existing at the time of requesting renewal of the crediting period which would impact the current baseline emissions.

The Official Decree for closing down LFC /23/ does not have an impact as this decree consists on a transfer of facilities owned by LFC to CFE (power plants, transmission and distribution lines, distribution and transformation substations), which in practice is a change in legal entity.

The Law for Renewable Energy /24/ and its regulation /25/ introduce various initiatives in order to improve the regulatory environment and strategy to enhance the electricity generation with renewables and through efficient cogeneration systems. The main two instruments to achieve this are /24//25/: the 'National strategy for energy transition and sustainable use of energy' /37/ and the 'Special programme for the development of renewable energies'/39/. These two instruments establish actions for promoting clean technologies in electricity generation, use of the cogeneration potential and support the improvement of bioenergy under competitive conditions. As DNV was able to confirm these actions are general actions which seek to improve the investment environment yet their expected impact is reduced, i.e. the participation of renewable energies (without considering hydroelectric plants of >30MW) is expected to increase from 3.9% of the total electricity generated to 4.5 – 6.6 % only in the period 2008-2012 /39/. This fact would be confirmed by the 'National energy strategy' /38/ which establishes that the objectives for the period 2008-2024 is to increase the natural gas exploitation 99.4% (combined cycle with natural gas represented 46% of the total electricity generation in 2008 /3/) while the objective for renewables is an increase of 35% (electricity generation with renewables represented 20% of the total electricity generation in 2008 /3/).

Therefore, it is expected that in the second crediting period the electricity generation in the Mexican grid will still be predominantly based on fossil fuels, namely natural gas.

Therefore, DNV is able to confirm that based on the analysis of the market characteristics, the conditions used to determine the baseline emissions in the previous crediting period are still valid.

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

Following the provisions of AMS-I.D version 17, the baseline scenario would be "*the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid*".

Following the provisions of the 'Procedures for renewal of the crediting period of a registered CDM project activity' (version 06), this sub-step would only be applicable in the situation where the baseline scenario identified at the validation of the project activity was the continuation of use of the current equipment(s) without any investment and, the projects proponents or third party (or parties) would undertake an investment later due, for example, to the end of the technical lifetime of the equipment(s) before the end of the crediting period or the availability of a new technology. Therefore, this step would not be applicable as the baseline scenario identified at the validation of the project activity was the continuation of the current practice.

Step 1.4: Assessment of the validity of the data and parameters

Following the provisions of the 'Procedures for renewal of the crediting period of a registered CDM project activity' (version 06), if "*any of the data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, the current baseline needs to be updated for the subsequent crediting period*".

As evidenced by the registered PDD /2/, the project participant determined at the start of the crediting period data and parameters to calculate the grid emission factor. These data and parameters were sourced from:

- Electricity generation of the power plants connected to the SIN grid sourced from the annual reports published by SENER for years 2002, 2003 and 2004 /27/;
- Fuel CO_2 emission factors were based on IPCC default values and other publicly available at the time of the submission of the PDD i.e. 19 April 2006 /28/.

Therefore, following the provisions of the 'Procedures for renewal of the crediting period of a registered CDM project activity' (version 06), as these data and parameters were only determined at the start of the crediting period and are not valid anymore, the current baseline needs to be updated for the subsequent crediting period.

Conclusion on step 1

Following the assessment performed in Step 1.1, 1.2 and 1.3 above, DNV confirms that the baseline would be in compliance with relevant mandatory national and/or sectoral policies

(c.f. Step 1.1) and that the changes in the market characteristics would not have an impact in the current baseline emissions (c.f. Step 1.2); hence, the current baseline is valid.

Following the assessment performed in Step 1.4 above, the data and parameters used for the calculation of the OM and BM were determined only once at the start of the crediting period and are no valid anymore. Therefore, these data and parameters cannot be used for the renewed crediting period and will have to be updated as part of Step 2 below.

Step 2: Update the current baseline and the data and parameters

Step 2.1: Update the current baseline

The baseline defined by version 17 of has not changed with regard to version 8 applied in the PDD version of the first crediting period. According to version 8 of the AMS-I.D /19/ the baseline is "*the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2equ/kWh) calculated in a transparent and conservative manner as: (a) The average of the "approximate operating margin" and the "build margin"; OR (b) The weighted average emissions (in kg CO_2equ/kWh) of the current generation mix"*.

According to version 17 of the AMS-I.D /20/, the baseline is "*the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor*" which can be "*A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the Tool to calculate the Emission Factor for an electricity system; OR The weighted average emissions (in t CO_2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used*".

Furthermore, as confirmed by DNV, the baseline would be in compliance with relevant mandatory national and/or sectoral policies (c.f. Step 1.1) and that the changes in the market characteristics would not have an impact in the current baseline emissions (c.f. Step 1.2).

The approved baseline methodology has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PDD and/or supporting documents. All documentation relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD.

Step 2.2: Update the data and parameters

According to the assessment performed in Step 1.4, the data used for OM and BM calculations have to be updated, as well as the calculation of the emission factor of the grid.

In the first crediting period, the combined margin emission factor was determined *ex-ante* as 0.531 tCO_2e/MWh, based on data sourced from the SENER /27/ and appropriate IPCC default values /2/.

The combined margin emission coefficient for the grid is determined *ex-ante* in accordance with AMS-I.D (version 17) which gives as option to determine the grid emission factor the calculation through the 'Tool to calculate the emission factor for an electricity system'

(version 2). The project boundary includes the project plant and the SIN grid to which the plant is connected to /1/.

The baseline emission factor is determined *ex ante* according to the methodological tool 'Tool to calculate the emission factor for an electricity system' (version 2) as the weighted average of OM and BM. The weights of OM and BM are selected for the second crediting period as 0.25 and 0.75 respectively and as required by the methodological tool.

The build margin CO_2 emission factor (EF_{BM}) and the operating margin CO_2 emission factor (EF_{OM}) are determined *ex-ante* /2/ based on the most recent information available by the time the PDD version 04 of 10 November 2009 was received. DNV is able to confirm that the data source is reliable, and the calculation and results are correct (c.f. section 4.4.1).

4.4 Validity of monitoring plan

The project activity applies the approved methodology for small scale activities AMS-I.D (version 17) – "Grid connected renewable electricity generation" in combination with "Tool to calculate the emission factor for an electricity system" for the grid emission factor.

The project monitoring plan is in compliance with the monitoring methodology AMS-I.D (version 17). The monitoring plan will give opportunity for real measurements of achieved emission reductions.

It is DNV's opinion, that the project participants are able to implement the monitoring plan.

4.4.1 Parameters determined ex-ante

The baseline emission factor is determined *ex ante* according to the methodological tool 'Tool to calculate the emission factor for an electricity system' (version 2) as the weighted average of OM and BM. The weights of OM and BM are selected for the second crediting period as 0.25 and 0.75 respectively and as required by the methodological tool.

The OM was determined using the simple adjusted OM calculation approach. Its applicability as per the 'Tool to calculate the emission factor for an electricity system' (version 2) was confirmed as according to the data from SENER /26/, the low-cost/must-run resources in the latest five years constitute less than 50% of the total grid generation (20% in 2004, 21% in 2005, 21% in 2006, 19% in 2007 and 24% in 2008).

