




**Validation report form for post-registration changes for
CDM project activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Chacayes Hydroelectric Project, Chile UNFCCC ref. no: 6848
Process track	<input type="checkbox"/> Prior approval <input type="checkbox"/> Issuance <input checked="" type="checkbox"/> Renewal of crediting period
Version number of the validation report	2
Completion date of the validation report	18/06/2020
Type(s) of PRCs	<input type="checkbox"/> Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents ¹ <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan <input type="checkbox"/> Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents <input type="checkbox"/> Changes to the project design <input type="checkbox"/> Changes specific to afforestation and reforestation project activities
Version number of PDD to which this report applies	PDD v5.0
Project participants	Pacific Hydro Chacayes S.A. (PHCSA)
Host Party	Chile
Applied methodologies and standardized baselines	Methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 20.0
Mandatory sectoral scopes	1: Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	Not applicable
Name and UNFCCC reference number of	AENOR INTERNACIONAL S.A.U

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

the DOE	Reference number: E-0021
Name, position and signature of the approver of the validation report	 José Luis Fuentes Climate Change Manager

SECTION A. Executive summary

AENOR INTERNACIONAL S.A.U (AENOR) has performed the validation of the Post Registration Changes of the project "Chacayes Hydroelectric Project, Chile" (Registration Ref. Nº 6848).

The Chacayes Hydroelectric Project, Chile (the Project), developed by Pacific Hydro Chacayes S.A. (PHCSA), is a run-of river hydroelectric power plant with an installed capacity of 113.36 MW (56.68 MW x 2 turbines) and an expected annual net generation of approximately 560,457 MWh of electricity per annum. The purpose of the proposed project activity is to utilize the waters of the Cipreses and Cachapoal Rivers to generate hydro-electricity for export to the SEN grid.

The proposed project activity is located in the Cachapoal Valley, approximately 10 km upstream of the town of Coya on the northern bank of the Cachapoal River. Coya town is approximately 30 km east of the city of Rancagua, which is the major city of Chile's 6th Region. Rancagua is located on the Pan American Highway (Ruta 5) approximately 80 km south of Santiago. The scope of the present validation report is to address the post registration changes addressed by PPs and assess their validity.

AENOR validated that proposed changes comply with the relevant requirements of the CDM PS version 02.0, i.e, that in accordance with paragraphs 228 and 229 the project participant has identified and documented any actual or proposed changes to the operation, implementation or monitoring of the registered CDM project activity.

The project participant has prepared a revised PDD (in both track-change and clean versions) that reflects the actual or proposed changes, using the valid version of the applicable PDD form.

The post-registration changes submitted with the request for renewal of crediting period are corrections in accordance with the CDM PS, paragraph 232. According to the paragraph 289 of the PS, the project participant can combine a request for approval of any types of changes to the registered CDM project activity with a request for renewal of the crediting period.

Furthermore, AENOR, as it is demonstrated below has validated through evidence provided and cross-checks with registered information that the PPs have correctly revised the PDD to reflect the proposed changes and they are in compliance with the requirements in the CDM PS, applicable methodology and associated tools and guidelines.

SECTION B. Validation team, technical reviewer and approver**B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	Llorente Pérez	Elena	AENOR	Yes	No	Yes	Yes

B.2. Technical reviewer and approver of the validation report on PRCs

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Arribas Alonso	Luis Javier	AENOR
2.	Approver	IR	Fuentes Perez	Jose Luis	AENOR

SECTION C. Means of validation**C.1. Desk/document review**

The assessment of post registration changes consisted of the following steps:

- Appointment of team members and technical reviewers
- A desk review of the registered and revised PDD/1/ submitted by the client and additional supporting documents
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Resolution of corrective actions (CARs / CLs)
- Final reporting
- Technical review
- Final approval.

A complete list of all documents reviewed is attached in Appendix 3 of this report.

