

**Swiss Association for Quality and  
Management Systems (SQS)**

Bernstrasse 103  
P.O. Box 686  
CH-3052 Zollikofen  
Tel. +41 31 910 35  
Fax. +41 31 910 35 45  
headoffice@sqs.ch  
www.sqs.ch

# CDM Validation Report

**Enterprise**

Business account:  
Company:  
Address:

324294  
EnBW Kraftwerke AG  
Durlacher Allee 93  
D-76131 Karlsruhe

Phone:  
Fax:  
E-Mail:  
Contact person:

+49 721 632 31 03  
+49 721 632 31 19  
c.voigt@enbw.com  
Mrs Dr. Cora Voigt

**Service**

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UNFCCC Scale:

1 Energy  
ACM0002, Consolidated baseline methodology for grid-connected  
electricity generation from renewable sources ver. 13.0.0  
Large-scale

Team of auditors/assessors:

Mr Zsolt Lengyel  
Ms Margit Haberleiter  
Mr Marco Bedoya

**Approved by**

Lead auditor/assessor:  
Mr Zsolt Lengyel

Reviewer:  
Mr Marco Bedoya

Executive board:  
Mr Silvio Leonardi

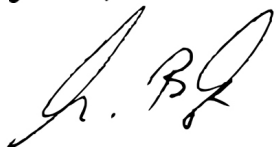
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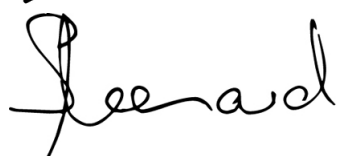
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## Table of Contents

|        |  |    |
|--------|--|----|
| 1      | Introduction.....  | 3  |
| 1.1    | Objective .....  | 3  |
| 1.2    | Scope .....  | 3  |
| 1.3    | The Programme of Activity and first CPA at glance.....   | 4  |
| 1.4    | Validation approach .....  | 5  |
| 2      | Validation Opinion .....   | 6  |
| 2.1    | Summary of validation conclusions.....   | 6  |
| 2.2    | Summary of the validation methodology and process used and the validation criteria applied .....                           | 6  |
| 2.3    | Description of project components or issues not covered by the validation process .....                                    | 7  |
| 2.4    | Statement on the validation of the expected emission reductions for the 1st CPA .....                                      | 7  |
| 2.5    | Statement whether the proposed CDM project activity meets the stated criteria .....  | 7  |
| 3      | Validation Findings .....  | 8  |
| 3.1    | Global stakeholder consultation.....   | 8  |
| 3.2    | Approval .....   | 8  |
| 3.3    | Authorisation .....  | 8  |
| 3.4    | Contribution to sustainable development.....   | 9  |
| 3.5    | Modalities of communications.....  | 9  |
| 3.6    | Project design document.....   | 9  |
| 3.7    | Description of project activity .....  | 9  |
| 3.8    | Application of the selected baseline and monitoring methodology.....   | 11 |
| 3.8.1  | General .....  | 11 |
| 3.8.2  | Applicability of the selected baseline and monitoring methodology to the PoA, including the generic CPA, and the 1st CPA.. | 13 |
| 3.8.3  | Non-coverage by the methodology .....  | 15 |
| 3.8.4  | Deviation from an approved methodology .....   | 15 |
| 3.8.5  | Clarification on the applicability of an approved methodology.....   | 15 |
| 3.8.6  | Project boundary of PoA and 1st CPA.....   | 15 |
| 3.8.7  | Baseline scenario identification and description .....   | 15 |
| 3.8.8  | Algorithms and/or formulae used to determine emission reductions.....  | 16 |
| 3.8.9  | Additionality of the project activity.....   | 19 |
| 3.8.10 | Identification of alternatives to the project activity consistent with current laws and regulations .....                  | 20 |
| 3.8.10 | Investment analysis.....   | 21 |
| 3.8.11 | Barrier analysis .....   | 29 |
| 3.8.12 | Common practice analysis.....  | 30 |
| 3.8.13 | Eligibility criteria for inclusion of a CPA in the PoA.....  | 32 |
| 3.8.14 | Operational and management arrangements of the CME .....   | 37 |
| 3.8.15 | Validation of the specific CPA (1st CPA) .....   | 39 |
| 3.9    | Monitoring plan.....   | 39 |
| 3.10   | Sustainable development.....   | 41 |
| 3.11   | Environmental impacts.....   | 41 |
| 3.12   | Local stakeholder consultation.....  | 42 |
| 4      | List of Interviewees and Documents Reviewed .....  | 42 |
| 5      | Validation Team and Reviewer.....  | 42 |
| 6      | Quality Control.....   | 43 |
| 7      | Appendix A and B: On-Site Visit Programme & Interviews .....   | 44 |
| 8      | Appendix C: Documents Reviewed .....   | 45 |
| 9      | Appendix D: Certificates of Competence.....  | 47 |
| 10     | Appendix E: Abbreviations .....  | 50 |
| 11     | Appendix F: Validation Protocol .....  | 51 |

# 1 Introduction

## 1.1 Objective

EnBW Kraftwerke AG on behalf its fully owned subsidiary company Carbon BW Peru S.A.C. has retained SQS to validate the “EN BADEN Large-Scale Hydro PoA in Peru” Programme of Activities (hereafter called “the project” or “EN BADEN PoA”).

The objective of the validation process is to provide an independent assessment by a third party, a Designated Operational Entity (DOE), of a proposed Programme of Activities (PoA).

The assessment involves the evaluation of the project basis and design identified in the PoA-DD, CPA-DD generic and CPA-DD real case using the defined criteria outlined by the registration under the Clean Development Mechanism (CDM). Validation is part of the CDM project cycle and results in a conclusion by the executing DOE on whether or not a project (programme) activity is valid to be submitted for registration to the CDM Executive Board (CDM-EB).

The ultimate decision on the registration of a proposed PoA rests with the CDM-EB.

## 1.2 Scope

The scope of the validation is an independent and objective review of the project documentation, the PoA-DD, CPA-DD generic and CPA-DD real case and other documents using a risk-based approach and focusing on the identification of significant risks for project implementation and the generation of Certified Emission Reductions (CERs) against the criteria stated in:

- The Kyoto Protocol, in particular Article 12
- Decisions 2/CMP.1 and 3/CMP.1
- Modalities and Procedures for a Clean Development Mechanism
- Decisions and specific guidance issued by the CDM EB published under <http://cdm.unfccc.int>
- Glossary of CDM terms (version 06)
- Clean Development Mechanism Validation and Verification Manual (ver. 01.2)
- ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 13.0.0
- Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (version 01.0) EB 65 Annex 3
- Procedures for registration of a programme of activities as a single CDM project activity and issuance of CERs for a PoA (EB55 Annex 38)
- Eligibility of activities under the CDM (EB 33 Annex 30)
- Guidance on Programme of Activities (PoA) (EB 35 Annex 15)
- Guidelines for objective demonstration and assessment of barriers (EB 50 Annex 13)
- Tool for the demonstration and assessment of additionality, version 6.0.0, EB 65 Annex 21
- Tool to calculate the emission factor for an electricity system, version 02.2.1 EB 63 Annex 19
- Guidelines on the Assessment of Investment Analysis, version 05, EB 62, Annex 05
- Guidelines on the demonstration and assessment of prior consideration of the CDM Version 04, EB 62 Annex 13
- A comprehensive list of the normative references given in the validation protocol (Appendix F)

SQS has remained independent during the validation process, free from bias and conflict of interest. SQS has maintained objectivity throughout the validation to ensure that the findings and conclusions will be based on objective evidence generated during the validation.

SQS has maintained trust, integrity, confidentiality and discretion throughout the validation process. This report reflects truthfully and accurately the validation activities.

SQS has exercised due professional care and judgement in accordance with the importance of the task performed.

The PoA-DD, CPA-DD generic and CPA-DD real case validation findings are presented in a reporting structure in which

*indented paragraphs* will provide the validation findings related to the CPA-DD generic and real case and text with

*normal margins* will be used for the PoA-DD related findings.

In case of tabular format representation of the validation findings different columns will refer to the PoA-DD and the CPA levels as follows:

| Criteria, parameter etc. | PoA related findings | 1st CPA related findings |
|--------------------------|----------------------|--------------------------|
|--------------------------|----------------------|--------------------------|

This presentational structure will provide for an easy distinction between the two levels of a PoA; the programme itself and the first, real implemented project activity component, the 1st CPA.

### 1.3 The Programme of Activity and first CPA at glance

The EN Baden PoA [3] facilitates the development of new hydropower projects with a total or combined installed capacity not greater than 20 MW in Peru connected to the Peruvian National Electricity Grid (SEIN). Each CDM programme activity consists of one or more new hydropower plants having a combined installed capacity of not more than 20 MW. This PoA is a voluntary action coordinated and managed by Carbon BW Peru S.A.C. a Peruvian company, a fully owned subsidiary of EnBW Kraftwerke AG, Germany. The CME intends to work closely with hydropower developers and other organisations active in the hydropower sector to promote the development of hydropower and the inclusion of new plants in the PoA.

The first CPA “El Carmen Hydropower Project” [3] is a new run-of-river power plant with an installed capacity of 8.4 MW with two horizontal Francis turbines for a net head of 220.85 m and 4.5 m<sup>3</sup>/s water flow, connected to the national Peruvian Electricity Grid (SEIN). There is no reservoir associated with the plant (only a small desander); it will be implemented in Monzón district, Huamalie province, Huánuco department of Peru and the geographical coordinates of its powerhouse were confirmed during validations as follows -9.297879 (South), -76.464447 (West), UTM WGS84 coordinate values are used by the Peruvian Water Authority in its permit defining the intake and discharge locations (337254,24;8971210,20 and 338689,40;8972188,70 respectively)” [34].

The power plant will produce 55 154 MWh per year using water flow from El Carmen River and which is tributary to the Monzón River. The 1st CPA is expected to reduce 36 222 tCO<sub>2</sub> annually, resulting in 253 557 tCO<sub>2</sub> emission reductions in the first 7-year crediting period by producing electricity from a renewable source substituting fossil fuel based electricity generation [6].

The PoA project participant (PP) is Carbon BW Peru S.A.C. registered in Peru.

The CDM-POA-DD [1] was published for global stakeholder consultation on 06/01/2012.

The starting date of the 1st CPA is 28/02/2013, the date of the expected date of financial closing [33]. Though the DOE is not required to assess prior consideration of CDM for PoAs in line with EB 62 Annex 13 requirements, it is confirmed that the first component of the programme will commence after the start date of validation. The 1st CPA-s owner submitted the Prior Consideration notification to the UNFCCC on 24/08/2011[11] and to the Peruvian DNA on 23/08/2011 [12]. The 1st CPA uses the renewable, 21-year period and its first 7-year crediting period will start on 01/01/2015.

The starting date of the PoA will be 07/01/2013. The length of the programme of activities is the maximum allowed, 28 years.

## 1.4 Validation approach

The DOE applies standard auditing techniques to assess the correctness, accuracy, relevance, completeness, consistency, transparency and conservativeness of the information provided by the PPs, including, where appropriate, but not limited to:

- a) Document review, involving: review of data and information to verify the correctness, credibility and interpretation of information, cross-checks between information provided in the PDD and information from other sources, if available, and if necessary independent background investigations.
- b) Follow-up actions (on-site visit, telephone, e-mail interviews), including: interviews with relevant stakeholders in the host country, personnel with knowledge of the project design and implementation and cross-checks between information provided by interviewed personnel to ensure that no relevant information has been omitted from the validation.
- c) Reference to available information relating to projects or technologies similar to the proposed CDM project activity under validation.
- d) Review, based on the approved methodology being applied, of the appropriateness of formulae and correctness of calculations.

Requests: The DOE raises a corrective action request (CAR) if:

- a) The PPs 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; or
- c) There is a risk that emission reductions cannot be monitored or calculated.

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

The DOE raises a forward action request (FAR) during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs do not relate to the CDM requirements for registration.

The DOE resolves or “closes out” CARs and CLs only if the PPs modify the project design, rectify the PDD or provide adequate additional explanations or evidence that satisfies the DOE’s concerns. If this is not done, the DOE does not recommend the project activity for registration to the CDM Executive Board.

Methodology-specific validation protocol: To organise its validation of methodology-specific requirements, the DOE has used a methodology-specific validation protocol for the project, attached to this report as Appendix F.

The validation team has the necessary skills and competences to undertake the validation as listed in Appendix D: Certificates of Competence.

## 2 Validation Opinion

### 2.1 Summary of validation conclusions

Based on:

- PoA-DD, generic CPA-DD and 1st CPA-DD version 03 dated 15/10/2012 [3]
- Consulted documents listed in Appendix C
- Clean Development Mechanism Validation and Verification Manual (ver. 01.2)
- ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 13.0.0
- Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (version 01.0) EB 65 Annex 3
- Procedures for registration of a programme of activities as a single CDM project activity and issuance of CERs for a PoA (EB55 Annex 38)
- Eligibility of activities under the CDM (EB 33 Annex 30)
- Guidance on Programme of Activities (PoA) (EB 35 Annex 15)
- Guidelines for objective demonstration and assessment of barriers (EB 50 Annex 13)
- Tool for the demonstration and assessment of additionality, version 6.0.0, EB 65 Annex 21
- Tool to calculate the emission factor for an electricity system, version 02.2.1 EB 63 Annex 19
- Guidelines on the Assessment of Investment Analysis, version 05, EB 62, Annex 05
- Guidelines on the demonstration and assessment of prior consideration of the CDM version 04, EB 62 Annex 13
- A comprehensive list of the normative references given in the validation protocol (Appendix F).
- Site visit of 1st CPA and meetings with CME, authorities and CPA owner in Lima on 24 - 27/01/2012

It is SQS' opinion, that the project "EN BADEN Large-Scale Hydro PoA in Peru" described in the PoA-DD, generic CPA-DD and 1st CPA-DD version 03 dated 15/10/2012 [3] with a PoA length of 28 years, a PoA starting date of 07/01/2013 or the date of registration as a CDM PoA and the first crediting period of the 1st CPA from 01/01/2015 to 31/12/2021 meets all relevant criteria of the listed references.

SQS confirms that ACM0002, Consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13.0.0 is applicable for this project activity and that the criteria are discussed in an exhaustive manner in the PoA-DD and supported by the submitted documents. Furthermore, the selected methodology is correctly applied and therefore, SQS requests the registration of the given CDM PoA.

### 2.2 Summary of the validation methodology and process used and the validation criteria applied

The PoA validation process has been carried out using the methodology described above in paragraph 1.4.

In the course of the PoA validation according to VVM. 1.2 paragraph 168 SQS has assessed the specific CDM SSC CPA-DD (CPA-001), which the PPs submitted together with the CDM-SSC- PoA-DD for validation, to determine whether or not it complies with the eligibility criteria specified in the PoA-DD [3].

The validation process has included

- a desk review of the POA-DD, generic CPA-DD and 1st CPA-DD [3] including the annexes and the additional documents not limited to that provided by the PPs. All reviewed documents are listed in the Appendix C of this report.

- an on-site visit between 24 - 27/01/2012 including interviews. The detailed on-site visit programme and the full list of interviews is in Appendix A and B of this report.

6 CARs, 40 CLs and one FAR have been raised; all CARs and CLs are closed. As a consequence of these requests the PoA-DD has been modified from the original version 1 (25/11/2011) to the current version 03 (15/10/2012), the generic CPA-DD has been modified from the original version 1 (25/11/2011) to the current version 03 (15/10/2012) and the 1st CPA-DD has been modified from the original version 1 (25/11/2011) to the current version 03 (15/10/2012).

### 2.3 Description of project components or issues not covered by the validation process

All project components have been covered by the validation process.

### 2.4 Statement on the validation of the expected emission reductions for the 1st CPA

The expected emission reduction of 36 222 tCO<sub>2</sub>e per year and 253 557 tCO<sub>2</sub>e for the first crediting period of 7 years is correctly, accurately and conservatively calculated for the 1st CPA, "El Carmen Hydropower Project", located in Monzón district, Huamalíe province, Huánuco department, Peru so that the calculated emission reductions are most likely to be achieved, given that the underlying assumptions do not change [3]. SQS confirms that the starting date of the first crediting period is 01/01/2015.

### 2.5 Statement whether the proposed CDM project activity meets the stated criteria

Based on the observations made during the validation process, SQS concludes that the proposed project activity complies with the requirements of paragraph 37 of the CDM modalities and procedures, the applicability conditions of the selected methodology and guidance issued by the CDM Executive Board.

It is the opinion of SQS that the statements in the documentation are complete, accurate, relevant, credible and reliable; the assumptions made in the PoA-DD and 1st CPA-DD are conservative.

### 3 Validation Findings

#### 3.1 Global stakeholder consultation

The POA-DD, generic CPA-DD and 1st CPA-DD version 1 dated 25/11/2011 were published on 06/01/2012 for global stakeholder consultation open for comments for 30 days.

The project activity received no comments.

#### 3.2 Approval

*Receipt of LoA:*

LoA host party with reference 089-2012-DGCCDRH/DVMDERN/MINAM dated 10/04/2012 has been received [9]. The LoA is from the DNA of Peru, the host party. The project is designed as unilateral CDM project with Peru as host country.

The LoA indicates the participation of the PP has been approved by a Party to the Kyoto Protocol. No entities other than the one approved as PP are included in the PDD.

*LoA source:*

The LoA was received from the PP.

*Authenticity:*

The authenticity of the LoA is confirmed through a telephone interview on 20/06/2012 with the DNA of Peru, the issuer of the LoA<sup>1</sup>.