Following the provisions of the 'Tool to calculate the emission factor for an electricity system' (version 2), the project participant has chosen option B to calculate the simple OM since the necessary data for option A is not available (i.e. only gross generation data is available for each power plant), only nuclear and renewable power generation are considered low-cost/must-run and off-grid plants are not included in the calculation.

Because on the first crediting period the build margin emission factor was calculated *ex-ante*, then according to the guidelines provided by the 'Tool to calculate the emission factor for an electricity system' (version 2), the build margin emission factor for the second crediting period must be calculated *ex-ante*. The BM was determined considering the option (b) of the 'Tool to calculate the emission factor for an electricity system' (version 2) as the set of five power units that have been built most recently excluding CDM projects and for which electricity generation data are available accounted only for 7.85% of the system generation in 2008 /3/. The calculation therefore considered set power capacity additions in the electricity

system that comprises 20% of the system generation in 2008 /3/. DNV confirmed that this set of power additions does not include power units built more than 10 years ago /3/. Following the provisions of the 'Tool to calculate the emission factor for an electricity system' (version 2), since only data on electricity generation and the fuel types used are available for power the power units connected to the National Interconnected System /26/, the CO_2 emission factor of each power unit has been determined using option A2 indicated in Step 4 (a) of the mentioned tool /3/.

For the determination of the OM and BM the project participant has used the most recent information available on units already built at the time of CDM-PDD submission to the DOE for validation (i.e. PDD version 4 of 10 November 2009); this is a vintage of 2008, 2007 and 2006 for the OM and 2008 for the BM /3/. The combined margin emission factor has been determined *ex-ante* based on:

- Data on gross electricity generation in the grid and contribution of each generation technology sourced from the SENER annual reports (2006, 2007 and 2008) /26/. Although the 'Tool to calculate the emission factor for an electricity system' (version 2) requires the OM to be estimated using net electricity generation figures, the project participant has conservatively applied gross electricity figures, which would lead to a lower OM..
- Fuel consumption of each generation technology sourced from the SENER annual reports (2006, 2007 and 2008) /26/.
- Gross generation by each power unit and year of commissioning of each power unit /26/ and electricity self-consumption of different types of fossil-fuel based generation technologies /26/. The 'Tool to calculate the emission factor for an electricity system' (version 2) requires the BM to be calculated using net electricity generation figures which are not available in Mexico /26/. In order to convert the gross electricity generation figures to net electricity figures the project participant has subtracted the expected electricity self-consumption of different types of fossil-fuel based generation technologies used in Mexico /26/. As DNV confirmed, this would lead to conservative estimates as no self-consumption is considered for renewable energy additions to the grid, which would lead to a lower BM. It is worth noting that gross electricity values for some additions were not available as DNV was able to confirm through the SENER reports /26/ and as cross-checked with other registered projects under the UNFCCC /35/; the project participant has assumed zero generation for these additions which would lead to conservative estimates as most of the additions for which data is not available are small units with very low efficiency /26/.
- Fuel emission factors were obtained from IPCC guidelines using the lower limit of the 95% confidence interval for fuel oil (i.e. residual oil), diesel oil, and coal /22/.
- Average net energy conversion efficiency sourced from the annual report published by the grid operator SENER "Prospectiva del Sector Eléctrico 2009-2024" /26/. As indicated in the mentioned report, the efficiencies presented in the report are based on actual measurements using standardised methods /26/: For turbogas and combined cycle units the efficiencies are assessed under ISO conditions of 15°C, 60% relative humidity and atmospheric pressure at sea level; for internal combustion units, the efficiencies are assessed under ISO 3046/1-1986 conditions (temperature of 25°C, 30% relative humidity and atmospheric pressure equal to 1 bar). Although these differ significantly from those showed in Annex I of the 'Tool to calculate the emission factor for an electricity system'

(version 2), it can be concluded that the values used are reliable as are based on actual measurements following accepted methods.

Using the above references the OM for the vintage 2006-2008 equals 0.575 tCO_2e/MWh while the BM for year 2008 equals to 0.344 tCO_2e/MWh. Therefore, the CM is equal to 0.4016 tCO_2e/MWh rounded-up which is significantly lower than the 0.531 tCO_2e/MWh applied in the first crediting period /2/.

DNV confirms that the data used are acceptable and the combined margin grid emission factor of the National Interconnected System has been calculated in an accurate manner.

4.4.2 Parameters monitored ex-post

The parameter that is monitored *ex-post* is the electricity generated and delivered to the grid by the project activity /1/, which is measured continuously by a cumulative meter that is located in the CFE electrical substation. This meter is a class CL0.2 with a 0.1% of accuracy for voltage readings, 0.1% for current readings, 0.2% for power readings and 0.2% for energy readings /12/. This power meter continuously measures the electrical variables at 256 samples per cycle /12/. The electrical energy is recorded on a monthly basis and the recordings are used for invoicing /9/. Since the cumulative meter is owned by CFE, its calibration and maintenance is completely in charge by CFE who will conduct the calibration on annual basis /1/. There is also an internal meter located in the control room that is used to compare its readings against readings provided by CFE's meter /1/. Measurement results from the CFE meters will be cross-checked with the energy reports generated by the SCADA System and used by Myocen supervisor to generate the daily, weekly, monthly and yearly reports /1/. Data will be archived for a period of two years after the end of the last crediting period /1/.

4.4.3 Management system and quality assurance

The management system, quality control and quality assurance procedures are based on the principle of a redundant metering supported by electronic files /1/.

A cumulative meter owned by CFE records the electrical energy dispatched to the grid and readings are taken on a monthly basis by CFE's staff /9/. A second meter, owned by the project participant is used to record on a daily basis the electrical energy generated /9/. A SCADA system creates electronic files where the information of the electrical energy is stored /12/. With this information daily, weekly, monthly and yearly reports are generated /9/. As DNV was able to confirm during the site visit, the access to the reports is controlled through the use of passwords and only authorized ENEL staff has access to this information.

The plant operator is responsible of taking the daily operation readings and elaborating the daily report /12/. The monthly and annual report elaboration as well as the historical report is a responsibility of the plant supervisor /12/.

For the monitoring plan, the management system and quality assurance includes procedures /12/:

- To deal with erroneous measurements.
- For maintenance of the monitoring equipments and installations.
- For identification of training for the monitoring personnel.
- For review of reported results/data.

- For corrective actions in order to provide more accurate future monitoring and reporting.

The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions. The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

It is DNV's opinion, that the project participants are able to implement the monitoring plan.

4.5 Estimation of GHG emissions

The project correctly applies the baseline and monitoring methodology AMS-I.D, version 17. The emission reduction ER_y by the proposed project activity during the crediting period is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (L_y) as follows: $ER_y=BE_y-PE_y-LE_y$

Baseline emissions (BE_y)

The baseline emissions have been calculated as per the small scale methodology AMS-I.D version 17, by multiplying the annual electricity production supplied to the grid by the combined margin CO_2 emission factor coefficient of the grid and according to the formula:

$BE_y = EG_y \times EF_{CO2,grid,y}$

Where:

-EG_y: The electricity generated by the project activity and fed in the SNI. This energy will displace other electricity generated mainly by fossil fuel power plants. This value is 37 157 MWh/year which is consistent with the electricity generation observed in the project monitoring /30//29/.