C.2. On-site inspection

Duration of on-site inspection: N/A				
No.	Activity performed on-site	Site location	Date	Team member
1.	N/A	N/A	N/A	N/A

No on-site inspection was conducted as part of the validation assessment.

Due to the COVID-19 pandemic the on site visit could not be made and could not be postponed, since the validation of the renewal period was made from May 2020 to June 2020.

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Pérez-Cotapos	Jose Miguel	Project participant at Pacific Hydro Chacayes S.A.	27/05/2020	<ul style="list-style-type: none"> - Basic information, technology of the project, etc.; - Monitor Data: meter readings, control and maintenance, QA&QC systems - Status of the project activity and any modifications with respect to the registered PDD. - Applicability to the latest methodology. - National and local policies and changes - Baseline of the project and its updates - The lifetime of the project activity - Emission Factors and their updates - Monitoring plan and changes 	Elena Llorente Pérez
2.	Vaquero	Laura	Carbon consultant at Everis			
3.	Medrano	Alfonso	Carbon consultant at Everis			

C.4. Sampling approach

Not applicable.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	0	0	0
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	0	0	0
Corrections	CL 1	0	0
Changes to the start date of the crediting period	0	0	0
Inclusion of a monitoring plan	0	0	0
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents	0	0	0
Changes to the project design	0	0	0
Changes specific to afforestation and reforestation project activities	0	0	0
Others (please specify)	0	0	0
Total	1	0	0

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.2. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.3. Corrections

Means of validation	<p>The PDD has been revised using the valid version of the template /10/. To meet the template guidelines, minor corrections have been made to the revised PDD/9/, which do not affect the project description or design.</p> <p>The proposed corrections in the registered PDD are requested in this PRC:</p> <ul style="list-style-type: none"> - The total maximum rated power of each turbine installed in the project is 56.68 MW, and therefore the total installed capacity is 56.68 MW x 2 turbines = 113.36 MW. In the registered PDD, the installed capacity is 110.8 MW, since it is the <i>“rated plant electrical output measured at revenue metering points, with both turbines operating at a net head of 168.6m and each discharging 36.35 m3/s, and both units generating at rated voltage, frequency and indicated power factor”</i>. Therefore, the electricity generation it is the same, as the one stated in the registered PDD, but the total installed capacity has been corrected to the sum of the turbine’s capacity. - Regarding the pond surface area value, it has been updated to the most recent data measured by the PP, 180,179 m² instead of the 180,000 m² data from the registered PDD.
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	<p>AENOR has checked this information against a picture of the nameplates and the updated pond surface report.</p> <p>The DOE confirms that the information transferred to the latest version of the form is materially the same as that in registered PDD /11/, except the proposed changes mentioned above and the changes required in the renewal of crediting period.</p>
Findings	CL 1- In accordance with the registered PDD, Chacayes Hydroelectric Project has an installed capacity of 110.8MW and a surface area of 180,000 m2. The revised PDD has an installed capacity of 113.36 MW and a pond surface area of 180,179 m2. Please provide evidences of the technical characteristic of the project activity.
Conclusion	<p>AENOR deems that these changes do not adversely affect to the additionality of the project, the scale of the project, applicability and application of the methodology and other regulatory documents with which the project was registered, the compliance of the monitoring plan with the applied methodology, the level of accuracy of the monitoring compared with registered monitoring plan, and the project boundary and associated leakages due to changes.</p> <p>The proposed changes in the revised PDD make it a more accurate reflection of the actual situation. The changes made to PDD are consistent with the applicable form version. The information reported is consistent and accurate.</p> <p>Hence, AENOR confirms that information is consistent and complete in the revised PDD and spreadsheet calculations.</p> <p>The proposed change does not affect to the quality of monitoring equipment, frequency of measurements and QC/QA procedures.</p>

D.4. Changes to the start date of the crediting period

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.5. Inclusion of a monitoring plan

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.7. Changes to the project design

Means of validation	N/A
Findings	N/A
Conclusion	N/A

D.8. Changes specific to afforestation and reforestation project activities

Means of validation	N/A
Findings	N/A
Conclusion	N/A

SECTION E. Internal quality control

Following the completion of the assessment process by the validation team, all documentation undergoes an internal quality control through a technical review before submission to the CDM-EB. The technical reviewer is a qualified member of AENOR, independent from the team that carried out the validation of the post registration changes. The technical review team has collectively all the competence required including the technical area(s).