*Statements:*

The LoA host party, Peru, dated 10/04/2012 include clear statements that:

- a. Peru is a Party to the Kyoto Protocol;
- b. Participation is voluntary;
- c. the proposed CDM PoA contributes to the sustainable development of Peru;
- d. It refers to the precise proposed CDM project activity title in the PDD

The LoA is unconditional with respect to (a) to (d) above therefore SQS confirms that the LoA is in accordance with paragraphs 45–48 of the VVM.

The LoA does not specify the PDD version number.

The LoA does not contain any additional specification of the project activity.

#### 3.3 Authorisation

The Coordinating or Managing Entity (CME) of the PoA, being the single PP, as listed in tabular form in section A.3 of the CDM-PoA-DD. This has been validated against the contact details provided in Annex 1 of the CDM-PoA-DD and the LoA is provided for this entity, Carbon BW Peru S.A.C.. The CME, Carbon BW Peru S.A.C., is explicitly authorised by the Host Country DNA to act as the coordinating and managing entity for the PoA [9].

No entities other than the one approved as project participant are included in the A.3. section of the CDM-PoA-DD.

This information is consistent with the contact information details of the project participant as provided in Annex I of PoA-DD. No entities other than those approved as project participants are included in these sections of the PDD.

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<sup>1</sup> Contacte don +511 611-6000 ext. 1350; confirmed by assistant of Mr. Eduardo Durand López – Hurtado, the DNA of Peru.



### 3.4 Contribution to sustainable development

The host Party's DNA confirmed in the LoA the contribution of the project to the sustainable development of the host Party.

SQS was able to confirm during on-site visit the 1st CPA's contribution to the sustainable development of the local community where the 1st CPA is located.

### 3.5 Modalities of communications

The Modalities of Communication statement, including its annexes, is complete and has used the applicable version of the form "Modalities of Communication statement" (F-CDM-MOC) and complies with all relevant forms and requirements [5].

### 3.6 Project design document

The PoA documentation [3] was completed using the latest applicable templates, namely the CDM-PoA-DD - version 01 and the CDM-CPA-DD - version 01. The PoA documentation complies with relevant forms and guidance and appropriate to the type of project activity.

### 3.7 Description of project activity

The description of the project activity contained in the PoA documentation is unambiguous, detailed and provides a good overview of the project. Its content was confirmed by means of document review, an on-site visit and interviews in the 24 - 27/01/2012 period in order to validate the accuracy and completeness of the project description.

SQS has undertaken the validation of the 1st CPA by reviewing the available design and feasibility study and carried out a comparison analysis by checking published data about most recent similar sized 5 HPP projects in Peru [31,41].

Main changes between the PoA documentation (version 1., dated 25/11/2011) [1] published for the 30-day stakeholder commenting period and the final version (version 03, dated 15/10/2012)[3], submitted for registration are issues related to the CARs and CLs identified during validation. The PoA documentation changes are related to CLs and CARs covering the following broader areas:

CAR 1, CL 1, CL 4, CL 5, CL 6, CL 13, CL 37: Eligibility criteria  
CL 9: Quality and management system (QMS) of the CME  
CAR 4, CL 3, CL 19, CL 20, CL 22, CL 23, CL 35: Editorial, reference and weblink updates  
CAR 3, CAR 6, CL 2, CL 7, CL 8, CL 14, CL 26, CL 27, CL 28, CL 29, CL 30, CL 31, CL 32, CL 33, FAR 1: Additionality and investment analysis  
CAR 3, CAR 5, CL 10, CL 16, CL 17, CL 18, CL 21: Monitoring plan  
CL 11: starting date of the PoA  
CL 12, CL 36: Local stakeholder consultation  
CL 34: Common practice analysis  
CL 15, CL 24, CL 25, CL 38: 1st CPA specifics.  
CAR 2, CL 39, CL 40: Emerging EB decisions regarding PoAs in the course of validation

The above mentioned CARs, CLs and a single FAR, the respective PP responses and SQS conclusions can be consulted in the final section of Appendix F, under the "Summary of Requests" heading.

*Technical description of the project activity*

Each CDM Program Activity consists of one or more new hydropower plants having a combined installed capacity of not more than 20 MW.

The first CPA “El Carmen Hydropower Project” [3] is a new run-of-river power plant with an installed capacity of 8.4 MW with two horizontal Francis turbines for a net head of 220.85 m and 4.5 m<sup>3</sup>/s water flow, connected to the national Peruvian Electricity Grid (SEIN). There is no reservoir associated with the plant as it only has a small desander (14m\*9m); it will be implemented in Monzón district, Huamalie province, Huánuco department of Peru and the geographical coordinates of its powerhouse were confirmed during validations as follows -9.297879 (South), -76.4644447 (West), UTM WGS84 coordinate values are used by the Peruvian Water Authority in its permit defining the intake and discharge locations (337254,24;8971210,20 and 338689,40;8972188,70 respectively) [34]. The coordinates to be used by the UNFCCC as the location of the project is the coordinate of the power house. On-site GPS measurements during the on-site visit resulted in confirming the geographical coordinates of Longitude -76.4644447 (West), Latitude -9.297879 (South) [50].

### Technological Characteristics

|                                  |  |
|----------------------------------|--|
| <b>HYDROLOGY</b>                 |  |
| Catchment area at diversion site | 56.00 km <sup>2</sup>                  |
| Intake design flood              | 48.0 m <sup>3</sup> /s                 |
| Powerhouse design flood          | 83.0 m <sup>3</sup> /s                 |
| Discharge design flood           | 4.5 m <sup>3</sup> /s                  |
| Intake type                      | Tyrolese                               |
| No. of spillways                 | 1                                      |
| Crest elevation                  | El. 1 332.30 masl                      |
| <b>INTAKE STRUCTURE</b>          |  |
| Crest level                      | 1 332.0 masl                           |
| No. of intake gates              | 1                                      |
| Size of bottom opening           | 2.50 m x 2.00 m                        |
| Level of intake gate             | 1 330.3 masl                           |
| <b>DESANDER</b>                  |  |
| Type                             | Flushing unit                          |
| No. of basins                    | 1                                      |
| Size of basins                   | 14.0 m width, 9.0 m depth              |
| Length of basin                  | 40.0 m                                 |
| Min. particle size to be removed | 0.25 mm                                |
| Flushing channel size            | 12.0 m, circular-shaped, $\phi = 30$ m |
| <b>HEAD RACE PIPE</b>            |  |
| No.                              | 1                                      |
| Length                           | +/- 1 691 m                            |
| Design discharge                 | 4.50 m <sup>3</sup> /sec               |
| Average slope (aprox.)           | 0.070 m/m                              |
| Flow velocity                    | 3.39 m/s                               |
| <b>SURGE SHAFT</b>               |  |
| Size                             | $\phi = 1,000$ mm                      |
| Maximum surge level              | El. 1 381.00 masl.                     |
| Minimum surge level              | El. 1 260.00 masl.                     |
| Top level                        | El. 1 382.00 masl.                     |
| <b>PENSTOCK</b>                  |  |
| Length                           | 340 m                                  |
| Flow velocity (main)             | 4.73 m/s                               |
| <b>POWER HOUSE</b>               |  |
| Type                             | Open air                               |
| Installed capacity               | 8.40 MW                                |
| No. and capacity of unit         | 2 Nos. 4.2 MW                          |
| Size of machine hall (aprox.)    | 15.4 m x 24.30 m x 6.0 m               |

|  |  |
|--|--|
| Type of turbine  | Francis turbine / horizontal axis  |
| Speed of turbine   | 900 rpm  |
| Gross head   | 1 331.00 – 1 088.00 = 243.00 m   |
| Maximum tail water level   | 1 089.00 masl  |
| Normal tail water level  | 1 088.00 masl  |
| Minimum tail water level   | 1 087.50 masl  |
| Net operating head for design discharge of 4.5 m <sup>3</sup> /s | 220.85 m   |
| <b>POWER POTENTIAL</b>   |  |
| Mean annual energy gross   | 56 280 000 kWh (resulting in 55 140 000 kWh supplied to the grid with a 2% transmission loss) [37] |
| Firm capacity  | 2 750 kW   |

The power plant will produce 55 154 MWh per year using water flow from El Carmen River and which is tributary to the Monzón River. The 1st CPA is expected to reduce 36 222 tCO<sub>2</sub> annually, resulting in 253 557 tCO<sub>2</sub> emission reductions in the first 7-year crediting period by producing electricity from a renewable source substituting for fossil fuel based electricity generation [6].

The CPA-DD has additional information listed in its Annex No.4 regarding its monitoring. The PoA and its first CPA will not receive any public funding; this has been declared by the CME and the 1st CPA's owner [10].

The description of the PoA and 1st CPA activity contained in the CPA-DD is unambiguous, detailed and provides a good overview of both the PoA and its 1st CPA[3].

#### *Validation method*

The accuracy and completeness of the project description was validated by:

1. A desk review of the PDD submitted by the client and additional supporting documents;
2. On-site visit between 24/01/2012 - 27/01/2012 and interviews with CME/PP and first CPA representatives, follow-up interviews with CME and the 1st CPA owner;
3. Cross-checks with independent sources.

The DOE's validation opinion is that both the PoA and 1st CPA project description is accurate and complete.

### 3.8 Application of the selected baseline and monitoring methodology

#### *3.8.1 General*

The PoA applies the following methodology:

- ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 13.0.0).

The project applies the following tools and guidelines:

- Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities version 01.0, EB 65 Annex 3
- Tool for the demonstration and assessment of additionality, version 6, EB 65 Annex 21
- Tool to calculate the emission factor for an electricity system version 02.2.1 EB 63 Annex 19
- Guidelines on the Assessment of Investment Analysis, version 05, EB 62, Annex 05
- Guidelines on the demonstration and assessment of prior consideration of the CDM version 04, EB 62 Annex 13



### 3.8.2 Applicability of the selected baseline and monitoring methodology to the PoA, including the generic CPA, and the 1st CPA

|   | Applicability Criteria  | PoA and generic CPA   | 1st CPA   |
|---|---|---|---|
| 1 | The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydropower plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.   | The PoA is based on installing new hydropower plants (based on either run-of-river reservoir or an accumulation reservoir). | The first CPA is a new, national grid connected hydropower plant [14,18,20,21,32,36].   |
| 2 | In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use <i>the methodology</i> to calculate the parameter EGPJ,y): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.  | The PoA is based on new hydropower plants. This criterion is therefore not applicable.                                      | The first CPA is a new hydropower plant. This criterion is therefore not applicable.  |
| 3 | In the case of hydropower plants, one of the following conditions must apply: <ul style="list-style-type: none"> <li>The project activity is implemented in an existing reservoir, with no change in the volume of the reservoir.</li> <li>The project activity is implemented in an existing reservoir, where the volume of the 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<sup>2</sup>.</li> <li>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<sup>2</sup>.</li> </ul> | The PoA is based on new hydropower plants and one of the three conditions listed is applicable.                             | <p>There is no reservoir in the first CPA, as it involves only the construction of an intake /desander, tunnel, load chamber, penstock and powerhouse, a typical setup for smaller-scale hydro projects [18].</p> <p>As the applicability requires a greater than 4 W/m<sup>2</sup> power density, the following can be demonstrated:</p> <p>The 8.4 MW installed capacity is associated with a small desander equalling to the surface of the intake. If the power density is calculated based on the 8.4 MW installed capacity and the insignificant surface of the intake/desander (14m*9m), the resulting power density is far bigger than the required 4 W/m<sup>2</sup> (also higher than 10W/m<sup>2</sup>).</p> |

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| 4 | <p>In case of hydropower plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m<sup>2</sup> all the following conditions must apply:</p> <ul style="list-style-type: none"> <li>• The power density calculated for the entire project activity using equation 5 is greater than 4 W/m<sup>2</sup>;</li> <li>• Multiple reservoirs and hydropower plants located at the same river and where are designed together to function as an integrated project<sup>2</sup> that collectively constitute the generation capacity of the combined power plant;</li> <li>• Water flow between multiple reservoirs is not used by any other hydropower unit which is not part of the project activity;</li> <li>• Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m<sup>2</sup>, is lower than 15 MW;</li> <li>• Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m<sup>2</sup>, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.</li> </ul> | <p>The PoA may include new hydropower plants with multiple reservoirs with all five criteria being met.</p>   | <p>There is no reservoir (only a small desander) in the 1st CPA therefore the multiple reservoir criterion is not applicable [18].</p>   |
| 5 | <p>The methodology is not applicable to the following:</p> <ul style="list-style-type: none"> <li>• Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;</li> <li>• Biomass fired power plants;</li> <li>• A hydropower plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m<sup>2</sup>.</li> </ul>  | <p>The PoA will not involve any new single reservoirs where the power density of the power plant is less than 4 W/m<sup>2</sup></p>   | <p>There is no reservoir (only a small desander) in the first CPA [18]. The 8.4 MW installed capacity is associated with an indefinitely small desander equalling to the surface of the intake. If the power density is calculated based on the 8.4 MW installed capacity and the insignificant surface of the intake/desander, the resulting power density is far bigger than the required 4 W/m<sup>2</sup>.</p> |
| 6 | <p>In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power</p>  | <p>The PoA is based on installing new hydropower units (based on either run-of-river reservoir or an accumulation reservoir). This criterion is therefore not applicable.</p> | <p>The first CPA is based on installing a new hydropower unit [18]. This criterion is therefore not applicable.</p>  |

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|  | generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance". |  |  |
|--|--|--|--|

SQS confirms that baseline and monitoring methodology ACM0002, consolidated baseline methodology for grid-connected electricity generation from renewable sources version 13.0.0 is applicable for the PoA and its 1st CPA, that the criteria are discussed in an exhaustive manner in the PoA-DD and CPA-DD and supported by the submitted documents. Subsequently, SQS also confirms based on the validation of the baseline identification and additionality steps that the applicability criteria of the methodology are fully met.

### 3.8.3 *Non-coverage by the methodology*

No GHG emission within the project boundary is caused by the implementation of the 1st CPA, which contributes more than 1% of the expected annual emission reductions and is not addressed by the applied methodology.

### 3.8.4 *Deviation from an approved methodology*

Neither the PoA nor the 1st CPA deviate from the applicable methodology.

### 3.8.5 *Clarification on the applicability of an approved methodology*

Neither the PoA nor the 1st CPA require any clarification on the applicability of an approved methodology.

### 3.8.6 *Project boundary of PoA and 1st CPA*

The physical location of the PoA, Peru, is described in the PoA-DD Chapter A.4.1.2 [3]. Within the PoA system boundary, there could be project emissions in case of reservoir emissions due to low power density ( $4 \text{ W/m}^2 < 10 \text{ W/m}^2$  threshold).

Leakage is considered zero in line with the methodology.

Baseline emissions are attributed to the fossil fuel emissions used for generating electricity for the Peruvian National Grid. SQS confirms that all sources and GHGs required by the methodology have been included within the project boundary.

The physical project boundary of the first CPA was verified during the on-site visit. The 1st CPA location is described in the CPA-DD Chapter A.4.1.2 with geographical coordinates of its powerhouse being confirmed during validations as follows -9.297879 (South), -76.464447 (West) [50], UTM WGS84 coordinate values are used by the Peruvian Water Authority in its permit defining the intake and discharge locations (337254,24;8971210,20 and 338689,40;8972188,70 respectively [34].

As the 1st CPA has no reservoirs (only a small desander) project emissions are considered zero. As there will be no backup generation, if there is power outage then they will import power from the grid.

The physical project boundary was verified during the on-site visit on 26/01/2012. The detailed plans [18,36,37], the construction schedule [32] and the coordinates of the project [34,50] have been consulted and verified. Therefore, the project boundary fully corresponds to the applied methodology.

### 3.8.7 *Baseline scenario identification and description*

According to ACM0002 if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

In line with the methodology, as the project is a new grid-connected renewable power plant, the baseline scenario is therefore electricity delivered to the grid by the operation of grid-connected power plants and by the addition of new generation sources to the national grid of Peru.

SQS confirms that there is no Peruvian energy, environmental or water regulation that considers the implementation of hydropower plants or CDM PoA as mandatory. SQS checked the respective regulations related to the electricity market, the environment and water that there is no sectoral or national regulation obliging any potential CPA owner to build a HPP.

The PoA-DD and CPA-DD provide a description of the identified baseline scenario as prescribed by the methodology; all applicable CDM requirements have been taken into account in the identification of the baseline scenario for the proposed CDM PoA and its 1st CPA.

The authenticity of the reviewed documents were checked by SQS by cross-checking content with official documents and interviews with the PP and first CPA owner.

With regard to the criteria 87 of VVM, SQS confirms the following statements:

- All assumptions and data used by the PPs are listed in the PoA-DD and 1st CPA, including their references and sources.
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PoA documentation.
- 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 sectoral policies and circumstances are considered and listed in the PDD.
- The PoA documentation also provides an accurate description of the baseline scenario which includes the continued use of fossil fuel power plants to supply electricity to the grid.
- The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM PoA.

#### 3.8.8 Algorithms and/or formulae used to determine emission reductions

SQS has assessed the calculations of project emissions, baseline emissions, leakage, and emission reductions. Corresponding calculations were carried out based on calculation spreadsheets [6]. The equation comparison has been made explicitly following all the formulae presented in the calculation files. Parameters, options selected and the mathematical functions used for the *ex-ante* estimation of the project's emission reductions are appropriate, correct, plausible and conservative as per the methodology and its applicable tools applied [6,7].