-$EF_{CO2,grid,y}$: The emission factor is calculated as per the methodological tool 'Tool to calculate the emission factor for an electricity system' (version 2); the grid emission factor has been calculated as the weighted average of OM and BM. The weight of OM and BM are selected for the second crediting period as 0.25 and 0.75 respectively as requested for hydroelectric projects by the methodological tool. The combined factor of the National Interconnected System (SNI) is equal to 0.4016 tCO2e/MWh and fixed *ex-ante* for the entire second crediting period of 7 years.

Therefore BE_y, the annual baseline emissions in a full load year is equal to:

BE_y = 38 700 MWh/year × 0.4016 tCO2e/MWh = 15 542 tCO_2e /year.

Project emissions (PE_y)

According to the applicable methodology AMS-I.D version 17, emissions from water reservoirs of hydro power plants have to be considered following the procedure described in the most recent version of ACM0002.

According to ACM0002 version 12.1.0 "*For hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, project proponents shall account for CH_4 and CO_2 emissions from the reservoirs*".

Considering that for the project activity the water reservoir already exists and the power plant installation did not result in the increase of existing reservoir (c.f. section 4.3), project emissions are set to zero. Hence $PE_y=0$.

Leakage emissions (L_y)

According to the applicable methodology AMS-I.D version 17, leakage emissions have to be considered if the energy generating equipment is transferred from another activity.

According to the registered PDD /2/ and the final validation report /28/, leakage is not to be considered as the equipment is not transferred from another activity. DNV further confirms that the energy generating equipment is not transferred from another activity as evidenced by the specifications of the electro-mechanical equipment /10//11/ which does not indicate that the equipment is sourced from the second-hand market. Hence $L_y=0$.

Emission reductions (ER_y)

$ER_y = BE_y - PE_y - L_y = 15\,542 - 0 - 0 = 15\,542$ tCO_2e/year in a full year of operation.

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 15 542 tCO_2e per year for the selected crediting period.

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, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

The methodologies for calculating emission reductions are transparently documented and the accuracy of the calculations has been verified.

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APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Requirements checklist