SECTION F. Validation opinion

AENOR was contracted to perform the validation of the PRC for the CDM project activity: "Chacayes Hydroelectric Project, Chile" (Registration Ref. No. 6848).

AENOR has performed the validation of the proposed PRC according to the CDM Requirements approved.

This post-registration change is submitted along with the request for renewal of crediting period in accordance with paragraph 289 of the PS.

AENOR planned and performed its work to obtain the information and explanations considered necessary to provide sufficient evidence to give reasonable assurance that the level of accuracy of GHG emission reductions is not adversely affect. This assessment included:

- Collection of evidence supporting the reported data.
- Checking whether the provisions in the provided documents were consistently and appropriately applied.

AENOR confirms that the proposed correction, do not adversely affect to the additionality of the project, the scale of the project, applicability and application of the methodology and other regulatory documents with which the project was registered.

The proposed correction to the project activities neither impact the applicability conditions of the methodology and baseline, nor impact the additionality and the scale of the project and the accuracy is not reduced.

Madrid 18 June 2020



Elena Llorente Pérez
Team leader



José Luis Fuentes
Authorized person

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM0002	Consolidated baseline methodology for grid-connected electricity generation from renewable sources - Version 20.0
BM	Build margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CEN	National Electricity Coordinator
CER	Certified Emission Reductions
CNE	National Energy Commission
CL	Clarification Action
CM	Combined margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DOE	Designated operational entity
DR	Desk review
ER	Emission reduction
EF	Emission factor
FAR	Forward action request
GHG	Greenhouse Gases
GSC	Global stakeholder consultation
GWh	Electrical Giga Watt hour
IPPC	Intergovernmental Panel on Climate Change
kW	Kilowatt
LC/MR	Low cost/Must run
MP	Monitoring plan
MW	Megawatt

Abbreviations	Full texts
OM	Operating margin
PDD	Project Design Document
PP	Project participant
PS	CDM project standard for project activities version 02.0
RCP	Renewal of crediting period
SEN	National Electricity System (Chilean grid after interconnection of SIC and SING by the end of year 2017)
tCO _{2e}	Carbon dioxide equivalent tonnes
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM validation and verification standard for project activities version 02.0

Appendix 2. Competence of team members and technical reviewers

CERTIFICATE OF QUALIFICATION

Subject: Validation and technical review team for “Chacayes Hydroelectric Project, Chile”

Madrid, 18/06/2020

Hereby I confirm the following records of qualification, according with AENOR internal instruction “Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities” IE-DTC-039, and with regard to the validation process of the above mentioned project activity:

Name: Elena Llorente Pérez

CDM team leader: YES

CDM validator: YES

CDM verifier: N.A.

External technical expert: N.A.

Technical areas related with the project activity:

Technical areas related with the project activity: 1.2. Renewables



Jose Luis Fuentes
Climate Change Manager

CERTIFICATE OF QUALIFICATION

Subject: Validation and technical review team for “Chacayes Hydroelectric Project, Chile”

Madrid, 18/06/2020

Hereby I confirm the following records of qualification, according with AENOR internal instruction “Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities” IE-DTC-039, and with regard to the validation process of the above mentioned project activity:

Name: Luis Javier Arribas

CDM team leader: NO

CDM Tehnical reviewer: YES

CDM verifier: N.A.

External technical expert: N.A.