#### ACM0002 version 13.0.0

SQS has validated the calculations, data and parameters used for the PoA and its first CPA (Excel spreadsheet)[6] by using a checklist for Methodology ACM0002 version 13.0.0.

According to the applied methodology no leakage emissions are considered.



The data and parameters used in the equations were correctly applied; they are as follows:

### PROJECT EMISSIONS (PE<sub>y</sub>)

*Power plants with new reservoirs or hydropower project activities that result in the increase of existing reservoirs:*

Project emissions that accounts for CH<sub>4</sub> emissions from reservoirs are estimated as follows:

- (a) If the power density of the project activity (*PD*) is greater than 4 W/m<sup>2</sup> and less than or equal to 10 W/m<sup>2</sup>:

$$PE_{HP,y} = \frac{EF_{Res} \cdot TEG_y}{1000}$$

- (b) If the power density of the project activity (*PD*) is greater than 10 W/m<sup>2</sup>:

$$PE_{HP,y} = 0$$

The power density of the project activity (*PD*) is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

- PD* = Power density of the project activity (W/m<sup>2</sup>)
- Cap<sub>PJ</sub>* = Installed capacity of the hydropower plant after the implementation of the project activity (W)
- Cap<sub>BL</sub>* = Installed capacity of the hydropower plant before the implementation of the project activity (W). For new hydropower plants, this value is zero
- A<sub>PJ</sub>* = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m<sup>2</sup>)
- A<sub>BL</sub>* = Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m<sup>2</sup>). For new reservoirs, this value is zero

SQS confirms the correctness of the project emission calculation approach for the PoA which contains new hydropower plants only.

### BASELINE EMISSIONS (BE<sub>y</sub>)

The following equation is used to calculate baseline emissions from electricity generation for a CPA implementing a new power plant:

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

Where:

- BE<sub>y</sub>* = Baseline emissions from electricity generation in year y (tCO<sub>2</sub>)
- EG<sub>PJ,y</sub>* = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
- EF<sub>grid,CM,y</sub>* = Combined margin CO<sub>2</sub> emission factor for grid connected power generation in year y (tCO<sub>2</sub>/MWh)

The PoA does not include any CPAs implementing capacity additions, retrofits or replacements, therefore the corresponding methodology specific project emission calculations are not listed in the PoA documentation.

SQS confirms the correctness of the baseline emission calculation approach for the PoA which contains new hydropower plants only, for which for EGPJ,y is calculated as EGfacility,y (Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)) in line with the methodological requirements for greenfield renewable energy power plants.

In order to calculate the baseline emissions the applicable CO<sub>2</sub> emission factor for the grid ( $EF_{grid,CM,y}$ ) needs to be calculated; this is validated as follows:

#### Grid Emission Factor ( $EF_{grid,CM,y}$ )

The "Tool to calculate the emission factor for an electricity system" determines the CO<sub>2</sub> emission factor for the displacement of electricity generated by power plants in an electricity system by calculating the "operating margin", "build margin" and "combined margin" through the following 6 steps.

- Step 1: Identify the relevant electric power system.
- Step 2: Choose whether to include off-grid power plants in the project electricity system (optional).
- Step 3: Select a method to determine the operating margin (OM).
- Step 4: Calculate the operating margin emission factor according to the selected method.
- Step 5: Calculate the build margin (BM) emission factor.
- Step 6: Calculate the combined margin (CM) emission factor.

SQS has validated the calculations, data and parameters used in the PoA-DD (Excel spreadsheets)[7] and the data input files provided by COES [24,51] based on the "Tool to calculate the emission factor for an electricity system" version 02.2.1.

The "Tool to calculate the emission factor for an electricity system" has been applied correctly to calculate the emission factor (EF) of the Peruvian electricity system. SQS checked the calculations from the available 2010 power sector data publicly available from the National Interconnected Electric Grid (COES)<sup>3</sup>[24] and found that the CM has been established correctly and without any mistakes. SQS confirms that the Grid Emission Factor (GEF) calculation was based on the most recent data available [24,51] at the time of submission of the PDD to the DOE for validation in line with the requirements of the applicable tool. The resulting CM is 0.65675 tCO<sub>2</sub>e/MWh based on available data for calendar year 2010 [7,24,51]. SQS cross-checked this value with its own calculations based on the publicly available COES raw data used for the PP's calculations [7,24,51] and with other, registered CDM projects that have calculated the emission factor of the Peruvian electricity system. SQS confirms that the CM calculated, 0.65675 tCO<sub>2</sub>e/MWh, is correct.

#### Summary of the findings regarding the algorithms and/or formulae used to determine emission reductions:

Parameters, options selected and the mathematical operations used for the *ex-ante* estimation of the project's emission reductions are correct, plausible and conservative as per the methodology applied.

#### *Assumptions*

It is the DOE's validation opinion that all assumptions and data used by the PPs are listed in the PoA documentation, including their references and sources.

#### *References*

It is the DOE's validation opinion that all documentation used by PPs as the basis for assumptions and source of data for the calculation of emission reductions are correctly quoted and interpreted in the PoA documentation.

<sup>3</sup> <http://www.coes.org.pe/wcoes/coes/salaprensa/estadannual.aspx?anio=2010> (date of access 24/09/2012)

*Reasonableness*

It is the DOE's validation opinion that all values used in the PoA documentation are considered reasonable in the context of the proposed CDM project activity.

*Methodology application*

It is the DOE's validation opinion that the baseline methodology and corresponding tools have been applied correctly to calculate project emissions, baseline emissions, leakage, and emission reductions.

*Reliability*

All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PoA documentation.

*Monitoring data*

The data and parameters are monitored during implementation (*ex-post*) and are available after validation. It is the DOE's validation opinion that the estimates provided in the PDD for these data and parameters are reasonable.

All estimates of the baseline emissions are reasonable, correctly quoted and could be replicated using the data and parameter values provided in the 1st CPA [3,6,7].

*3.8.9 Additionality of the project activity*

Additionality of a CPA under the PoA is defined as mandated by the methodology ACM0002 version 13.0.0. by using version 6.0.0 of the "Tool for demonstration and assessment of additionality". As it is a PoA the Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities (version 01.0, EB 65 Annex 3) is also applicable and has been used for the development of the PoA and its validation.

The PoA and its 1st CPA analyses the project additionality carrying out the steps established in the tool and performed the "Investment Analysis" detailed below for the 1st CPA. Each future CPA will follow the same route and the "Tool for demonstration and assessment of additionality" will be applied to establish the additionality.

Regarding the application of the additionality tool, the following four steps were followed transparently:

- Step 1: Identification of alternative to the project activity consistent with current laws and regulations
- Step 2: Investment Analysis
- Step 3: Barrier Analysis
- Step 4: Common practice Analysis

The four steps of the tool mentioned were followed correctly by the PP. For this reason, it can be confirmed that the project has demonstrated additionality correctly and transparently for its 1st CPA. The step-by-step validation findings are presented below.

Though the DOE is not required to assess prior consideration of CDM for PoAs in line with EB 62 Annex 13 requirements, it is confirmed that the first component of the programme will commence after the start date of validation, 30/12/2011, the contract signature for validation. The 1st CPA-s owner submitted the Prior Consideration notification to the UNFCCC on 24/08/2011[11] and to the Peruvian DNA on 23/08/2011 [12]. The 1st CPA will reach financial closure [33] by 28/02/2013 which will be considered as the starting date of the CPA.

### 3.8.10 Identification of alternatives to the project activity consistent with current laws and regulations

The tool requires the (sub-step 1a) definition of alternatives to the project activity. As per ACM0002 since the project activity is the installation of a new grid-connected renewable power plant, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the CM calculations described in the "Tool to calculate the emission factor for an electricity system". This leads to two alternative scenarios: implementation of the CPA without CDM incentives and continuation of the current practice, whereas the CPA owner does not invest and power is generated by the operation of grid-connected power plants and by the addition of new generation sources.

The tool requires the (sub-step 1b) the checking of consistency with mandatory laws and regulations of the host country. Both scenarios are in compliance with all applicable legal and regulatory requirements as generation within the Peruvian grid could only occur by full compliance with the regulatory requirements.

Both scenarios are in compliance with all applicable legal and regulatory requirements, including the Electric Concessions Law<sup>4</sup> (ECL)[29] with its modifications and regulations including the Law to Ensure the Efficient Development of the Electric Generation No 28832 (2006)[40]. These top level Peruvian acts implementing the governmental energy policy do not include any provisions for subsidies for hydro projects. The Peruvian regulation supports renewable without attaching any prioritisation to the particular type of the energy source. The fir CPA's PPA [14] signed with the Government of Peru contains all references to the regulatory setup and it does not contain any subsidy elements. Subsequently, the ECL and the entirety of the energy regulation demonstrates that the CPA without CDM incentives and continuation of the current practice scenarios identified are valid and realistic options.

In Article 9 of the ECL the environmental preservation and sustainability is listed as part of the project evaluation required for any concessions for energy projects:

Article 9: The Peruvian Government seeks to preserve the environmental quality and cultural heritage of the country, as well as the rational use of natural resources in the development of activities related to generation, transmission and distribution of electricity.

The environmental assessments in the energy sector are ruled by the Supreme Decree No. 29-94-EM.- Approval of the Rulebook of Environmental Protection in Electric Activities (1994)<sup>5</sup>[52], stating the detailed requirements of the environmental evaluations needed for new or extension projects. However, the lower threshold for an EIA, defined in the so-called Generation Authorisation applicable to smaller scale plants, was increased to 20 MW in the Law to Ensure the Efficient Development of the Electric Generation No. 28832 (2006)[40]. As a result, Scenario 1 is not legally bound to present an EIA for any CPA under 20 MW installed capacity; 20 MW being the threshold for the PoA.

Based on the applicable Peruvian governing rules and regulations, SQS concludes that a CPA hydro project without considering CDM benefits, would be in compliance with current laws and regulations, as:

- There is no specific law which prevents the construction of a new HPP (including its environmental implications).
- There is no regulation or law enforcing the construction of a new HPP.

<sup>4</sup> Electric Concessions Law, Law No. 25844 (Ley de Concesiones Eléctricas, Ley No. 25844).

<http://www2.osinerg.gob.pe/MarcoLegal/pdf/LEYCE-DL25844.pdf> - (accessed on 12/10/2012)

<sup>5</sup> Supreme Decree N° 29-94-EM.- Approval of the Rulebook of Environmental Protection in Electric Activities (1994). <http://intranet2.minem.gob.pe/Web/archivos/dgaee/legislacion/DS-029-94.pdf>, (accessed on 12/10/2012)

SQS concludes that continuing with the current situation, is clearly consistent with prevailing laws and regulations as there is no regulation in Peru which prevents the continuation of this current practice.

According to the methodology, the baseline is the electricity delivered to the grid by the project activity that otherwise have been generated by the operation of grid connected power plants and by the addition of new generation sources; this satisfies the VVM Article 106 requirements.

Each CPA will demonstrate additionality in an independent way following the PoA standard and the “Tool for demonstration and assessment of additionality”. The way how the PoA and its 1st CPAs follow the tool is deemed reasonable, credible and completely in line with VVM Article 107 requirements.

### 3.8.10 Investment analysis

As prescribed by the additionality tool itself, the project developer has chosen project IRR to demonstrate the additionality of the CPAs within the PoA by evaluating the financial attractiveness of the CPA without CDM income. As the alternative to the component project activity is the supply of electricity from a grid and this is not an investment, the benchmark analysis is appropriate. Therefore, the sub-step 2a (Determine appropriate analysis method) has been conducted appropriately.

Sub-step 2b resulted in correctly choosing “Option III. Apply benchmark analysis” and applying sub-step 2c (calculation and comparison of financial indicators).

The financial return of the proposed CPA is insufficient to justify the investment according to the validated IRR of 9.62% [6] compared to a benchmark of 12.00% [29].

The parameters used in the financial calculations have been validated based on an assessment of the sources presented in the PoA documentation, namely the PoA-DD and CPA-DD [3]. The main source of inputs to the investment model, which led to the investment decision is the cost estimation from the independent Prefeasibility Study [18] dated 07/2011 conducted by Armand Alva, cross-checked with independent offers of Gugler [20] and Otek [21] for the construction of the first CPA HPP and its corresponding development budget [23]. The DOE confirms that the values in the CPA-DD and its investment calculation Excel-sheet [6] are fully consistent with the above mentioned referenced documents[18,20,2,231].

The CME has defined the financial parameters for the CPA analysis and used a standardised Excel worksheet [6] for the calculations of the 1st CPA. The parameters to calculate the IRR benchmark are in line with the EB 62 Annex 5 “Guidelines on the assessment of Investment Analysis”(version 05) as detailed in the table below:

| EB Guideline<br>- EB 62 Annex 5  | PoA                                 | PoA compliance with validation Guideline   | 1st CPA compliance with validation Guideline  |
|----------------------------------|-------------------------------------|--|---|
| Point 3:<br>Period of assessment | Specified on CPA level, applicable. | The period of assessment is not limited to the proposed crediting period of the PoA CPA project activity but to the technical lifetime of a HPP.<br>According to the Guideline "In general a minimum period of 10 years and a maximum of 20 years will be appropriate" is required. The CPAs will most likely take at least a 20 years period which is conservative. | 1st CPA has 40 years assessment time span based on the technical lifetime of the project as stipulated in the pre-feasibility study [18].SQS confirms the correctness and conservativeness of this assessment period. |

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| Point 4:<br>Salvage value                         | Specified on CPA level, applicable.   | IRR will be computed for a period of the lifetime of the project (at least 20 years) and the entire assets are most likely to be fully depreciated, the question of salvage value is unlikely to arise. If this is not the case, fair value/ residual value will be introduced.      | The IRR is computed for a period of the lifetime of the project (40 years), with full depreciation in line with host country regulations [26,27]. Therefore, no salvage value is considered.   |
| Point 5:<br>Depreciation and other non-cash items | Treatment is in line with Peruvian taxation regulations.  | Treatment is in line with Peruvian Income Tax Law [26,27]( <a href="http://www.sunat.gob.pe/legislacion/renta/reglamento.html#">http://www.sunat.gob.pe/legislacion/renta/reglamento.html#</a> ), Capítulo VI, Article 22: defines the standard depreciation rates per category.[26] | The chosen depreciation periods (10 and 30 years) for the various investment components are in line with taxation rules [26,27].   |
| Point 6:<br>Time of assessment                    | All calculations are based on data available prior to CPA starting date.  | This feature of the calculations can only be assessed at the time of CPA inclusion.  | The 1st CPA estimations are based on data available at time of the creation of PoA documentation obtained in 2011 [3,6,18,20,21,23]. The 1st CPA starting date is the financial closure expected by 28/02/2013 [33]. Hence a FAR (FAR 1) is formulated to check whether the then available investment analysis supports the claim that the CPA IRR is below the benchmark. |
| Point 7:<br>Cessation of implementation           | Applicable, if relevant for project.  | This feature of the calculations can only be assessed at the time of CPA inclusion.  | Not applicable.  |
| Point 8:<br>Provision of spreadsheet              | Standardised Excel worksheet to be used for CPAs.   | This feature of the calculations can only be assessed at the time of CPA inclusion.  | Spreadsheet "Cashflow_ElCarmen_DOEv3dated 2012 07 02.xls", [6] contains all investment analysis data and calculations based on the . The DOE confirms that the results can be reproduced.  |
| Point 9:<br>Finance expenditures                  | The cost of financing expenditures is not included in the calculation of project IRR.   | This feature of the calculations can only be assessed at the time of CPA inclusion.  | The DOE has verified the Spreadsheet "Cashflow_ElCarmen_DOEv3dated 2012 07 02" [6] and can confirm that the costs of financing expenditures are not included in the calculation of project IRR.  |
| Point 10:<br>Equity IRR                           | The project IRR and not equity IRR is calculated in the Excel worksheet due to the fact that CPA ownership could be very different in various CPAs. | This feature of the calculations can only be assessed at the time of CPA inclusion.  | DOE has verified that project IRR has been calculated in the spreadsheet "Cashflow_ElCarmen_DOEv3dated 2012 07 02" [6].  |
| Point 11:<br>Taxation                             | Taxation is applied in accordance with relevant tax laws on income tax and "Distribution of Income to Workers" [ ] fee.                             | This feature of the calculations can only be assessed at the time of CPA inclusion.  | DOE has verified that the financial analysis only includes the corporate income tax and the so-called "Distribution of Income to Workers" [25] in accordance with the Peruvian tax rules and regulations. DOE confirms the correctness of the treatment of taxation.   |
| Point 12-18:<br>Benchmark                         | The applied benchmark is a 12% discount-rate established by the government in the Electric Concession Law (Law 25844 – Electric Concessions         | This feature of the calculations can only be assessed at the time of CPA inclusion.  | DOE has verified the benchmark IRR through the official documents provided [29]. SQS confirms that the IRR benchmark has been established correctly .  |