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A General description of project activity						
A.1	**Title of the project activity (VVM para 55-57)**					
A.1.1	Does section A.1 of the PDD include a clearly identifiable project title, version number of the PDD and date of the PDD?	/1/	DR	☒ Clearly identifiable title of the project activity ☒ Version number of the PDD is included ☒ Date of the PDD is included.		OK
A.1.2	Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/	DR	☒ Yes *If no, list where the PDD is not in accordance:*		OK
B Application of a baseline and monitoring methodology						
B.1	**Methodology applied (VVM para 65-76 and VVM para 136 (b) for small-scale project activities, as applicable)**					
B.1.1	Does the project apply an approved methodology and the correct version thereof?	/1/	DR	The project activity was registered as a CDM project applying the Grid connected renewable electricity generation methodology AMS-I.D version 8. **CAR1:** Requirement According to the 'Procedures for renewal of the crediting period of a registered CDM project activity' (version 06) "*The latest approved version of a baseline and monitoring methodology, applied in the original CDM-PDD of the registered CDM project activity, shall be used whenever applicable*".	~~CAR1~~	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			Evidence DNV checked the first version of the PDD and found that the applied methodology is AMS-I.D version 15. Failure The applied version of AMS-I.D (i.e. version 15) is no longer valid.		
B.2 Applicability of methodology (and tools) (VVM para 65-76) *Insert a row for each applicability criteria of the applied methodology (and tools)*					
B.2.1 How was it validated that project complies with the following applicability criteria: "This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to a national or a regional grid. Project activities that displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit shall apply AMS-I.F."?	/1/ /2/ /28/	DR	The purpose of the project activity is to generate electrical energy by hydroelectrical generation and sell it to several consumer partners, mainly municipalities and industrial consumers, using the transmission system of the Comisión Federal de Electricidad for energy delivery /2//28/. DNV confirmed that the project is connected to the grid through the grid connexion agreement with the FEC /7/. **CL1:** a) The project participant is requested to clarify if the project would comply with all the applicability conditions of AMS-I.D version 17.	~~CL1~~	OK
B.2.2 How was it validated that project complies with the following applicability criteria: "This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project	/1/ /28/ /2/	DR	The proposed project activity consists in the installation of a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant) as confirmed		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	activity (Greenfield plant); (b) involve a capacity addition1; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).”?			during the site visit conducted as part of the project’s validation /28/.		
B.2.3	How was it validated that project complies with the following applicability criteria: “Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir; b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.”?	/1/ /2/	DR	The proposed project activity was implemented in an existing reservoir built for irrigation purposes /2/. The proposed project activity was built downstream the point where the water intake tunnel for irrigation exits the dam and uses an existing penstock to feed the turbine /2/. Hence, the proposed project activity has not caused any variation in the in the volume of reservoir.		OK
B.2.4	How was it validated that project complies with the following applicability criteria: “In the case of biomass power plants, no other biomass types than renewable biomass are to be used in the project plant.”?	/1/ /2/	DR	The proposed project activity is not a biomass power plant /2/. Therefore, this is not applicable to the proposed project activity.		OK
B.2.5	How was it validated that project complies with the following applicability criteria: “If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW”?	/1/ /2/	DR	The proposed project activity has only renewable components on-site /2/. Therefore, this is not applicable to the proposed project activity.		OK
B.2.6	How was it validated that project complies with the following applicability criteria: “Combined heat and power (co-generation) systems are not eligible under this category”?	/1/ /2/	DR	The proposed project activity is a hydroelectric project so no co-generation can occur /2/.		OK
B.2.7	How was it validated that project complies with the	/1/	DR	The proposed project activity consists in the		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	following applicability criteria: "In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units."?	/28/		installation of a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant) as confirmed during the site visit conducted as part of the project's validation /28/. Therefore, this is not applicable to the proposed project activity.		
B.2.8	How was it validated that project complies with the following applicability criteria: "In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW"?	/1/ /28/	DR	The proposed project activity consists in the installation of a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant) as confirmed during the site visit conducted as part of the project's validation /28/. Therefore, this is not applicable to the proposed project activity.		OK
B.2.9	Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/ /11/ /10/	DR	The output power of the hydro turbine is 10.576 MW as evidenced by the turbine technical specifications /11/. The rated output apparent power of the generator is 8 760 kVA and its rated output active power is 8.0 MW /10/ As the output capacity is less than 15 MW, the project qualifies as a small-scale CDM project activity according to category (i) defined in paragraph 6, subparagraph (c) of decision 17/CP.7 on the modalities and procedures for the CDM.		OK
B.3	**Project boundary (VVM para 78-80)**					
B.3.1	What are the project's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR	**CL2:** The project participant is requested to clarify which would be the project boundaries.	~~CL2~~	OK
B.3.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to	/1/	DR	See CL2.	~~CL2~~	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	arrive at this conclusion.					
B.3.3	Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR	The re-validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by AMS-I.D version 17.		OK
B.4	**Baseline scenario determination ((VVM para 81-88, 105-107)** *Ensure that the evaluation of all alternatives provided in the PDD and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. Check that all alternatives required to be considered by the methodology are included in the final PDD. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this.*					
B.4.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/ /20/	DR	The alternative baseline is defined in the applicable methodology as "*If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources.*" The baseline as per the original registered PDD of version 03 dated 19 April 2006 /2/ was electricity delivered to the grid of FEC. This		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				energy would have been otherwise generated by plants based on fossil fuels connected to the grid. Baseline emission rate considered a combined margin methodology based on the operating margin and the build /2/.		
B.4.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/	DR	Not applicable as it is a baseline methodology.		OK
B.4.3	What is the baseline scenario?	/1/	DR	Not applicable as it is a baseline methodology.		OK
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/	DR	Not applicable as it is a baseline methodology.		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Not applicable as it is a baseline methodology.		OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Not applicable as it is a baseline methodology.		OK
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Not applicable as it is a baseline methodology.		OK
B.4.8	Is the baseline determination adequately documented in the PDD? • All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. • The methodology has been correctly applied to identify	/1/	DR	Not applicable as it is a baseline methodology.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	what would occurred in the absence of the proposed CDM project activity					
B.5	**Calculations of GHG emission reductions**					
	Data and parameters that are available at validation and that are not monitored (VVM para 199-203)					
B.5.1	How was the "The installed capacity of each power plant included in the electric power system (Installed Capacity)" verified?	/1/ /26/	DR I	This is sourced from SENER, Prospectiva del Sector Eléctrico 2007-2016, 2008-2017, 2009-2024 which publicly available information published by the grid operator. **CL3**: a) The project participant is requested to clarify why it has considered "The installed capacity of each power plant included in the electric power system (Installed Capacity)" as parameter available at validation.	~~CL3~~	OK
B.5.2	How was the "Average net energy conversion efficiency of each power plant included in the electric power system ($\eta_{m,y}$)" verified?	/1/	DR	**CAR2:** Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2), for the determination of $\eta_{m,y}$ "if the data obtained from the manufacturer, the utility, the dispatch center of official records is significantly lower than the default value provided in Annex 1 for the applicable technology, project proponents should assess the reliability of the values, and provide appropriate justification if deemed reliable. Otherwise, the default values provided in Annex 1 shall be used" Evidence DNV checked the ER calculations /3/ and	~~CAR2~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				confirmed that the project participant has sourced the conversion efficiency from public available data from the SENER, i.e. the grid operator /26/. This report provides conversion efficiencies for gas combined cycle plants of 50.27-51.66%. However, according to Annex 1 of the 'Tool to calculate the emission factor for an electricity system' (version 2) the efficiency for new gas combined cycle units should be 60%. Failure The difference between the official records and Annex I values is significantly different and the project participant has not provided any justification or an assessment of its reliability.		
B.5.3	How was "Average CO_2 emission factor of fuels used in power plants ($EF_{CO2,m,i,y}$)" verified?	/1/	DR	**CAR3:** Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2) the project participant can use for $EF_{CO2,i}$ "IPCC default values at the lower limit of the uncertainty at a 95% confidence interval" Evidence The project participant has used default values. Failure The project participant has not applied IPCC default values at the lower limit of the uncertainty at a 95% confidence interval.	~~CAR3~~	OK
B.5.4	How was "Amount of fossil fuel type i consumed in the project electricity system in year y ($FC_{i,y}$)" verified?	/1/	DR	**CAR4:** Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2) the	~~CAR4~~ ~~CL3~~	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				parameter "Amount of fossil fuel type i consumed in the project electricity system in year y ($FC_{i,y}$)" has to be defined once for each crediting period using the most recent three historical years. Evidence and failure The project participant has not considered this parameter in the PDD. **CL3**: b) The project participant is requested to clarify why it has considered the figures of Graph 47 which seem to be values for 2009 and not 2008.		
B.5.5	How was "Net calorific value (energy content) of fossil fuel type i in year y ($NCV_{i,y}$)" verified?			**CAR5:** Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2) the parameter "Net calorific value (energy content) of fossil fuel type i in year y ($NCV_{i,y}$)": - has to be defined once for each crediting period using the most recent three historical years. - if equal to IPCC default values, these have to be at the lower limit of the uncertainty at a 95% confidence interval.. Evidence and failure The project participant has not considered this parameter in the PDD and has not applied the IPCC default values in a conservative way.	~~CAR5~~	OK
B.5.6	How was "Net quantity of electricity generated and delivered to the grid (National Interconnected System) during year	/1/ /26/	DR	This is sourced from SENER, Prospectiva del Sector Eléctrico 2007-2016, 2008-2017, 2009-	~~CL3~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	2006, 2007 and 2008 ($EG_{m,y}$)" verified?		I	2024 which publicly available information published by the grid operator. **CL3**: c) DNV checked Table 21 of the SENER, Prospectiva del Sector Eléctrico 2009-2024 which indicates the gross generation of each generation technology and it seems that values are inconsistent with those provided in the ER calculations. The project participant is requested to clarify why there is such an inconsistency. d) DNV checked the ER calculations and found that the self-consumption considered in the OM calculation includes the items "self-consumption" and "self-supply". The project participant is requested to clarify the rationale of this assumption. e) DNV checked the BM calculations and found that the project participant has used gross generation instead of net generation for the calculations. The project participant is requested to clarify why it has done so.		
B.5.7	How was "CO_2 emission factor calculated through the combined margin method ($EF_{grid,CM,y}$; $EF_{CO2,grid,y}$)" verified?	/1/	DR	**CL3**: f) The project participant is requested to clarify why it has considered "CO_2 emission factor calculated through the combined margin method ($EF_{grid,CM,y}$; $EF_{CO2,grid,y}$)" in section B.6.2 as data that is calculated with equations provided in the methodology should not be part of this section.	~~CL3~~	OK
	Baseline emissions (VVM para 89-93)					
B.5.8	Are the calculations documented according to the approved	/1/	DR	The baseline emissions have been calculated in	~~CAR6~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
methodology and in a complete and transparent manner?			accordance with the baseline methodology AMS-I.D version 17 and 'Tool to calculate the emission factor for an electricity system' (version 2). In accordance with the 'Tool to calculate the emission factor for an electricity system' (version 2), the electricity baseline emission factor is determined *ex-ante* as a combined margin consisting of the operating margin emission factor (EF_{OM}) and the build margin emission factor (EF_{BM}). **CAR6:** Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2), Step 3, the *ex-ante* simple OM shall be calculated as the 3-year generation-weighted average. Evidence and failure DNV checked the ER calculations and found that the OM has not been calculated as the weighted average. **CAR7:** Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2), the BM has to be based on power units most recently built. Evidence and failure DNV checked the ER calculations and found that the for the BM the project participant has not considered any addition in year 2008 and all	~~CL4~~	