Technical areas related with the project activity:

Technical areas related with the project activity: 1.2. Renewables



José Luis Fuentes
Climate Change Manager

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UNFCCC	CDM project standard for project activities version 2.0	https://cdm.unfccc.int/Reference/Standards/index.html	UNFCCC
2	PPs	Previous PDD versions.		PPs
3	UNFCCC	ACM0002: Grid-connected electricity generation from renewable source version 20.0	https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG	UNFCCC
4	UNFCCC	CDM Validation and Verification Standard for project activities version 2.0	https://cdm.unfccc.int/Reference/Standards/index.html	UNFCCC
5	UNFCCC	CDM Project Cycle Procedure for project activities version 2.0	https://cdm.unfccc.int/Reference/Procedures/index.html	UNFCCC
6	UNFCCC	Methodological Tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period version 03.0.1	https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf	UNFCCC
7	UNFCCC	Methodological Tool: Tool to calculate the emission factor for an electricity system version 07.0	https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf	UNFCCC
8	AENOR	Specific Instruction for the Validation, verification and certification of clean development mechanism (CDM) project activities(IE/DTC/0039)		AENOR
9	PPs	Final PDD version 5.0		PPs
10	UNFCCC	CDM-PDD form version 11.0	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	UNFCCC

11	PPs	Registered PDD version 4.4	https://cdm.unfccc.int/Projects/DB/DNV-CUK1343210523.53/view	UNFCCC
12	UNFCCC	Validation Report version 2	https://cdm.unfccc.int/Projects/DB/DNV-CUK1343210523.53/view	UNFCCC
13	PPs	Ex-ante emission reduction calculation v4		PPs
14	PPs	Chile Electricity System Emission Factor 2019 CDM Chacayes v4.0		PPs
15	CEN	Resolution 668	https://www.leychile.cl/Navegar?idNorma=1111361	CEN

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CLs from this validation

CL ID	1	Section no.	D.3	Date:	08/05/2020
Description of CL					
In accordance with the registered PDD, Chacayes Hydroelectric Project has an installed capacity of 110.8MW and a surface area of 180,000 m ² . The revised PDD has an installed capacity of 113.36 MW and a pond surface area of 180,179 m ² . Please provide evidences of the technical characteristic of the project activity.					
Project participant response					Date: 11/05/2020
<p>As it was explained in the registered PDD (page 36; parameter Cap_{PJ}) “110.8 MW, is the rated plant electrical output measured at revenue metering points, with both turbines operating at a net head of 168.6m and each discharging 36.35 m³/s, and both units generating at rated voltage, frequency and indicated power factor”, defined in Schedule F “Performance Guarantee” of the EPC Contract.</p> <p>However the maximum rated power of each turbine installed in the project is 56.68 MW, and therefore the installed capacity is 56.68 MW x 2 turbines = 113.36 MW. Please see evidence attached.</p> <p>Regarding the pond surface area value, it has been updated to the most recent data measured by the PP. Please see “INFORME TOPOBATIMETRICO TRANQUE CHUPALLAL 25-02-2020 3-4” attached.</p>					
Documentation provided by project participant					
<i>Placa Turbina U1.png</i> <i>Placa Turbina U2.png</i> <i>INFORME TOPOBATIMETRICO TRANQUE CHUPALLAL 25-02-2020 3-4</i>					
DOE assessment					Date: 19/05/2020
A correction to the registered PDD should be made in accordance with the installed capacity of both turbines and the pond surface area. CL 1 is closed.					

Table 2. CARs from this validation

CAR ID	xx	Section no.		Date:	DD/MM/YYYY
Description of CAR					
Project participant response					Date: DD/MM/YYYY
Documentation provided by project participant					
DOE assessment					Date: DD/MM/YYYY

Table 3. FARs from this validation

FAR ID	xx	Section no.		Date:	DD/MM/YYYY
Description of FAR					
Project participant response					Date: DD/MM/YYYY
Documentation provided by project participant					

DOE assessment		Date: DD/MM/YYYY
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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); Make editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.

Decision Class: Regulatory

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