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|  | Law. Article 79, Page 40)[29] as the reference rate to evaluate investments in the power sector.  |   |   |
| Point 19:<br>If the alternative to the project activity is the supply of electricity from a grid, this is not to be considered; an investment and a benchmark approach is considered appropriate | According to the methodology: "The baseline scenario is that 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"   | The benchmark approach is applicable according to the guideline.                    | The benchmark approach is applicable according to the guideline.  |
| Point 20:<br>Choice of variables for sensitivity analysis  | <p>Sensitivity analysis is made assuming each of the following key parameters:</p> <ol style="list-style-type: none"> <li>1. CAPEX</li> <li>2. OPEX</li> <li>3. Plant load factor</li> <li>4. Electricity sales prices.</li> </ol> <p>by at least up to +/-10%, and assessing the impact on the financial indicator, the IRR.</p> | This feature of the calculations can only be assessed at the time of CPA inclusion. | <p>The selection of the parameters included in the sensitivity analysis was validated against the "Guidance on the Assessment of Investment Analysis" defining that variables that constitute more than 20% of either total project costs or total project revenues should be subject to the sensitivity analysis. The selected parameters (CAPEX, OPEX, Plant load factor, Electricity sales prices) are in line with "Guidance on the Assessment of Investment Analysis" as they are the key cost (CAPEX) and revenue (PLF and electricity sales prices) factors.</p> <p>SQS confirms that it is a general feature of hydropower installations that their O&amp;M costs are moderate. In case of the first CPA the annual and total O&amp;M costs constitute 13.5% of annual and total revenues during the operation of the plant.</p> <p>The DOE has assessed the financial parameters and the variations of all key parameters and confirms the correctness of the sensitivity analysis calculations.</p> <p>In addition to the sensitivity analysis with the fixed +/-10% variations, the first CPA contains the "turning points", the % changes, where the IRR reaches the benchmark and a description of the likelihood of this happening.</p> |
| Point 21:<br>Range of variation of sensitivity analysis  | The sensitivity analysis covers a range of $\pm 10\%$ . Additionally, a cross comparison if data ranges and their variations are plausible.   | This feature of the calculations can only be assessed at the time of CPA inclusion. | The 1st CPA contains the fixed +/-10% variations. In addition, it contains the "turning points", the % changes, where the IRR reaches the benchmark.  |

The table below contains all input values used for the 1st CPA's benchmark analysis calculation establishing the 1st CPAs project IRR and their respective validation findings.

| Item | Uni | Value | Data / Information in PoA | Validation |
|------|-----|-------|---------------------------|------------|
|------|-----|-------|---------------------------|------------|

|  | t                         |                              | documentation  |  |
|--|---------------------------|------------------------------|--|--|
| Benchmark                              | %                         | 12                           | The applied benchmark is a 12% discount-rate established by the government in the Electric Concession Law (Law 25844 – Electric Concessions Law. Article 79, Page 40 [ 29]) as the reference rate to evaluate investments in the power sector.   | DOE has verified the benchmark IRR through the official documents provided [ 29].<br>This 12% rate corresponds to the EB 62 Annex 5 Group 1 rate of 11.75% for Peruvian energy projects. As the project IRR is below both the Peruvian benchmark of 12% and the EB defined value of 11.75% SQS deems the 12% as an unambiguously correct benchmark.  |
| Period of assessment                   | Years                     | as required by guideline     | The period of assessment is not limited to the proposed crediting period of the PoA CPA project activity but to the technical lifetime of a HPP.<br>According to the Guideline "In general a minimum period of 10 years and a maximum of 20 year will be appropriate" is required."<br>The CPAs will most likely to take at least a 20 years period which is conservative. | 1st CPA has 40 years assessment time span based on the technical lifetime of the project as stipulated in the pre-feasibility study [18].  |
| Salvage value                          | USD                       | as required by the guideline | The period of assessment is not limited to the proposed crediting period of the PoA CPA project activity but to the technical lifetime of a HPP.<br>The technical lifetime is most likely to be longer than the period in which a HPP CPA is fully depreciated (30 years).   | The financial analysis is calculated over a period of 40 years. As assets are fully depreciated after 30 years according to Peruvian regulation [26,27], the issue of salvage value should not arise.  |
| Operating hours (Plant Load Factor)    | % (of total annual hours) | 76.484%                      | Based on pre-feasibility study [18 ].  | Based on the pre-feasibility study [ ] which was produced by an independent consultant in accordance with EB 48 Annex 11 "Guidelines For The Reporting And Validation Of Plant Load Factors" II.3.b. and based on hydrological information of the area.<br>SQS confirms the correctness of the PLF based on hydrological data contained in the pre feasibility report [18] subsequently confirmed by the Water utilisation permit [34] and the PPA [14]. |
| Generation capacity                    | MW                        | 8.4                          | Based on pre-feasibility study [18].   | The generation capacity is consistent with the technical design. All documents such as government PPA [14 ] and water authority, ANA, approval [34 ] have been analysed and the value can be confirmed as correct.   |
| Total electricity generated per annum  | MWh                       | 56 277                       | Calculated with PLF (76.484%) and 8.4 MW installed generating capacity.  | The installed generating capacity will be 8.4 MW as described above. The calculations have been done with the capacity of 8.4 MW. The electricity production by 8.4 MW with a 76.484% PLF.   |
| Electricity sold to the grid per annum | MWh                       | 55 154                       | Calculated with PLF (76.484%) and 8.4 MW installed generating capacity reflecting additional 2% grid losses.   | The 55 154 MW value is used in the calculations [6 ] and is supported by the 20 years long PPA [14] and has been correctly calculated.   |



|   |                                       |   |   |  |
|---|---------------------------------------|---|---|--|
|   |                                       |   |   | <p>Net electricity delivered to the grid will be measured by COES independently and this value will be used for monitoring purposes.</p> <p>2% grid losses [37] results in 55 154 MWh from the total of 56 277MWh confirmed by the DOE.</p> <p>SQS confirms that the losses percentage – 2.0% - is plausible given the technical configuration of the plant and its 60 km connection distance to the grid. An Independent Transmission Losses calculation conducted by Mr Jorge Pineda [37 ] supports the net electricity volumes as it calculates grid losses as at 2.17%, therefore the use of 2% is appropriate. It must be noted that the CER volume will be based of COES measurement at the grid connection and therefore the transmission losses calculation has relevance for the calculation of ex/anta ER estimations only.</p>  |
| Electricity sale price                      | \$USD / KWh and US\$ per KW per month | <p>Electricity Price - Peak Hours = 0.03554</p> <p>\$USD / KWh Electricity Price - Off-peak Hours = 0.03405</p> <p>PPA Price = 0.05590 ( for 20 years)</p> <p>\$USD / KWh Guaranteed Power Capacity Tariff (US\$ per KW per month) = 6.028520</p> | PPA [14] and Resolution OSINERGMIN N° 067-2011-OS/CD [22] on fixed prices; Resolution with determination of Peak and Off-Peak Hours OSINERG Resolution of the Commission on Electrical Tariffs No. 024-97 P/CTE [39]                        | <p>The values were cross-checked with the applicable regulations [22,29,39] and the PPA itself [14]. SQS confirms that this is in line with the Peruvian electricity concession law [29] and that the prices are defined and not subject to change in the future. This fixed PPA pricing - covering peak and off-peak tariffs and power capacity fee – defines the financial boundaries for the project. The amount of electricity that the PP can sell on the spot market (10 154 MWh) is 18.4 % of the total volume of electricity produced in the 20 years of the PPA; from year 21 onwards the entire volume of electricity production will be sold at the regulated spot price based on Resolution OSINERGMIN N° 067-2011-OS/CD [22].</p> <p>SQS also confirms that the calculation of the revenues associated with the guaranteed power capacity tariff (US\$ per KW per month) = 6.028520) has been correctly calculated and used for the period after the expiration o f the PPA (i.e. the Guaranteed Power Capacity Tariff will not result in any revenues during the 20 years of the PPA).</p> |
| Annual operation and maintenance (O&M) cost | \$USD                                 | 386 575   | <p>Pre-feasibility study [18] established O&amp;M costs and regulatory requirements are included.</p> <p>The O&amp;M (169 350) and administration (45 757) costs are defined by the pre-feasibility study [18]. The insurance costs are</p> | <p>PP has chosen an adequate, conservative value for O&amp;M cost estimations. It must be noted that the values are taken from the independent pre-feasibility study. The proportion of annual O&amp;M costs to the overall investment costs (2.4%, 52.86 USD/kW/year) is in line with similar small scale hydro projects accord-</p>  |

|   |       |  |   |   |
|---|-------|--|---|---|
|   |       |  | <p>envisaged to be 1% of the hardware part of the CAPEX (155 170) and the Social Investment Plan (16297) see Fonam Report [19] and Section 3.11 of this report. It does not include the turbine overhauling costs (50 000) scheduled for once in every four years.</p> <p>This overhauling costs are part of the "total expenses" (470 800 annually, and 520 800 in the years when overhauling occurs). Other components "total expenses" are state-sanctioned tariffs and contributions such as to OSINERGMIN [43 ] (1% of revenues) Water Authorities (ANA)[29 ] (1% of revenues), and COES [28 ] (0.75% of revenues) are included under this heading. The obligatory profit-sharing with workers based on "Distribution of Income to Workers" [25] is listed under taxation.</p> | <p>ing to data published recently (in June 2012) by IRENA<sup>6</sup> referring to 2.2%-3% of investment costs according to IEA (Energy Technology Perspectives 2010)<sup>7</sup> , and 52.86 USD/kW/year according to a study by Ecofys at al)</p>   |
| <p>Project Investment costs</p> <p>Civil works</p> <p>Machinery and Equipment cost</p> <p>Supervision</p> <p>Grid integration</p> <p>Development expenses</p> | \$USD | <p>16 170 637 (total)</p> <p>7 548 676</p> <p>4 276 335</p> <p>250 000</p> <p>3 691 998</p> <p>403 627</p> | <p>Pre-feasibility study [18] established the investment costs. Development budget [23 ] contains the common/joint costs with neighbouring HPPs from which 24% is allocated to the first CPA.</p>   | <p>DOE can confirm that values in the PDD are fully consistent with the pre-feasibility and other referenced documents [18,20,21,23]. The project investment costs are all sourced from external documents.</p> <p>The appropriateness of the costs has been checked and it was deemed that the overall investment costs are reasonable and correctly applied. The cost per installed MW (cc. 1.925 million USD per installed MW) of the project reflect the design and the terrain where the project is implemented.</p> <p>After assessment of all referenced documents, SQS assumes that the costs are appropriate and conservative.</p> <p>The 1st CPA starting date is the financial closure expected by 28/02/2013. Hence a FAR (FAR 1) is formulated to check whether the then available investment analysis supports the claim that the CPA IRR is below benchmark.</p> |
| Inflation considered  | %     | not considered   | not considered  | <p>In order to establish the applicable project investment costs at the time of the project starting date, the third party cost estimations [20,21] were not adjusted</p>   |

<sup>6</sup> International Renewable Energy Agency, Renewable Energy Technologies: Cost analysis series; Hydropower [http://www.irena.org/DocumentDownloads/Publications/RE\\_Technologies\\_Cost\\_Analysis-HYDROPOWER.pdf](http://www.irena.org/DocumentDownloads/Publications/RE_Technologies_Cost_Analysis-HYDROPOWER.pdf) page 30-31 (last accessed on 15/10/2012)

<sup>7</sup> International Energy Agency , [http://www.iea.org/Textbase/nppdf/free/2010/etp2010\\_part1.pdf](http://www.iea.org/Textbase/nppdf/free/2010/etp2010_part1.pdf) . (last accessed on 15/10/2012)

|  |                    |                                       |   |  |
|--|--------------------|---------------------------------------|---|--|
|  |                    |                                       |   | <p>with the inflation rate of Peru for the period between the date of the estimations/offers and PoA documentation preparation in 2011. As the starting date of the CPA is Q1 of 2013 the use of 2011 values is deemed conservative.</p> <p>The 1st CPA starting date is the financial closure expected by 28/02/2013. Hence a FAR (FAR 1) is formulated to check whether the then available investment analysis supports the claim that the CPA IRR is below benchmark.</p> |
| Income tax and distribution of income to workers | %                  | 30%<br>5%                             | Taxation is applied in accordance with relevant tax laws [26,27] on income tax and "Distribution of Income to Workers" [25] fee.  | DOE has verified that the financial analysis only includes the 30% corporate income tax [26,27] and the so called "Distribution of Income to Workers" [25] (5% of earnings before taxes) in accordance with the Peruvian tax rules and regulations. DOE confirms the correctness of the treatment of taxation and the correctness of the value used.   |
| Depreciation                                     | %                  | 10% for equipment, 3% for civil works | Peruvian Income Tax Law, Capítulo VI, Article 22 [26,27].   | As the PP followed the Tax Law [26,27] on this parameter, these values are considered appropriate.   |
| Exchange rate                                    | \$USD/<br>€        | 1.4308                                | The exchange rate is only used for calculating the USD value of equipment and machinery values provided in EUR by Gugler [20] and for the conversion of the CER revenues based on the shareholders' agreement [15].                         | The EUR => USD conversion rate used in the calculations reflects the exchange rate applicable at the beginning of the creation of the PoA documentation <sup>8</sup> .   |
|  | Peruvian Sol/\$USD | 2.805                                 | The exchange rate for Peruvian Soles and US Dollar for 07/ 2011, as provided by OSIGNERMIN Resolution Nr. 067-2011-OS/CD [22] to be used when converting PPA [14] and spot market revenues to USD for the project IRR calculation purposes. | The exchange rate (2.805) for Peruvian Soles and US Dollar for 07/2011 are correctly used in line with the applicable OSIGNERMIN resolution [22].  |
| Price of CERs                                    | €/CER              | 5.5 €                                 | As defined in the shareholder agreement [15] (page 28).   | The CER price used is based on the agreement of project partners. It must be noted that the CER price influences the "project with the CER revenues" scenario only, the choice of the CER price does not influence the additionality and baseline analysis of the project at all.  |

The above-mentioned pre-feasibility report [18] and the used independent quotes [20,21] were once again cross-checked against the CPA-DD, and the DOE has conducted a further examination of the computations in the spreadsheet [6] in addition to the procedures to ensure correctness applied during validation. It is SQS' opinion that all input values and assumptions are reasonable, its input data is in line with industry experience and cost features described by IEA and IRENA studies referred on the previous page. and that the investment analysis calculations were done in a correct way.

<sup>8</sup> <http://coanda.com/lang/en/currency/converter/> (used for checking PoA document creation applicable exchange rate, date of access 29/09/2012)

All referenced documents have been verified and reviewed by the DOE and it can be confirmed that the values are correct.

All the input values used in the investment analysis and the table above were applicable at the time of the PoA documentation preparation (see FAR 1 for guaranteeing that the investment analysis input values remain valid at time of the financial closure of the first CPA) .

#### Sensitivity analysis

The sensitivity analysis is a crucial part of the investment analysis as it guarantees that reasonable changes in the assumptions do not lead to fundamentally different conclusions related to the project. Based on the modelling results, SQS is on the opinion that the sensitivity analysis conducted by the PP for the first CPA correctly applied realistic ranges for key factors and calculated their likely impacts on the IRR.

A sensitivity analysis has been conducted in line with sub-step 2d (Sensitivity analysis).

The sensitivity analysis was done for the 1st CPA with variation of the project's energy sales (both from changes in electricity sales prices and changes in net electricity generated due to changes in plant load factor (PLF)), initial investment costs (CAPEX) and operational and maintenance costs (OPEX). These parameters are fully in line with the applicable guidance and include all those parameters that are contributing more than 20% to the total costs/revenues (OPEX is below this level, however it's checking provides a broader picture). The PP therefore conducted the sensitivity analysis on the factors that are required and subsequently its sensitivity analysis results were found to be correct.

It is foreseen on the basis of the generic CPA and sensitivity analysis worksheet called "Sensitivity" [6], that a sensitivity analysis will be automatically realised for all future CPAs with the following parameters: CAPEX, OPEX, PLF and electricity sales prices selected in line with the applicable guidance for any future CPAs.

The PoA-DD and the generic CPA defines a calculation for each parameter with which the project benchmark IRR is exceeded and the assessment of the possibility of this occurring. Each of these calculations for the first CPA are shown in the table below and corresponding PP statements have been found correct.

| Turning point condition to reach the benchmark of 12% |  |       |                          |
|---|--|-------|--------------------------|
| CAPEX   | OPEX   | PLF   | Electricity sales prices |
| -19%  | not possible, even if the OPEX is reduced to zero the benchmark is not reached | + 33% | + 92%                    |

The smallest change of a parameter that would result in reaching the benchmark IRR is -19%, for CAPEX. The factor by factor values and probabilities are as follows:

- Total investment costs (CAPEX): To reach the 12% benchmark value, total investment costs would need to decrease significantly (-19%). This is unlikely in Peru and therefore SQS confirms a low likelihood of such drop of investment occurring. FAR 1 guarantees that in case of an unlikely, unforeseen investment cost decrease the 1st CPA will be considered ineligible provided investment costs decrease by more than 19%.
- PLF (energy sales increase due to higher PLF): To reach the 12% benchmark value, the PLF would need to be increased significantly (+33%) above 100%. Power generation has been properly estimated based on hydrological data as detailed in the feasibility study [18]. Power generation has been properly estimated based on the climatic conditions. The most likely scenario is a small fluctuation of PLF throughout the crediting period. The PLF rise from 76.484%% to 101.72% representing the 33% in-

crease of the PLF factor is impossible. The hydrological data [18] confirmed by water authority permit [34] of this run-of-river plant that cannot buffer the seasonal fluctuation of rainfall due to the lack of a reservoir (it has a small desander only); a small fluctuation is expected in the PLF. Therefore, SQS confirms that such an increase of the PLF is not possible.

- Electricity sales prices (energy sales increase due to higher electricity price): To reach the 12% benchmark value, the electricity sales prices would need to increase significantly (+92%). This is not possible as a fixed-price Power Purchase Agreement [14] is in place for more than 81.6% of the electricity generated during the 20 years validity of the PPA. The spot market price, applicable only to 18.4% of the overall sales, cannot increase to a level that would result in an overall 92% increase of the revenues. SQS also confirms that a multiplication of the spot market price for the electricity sold after 20 years of operation (from year 21 to 40) cannot be foreseen as a realistic scenario. Therefore SQS concludes the electricity price increase required to reach the benchmark is highly unlikely to occur.