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				capacity additions in 2007, 2006, 2005, 2004 and 2003. **CL4:** a) The project participant is requested to further explain and clarify in the PDD the compliance with the following condition of the 'Tool to calculate the emission factor for an electricity system' (version 2) "*The simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.*" b) The project participant is requested to further explain and clarify in the PDD why it has chosen option (b) of Step 5 of the 'Tool to calculate the emission factor for an electricity system' (version 2) c) The project participant is requested to further explain and clarify in the ER calculation spreadsheet why it has chosen option (b) of Step 5 of the 'Tool to calculate the emission factor for an electricity system' (version 2).		
B.5.9	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	See CAR3, CAR4, and CAR5.	~~CAR3~~ ~~CAR4~~ ~~CAR5~~	OK
B.5.10	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	See CAR3, CAR4, and CAR5.	~~CAR3~~ ~~CAR4~~ ~~CAR5~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	Project emissions (VVM para 89-93)					
B.5.11	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	According to the applicable methodology AMS-I.D version 17, emissions from water reservoirs of hydro power plants have to be considered following the procedure described in the most recent version of ACM0002. According to ACM0002 version 12.1.0 "*For hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, project proponents shall account for CH_4 and CO_2 emissions from the reservoirs*". Considering that for the project activity the water reservoir already exists and the power plant installation did not result in the increase of existing reservoir project emissions are set to zero. **CL5:** a) The project participant is requested to clarify in the PDD how it complies with the methodology requirements regarding project emissions.	~~CL5~~	OK
B.5.12	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	See B.5.11 above.		OK
B.5.13	Are uncertainties in the project emission estimates properly addressed?	/1/	DR	See B.5.11 above.		OK
	Leakage (VVM para 89-93)					
B.5.14	Are the leakage calculations documented according to the approved methodology and in a complete and transparent	/1/	DR	According to the applicable methodology AMS-I.D version 17, leakage emissions have to be		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	manner?			considered if the energy generating equipment is transferred from another activity. According to the registered PDD /2/ and the final validation report /28/, leakage is not to be considered as the equipment is not transferred from another activity. DNV further confirms that the energy generating equipment is not transferred from another activity as evidenced by the specifications of the electro-mechanical equipment /10//11/ which does not indicate that the equipment is sourced from the second-hand market.		
B.5.15	Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	See B.5.14 above.		OK
B.5.16	Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	See B.5.14 above.		OK
	Emission Reductions (VVM para 89-93)					
B.5.17	Algorithms and/or formulae used to determine emission reductions: • All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.	/1/	DR	See CAR3, CAR4 and CAR5.	~~CAR3~~ ~~CAR4~~ ~~CAR5~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.6	**Monitoring plan (VVM para 122-124)**					
	Data and parameters monitored					
B.6.1	Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR	The project developer has included the monitoring of the followings and these are in accordance with the baseline methodology: i. EG_y: Electricity generated and delivered to the grid by the project activity;		OK
B.6.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	Yes, all necessary parameters are included and are clearly described.		OK
B.6.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	Yes, the PDD provides the description of the electricity meters that are used for the monitoring of the proposed project activity.		OK
B.6.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR	The accuracy measurement is 0.2% as indicated in the PDD. This is deemed appropriate.		OK
B.6.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	**CL6:** a) The project participant is requested to clarify which are the procedures for maintenance of the monitoring equipments and installations and the calibration frequency.	~~CL6~~	OK
B.6.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	The project participant will use cumulative electricity meters with monthly recording.		OK
B.6.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	The project participant will use cumulative electricity meters with monthly recording.		
	Ability of project participants to implement monitoring plan	/1/				
B.6.8	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/	DR	The monitoring set up is simple, based on DNV expertise of similar projects and sectoral expertise, the monitoring plan is considered		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				feasible within the project design.		
B.6.9	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	The project participant has in place a procedures for handling the data as DNV confirmed /9/. DNV deems that this is adequate.		OK
B.6.10	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/	DR	**CL6:** b) The project participant is requested to clarify which are the procedures to deal with erroneous measurements. c) The project participant is requested to clarify which are the procedures for identification of training for the monitoring personnel. d) The project participant is requested to clarify which are the procedures for identification of training for the monitoring personnel. e) The project participant is requested to clarify which are the procedures for review of reported results/data and for corrective actions in order to provide more accurate future monitoring and reporting	~~CL6~~	OK
B.6.11	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	Yes, all data on electricity generation will be kept for two years after the end of the crediting period.		OK

Table 2 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
CAR1 Requirement According to the 'Procedures for renewal of the crediting period of a registered CDM project activity' (version 06) "*The latest approved version of a baseline and monitoring methodology, applied in the original CDM-PDD of the registered CDM project activity, shall be used whenever applicable*". Evidence DNV checked the first version of the PDD and found that the applied methodology is AMS-I.D version 15. Failure The applied version of AMS-I.D (i.e. version 15) is no longer valid.	B.1.1	Version 16 of the methodology AMS-I.D has been used. Type I. Renewable energy project Category I Renewable Electricity Generation for a Grid Version 16 (Approved at EB 54)	DNV checked the latest version of the PDD and confirmed that it has been updated with the latest version of AMS-I.D which is version 16. **CAR1 is closed.**
CAR2 Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2), for the determination of $\eta_{m,y}$ "if the data obtained from the manufacturer, the utility, the dispatch center of official records is significantly lower than the default value provided in Annex 1 for the applicable technology, project proponents should assess the reliability of the values, and provide appropriate justification if deemed reliable. Otherwise, the default values provided in Annex 1 shall be used" Evidence	B.5.2	As per the *"Tool to calculate the emission factor for an electricity system" (Version 2)*, Page 22, for ηm,y and ηk,y it is stated that project participants can use either: • Documented manufacturer's specifications (if the efficiency of the plant is not significantly increased through retrofits or rehabilitations); or • For grid power plants: data from the utility, the dispatch centre or official records if it can be deemed reliable; or • The default values provided in the table below in Annex 1 (if available	DNV checked the latest version of the PDD and confirmed that section B.6.2 has been updated. Following the provisions of the 'Tool to calculate the emission factor for an electricity system' (version 2), the project participant has include a justification of the assumed values for $\eta_{m,y}$ as these differ from the values provided in Annex 1 of the mentioned tool. The assumed efficiencies for the different generation technologies is sourced from the annual report published by the grid operator SENER "Prospectiva del Sector Eléctrico 2009-2024" /26/. As indicated in the