For all the chosen parameters a +/- 5% - 10% variation was calculated during the validation; it is confirmed that the benchmark is not reached with a +/- 10% variation. SQS has calculated all sensitivity factors - including the turning point values - by means of rebuilding the model excel sheet [6] and checking the values contained in the sensitivity analysis. 19% is the smallest required change that is required to reach the benchmark in case of an investment costs decrease. Hence, the project additionality is confirmed by the sensitivity analysis results.

The sensitivity and turning point analysis is conclusive: No realistic deviations from the key input prices resulted in an IRR that is above the benchmark of 12%.

The benchmark analysis, including the sensitivity analysis, demonstrated that the project cannot be economically feasible without the revenues associated with CDM. The 1st CPA contains the calculation of the IRR value (10.82%) with CER revenues; these calculations based on CER prices (5.5 €) defined by the shareholder agreement [15] are found to be correct.

The project IRR is increased from 9.62% to 10.82% when calculating with the CER revenue. This IRR value will be closer to the applied benchmark of 12 %. Therefore, the CER revenues is a way for the PP to obtain a closer to benchmark return on its hydropower investment.

SQS has used its local and sectoral experience to confirm that the underlying assumptions are accurate and appropriate and that the financial calculations are correct.

The financial calculations have been reproduced by the validation team with the same result and are therefore considered correct.

It is the opinion of SQS that the financial analysis worksheet [6] was established in an appropriate manner for the PoA and will provide the appropriate calculation together with EB 62 Annex 5 guidance for each and every CPA.

SQS concluded that the CDM benefits will enable the project to become financially more attractive by raising the IRR closer to the benchmark and consequently would support the project developer to overcome the investment barrier.

### 3.8.11 Barrier analysis

In case the investment analysis including the sensitivity analysis, the 2nd step of the tool, does not provide a valid result establishing additionality, the CPA-PDD shall provide a "Barrier Analysis" in line with the tool. As

the investment analysis of the 1st CPA was conclusive – the CPA is additional as its IRR is below the benchmark – no barrier analysis has been conducted.

The PoA-DD and generic CPA description of the barrier analysis step is accurate and correctly refers to the use of “Guidelines for objective demonstration and assessment of barriers” in case the barrier analysis is applied.

It is SQS’ opinion that the PoA documentation clearly and appropriately establishes the cases – the project or equity IRR being higher than the benchmark – for which the barrier analysis step is applicable. Therefore, at each CPA inclusion in the future the validation will be possible based on unambiguous ground referring to the PoA documentation and the “Guidelines for objective demonstration and assessment of barriers”.

### 3.8.12 Common practice analysis

The geographical scope of Peru is appropriate for the assessment of common practice related to each CPA. SQS has verified that due to the nationwide nature of the electricity grid, the geographical scope of the common practice analysis has been identified correctly. Step 4 of EB 65 Annex 21, “Tool for the demonstration and assessment of additionality” version 06.0.0 will be applied as a credibility check for each CPA.

For the first CPA, in line with Sub-step 4a (Analyse other activities similar to the proposed project activity), the PP has identified the thermoelectric and hydropower plants that are operational. PP has defined the geographic scope of the entirety of the host country, Peru, as the relevant area for the common practice analysis. SQS has verified that due to the nationwide nature of the electricity grid, the geographical scope of the common practice analysis has been identified correctly. Following the Sub-step 4b (Discuss any similar options that are occurring) PP elaborated the key features of thermo-electric and hydropower plants.

SQS has assessed the available official information about HPP developments in Peru by consulting various sources such as the 2010 and 2011 annual reports<sup>9</sup> of the Committee for the System’s Economic Operation (COES) [24], the Ministry of Energy and Mining (MINEM) reports [41,42] and the World Bank’s ESMAP (2011), “Peru Opportunities and Challenges for Small Hydropower Development” report [31] describing the trends and details of hydropower production which has increased very little as compared to the dynamic growth of gas-based generation supported by governmental policies favouring gas based power generation after the commissioning of the Camisea project in 08/2004.

PP has demonstrated that the construction of thermal power plants has been the common practice in Peru, adding most of the power generation capacity over the last years. Over the last 8 years (starting commercial operations after 2004) all small hydropower projects have been registered under the CDM or are currently under validation (except one small-scale project with a low 658 \$USD/kW investment cost). The 658 \$USD/kW cost project is the Roncador Hydropower Plant, which cannot be considered as similar to the proposed project activity, due to the fact that it has a smaller, 3.8 MW, installed capacity. This project falls outside the +/-50% size range for the F, Nall, Ndiff calculations and therefore, should not be considered as a “similar activity” anyway.

The common practice analysis revealed for the 1st CPA that  $F = 0$ ,  $N_{all} = 9$ ;  $N_{diff} = 9$ ; the calculations quantifying the common practice are in line with the applicable tool. SQS has checked the operational power plants in the applicable range (4 MW to 13 MW; see table below)

<sup>9</sup> <http://www.coes.org.pe/wcoes/coes/salaprensa/estadanual.aspx?anio=2010> (date of access 15/10/2012)  
<http://www.coes.org.pe/wcoes/coes/salaprensa/estadanual.aspx?anio=2011> (date of access 15/10/2012)

|    | List of Power Plants <sup>10</sup> | Capacity (MW) <sup>11</sup> | Fuel <sup>12</sup> | CDM Project | Year of commercial operation start <sup>13,14</sup> |
|----|------------------------------------|-----------------------------|--------------------|-------------|---|
| 1  | Arcata                             | 5.31                        | Hydro              | No          | 2003  |
| 2  | Bellavista                         | 4.80                        | Diesel             | No          | 2000  |
| 3  | Caña brava                         | 5.31                        | Hydro              | Yes         | 2010  |
| 4  | Carhuaquero IV                     | 10.00                       | Hydro              | Yes         | 2008  |
| 5  | Chilina Sulzer (1&2)               | 10.46                       | Diesel             | No          | 1987  |
| 6  | La Joya                            | 10.00                       | Hydro              | Yes         | 2009  |
| 7  | Oroya                              | 9.00                        | Hydro              | No          | 1914  |
| 8  | Pachachaca                         | 9.00                        | Hydro              | No          | 1917  |
| 9  | Paita                              | 5.06                        | Diesel             | No          | 1982  |
| 10 | Pariac                             | 4.86                        | Hydro              | No          | 2001  |
| 11 | Poechos II                         | 10.00                       | Hydro              | Yes         | 2010  |
| 12 | Santa Cruz I                       | 7.00                        | Hydro              | Yes         | 2009  |
| 13 | Santa Cruz II                      | 7.00                        | Hydro              | Yes         | 2010  |
| 14 | Sullana                            | 7.50                        | Diesel             | No          | 1986  |
| 15 | Taparachi                          | 6.70                        | Diesel             | No          | 2000  |

and confirmed that 9 plants constitute the  $N_{all}$  after deducting the CDM projects.

The  $N_{diff}$  group contains 9 projects - each project defined in the  $N_{all}$  step above - as shown in the table below.

|   | Power Plants <sup>15</sup> | Energy fuel <sup>16</sup> | Size of installation <sup>17</sup> | Different Investment Climate (started commercial operation before 2004) | Conclusion if project is different          |
|---|----------------------------|---------------------------|------------------------------------|---|---|
| 1 | Arcata                     | Hydro                     | Small                              | Yes   | Different Investment Climate                |
| 2 | Bellavista                 | Diesel                    | Micro                              | Yes   | Different Fuel, Size and Investment Climate |
| 3 | Chilina Sulzer (1 & 2)     | Diesel                    | Small                              | Yes   | Different Fuel and Investment Climate       |
| 4 | Oroya                      | Hydro                     | Small                              | Yes   | Different Investment Climate                |

<sup>10</sup> Source: COES (2010): COES Annual Statistic 2010, Chart 15.5 (date of access 15/10/2012).

<sup>11</sup> Source: COES (2010): COES Annual Statistic 2010, Chart 15.5 (date of access 15/10/2012).

<sup>12</sup> Source: COES (2010): COES Annual Statistic 2010, Chart 15.5 (date of access 15/10/2012).

<sup>13</sup> Source: COES (2010): COES Annual Statistic 2010, Chart 15.5 (date of access 15/10/2012).

<sup>14</sup> <http://www.osinerg.gob.pe/newweb/uploads/GFE/1.2%20COMPENDIO%20CENTRALES%20ELECTRICAS%20SEIN.pdf> (accessed 15/10/2012)

<sup>15</sup> Source: COES (2010): COES Annual Statistic 2010, Chart 15.5 (date of access 15/10/2012).

<sup>16</sup> Source: COES (2010): COES Annual Statistic 2010, Chart 15.5 (date of access 15/10/2012).

<sup>17</sup> Source: COES (2010): COES Annual Statistic 2010, Chart 15.5 (date of access 15/10/2012).

|   |            |        |       |     |                                       |
|---|------------|--------|-------|-----|---------------------------------------|
| 5 | Pachachaca | Hydro  | Small | Yes | Different Investment Climate          |
| 6 | Paita      | Diesel | Small | Yes | Different Fuel and Investment Climate |
| 7 | Pariac     | Hydro  | Micro | Yes | Different Size and Investment Climate |
| 8 | Sullana    | Diesel | Small | Yes | Different Fuel and Investment Climate |
| 9 | Tarapachi  | Diesel | Small | Yes | Different Fuel and Investment Climate |

The resulting calculations have resulted in  $F = 1 - (N_{diff}/N_{all}) = 1 - (9/9) = 0 < 0.2$ ;  $N_{all} - N_{diff} = 9 - 9 = 0 < 3$ . Therefore, the 1st CPA is not common practice according to the analysis and it is additional.

The DOE's validation opinion is that any proposed CPA can be identified as "common practice" or "not common practice" by applying step 4 of the "Tool for the demonstration and assessment of additionality", version 06.0.0. This common practice step will be conducted in the future for each CPA at the time of CPA inclusions.

Based on the compliance check with the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities" (version 01.0, EB 65 Annex 3) and the Tool for the demonstration and assessment of additionality, version 6.0.0, EB 65 Annex 21 SQS conforms that the additionality argumentation of the PoA, including the generic CPA, and its first CPA fully complies with the above mentioned rules.

### 3.8.13 Eligibility criteria for inclusion of a CPA in the PoA

The CME has developed and uses clear and unambiguous criteria for the inclusion of the CPAs [3]. The eligibility criteria meet the requirements of EB 65 Annex 3 paragraph 14 points (a) – (l). The eligibility criteria defined in each criterion is in a verifiable manner.

The CME Handbook [8] defines all procedures and refers to the respective forms and templates to assess, conclude and report on each of these criteria. Therefore, it is SQS validation opinion that the eligibility criteria as stated in the PoA-DD and demonstrated in the generic CPA-DD are sufficiently objective and comprehensive to permit the assessment of the inclusion of CPAs under the PoA.

1st CPA meets all eligibility criteria. In addition, CME has demonstrated how the eligibility criteria were applied to the 1st CPA demonstrating its ability to conduct the assessment of any future CPA. The CME Handbook [8] as detailed in the next section was finalised on the basis of experience with the 1st CPA inclusion.

The table below summarises the PoA CPA eligibility criteria and its full compliance with the PoA standard and the full compliance of the 1st CPA with the eligibility criteria established for the PoA.



| PoA eligibility criteria  | PoA standard compliance assessment/ conclusion by SQS for PoA and generic CPA  | Proof/ Evidence as PoA guidance used in case of 1st CPA  | 1st CPA <sup>18</sup> compliance assessment/ conclusion by SQS with reference to evidences submitted  | CME Handbook reference   |
|---|--|--|---|--|
| 1. The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA. The boundary of the PoA is currently the host country Peru.   | The boundary of a CPA is consistent with the programme's geographical boundary; it is within Peru, the host country.   | Based on project documentation   | 1st CPA is in Peru [14,18,34]   | Procedure for eligibility criteria check of each CPA, Section 2.2.2.1            |
| 2. Each CPA involves the construction and operation of one or several new hydropower projects connected to the national/sub-national power grid and with a total or combined installed capacity not greater than 20 MW. The technology and performance specifications fulfil the host country national standards.   | The PoA involves the construction and operation of one or several new hydropower projects.   | Based on project documentation   | The 1st CPA is grid connected new HPP with less than 20 MW capacity [14,18,34].   | Procedure for eligibility criteria check of each CPA, Section 2.2.2.1            |
| 3. The CPAs under its PoA are neither registered as an individual CDM project activity nor included in another registered CDM PoA.  | Double-counting requirements are appropriately addressed (see also next criteria).   | Based on project documentation and checks on the UNFCCC web interface of registered and projects under validation. | The CPA is unique and there are no CDM projects registered or seeking registration containing hydro-power plants located in the stated coordinates accordingly. | Procedure for eligibility criteria check of each CPA, Section 2.2.2.1            |
| 4. To avoid double counting of emission reductions each CPA-DD shall be uniquely identified and defined in an unambiguous manner by providing geographical information (e.g. coordinates), a unique CPA identification number, and the exact start and end date of the crediting period. The following data must be provided to/by the CME prior to inclusion in the PoA in written: <ul style="list-style-type: none"> <li>Name of the CPA;</li> <li>Name of the CPA developer;</li> </ul> | Doubly-counting requirements are appropriately addressed (see also previous criteria).<br><br>CPAs are identified with specific geographical information (region, department, district and the coordinates of the water intake, water discharge and power house). Moreover, the CME defines in the CPA-DD and internal documentation a unique CPA identification number. | Based on project documentation and checks on the UNFCCC web interface of registered and projects under validation. | The CPA is unique and there are no CDM projects registered or seeking registration containing hydro-power plants located in the stated coordinates accordingly. | Procedure for eligibility criteria check of each CPA, Section 2.2.2. and 2.2.2.1 |

<sup>18</sup> Other validation findings and conclusions related to 1st CPA project description, baseline and monitoring are found in the applicable sections of this report with indented text.

|   |  |   |  |  |  |   |
|---|--|---|--|--|--|---|
| <ul style="list-style-type: none"><li>• Contact details of the CPA developer including contact person, address, telephone and/or email address;</li><li>• Installed capacity and other relevant technical specifications of each power plant under the CPA;</li><li>• Location of each power plant under the CPA (e.g. GPS coordinates)</li></ul>   | <p>cation name and number and the complete name and contacts details of the project developer.</p> <p>The procedures and conditions for CPA inclusion as defined in the CME Handbook [8] (2.2.2) will ensure that those operating a CPA are aware of and have agreed that their activity is being subscribed to the PoA and no double-counting occurs.</p> |   |  |  |  |   |
| 5. Start date of the CPA shall be provided through documentary evidence and shall comply with the applicable CDM guidelines and standards.  | The definition of the earliest starting date (the publication of the PoA documentation on the UNFCCC website for public comments) is in line with the requirements. The checking of this parameter for each CPA is defined in the CME Handbook [8].  | Starting date is the expected date of financial closing on 28/02/2013 [33].                     | The starting date of the 1st CPA is the expected date of financial closing on 28/02/2013 [33]. | Procedure for eligibility criteria check of each CPA, Section 2.2.2.1  |  |   |
| 6. The CPAs need to sign an inclusion agreement with the CME.   | Inclusion agreement signed with each and every CPA owner.  | Signed inclusion agreement with 1st CPA owner [45]  | Signed inclusion agreement with 1st CPA owner [45] on 02/02/2012                               | Procedure for eligibility criteria check of each CPA, Section 2; including inclusion agreement template [46] |  |   |
| <p>Each CPA must be applicable to and needs to apply the latest version of the CDM baseline and monitoring methodology "ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (version 13.0.0 as per validation date).</p> <p>The following applicability conditions apply:</p> <table><tr><td><b>Applicability conditions in version 13.0.0 of ACM0002</b></td></tr><tr><td>The project activity is the installation, capacity addition, retrofit or replacement of a power</td></tr></table> | <b>Applicability conditions in version 13.0.0 of ACM0002</b>   | The project activity is the installation, capacity addition, retrofit or replacement of a power | The PoA/CPA meets the applicability criteria of ACM0002 version 13.0.0.                        | Based on project documentation   | 1st CPA falls under applicability criteria as the project activity results in new reservoirs (a small desander/intake) and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m <sup>2</sup> [18]. | Procedure for eligibility criteria check of each CPA, Section 2.2.2.1 procedure |
| <b>Applicability conditions in version 13.0.0 of ACM0002</b>  |  |   |  |  |  |   |
| The project activity is the installation, capacity addition, retrofit or replacement of a power   |  |   |  |  |  |   |

|   |  |  |  |  |
|---|--|--|--|--|
| <p>plant/unit of one of the following types: hydropower plant/unit (either with a run-of-river reservoir or an accumulation reservoir).</p> <p>For hydropower projects, one of the following criteria must apply:</p> <ul style="list-style-type: none"> <li>• The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or</li> <li>• 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<sup>2</sup>; or</li> <li>• 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<sup>2</sup>.</li> </ul> <p>In case of hydropower plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m<sup>2</sup> all the following conditions must apply:</p> <ul style="list-style-type: none"> <li>• The power density calculated for the entire project activity using equation 5 is greater than 4 W/m<sup>2</sup>;</li> <li>• Multiple reservoirs and hydropower plants located at the same river and were designed together to function as an integrated project that collectively constitute the generation capacity of the combined power plant;</li> <li>• Water flow between multiple reservoirs is not used by any other hydropower unit which is not part of the project activity;</li> <li>• Total installed capacity of the power units, which are</li> </ul> |  |  |  |  |
|---|--|--|--|--|

|   |   |  |   |  |
|---|---|--|---|--|
| <p>driven using water from the reservoirs with power density lower than 4 W/m<sup>2</sup>, is lower than 15 MW;</p> <ul style="list-style-type: none"> <li>Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m<sup>2</sup>, is less than 10% of total installed capacity of the project activity from multiple reservoirs.</li> </ul> <p>The methodology is NOT applicable for hydro projects that result in the creation of a new single reservoir or in the increase of an existing single reservoir where the power density of the power plant is less than 4 W/m<sup>2</sup>.</p> |   |  |   |  |
| <p>7. Only additional projects can be enrolled. Additionality is proven on the CPA level for each CPA separately in accordance with the applicable guidelines established by the UNFCCC.</p>  | <p>Additionality is proven on the CPA level for each CPA separately in accordance with the applicable guidelines established by the UNFCCC.</p> | <p>The project proves additionality by using the investment analysis according to the "Tool for the demonstration and assessment of additionality".</p>  | <p>Investment analysis has appropriately proven the additionality of the 1st CPA.</p>   | <p>Procedure for eligibility criteria check of each CPA, Section 2.2.2.1 procedure</p> |
| <p>8. The CPAs must have undertaken an environmental analysis as per requirements of the CDM modalities and procedures as outlined in Section C and must be in accordance with the applicable host country's environmental laws and/regulations.</p>  | <p>By meeting the National EIA standards the CPAs meet the environmental impact assessment requirements.</p>                                    | <p>According to the Peruvian Law N° 25844 (Ley de Concesiones Eléctricas) [29], the approval of an Environmental Impact Assessment (EIA) is only requested for energy projects of more than 20 MW installed capacity</p> <p>According to the Peruvian Law N° 27446 (Ley del Sistema Nacional de Evaluación del Impacto Ambiental) [53], the CPA has an environmental certificate (Declaración de Impacto Ambien-</p> | <p>According to the Peruvian Law N° 27446 (Ley del Sistema Nacional de Evaluación del Impacto Ambiental) [53], the CPA has an environmental certificate (Declaración de Impacto Ambiental – DIA) issued on 16/12/2011 by the Regional Directorate of Energy, Mines and Hydrocarbons, Regional Government of Huanuco, Republic of Peru [35].</p> | <p>Procedure for eligibility criteria check of each CPA, Section 2.2.2.1 procedure</p> |

|   |  |  |  |   |
|---|--|--|--|---|
|   |  | tal – DIA) .   |  |   |
| 9. The CPAs must have undertaken a local stakeholder consultation as outlined in Section D.   | LSC requirements are in line with general CDM standards. The checking of this parameter is obligatory for each CPA | National environmental Fund (FONAM ) Report of Local stakeholder consultation that took place on 11/09/2011, following national requirements [19]. | FONAM Report [19]  | Procedure for eligibility criteria check of each CPA, Section 2.2.2.1 procedure |
| 10. The CPAs must provide a written affirmation that funding from Annex I party, if any, does not result in a diversion of official development assistance. | The CME Handbook provides clear guidance on how to obtain such a statement from each CPA developer.                | Declaration included CPA-DD Annex  | The required statement [10] has been signed by the CPA owner; the project will not use funding from Annex I parties. | Procedure for eligibility criteria check of each CPA, Section 2.2.2.1 procedure |

Other validation findings and conclusions related to CPA-001 project description, baseline and monitoring are found in the relevant section of this report.

#### 3.8.14 Operational and management arrangements of the CME

During the on-site visit SQS assessed the CME management system by interviews and cross-checks. In addition, a desk review of the operational and management arrangements established and described in the CME Handbook [8] was performed. The CME management system is characterised by the following:

- A clear and transparent description of the operational and management arrangements has been established and stated in the CME Handbook [8]. This CME Handbook of the PoA address all requirements of the PoA Standard para 17 points (a) – (f).
- There is a record and documentation keeping system for each CPA under the PoA, and it has been checked during the on-site visit by SQS along with the established records and documentation control process applied in case of the 1st CPA.
- The CME will have control of all records and information related to the implementation of individual CPAs and will be in a position to ensure each CPA is being operated in accordance with the specific requirements of the programme.
- Clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs exist, including a review of their competencies. CME Handbook Section 2.1 details these requirements.
- Records of arrangements for training and capacity development for involved personnel made available and has been cross-checked by SQS as described in Section 4 of the CME Handbook
- The CME has presented its measures for continual improvements of the PoA to SQS, and it has been checked during the on-site visit.

SQS has checked that the operational and management arrangements described in the CME Handbook had been applied sufficiently in the course of the selection and development of the 1st CPA.

The roles and responsibilities of personnel involved in the management of the PoA are sufficiently described in the PoA-DD and in more detail in the CME Handbook [8].

The CME is already operational and it has demonstrated its competence in the establishment and management of stand-alone HPP proposed CDM projects. It must be noted that the CME's competence, management structure and quality assurance system have already been applied to these proposed CDM projects that are almost identical to the CPAs falling under the proposed PoA (for reference see CDM ref 7520 and 7704 projects).

The CME has unambiguously defined the following roles for itself and the CPA owner involved in the PoA:

CME:

- Define the roles and responsibilities of personnel involved in the process of inclusion of CPAs. The CME has a procedure of responsibilities and organisation (see CME Handbook Section 2.1).
- Maintain existing relationship with the CPA owners (e.g. assure that proper training for data monitoring is being provided to project developers) (see CME Handbook Section 2.2).
- Implement technical review of inclusions of CPAs. Then the CME will set a framework for the implementation of the PoA and approve the CPAs to be included under the PoA (see CME Handbook Section 2.2.2).
- Implement a procedure to avoid double-counting and de-bundling issues based on established formal documentation with the project developers (e.g. to avoid the case of including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA) (see CME Handbook Section 2.2.2.1).
- Establish operational and management arrangements for the implementation of the PoA, including a record keeping system for each CPA under the PoA, that considers the following (see CME Handbook Section 2.2.2.1 and 2.2.2.5):
  - Name of the CPA;
  - Name of the developer of the CPA;
  - Contact details of the developer including contact person, address, telephone and/or email address;
  - Installed capacity and other relevant technical specifications of each CPA;
  - Location of the CPA (e.g. GPS coordinates).
- Maintain the recording and storing of all relevant information of the PoA and CPAs. The CME has developed and implemented a procedure of documentary and data control for the CPA process that will lead to records and documentation for each CPA under the PoA (see CME Handbook Section 2.2.1 and 2.2.2.5).
- Maintain and implement a procedure for continual improvements of the PoA management (see CME Handbook Section 1).
- Be the focal point for all communication with the UNFCCC related to the PoA.
- Ensure that those operating the CPA are aware and agree that their activity is being subscribed to the PoA (see CME Handbook Section 2.2.2.1 and 2.2.2.2).
- Submit to the DOE the necessary documents for validation and inclusion of CPAs (see CME Handbook Section 2.2.2 and 2.2.2.3.3).
- Collect monitoring data of all CPAs (see CME Handbook Section 2.2.2.5).
- Prepare monitoring reports for emission reduction verification (see CME Handbook Section 2.2.2.5).
- Maintain all monitoring reports of all CPAs in accordance with the record-keeping system identified in the CDM-POA-DD. (see CME Handbook Section 2.2.2.5).

- Make available all monitoring reports requested by a DOE for verification purposes (see CME Handbook Section 2.2.2.5).
- Measurement device calibration - as required by the host country standards (see CME Handbook Section 2.2.2.5).

Based on the assessment of the CME management system and the description of the roles and responsibilities it is SQS' opinion that the arrangements are sufficient to ensure that the CME has and will have control of all records and information related to the implementation of individual CPAs and has been and will be in a position to ensure each CPA is being operated in accordance with the specific requirements of the programme. It is SQS' opinion that the arrangements and procedures are sufficient to meet the requirements of the PoA Standard, EB 65. Annex 3 paragraph 17. CME's proven experience of establishing and managing similarly sized CDM hydro project provides a guarantee that it will be able to cover all aspects of the CME obligations in a professional manner.

### 3.8.15 Validation of the specific CPA (1st CPA)

According VVM. 1.2 paragraph 168 SQS has assessed the specific CDM SSC CPA-DD (1st CPA) [3] which the PPs submitted together with the CDM-SSC- PoA-DD for validation, to determine whether or not it complies with the eligibility criteria specified in the PoA-DD. The means of validation to determine compliance with this requirement are listed below.

#### Validation method

The accuracy and completeness of the 1st CPA description was validated by:

- A desk review of the specific CDM-CPA-DD submitted by the client and additional supporting documents (a list of all documents reviewed during validation is provided in Appendix C).
- On-site visit between 24 - 27/01/2012 (programme of the on-site visit and list of interviewees are provided in Appendix A).
- A desk review to check eligibility of the proposed first CPA to determine compliance with the eligibility criteria specified in the PoA-DD.
- Follow-up interviews with PPs.

SQS determined that the specific 1st CPA was eligible to be included under the PoA. Section 3.8.13 "Eligibility criteria for inclusion of a CPA in the PoA" provides the assessment and conclusions of the DOE to determine compliance of the 1st CPA with respect to the eligibility criteria defined in the PoA. Other validation findings and conclusions related to 1st CPA project description, baseline and monitoring are found in the respective section of this report.

## 3.9 Monitoring plan

The monitoring plan described in the PoA-DD was checked by desk-review with all relevant guidelines and tools and against requirements of ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 13.0.0). Furthermore the monitoring plan was checked by reviewing the CME Handbook.

### Parameters determined ex-ante

The *ex-ante* parameter for the emission factor of the grid (0.657 tCO<sub>2e</sub>/MWh) used in the calculations is calculated from the latest available power sector data (covering 2010) publicly available from the National Interconnected Electric Grid (SEIN) at the time of submission of the PDD to the DOE for validation in line with the requirements of the applicable tool [51]. All necessary parameters of  $EF_{CO2,i,y}$  and  $EF_{CO2,m,i,y}$ ,  $EF_{EL,m,y}$  for establishing the emission factor of the grid ( $EF_{CO2,grid,y} = EF_{grid,CM,y}$ ) have been vali-

dated by SQS and found correct.

As the first CPA does not involve any reservoir or regulation tank for its normal operation, only an intake and desander, therefore reservoir related *ex ante* parameters  $CAP_{BL}$ ,  $A_{BL}$  are not applicable. The parameters required in case of (existing) reservoirs are listed in the generic CPA. Hence, future CPAs have all the required potential parameters available.

### Parameters monitored *ex-post*

According to the documentation, the following parameters are to be monitored:

- a. the quantity of net electricity supplied to the grid (auxiliary consumption; the electricity supplied to the grid by the project and the electricity delivered from the grid to the project)
- b. parameters that are required to calculate the 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".

The surface area of the reservoir when the reservoir is full, this parameter is not monitored as the first CPA does not have a reservoir (only a small desander).

The monitoring procedures of those parameters have been sufficiently identified in the PDD.

The net electricity supplied to the grid will be measured and recorded in 15-minute intervals by a power metre which is calibrated by Peru's COES. This data will be used for invoicing electricity sales.

Methods of measurement are as per ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 13.0.0) guidance.

In case of the 1st CPA the CPA owner has provided the detailed project diagram and metering location [ ] demonstrating that the metering system is in line with both the methodology and the national requirements.

The validation team thus confirmed that the parameters identified to be monitored are completely in accordance with the selected methodology.

The technical experts of the PP involved with the project activity have substantial experience in the field of energy generation. Therefore, it is SQS' unambiguous opinion that the PP has the ability to implement the monitoring plan as required under CDM.

### Management system and quality assurance

The CPA owner is reported to be responsible for the management of monitoring and reporting of the project. The management team for monitoring the project is identified in the PoA-DD.

Detailed procedures have been developed in the PoA-DD as follows:

- Data to be monitored;
- Operational and management structure for monitoring plan;
- Monitoring of the net electricity supplied to the grid by the project;
- Quality assurance and quality control;
- Data management and training programme; and
- Verification.

The monitoring arrangements described in the monitoring plan of the PoA-DD and the corresponding first CPA-DD have been assessed by the validation team, by means of documentation review, interview-



ing the representative from the project owner and on-site observation. On that basis, the effective implementation of the monitoring plan is considered feasible. The validation team deems the project owner capable of implementing the monitoring plan.

The DOE confirms compliance of the monitoring plan with the requirements of the methodology and that it is feasible to be implemented.

The net energy input to the grid will be measured by COES. The net electricity supplied to the grid will be monitored by a power metre and calibrated according to national standards with continuous measurements and a monthly recording. COES owns the measurement equipment and is responsible for its calibration. PP also installs a second metre for quality assurance purpose only. Readings and invoicing are based on the COES metre.

The annual monitoring reports and data quality check will be realised jointly by CME and the CPA-owner.

Based on the above, SQS confirms that

- the monitoring plan contains all necessary parameters, they are clearly described and that the means of monitoring described in the plan complies with the requirements of the methodology.

It is SQS' opinion that

- the monitoring arrangements described in the PoA monitoring plan and the CME Handbook are feasible within the PoA and its CPA(s); the CME is able to implement the monitoring plan; the 1st CPA is able to implement the monitoring plan

### 3.10 Sustainable development

The LoA from Peru [9] was issued during the validation process and it confirms explicitly that the proposed PoA meets the sustainable development criteria set by the host country for CDM projects. As confirmation for the contribution of the project to the sustainable development criteria of the host party, also refer to Section 3.1 of this report.

### 3.11 Environmental impacts

The host party does not require an environmental impact assessment for the project activities under the PoA. According to Peruvian law (Law to Assure the Efficient Development of Electric Generation; Law No. 28832 of 23/07/2006) [40] hydropower plants are not required to have their environmental impacts assessed with an Environmental Impact Assessment (EIA), provided their installed capacity is below 20 MW. For these plants with less than 20 MW installed capacity according to the Peruvian Law N° 27446 (Ley del Sistema Nacional de Evaluación del Impacto Ambiental) [53], an environmental certificate (Declaración de Impacto Ambiental – DIA) is required. The DIA for the first CPA was issued on 16/12/2011 by the Regional Directorate of Energy, Mines and Hydrocarbons, Regional Government of Huanuco, Republic of Peru [35].

The DOE's validation opinion is that for the 1st CPA an appropriate analysis of potential environmental impacts [17] have been conducted prior to obtaining the environmental certificate (DIA)[35] and Water Authority permit [34].

SQS confirms that the applicable environmental impact analysis [17] - as referred to by the environmental certificate (DIA)[35] issued by the Regional Directorate of Energy and Mines - is complete and are there no open issues. The environmental impact analysis [17] document was updated in January 2012 [44] after receiving the environmental certificate, DIA. All environmental obligations will be enforced by the Regional Directorate of Energy, Mines and Hydrocarbons in the course of the construction and operation of HPP. The

minor negative impacts on the physical and biological I - associated with the construction of the HPP - will be monitored by the authorities and compliance with applicable national standards will be guaranteed by the owner of the first CPA and the respective authorities.

### 3.12 Local stakeholder consultation

The CME is obliged to conduct the local stakeholder consultation for each CPA, this is according to EB 55 Annex 38.

For the 1st CPA, the stakeholder groups that have been identified and interviewed are the local residents, affected persons and local authorities. In SQS' opinion, these are groups affected by the project and the PPs selected the right groups, conducted the consultation and reported the local stakeholder consultation correctly and sufficiently. For the local stakeholder consultation process FONAM<sup>19</sup>, the National Environmental Fund, was contracted and held workshops in the period of 04 -11/09/2011[19].

SQS has checked the documentation and attendance list of the local stakeholder consultation [19]. SQS is satisfied about the manner of how the local stakeholder consultation was conducted by FONAM, the OSV included the interviewing local representatives who attended the LSC process previously confirming the content of the FONAM report. The DOE's validation opinion is that the local stakeholder consultation is adequate.

## 4 List of Interviewees and Documents Reviewed

The on-site audit and interviews were done according to the on-site visit programme. The on-site visit programme and stakeholders interviewed during validation are listed in Appendix A and B respectively. The documents that were assessed during validation are listed in Appendix C.

## 5 Validation Team and Reviewer

The following matrix shows the names and roles of the members of the validation team and the reviewer. The reviewer is not a member of the validation team. Certificates of competence for each validation team member and of the reviewer are included in Appendix D to this report.

| Name                    | Role<br>(1) | Country     | Duties      |               |                        |        |                  |
|-------------------------|-------------|-------------|-------------|---------------|------------------------|--------|------------------|
|                         |             |             | Desk review | On-site audit | Resolution of CAR & CL | Report | Technical review |
| Zsolt Lengyel           | LA          | Switzerland | X           | X             | X                      | X      |                  |
| Margit Haberreiter, PhD | TM          | Switzerland | X           |               | X                      |        |                  |
| Marco Bedoya            | TR          | Switzerland |             |               |                        |        | X                |

(1) LA = Lead auditor/assessor; TM = Team member; TE = Technical expert (if any); TR = Technical reviewer

<sup>19</sup> <http://www.fonamperu.org/general/mdl/bienvenida.php> (date of access 24/09/2012)

## 6 Quality Control

Cross checks and/or other plausibility checks undertaken during validation are mentioned in the report or in the protocol. The draft validation report, including the initial validation findings, is checked by an internal reviewer (a member of the validation team) before being sent to the project participants. The final validation report undergoes a technical review before requesting registration of the project activity. The technical reviewer (not a member of the validation team) is qualified in accordance with SQS' qualification scheme for CDM validation and verification.