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
DNV checked the ER calculations /3/ and confirmed that the project participant has sourced the conversion efficiency from public available data from the SENER, i.e. the grid operator /26/. This report provides conversion efficiencies for gas combined cycle plants of 50.27-51.66%. However, according to Annex 1 of the 'Tool to calculate the emission factor for an electricity system' (version 2) the efficiency for new gas combined cycle units should be 60%. Failure The difference between the official records and Annex I values is significantly different and the project participant has not provided any justification or an assessment of its reliability.		for the type of power plant) In the PDD, we chose to use the second option (ie official records from SENER). These data have been also used by other registered CMD projects in Mexico, such as Eléctrica del Valle de México Wind Farm registered in Feb 2011, and Oaxaca I Wind Farm registered in April 2011. As the project participant have chosen 'grid power plants' option, as per methodology, we use the SENER data. Please see page 10 of PDD for the discussion of applied efficiencies sourced from the SENER. Additional information has been included regarding the efficiency data reliability. Section B.6.2 has been modified to include a description of the methods applied to determine the use efficiency in SENER report data	mentioned report, the efficiencies presented in the report are based on actual measurements using standardised methods /26/: For turbogas and combined cycle units the efficiencies are assessed under ISO conditions of 15°C, 60% relative humidity and atmospheric pressure at sea level; for internal combustion units, the efficiencies are assessed under ISO 3046/1-1986 conditions (temperature of 25°C, 30% relative humidity and atmospheric pressure equal to 1 bar). **CAR2 is closed.**
CAR3 Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2) the project participant can use for EFCO2,i "IPCC default values at the lower limit of the uncertainty at a 95% confidence interval" Evidence The project participant has used default values.	B.5.3	The lower default value in IPCC has now been used. Please see Annex 3 of revised PDD. The value for diesel has been corrected, and also a note (7) is included in the excel spreadsheet for the use of residual fuel oil values instead of heavy fuel oil. Indeed, heavy fuel oil can be also referred to as residual fuel oil, as described in the	DNV checked the latest version of the ER calculations /3/ and confirmed that the project participant has applied IPCC default values at the lower limit of the uncertainty at a 95% confidence interval for the $EF_{CO2,i}$. The project participant has applied the IPCC default values for residual Fuel Oil for power plants consuming heavy fuel oil which would be acceptable considering the

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
Failure The project participant has not applied IPCC default values at the lower limit of the uncertainty at a 95% confidence interval.		technical CONCAWE document in attachment. In particular, the IPCC provides default information for "residual" fuel oil.	definition of Heavy Fuel Oil /31/ and the definition of residual fuel oil included in the IPCC guidelines /22/. **CAR3 is closed.**
CAR4 Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2) the parameter "Amount of fossil fuel type i consumed in the project electricity system in year y ($FCi_{,y}$)" has to be defined once for each crediting period using the most recent three historical years. Evidence and failure The project participant has not considered this parameter in the PDD.	B.5.4	As per the "Tool to calculate the emission factor for an electricity system" (Version 2), the parameter "Amount of fossil fuel type i consumed in the project electricity system in year y ($FCi_{,y}$)" has been defined using the most recent three historical years. Data for FCi,m,y can be found in the TJ/day in the "Prospectiva Reports" from SENER. A table in section B.6.2 of the PDD has been added to clarify this point.	DNV checked the latest version of the PDD and confirmed that it includes within section B.6.2 the parameter "Amount of fossil fuel type i consumed in the project electricity system in year y" ($FC_{i,y}$). The project participant has sourced the values from the "Prospectiva Reports" from SENER /26//27/ and has applied the latest three years at the time the PDD was sent to the UNFCCC. **CAR4 is closed.**
CAR5 Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2) the parameter "Net calorific value (energy content) of fossil fuel type i in year y ($NCVi_{,y}$)": - has to be defined once for each crediting period using the most recent three historical years. - if equal to IPCC default values, these have to be at the lower limit of the uncertainty at a 95% confidence interval.. Evidence and failure	B.5.5	Corrected. As per the "Tool to calculate the emission factor for an electricity system" (Version 2), the lower default value in IPCC has been used. This is now Added in Section B.6.2. Please see note 7 of the spreadsheet for the use of residual fuel oil values instead of heavy fuel oil. Indeed, heavy fuel oil can be also referred to as residual fuel oil, as described in the technical CONCAWE document in attachment. In particular, the	DNV checked the ER calculations and confirmed that project participant has applied for the NCV the IPCC default values at the lower limit of the uncertainty at a 95% confidence interval. The project participant has applied the IPCC default values for residual Fuel Oil for power plants consuming heavy fuel oil which would be acceptable considering the definition of Heavy Fuel Oil /31/ and the definition of residual fuel oil included in the IPCC guidelines /22/.

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
The project participant has not considered this parameter in the PDD and has not applied the IPCC default values in a conservative way.		IPCC provides default information for "residual" fuel oil.	**CAR5 is closed.**
CAR6 Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2), Step 3, the *ex-ante* simple OM shall be calculated as the 3-year generation-weighted average. Evidence and failure DNV checked the ER calculations and found that the OM has not been calculated as the weighted average.	B.5.8	This point has been corrected in the PDD, and the *ex-ante* simple OM has been calculated as the 3-year generation-weighted average over the 2006 to 2008 period	DNV checked the ER calculations and confirmed that the project participant has now calculated the 3-year generation weighted average over the 2006 to 2008 period as required by the tool. **CAR6 is closed.**
CAR7 Requirement According to the 'Tool to calculate the emission factor for an electricity system' (version 2), the BM has to be based on power units most recently built. Evidence and failure DNV checked the ER calculations and found that the for the BM the project participant has not considered any addition in year 2008 and all capacity additions in 2007, 2006, 2005, 2004 and 2003.	B.5.8	The BM has been based on the latest data available at the time of first submission of the PDD for validation, and the ER table has data on power plants built and additions to existing facilities from 2004 to 2008. We supply in attachment a copy of the dataset used to assess the BM. We have revised the BM to include more capacity additions as requested. However, Los Cabos is not included since it belongs to the other grid (Peninsule of Baja California). Also, there is no information on the generation for only capacity additions, or Net Generation for power plants. Therefore, we have used the Gross	DNV checked the emission reduction calculations and confirmed that the project participant has updated the BM calculations including the power units most recently built based on the annual reports published by the grid operator SENER /26//27/. The 'Tool to calculate the emission factor for an electricity system' (version 2) requires the BM to be calculated using net electricity generation figures which are not available in Mexico /26/. In order to convert the gross electricity generation figures to net electricity figures the project participant has subtracted the expected electricity self-consumption of different types of fossil-fuel based generation technologies used in Mexico /26/. As DNV confirmed, this would lead to conservative

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
		Generation minus the self consumption percentage (specific for each technology as outlined in Cuadro 47, SENER 2009-2024 report) as is consistent with other registered PDD in 2011 for Mexico. The BM calculations have been updated on the basis of the added generation, computed as a function (ratio) of the added units capacity vs the total capacity of the plants. CDM projects have now been excluded from the BM calculations. Furthermore, the plants for which no gross generation data are available are now highlighted in the BM calculations spreadsheet.	estimates as no self-consumption is considered for renewable energy additions to the grid, which would lead to a lower BM. It is worth noting that gross electricity values for some additions were not available as DNV was able to confirm through the SENER reports /26/ and as cross-checked with other registered projects under the UNFCCC /35/; the project participant has assumed zero generation for these additions which would lead to conservative estimates as most of the additions for which data is not available are small units with very low efficiency /26/. **CAR7 is closed.**
CL1 a) The project participant is requested to clarify if the project would comply with all the applicability conditions of AMS-I.D version 17.	B.2.1	AMS-I.D, version 16 is used. Applicability conditions are described in ***Table B.2.1*** in the PDD.	DNV checked the latest version of the PDD and confirmed that it has been updated discussing all the applicability conditions of AMS-I.D version 17. **CL1 is closed.**
CL2 The project participant is requested to clarify which would be the project boundaries.	B.3.1	The project boundary is now defined. A new paragraph has been included, indicating the following:	The project participant has defined clearly the boundaries of the project activity in the PDD, including project's components and their physical location inside Mexico.

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
		The project boundary comprises all the components of the project activity like the water reservoir generated by the existing dam on the Barreras River in the municipality of Pihuamo, the diversion tunnels, the power house and the substation. Also, the Mexican electrical grid is included in the project boundary; however the power plants located in the Baja California region have been excluded from the boundary due to their connection to a grid outside the National Interconnected System.	**CL2 is closed.**
CL3 a) The project participant is requested to clarify why it has considered "The installed capacity of each power plant included in the electric power system (Installed Capacity)" as parameter available at validation. b) The project participant is requested to clarify why it has considered the figures of Graph 47 which seem to be values for 2009 and not 2008. c) DNV checked Table 21 of the SENER, Prospectiva del Sector Eléctrico 2009-2024 which indicates the gross generation of each generation technology and it seems that values are inconsistent with those provided in the ER calculations. The project participant is requested to clarify why there is such an inconsistency. d) DNV checked the ER calculations and found that the self-consumption considered in the OM calculation includes the items "self-consumption"	B.5	a) Corrected. This has now been deleted. b) Since there is no information for 2008 in TJ, we have used the daily fuel consumption for 2008 shown in Table 38 Page 144 of the SENER report (in attachment). NCV from IPCC is used, and density from MSDS obtained from PEMEX were referenced (in attachment). The data source for diesel density has been now included in the ER calculations excel spreadsheet Information sources were attached to the document, information from PEMEX was used. Please refer to this document for density sources. Density sources are now explicitly stated in the excel spreadsheet.	a) DNV checked the latest version of the PDD and confirmed that it has been updated. The project participant has deleted the installed capacity of each power plant as it is not used in any calculation – OK. b) The project participant has sourced the density of natural gas and heavy fuel oil from two safety data sheets for chemiclas provided by PEMEX, which is the national oil company /33//32/ - OK. c) DNV checked the ER calculation spreadsheet and found that the project participant has applied electricity generation values in a gross basis and not in a net basis. As the project participant is applying Option B of the 'Tool to calculate the emission factor for an electricity system' (version 2) to calculate the simple OM, the use of the electricity generation in a gross basis would lead to conservative

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
and "self-supply". The project participant is requested to clarify the rationale of this assumption. e) DNV checked the BM calculations and found that the project participant has used gross generation instead of net generation for the calculations. The project participant is requested to clarify why it has done so. f) The project participant is requested to clarify why it has considered "CO2 emission factor calculated through the combined margin method ($EFgrid_{,CM,y}$; EFCO2,grid,y)" in section B.6.2 as data that is calculated with equations provided in the methodology should not be part of this section.		c) We have corrected the value from 97, 813 to 107,830 for combined cycle type gas power plant (table 21). The document was updated, and only information from table 21 of the Prospectiva del Sector Electrico 2009-2024 has been used. This is now explicitly stated in the excel spreadsheet d) Based on the Tool to Calculate Electricity from a Grid System Version 2 the Net electricity generation refers to the difference between the total quantity of electricity generated by the power plant/unit and the auxiliary electricity consumption (also known as parasitic load) of the power plant/unit. We have taken this to mean "self consumption" in the SENER report (Table 21, page 110), as it is defined in the report as "the energy used by the system for generation, transmission and distribution". The ER Sheet has been updated accordingly. NOTE: We have already removed the "servicios por particulares" upon reviewing some definitions of the tool, which stated that "off grid power plant is the power plant that supplies to specific consumers through a dedicated distribution network which is not used by any other power plants. In our case the "servicios por particulares" do not	values – OK. d) DNV checked the ER calculations and confirmed that they have been corrected in order to determine the gross generation by subtracting only the "self consumption" to the gross generation. In any case, as mentioned above, this would not impact the calculations as the project participant has used values in a gross basis - OK. e) DNV checked the ER calculations and confirmed that the net generation has been determined by applying the self-consumption seen in Mexico. Various "self –consumption" values are provided in the SENER report /26/. DNV confirmed that the project participant has used efficiencies in accordance to the generation technology and the installed capacity of the power unit – OK f) DNV checked the PDD and confirmed that it has been updated. It does not show the "CO2 emission factor calculated through the combined margin method ($EF_{grid,CM,y}$; $EF_{CO2,grid,y}$)" – OK. **CL3 is closed.**

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
		necessarily have a specific distribution network (servicios por particulares mean companies who generate their own electricity). The calculations already include this change. Also, and more important the total electricity that we are using is the fuel generated electricity (where no "servicios por particulares" is considered). e) Corrected. Net generation has been computed on the basis of plants' efficiency from SENER data depending on the technology and net generation is used for BM calculations. Corrected. Plants' efficiencies are taken from table 47 of the SENER 2009-2024 report, and are applied to the different units on the basis of the corresponding added capacity. When the added capacity lies between two different 'efficiency classes', the one with the lowest EF has been selected as a conservative approach. f) Corrected. This has now been deleted.	
CL4 a) The project participant is requested to further explain and clarify in the PDD the compliance with the following condition of the 'Tool to calculate the emission factor for an electricity system' (version 2) "*The simple OM method*	B.5	a) This point is addressed in page 16 of PDD, 1st paragraph with reference. "In this case, option (a) was chosen because the low-cost/must run resources in Mexico are well below the 50% of total grid generation in both the average of the five	a) DNV checked the PDD and confirmed that it has been updated including the clarification. The OM was determined using the simple adjusted OM calculation approach. Its applicability as per the 'Tool to calculate the emission factor for an

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
(option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production." b) The project participant is requested to further explain and clarify in the PDD why it has chosen option (b) of Step 5 of the 'Tool to calculate the emission factor for an electricity system' (version 2) c) The project participant is requested to further explain and clarify in the ER calculation spreadsheet why it has chosen option (b) of Step 5 of the 'Tool to calculate the emission factor for an electricity system' (version 2).		most recent years and in the long-term normal for hydroelectricity production[1]. " The calculations showing the percentage of LCMR resources for the 5 most recent years have been included into Annex 3, and explicitly stated in the PDD. b) This is described in the first paragraph of page 18 of the PDD. For the Project Activity, Option (b) was chosen because the Tool to Calculate the Emission Factor for an Electricity System V2 specified that "the set of power units that comprises the larger annual generation shall be selected", and as is shown in the SENER report3 the set of power capacity additions in the electricity system which comprise 20% of the system generation which has been built most recently comprise the larger annual generation capacity. The power unit's built date is considered the date it starts supplying electricity to the grid. Capacity additions from retrofit of power plants are not included in the calculation. C) This is described in the first paragraph of page 18 of the PDD, in the ER section. The excel spreadsheet has also been updated to show the percentage of power generation of the selected power units in the	electricity system' (version 2) was confirmed as according to the data from SENER /26/, the low-cost/must-run resources in the latest five years constitute less than 50% of the total grid generation - OK. b) DNV checked the PDD and confirmed that it has been updated including the clarification. The BM was determined considering the option (b) of the 'Tool to calculate the emission factor for an electricity system' (version 2) as the set of five power units that have been built most recently excluding CDM projects accounted for significantly less than 20% of the system generation in 2008 – OK. c) DNV checked the ER calculation spreadsheet and found that it has been updated, demonstrating transparently why it has chosen option (b) of Step 5 of the 'Tool to calculate the emission factor for an electricity system' (version 2) - OK **CL4 is closed.**

[1] SENER Prospectiva del Sector Eléctrico 2009-2024, Cuadro 21, p 110.