## 7 Appendix A and B: On-Site Visit Programme & Interviews

Date 24-27/01/2012

| Time       |       | Topic   | Function/Department   | People interviewed   |
|------------|-------|---|---|--|
| from       | to    |   |   |  |
| 24.01.2012 |       |   |   |  |
| 9.00       | 12.00 | Project presentation (PoA) and analysis of technical aspects (CPA)                          | Consultant, Perspectives<br>PP representatives<br>Project coordinator, Carbon BW Peru S.A.C.<br>Managing Director, Carbon BW Peru S.A.C.<br>Project Manager, ENBW Kraftwerke AG               | Mr Alberto Galante<br><br>Ms Jocelyn Bueno<br><br>Mr Karsten Schlageter<br><br>Ms Cora Voigt |
| 13.00      | 17.00 | Project additionality including investment analysis (financial aspects) of the PoA and CPA. | Consultant, Perspectives<br>PP representatives<br>Project coordinator, Carbon BW Peru S.A.C.<br>Project Manager, ENBW Kraftwerke AG   | Mr Alberto Galante<br><br>Ms Jocelyn Bueno<br><br>Ms Cora Voigt                              |
| 25.01.2012 |       | Travel to 1st CPA Project location (El Carmen HPP)  |   |  |
| 26.01.2012 |       |   |   |  |
| 09.00      | 16.00 | On-site visit (EL Carmen HPP)<br>Stakeholder consultation and environmental analysis.       | Project Manager for El Carmen HPP, Generación Andina S.A.C.<br>PP representative, Carbon BW Peru S.A.C.<br><br>Representatives of the affected communities affected by the project (see [19]) | Mr Robert Azanero<br><br>Ms Cora Voigt   |
| 27.01.2012 |       |   |   |  |
| 9.00       | 16.30 | Discussion of Grid factor, ER-Calculation and Regulatory issues                             | PP representative, Carbon BW Peru S.A.C.  | Ms Cora Voigt  |
| 18.00      | 20.00 | Initial CAR/CL identification, closing of OSV   | Managing Director, Carbon BW Peru S.A.C.<br>Project Manager, ENBW Kraftwerke AG   | Mr Karsten Schlageter<br><br>Ms Cora Voigt   |

## 8 Appendix C: Documents Reviewed

| No | Title  |
|----|--|
| 1  | PoA-DD, CPA-DD ( generic, 1st CPA) EN BADEN version 1 dated 25/11/2011   |
| 2  | PoA-DD, CPA-DD ( generic, 1st CPA) EN BADEN version 2 dated 14/06/2012   |
| 3  | PoA-DD, CPA-DD ( generic, 1st CPA) EN BADEN version 3 dated 15/10/2012   |
| 4  | Prior Consideration screenshot for first CPA indicating UNFCCC receipt on 24 Aug 2011  |
| 5  | MoC Form   |
| 6  | IRR and Cash flow for 1st CPA (including ER calculation) xls sheet (Cashflow_ElCarmen_DOEv3dated 2012 07 02.xls)   |
| 7  | OM & BM calculation, grid factor excel sheet   |
| 8  | CME Handbook (Manual/Procedures for CME operations) version 1.0 dated 20/02/2012 & templates for CPA statements  |
| 9  | LoA Peru 089-2012-DGCCDRH/DVMDERN/MINAM dated 10/04/2012   |
| 10 | Annex I Funding statements by CME and 1st CPA owner dated 11/06/2012   |
| 11 | Prior Consideration to the UNFCCC received 24 August 2011(24/08/2011)  |
| 12 | Prior Consideration to the Peruvian DNA 23 August 2011   |
| 13 | Performance Bond as part of the PPA by HSBC dated 26/09/2011   |
| 14 | PPA signed with the government of Peru dated 29/09/2011  |
| 15 | Shareholders Agreement dated 08/07/2011  |
| 16 | Contract with Endesa Carboneo dated 29/07/2011   |
| 17 | EIA El Carmen(May 2011 leading to finalised, approved DIA document [35])   |
| 18 | Prefeasibility Study dated July 2011   |
| 19 | Report Local Stakeholder Consultations (LSC; by FONAM) & highlighted list of LSC interviewees during OSV   |
| 20 | Offer E&M by Gugler dated 01/04/2011   |
| 21 | Offer OTEK dated 19/04/2011  |
| 22 | OSINERGMIN Resolution on Fixed Prices Nr. 067-2011-OS/CD   |
| 23 | Development Budget for El Carmen ( part of Shareholders Agreement dated 08/07/2011 [ 15])  |
| 24 | COES (2010) Annual Statistic & COES (2011) Annual Statistic  |
| 25 | Law 892 for Worker Participation in Income   |
| 26 | Income Tax Law Chapter VII. & Chapter VI   |
| 27 | Rulebook for the Income Tax Law  |
| 28 | COES Administrative Procedure 8A dated 22/10/2008  |
| 29 | Electric Concessions Law No 25844 (24/01/2007). & Rulebook for the Electric Concessions Law  |
| 30 | Supreme Decree No. 136-2002-PCM Article 1  |
| 31 | ESMAP (2011), Peru Opportunities and Challenges for Small Hydropower Development   |
| 32 | Chronogram Implementation dated 03/11/2011   |
| 33 | Estimated Financial Closing and Commissioning dated 18/01/2012   |
| 34 | ANA-Resolution (Water use authorisation for HPP) dated 14/11/2011  |
| 35 | Certificado Ambiental (DIA) dated 26/12/2011   |
| 36 | Single Line Diagram dated October 2011   |
| 37 | Transmission Line Losses ( as calculated by Armando Alva independent engineer)   |
| 38 | Certification Ing. Armando Alva (author of document [18], Prefeasibility Study)  |
| 39 | Resolution with determination of Peak and Off-Peak Hours OSINERG Resolution of the Commission on Electrical Tariffs No. 024-97 P/CTE ( <a href="http://www2.osinerg.gob.pe/Resoluciones/1997/24-1997.html">http://www2.osinerg.gob.pe/Resoluciones/1997/24-1997.html</a> ) |
| 40 | Law to Promote the Efficient Development of Electric Generation – Law 28832.   |
| 41 | MINEM (2010). Perú Sector Eléctrico (Peru Electricity Sector Report).  |
| 42 | MINEM 2007 Portfolio of Generation Projects.   |
| 43 | Contribution to Osinerg – D.S. 136-2002-PCM.   |
| 44 | DIA (EIA for small scale projects) document updated January 2012 after receipt t of DIA [35]   |
| 45 | Inclusion Agreement between CME and 1st CPA Owner (Generación Andina S.A.C.) dated 02-   |

|    |  |
|----|--|
|    | 03/02/2012   |
| 46 | Inclusion Agreement Template to be used by CME for future CPAs   |
| 47 | Law for Promotion of the Development of the Natural Gas Industry No. 27133.  |
| 48 | MINEM 2007 Portfolio of Generation Projects.   |
| 49 | Osinermin – Barriers for Hydroelectric Investments   |
| 50 | MINEM (2010) Perú Sector Eléctrico (Peru Electricity Sector Report).   |
| 51 | Electricity 2010 raw data (excel database format) from National Interconnected Electric Grid (SEIN)  |
| 52 | Supreme Decree N° 29-94-EM.- Approval of the Rulebook of Environmental Protection in Electric Activities (1994). <a href="http://intranet2.minem.gob.pe/Web/archivos/dgaae/legislacion/DS-029-94.pdf">http://intranet2.minem.gob.pe/Web/archivos/dgaae/legislacion/DS-029-94.pdf</a> , |
| 53 | Peruvian Law N° 27446 (Ley del Sistema Nacional de Evaluación del Impacto Ambiental) defining National Environmental Impact Assessment System  |

## 9 Appendix D: Certificates of Competence

Name: Mr Zsolt Lengyel

### Scopes of expertise:

|    |  |                          |
|----|--|--------------------------|
| 1  | Energy industries (renewable/non-renewable sources)  | X                        |
|    | TA 1.1: Thermal energy generation from fossil fuels as well as thermal energy from solar   | <input type="checkbox"/> |
|    | TA 1.2: Energy generation from renewable energy sources                                    | X                        |
| 2  | Energy distribution  | X                        |
|    | TA 2.1: Electricity distribution   | <input type="checkbox"/> |
|    | TA 2.2: Heat distribution  | X                        |
| 3  | Energy demand  | X                        |
|    | TA 3.1 Energy demand   | X                        |
| 4  | Manufacturing industries   | <input type="checkbox"/> |
|    | TA 4.1: Cement sector  | <input type="checkbox"/> |
|    | TA 4.2: Aluminium  | <input type="checkbox"/> |
|    | TA 4.3: Iron and steel   | <input type="checkbox"/> |
|    | TA 4.4: Refinery   | <input type="checkbox"/> |
| 5  | Chemical industry  | <input type="checkbox"/> |
|    | TA 5.1: Chemical process industries  | <input type="checkbox"/> |
| 6  | Construction   | <input type="checkbox"/> |
|    | TA 6.1: Construction   | <input type="checkbox"/> |
| 7  | Transport  | <input type="checkbox"/> |
|    | TA 7.1: Transport  | <input type="checkbox"/> |
| 8  | Mining/mineral production  | <input type="checkbox"/> |
|    | TA 8.1: Mining and mineral processes, excluding those included in TA 8.2 below             | <input type="checkbox"/> |
|    | TA 8.2: Oil and gas industry, coal mine methane recovery and use                           | <input type="checkbox"/> |
| 9  | Metal production   | <input type="checkbox"/> |
|    | TA 9.1: Metal production   | <input type="checkbox"/> |
| 10 | Fugitive emissions from fuels  | <input type="checkbox"/> |
|    | TA 10.1: Mining and mineral processes, excluding those included in TA 10.2 below           | <input type="checkbox"/> |
|    | TA 10.2: Oil and gas industry, coal mine methane recovery and use                          | <input type="checkbox"/> |
| 11 | Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride | <input type="checkbox"/> |
|    | TA 11.1: Chemical process industries   | <input type="checkbox"/> |
|    | TA 11.2: GHG capture and destruction   | <input type="checkbox"/> |
| 12 | Solvents use   | <input type="checkbox"/> |
|    | TA 12.1: Chemical process industries   | <input type="checkbox"/> |
| 13 | Waste handling and disposal  | X                        |
|    | TA 13.1: Waste handling and disposal   | X                        |
|    | TA 13.2: Animal waste management   | <input type="checkbox"/> |
| 14 | Afforestation and reforestation  | <input type="checkbox"/> |
|    | TA 14.1: Forestry  | <input type="checkbox"/> |
| 15 | Agriculture  | <input type="checkbox"/> |
|    | TA 15.1: Agriculture   | <input type="checkbox"/> |
|    | TA 15.2: Animal waste management   | <input type="checkbox"/> |

**Name: Mrs Margit Haberreiter, PhD**

**Scopes of expertise:**

|    |  |  |
|----|--|--|
| 1  | Energy industries (renewable/non-renewable sources)<br>TA 1.1: Thermal energy generation from fossil fuels as well as thermal energy from solar<br>TA 1.2: Energy generation from renewable energy sources | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>   |
| 2  | Energy distribution<br>TA 2.1: Electricity distribution<br>TA 2.2: Heat distribution   | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>   |
| 3  | Energy demand<br>TA 3.1 Energy demand  | <input type="checkbox"/><br><input type="checkbox"/>   |
| 4  | Manufacturing industries<br>TA 4.1: Cement sector<br>TA 4.2: Aluminium<br>TA 4.3: Iron and steel<br>TA 4.4: Refinery   | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> |
| 5  | Chemical industry<br>TA 5.1: Chemical process industries   | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>   |
| 6  | Construction<br>TA 6.1: Construction   | <input type="checkbox"/><br><input type="checkbox"/>   |
| 7  | Transport<br>TA 7.1: Transport   | <input type="checkbox"/><br><input type="checkbox"/>   |
| 8  | Mining/mineral production<br>TA 8.1: Mining and mineral processes, excluding those included in TA 8.2 below<br>TA 8.2: Oil and gas industry, coal mine methane recovery and use                            | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>   |
| 9  | Metal production<br>TA 9.1: Metal production   | <input type="checkbox"/><br><input type="checkbox"/>   |
| 10 | Fugitive emissions from fuels<br>TA 10.1: Mining and mineral processes, excluding those included in TA 10.2 below<br>TA 10.2: Oil and gas industry, coal mine methane recovery and use                     | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>   |
| 11 | Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride<br>TA 11.1: Chemical process industries<br>TA 11.2: GHG capture and destruction                                 | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>   |
| 12 | Solvents use<br>TA 12.1: Chemical process industries   | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/>   |
| 13 | Waste handling and disposal<br>TA 13.1: Waste handling and disposal<br>TA 13.2: Animal waste management  | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>   |
| 14 | Afforestation and reforestation<br>TA 14.1: Forestry   | <input type="checkbox"/><br><input type="checkbox"/>   |
| 15 | Agriculture<br>TA 15.1: Agriculture<br>TA 15.2: Animal waste management  | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>   |



Name: Mr Marco Bedoya

**Scopes of expertise:**

|    |  |                          |
|----|--|--------------------------|
| 1  | Energy industries (renewable/non-renewable sources)  | X                        |
|    | TA 1.1: Thermal energy generation from fossil fuels as well as thermal energy from solar   | <input type="checkbox"/> |
|    | TA 1.2: Energy generation from renewable energy sources                                    | X                        |
| 2  | Energy distribution  | <input type="checkbox"/> |
|    | TA 2.1: Electricity distribution   | <input type="checkbox"/> |
|    | TA 2.2: Heat distribution  | <input type="checkbox"/> |
| 3  | Energy demand  | <input type="checkbox"/> |
|    | TA 3.1 Energy demand   | <input type="checkbox"/> |
| 4  | Manufacturing industries   | X                        |
|    | TA 4.1: Cement sector  | X                        |
|    | TA 4.2: Aluminium  | <input type="checkbox"/> |
|    | TA 4.3: Iron and steel   | <input type="checkbox"/> |
|    | TA 4.4: Refinery   | <input type="checkbox"/> |
| 5  | Chemical industry  | <input type="checkbox"/> |
|    | TA 5.1: Chemical process industries  | <input type="checkbox"/> |
| 6  | Construction   | <input type="checkbox"/> |
|    | TA 6.1: Construction   | <input type="checkbox"/> |
| 7  | Transport  | <input type="checkbox"/> |
|    | TA 7.1: Transport  | <input type="checkbox"/> |
| 8  | Mining/mineral production  | X                        |
|    | TA 8.1: Mining and mineral processes, excluding those included in TA 8.2 below             | X                        |
|    | TA 8.2: Oil and gas industry, coal mine methane recovery and use                           | <input type="checkbox"/> |
| 9  | Metal production   | <input type="checkbox"/> |
|    | TA 9.1: Metal production   | <input type="checkbox"/> |
| 10 | Fugitive emissions from fuels  | <input type="checkbox"/> |
|    | TA 10.1: Mining and mineral processes, excluding those included in TA 10.2 below           | <input type="checkbox"/> |
|    | TA 10.2: Oil and gas industry, coal mine methane recovery and use                          | <input type="checkbox"/> |
| 11 | Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride | <input type="checkbox"/> |
|    | TA 11.1: Chemical process industries   | <input type="checkbox"/> |
|    | TA 11.2: GHG capture and destruction   | <input type="checkbox"/> |
| 12 | Solvents use   | <input type="checkbox"/> |
|    | TA 12.1: Chemical process industries   | <input type="checkbox"/> |
| 13 | Waste handling and disposal  | X                        |
|    | TA 13.1: Waste handling and disposal   | X                        |
|    | TA 13.2: Animal waste management   | X                        |
| 14 | Afforestation and reforestation  | <input type="checkbox"/> |
|    | TA 14.1: Forestry  | <input type="checkbox"/> |
| 15 | Agriculture  | X                        |
|    | TA 15.1: Agriculture   | X                        |
|    | TA 15.2: Animal waste management   | <input type="checkbox"/> |

## 10 Appendix E: Abbreviations

|                   |   |
|-------------------|---|
| CAR               | Corrective Action Request                               |
| CDM               | Clean Development Mechanism                             |
| CEF               | Carbon Emission Factor                                  |
| CER               | Certified Emission Reduction                            |
| CH <sub>4</sub>   | Methane   |
| CL                | Clarification Request                                   |
| COES              | Committee for the System's Economic Operation (Peru)    |
| CO <sub>2</sub>   | Carbon dioxide  |
| CO <sub>2</sub> e | Carbon dioxide equivalent                               |
| DNA               | Designated National Authority                           |
| FAR               | Forward Action Request                                  |
| GHG               | Greenhouse gas(es)                                      |
| GWP               | Global Warming Potential                                |
| IEE               | Initial Environmental Examination                       |
| IPCC              | Intergovernmental Panel on Climate Change               |
| MASL              | Meters above sea level                                  |
| MP                | Monitoring Plan   |
| MRTS              | Mass Rapid Transit System                               |
| MSW               | Municipal Solid Waste                                   |
| MVP               | Monitoring and Verification Plan                        |
| N <sub>2</sub> O  | Nitrous oxide   |
| NGO               | Non-governmental Organisation                           |
| ODA               | Official Development Assistance                         |
| O&M               | Operation and Maintenance                               |
| OSINERGMIN        | Supervisory Body of Energy and Mining Investment (Peru) |
| PoA               | Programme of Activities                                 |
| PDD               | Project Design Document                                 |
| SQS               | Swiss Association for Quality and Management Systems    |
| UNFCCC            | United Nations Framework Convention on Climate Change   |