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
		calculations.	
CL5 a) The project participant is requested to clarify in the PDD how it complies with the methodology requirements regarding project emissions.	B.5	We included this in Section B.6 Page 14 as follows: "Considering that for the project activity the water reservoir already exists and the power plant installation did not result in the increase of the basin, project emissions are set to zero."	DNV checked the PDD and confirmed that it states that project emissions shall not be accounted for as the reservoir already existed before the project implementation. **CL5 is closed.**
CL6 a) The project participant is requested to clarify which are the procedures for maintenance of the monitoring equipments and installations and the calibration frequency. b) The project participant is requested to clarify which are the procedures to deal with erroneous measurements. c) The project participant is requested to clarify which are the procedures for identification of training for the monitoring personnel. d) The project participant is requested to clarify which are the procedures for identification of training for the monitoring personnel. e) The project participant is requested to clarify which are the procedures for review of reported results/data and for corrective actions in order to provide more accurate future monitoring and reporting	B.6	The project participant provided all the procedures required: • To deal with erroneous measurements (HPA-PROC-2009-01 document). • For maintenance of the monitoring equipments and installations and calibration frequency (HPA-PROC-2009-01 document). • For review of reported results/data for corrective actions for providing more accurate future monitoring (HPA-PROC-2009-01 document).	Since the meter is owned by the grid operator (Comision Federal de Electricidad), the procedure was completely developed by CFE. It is DNV's opinion that this procedure satisfies the requirements for deal with erroneous measurements, for maintenance of monitoring equipments and installations and calibration frequency and for review of reported results/data for corrective actions. **CL6 is closed.**

Table 3 Forward action requests

Forward action request	Reference to Table 1	Response by project participants
NA	NA	NA

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APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Elfride Covarrubias Villegas

Elfride Covarrubias is the DNV Manager for Climate Change activities in South Europe, Africa and Middle East.

Ms. Covarrubias holds two Master Degrees, once on Pollution & Environmental Control, and on Environmental Science, she holds the Bachelor's Degree in Environmental Engineering. She has almost 15 years of working experience at international level.

Prior to joining DNV she has been working in projects in Latin America though the World Bank support in Bolivia, within the O&G sector in Mexico with a consultancy division of Bureau Veritas, and into the manufacturing car maker General Motors in Mexico. In DNV, she has follow ISO 14001/EMAS activities with customer and as interface with Accreditation bodies/Surveillance Committees. Moreover, during the last 8 years she has been fully involved into Climate Change activities & projects like those under CDM, EU-ETS systems, ISO 14064, WRI&GHG protocol and other voluntary schemes. Ms. Covarrubias has been working on Climate Change projects developed in Europe, Africa and Middle East as well as in China.

Andres Espejo

Holds a Bachelor/Master Degree in Forestry Engineering. Having an overall experience of around five years. Prior to joining DNV having 5 years experience in biomass generation, forest management, and generation with other renewables, covering the management of forestry operations, procurement of timber and biomass, management of forest states, pre-feasibility studies for renewable generation projects, etc.

He has experience of around one year in validation and verification of numerous CDM projects.

His qualification, industrial experience and experience in CDM demonstrate him sufficient sectoral competence in Energy Generation from renewable energy sources (Technical Area 1.2) and Forestry (Sectoral Scope 14).

Ricardo Diaz

Ricardo Díaz holds a Bachelor's Degree in Mechanical Engineering and has done a Energy Savings Systems Master Degree and a Business Administration Master Degree having an overall experience of around 10 years. Prior to joining DNV having 8.5 years experience in Power generation facilities (thermo power plants, wind and hydro power plants, energy efficiency process and energy demand. Responsible for operation, maintenance, project management and evaluation for energy facilities (fossil fuel and renewable sources) as well as energy efficiency improves. In addition, experience with limited scope to operation and maintenance duty for hospitality facilities and water treatment process. He has experience of around 1.5 years in validation and verification of numerous CDM projects.

His qualification, industrial experience and experience in CDM demonstrate him sufficient sectoral competence in:

1.1 Thermal energy generation from fossil fuels as well as thermal electricity from solar

1.2 Energy Generation from renewable energy sources and

3.1 Energy demand.

Gonzalo Sandoval holds a degree in electrical engineering with a specialty in electrical power systems, having an overall experience of around 14 years. Prior to joining DNV having 12.5 years of experience in electricity distribution, electrical energy demand and electrical equipment, covering power requirements and installation of electrical equipment in a nationwide media broadcaster, performing electrical studies in low and medium voltage grids for paper mills, food storage facilities, corporate offices, laboratories, refineries among others, assessing effects of electrical disturbances in the grid, electrical equipment and sensitive electronic devices plugged to the grid. Additionally, he has had experience in academia since 1999 as an electrical engineering professor of the National University of Mexico (UNAM).

Since joining DNV, he has performed several validations and verifications of CDM projects, including four inclusions of the first CDM PoA in Mexico, for over one and a half years in Mexico, Honduras, Guatemala and El Salvador.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sector competence in Electrical Equipment, Electricity Distribution and Energy Demand.

Simon Wong Yon Sing

Simon Wong Yon Sing holds a Bachelor's Degree in Chemical Engineering with Environmental Engineering, with a year experience in the field of design and operation/maintenance of wastewater treatment as part of working in wastewater design & equipment supply services.

His experience in designing and maintaining the wastewater treatment systems covers the fields of various manufacturing and chemical industries in Malaysia.

He has experience of more than 5 years in validation and verification of numerous CDM projects in DNV, both in Malaysia and abroad. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in "Energy Generation from Renewable Energy Sources", "Waste Handling and Disposal" and "Animal Waste Management System".

Andrea Leiroz

Mrs. Andrea Leiroz holds a Bachelor's Degree in Chemical Engineering, Master Degree in Material Science and Doctor Degree in Mechanical Engineering. Having an overall experience of around Thirteen years.

She has experience of around 4 years in validation and verification of numerous CDM projects in DNV, both in Brazil & abroad.

Her qualification, experience in CDM demonstrates her sufficient sectoral competence in Energy Generation from renewable energy sources, Waste handling and disposal and Animal waste management.