**Swiss Association for Quality and  
Management Systems (SQS)**

B e r n s t r a s s e 1 0 3  
P . O . B o x 6 8 6  
C H - 3 0 5 2 Z o l l i k o f e n  
T e l . + 4 1 3 1 9 1 0 3 5 3 5  
F a x . + 4 1 3 1 9 1 0 3 5 4 5  
h e a d o f f i c e @ s q s . c h  
w w w . s q s . c h

# CDM Validation Protocol

**Enterprise**

|                   |   |
|-------------------|---|
| Business account: | 324294                                  |
| Company:          | EnBW Kraftwerke AG                      |
| Address:          | Durlacher Allee 93<br>D-76131 Karlsruhe |
| Phone:            | +49 721 632 31 03                       |
| Fax:              | +49 721 632 31 19                       |
| E-Mail:           | c.voigt@enbw.com                        |
| Contact person:   | Mrs Dr. Cora Voigt                      |

**Service**

|                                    |  |
|------------------------------------|--|
| Audit/Assessment:                  | CDM PoA Validation   |
| Audit/Assessment beginning/end:    | 30/12/2011 – 09/11/2012                                      |
| Project name:                      | EN BADEN Large-Scale Hydro PoA in Peru                       |
| GBZ/Report-No.:                    | 324294/P32428.33   |
| UNFCCC Scope(s)/Technical area(s): | 1 Energy industries (renewable-/non-renewable sources)       |
| UNFCCC Methodology:                | ACM0002 (Version 13.0.0)                                     |
| UNFCCC Scale:                      | Large-scale, Programme of Activities                         |
| Team of auditors/assessors:        | Mr Zsolt Lengyel<br>Ms Margit Haberleiter<br>Mr Marco Bedoya |

## Contents

|  |           |
|--|-----------|
| <b>INTRODUCTION .....</b>  | <b>2</b>  |
| <b>NORMATIVE REFERENCES/DOCUMENTS .....</b>                                  | <b>2</b>  |
| <b>PROTOCOL 1: GENERAL CDM REQUIREMENTS.....</b>                             | <b>3</b>  |
| <b>PROTOCOL 2: METHODOLOGICAL REQUIREMENTS (INCL. TOOLS) .....</b>           | <b>21</b> |
| <b>TOOL TO CALCULATE THE EMISSION FACTOR FOR AN ELECTRICITY SYSTEM .....</b> | <b>27</b> |
| <b>PROTOCOL 3: PROJECT SPECIFIC REQUIREMENTS .....</b>                       | <b>31</b> |
| <b>PROTOCOL 4: SUMMARY OF REQUESTS* .....</b>                                | <b>32</b> |

## Introduction

[VVM] 26: The purpose of validation is to ensure a thorough, independent assessment of proposed CDM project activities submitted for registration as a proposed CDM project activity against the applicable CDM requirements.

[VVM] 35: The DOE shall raise a corrective action request (CAR) if one of the following occurs:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met;
- There is a risk that emission reductions cannot be monitored or calculated.

[VVM] 36: The DOE shall raise a clarification request (CL) if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

[VVM] 37: The DOE shall raise a forward action request (FAR) 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.

## Normative References/Documents

| No. | Title  | Version  |
|-----|--|----------|
| [1] | Clean Development Mechanism Validation and Verification Manual   | 1.2      |
| [2] | Guidance in the demonstration and assessment of prior consideration of CDM   | 4        |
| [3] | Guidelines on the Assessment of Investment Analysis  | 5        |
| [4] | Glossary of CDM terms  | 6        |
| [5] | Modalities and Procedures for a Clean Development Mechanism  | unedited |
| [6] | ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources,   | 13.0.0   |
| [7] | Tool for the demonstration and assessment of additionality   | 06.0.0   |
| [8] | Tool to calculate the emission factor for an electricity system  | 02.2.1   |
| [9] | Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities | 01.0     |

## Protocol 1: General CDM Requirements

Note: the template text refers to PDD; however in case of PoAs this term implies the full PoA documentation (PoA-DD, specific CPA, generic CPA).

|                    | Requirement  | Ref.     | MoV | Draft<br>Concl. | Final<br>Concl. |
|--------------------|--|----------|-----|-----------------|-----------------|
| <b>1</b>           | <b>Validation requirements based on paragraph 37 of the CDM modalities and procedures</b>  |          |     |                 |                 |
| <b>1.1</b>         | <b>APPROVAL</b>  |          |     |                 |                 |
| [1]<br>44          | All Parties involved have approved the project activity.   | 9        | DR  | OK              | OK              |
|                    | Comment: Unilateral CDM PoA hence it has just one LoA from the Host County.  |          |     |                 |                 |
| 1.1.1<br>[1]<br>45 | The DOE shall determine whether the DNA of each Party indicated as being involved in the proposed CDM project activity in Section A.3 of the PDD has provided a written Letter of Approval. The DOE shall determine whether each letter confirms that:<br>(a) The Party is a Party to the Kyoto Protocol;<br>(b) Participation is voluntary;<br>(c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country;<br>(d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration. | 9        | DR  | OK              | OK              |
|                    | Comment: The LoAs is in accordance with CDM modalities and procedures.<br>The LoA does not contain references to the version number of the PoA documentation.  |          |     |                 |                 |
| 1.1.2<br>[1]<br>46 | The DOE shall determine whether the letter(s) of approval is unconditional with respect to (a) to (d) above.   | 9        | DR  | OK              | OK              |
|                    | Comment: The LoA is unconditional with respect to (a) to (d) of para 45 of the VVM.  |          |     |                 |                 |
| 1.1.3<br>[1]<br>47 | The DOE shall confirm that the letter(s) of approval was issued by the respective Party's designated national authority (DNA) and is valid for the proposed CDM project activity under validation.<br>A list of DNAs is available on the UNFCCC CDM website.   | 9        | DR  | OK              | OK              |
|                    | Comment: The DOE received the LoA from the project participant; its authenticity was confirmed via telephone call with the DNA.  |          |     |                 |                 |
| 1.1.4<br>[1]<br>48 | If the DOE doubts the authenticity of the letter of approval, the DOE shall verify with the DNA that the letter of approval is authentic.  | 9        | DR  | OK              | OK              |
|                    | Comment: The authenticity of the LoAs is unambiguous and has been checked with the issuing DNAs.   |          |     |                 |                 |
| <b>1.2</b>         | <b>PARTICIPATION</b>   |          |     |                 |                 |
| [1]<br>51          | All project participants have been listed in a consistent manner in the project documentation. Also, their participation in the project activity was approved by a Party to the Kyoto Protocol.  | 3,5<br>9 | DR  | OK              | OK              |
|                    | Comment: Documentation, including the MoC form, is consistent. The PP's participation was approved by parties to the Kyoto Protocol.   |          |     |                 |                 |
| 1.2.1<br>[1]<br>52 | The DOE shall confirm that the project participants are listed in tabular form in Section A.3 of the PDD and that this information is consistent with the contact details provided in Annex 1 of the PDD. The DOE shall determine whether the participation of each PP has been approved by at least one Party involved, either in a LoA or in a separate letter specifically to approve participation. The DOE  | 3        | DR  | OK              | OK              |

|                    | Requirement  | Ref. | MoV   | Draft<br>Concl.  | Final<br>Concl. |
|--------------------|--|------|-------|------------------|-----------------|
|                    | shall confirm that no entities other than those approved as project participants are included in these sections of the PDD.  |      |       |                  |                 |
|                    | Comment: The PP is listed appropriately in the PoA documentation and it is the only entity which was approved by the DNA. The PP is also authorised as the CME of the PoA.   |      |       |                  |                 |
| 1.2.2<br>[1]<br>53 | The DOE shall ensure that the approval of participation was issued from the relevant DNA and if in doubt shall verify with the DNA that the approval of participation is valid for the proposed CDM project participant.   | 9    | DR    | OK               | OK              |
|                    | Comment: The authenticity of the LoA is unambiguous.   |      |       |                  |                 |
| 1.3                | <b>PROJECT DESIGN DOCUMENT</b>   |      |       |                  |                 |
| [1]<br>55          | The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.   | 3    | DR    | OK               | OK              |
|                    | Comment: The PDD has applied the latest template.  |      |       |                  |                 |
| 1.3.1<br>[1]<br>56 | The DOE shall determine whether the PDD is in accordance with the applicable CDM requirements for completing PDDs.   | 3    | DR    | OK               | OK              |
|                    | Comment: The PDD is in full compliance with relevant forms and guidance.   |      |       |                  |                 |
| 1.4                | <b>PROJECT DESCRIPTION</b>   |      |       |                  |                 |
| [1]<br>58          | The PDD shall contain a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.   | 3    | DR    | OK               | OK              |
|                    | Comment: Project activities in the PDD are clearly described.  |      |       |                  |                 |
| 1.4.1<br>[1]<br>59 | The DOE shall confirm that the description of the proposed CDM PoA as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity.   | 3    | DR    | CAR1/6<br>CL1/40 | OK              |
|                    | See Protocol 4 for the detailed description of the CAR-CLs.  |      |       |                  |                 |
|                    | Comment: The PoA documentation has been amended and supportive materials have been provided regarding the above- listed CARs and CLs and, therefore these CARs and CLs have been closed.   |      |       |                  |                 |
|                    | The project description is therefore accurate and complete in version 03 of the PoA documentation (dated 15/10/2012).  |      |       |                  |                 |
| 1.4.2<br>[1]<br>60 | For proposed CDM project activities in existing facilities or utilising existing equipment, the DOE shall conduct a physical site-inspection to confirm that the description in the PDD reflects the proposed CDM project activity for the following types of CDM project activities unless other means are specified in the methodology:<br>(a) Large scale projects;<br>(b) Non-bundled small scale projects with emission reductions exceeding 15 000 tons per year;<br>(c) Bundled small scale projects, each with emission reductions not exceeding 15 000 tons per year; in such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical analysis. | 3    | DR, I | OK               | OK              |
|                    | Comment: An on-site visit confirmed that the description in the PoA DD and first CPA reflects the proposed project activity accurately.  |      |       |                  |                 |

|                      | Requirement  | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|----------------------|--|------|-----|-----------------|-----------------|
| 1.4.3<br>[1]<br>61   | For other individual proposed small scale CDM project activities with emission reductions not exceeding 15 000 tons per year, the DOE may conduct a physical site visit as appropriate.  |      |     | N/A             | N/A             |
|                      | Comment:   |      |     |                 |                 |
| 1.4.4<br>[1]<br>62   | For all other proposed CDM project activities not referred to in paragraphs 59-61, the DOE shall undertake the validation by reviewing available designs and feasibility studies and may conduct comparison analysis to equivalent projects, as appropriate. The DOE may conduct physical site visit to assess the plan. For proposed CDM project activities for which the DOE does not undertake a physical site inspection, this shall be appropriately justified. |      |     | N/A             | N/A             |
|                      | Comment:   |      |     |                 |                 |
| 1.4.5<br>[1]<br>63   | If the proposed CDM project activity involves the alteration of an existing installation or process, the DOE shall ensure that the project description clearly states the differences resulting from the project activity compared to the pre-project situation.   |      |     | N/A             | N/A             |
|                      | Comment:   |      |     |                 |                 |
| <b>1.5</b>           | <b>BASELINE AND MONITORING METHODOLOGY</b>   |      |     |                 |                 |
| <b>1.5.1</b>         | <b>General requirement</b>   |      |     |                 |                 |
| 1.5.1.1<br>[1]<br>65 | The DOE shall ensure that the baseline and monitoring methodologies selected by the project participants comply with the methodologies previously approved by the CDM Executive Board.   | 3    | DR  | OK              | OK              |
|                      | Comment: The baseline and monitoring methodology used in the project fully complies with CDM EB requirements.  |      |     |                 |                 |
| 1.5.1.2<br>[1]<br>66 | To ensure that the project activity meets this general requirement, the DOE shall determine whether:<br>(a) The selected methodology is applicable to the project activity;<br>(b) The PP has correctly applied the selected methodology.  | 3    | DR  | OK              | OK              |
|                      | Comment: The baseline and monitoring methodology used in the project fully complies with CDM EB requirements.  |      |     |                 |                 |
| 1.5.1.3<br>[1]<br>67 | The DOE shall ensure that the selected methodology applies to the project activity and has correctly been applied with respect to the following:<br>(a) Project boundary;<br>(b) Baseline identification;<br>(c) Algorithms and/or formulae used to determine emission reductions;<br>(d) Additionality;<br>(e) Monitoring methodology.  | 3    | DR  | OK              | OK              |
|                      | Comment: The selected methodology applies to the project activity - both PoA and its first CPA - and has been correctly applied.   |      |     |                 |                 |
| <b>1.5.2</b>         | <b>Applicability of the selected methodology to the project activity</b>   |      |     |                 |                 |
| [1]<br>68            | The DOE shall validate that the selected baseline and monitoring methodology previously approved by the CDM Executive Board is applicable to the project activity, including that the used version is valid.   | 3    | DR  | OK              | OK              |
|                      | Comment: The methodology is applicable and the version used is the latest one available.   |      |     |                 |                 |
| [1]<br>69            | The DOE shall apply specific guidance provided by the CDM Executive Board in respect to any approved methodology.  | 3    | DR  | OK              | OK              |

|                      | Requirement   | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
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|                      | Comment: The applicability of the methodology is unambiguous.   |      |     |                 |                 |
| 1.5.2.1<br>[1]<br>70 | The DOE shall determine whether the methodology is correctly quoted and applied by comparing it with the actual text of the applicable version of the methodology available on the UNFCCC CDM website.  | 3    | DR  | OK              | OK              |
|                      | Comment: The methodology and its supporting tools are correctly quoted and applied.   |      |     |                 |                 |
| 1.5.2.2<br>[1]<br>71 | A selected approved methodology applies to the project activity if the applicability conditions of the methodology are met and the project activity is not expected to result in emissions other than those allowed by the methodology. The DOE shall determine whether the choice of methodology is justified, and the project participants have shown that the project activity meets each of the applicability conditions of the approved methodology or any tool or other methodology component referred to therein. This shall be done by validating the documentation referred to in the PDD and by verifying that its content is correctly quoted and interpreted in the PDD. If the DOE, based on local and sectoral knowledge, is aware that comparable information is available from sources other than the one used in the PDD, then the DOE shall cross-check the PDD against the other sources to confirm that the project activity meets the applicability conditions of the methodology. | 3    | DR  | OK              | OK              |
|                      | Comment: The project activity is in line with applicability criteria. Therefore, the validation opinion is unambiguous regarding the applicability of the selected methodology to the proposed CDM project.   |      |     |                 |                 |
| 1.5.2.3<br>[1]<br>72 | If the DOE cannot make a determination regarding the applicability of the selected methodology to the proposed CDM project activity, the DOE shall request clarification of the methodology in accordance with the guidance provided by the CDM Executive Board.  |      |     | N/A             | N/A             |
|                      | Comment:  |      |     |                 |                 |
| 1.5.2.4<br>[1]<br>73 | If the DOE determines that the proposed CDM project activity does not comply with the applicability conditions of the methodology, the DOE may proceed by means of requesting revision to or deviation from the methodology in accordance with the guidance provided by the CDM Executive Board.  |      |     | N/A             | N/A             |
|                      | Comment:  |      |     |                 |                 |
| 1.5.2.5<br>[1]<br>74 | If the DOE has requested clarification of revision to or deviation from a methodology, the DOE shall not submit a request for registration until the CDM Executive Board has approved the proposed deviation or revision.   |      |     | N/A             | N/A             |
|                      | Comment:  |      |     |                 |                 |
| 1.5.2.6<br>[1]<br>75 | Under no circumstance shall the DOE consider the submission of a request for registration as a means of seeking clarification from the CDM Executive Board on the applicability of a methodology.   |      |     | N/A             | N/A             |
|                      | Comment:  |      |     |                 |                 |
| <b>1.5.3</b>         | <b>Project boundary</b>   |      |     |                 |                 |
| [1]<br>78            | The PDD shall correctly describe the project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity.  | 3    | DR  | OK              | OK              |
|                      | Comment: Project boundary is appropriately described.   |      |     |                 |                 |



|                      | Requirement  | Ref.                                 | MoV | Draft<br>Concl. | Final<br>Concl. |
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| 1.5.3.1<br>[1]<br>79 | Based on documented evidence and corroborated by a site visit where required by paragraphs 59-62 above, the DOE shall determine whether the delineation in the PDD of the project boundary is correct and meets the requirements of the selected baseline methodology. The DOE also shall confirm that all sources and GHGs required by the methodology have been included within the project boundary. If the methodology allows project participants to choose whether a source or gas is to be included within the project boundary, the DOE shall determine whether the project participants have justified that choice. The DOE shall confirm that the justification provided is reasonable, based on assessment of supporting documented evidence provided by the project participants and corroborated by observations if required. | 3                                    | DR  | OK              | OK              |
|                      | Comment: Project boundary is appropriately described.  |                                      |     |                 |                 |
| <b>1.5.4</b>         | <b>Baseline identification</b>   |                                      |     |                 |                 |
| [1]<br>81            | The PDD shall identify the baseline for the proposed CDM project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity.   | 3                                    | DR  | OK              | OK              |
|                      | Comment: Baseline has been established in line with the methodology.   |                                      |     |                 |                 |
| [1]<br>82            | The DOE shall confirm that any procedure contained in the methodology to identify the most reasonable baseline scenario has correctly been applied. If the selected methodology requires use of tools (such as the "Tool for the demonstration and assessment of additionality" and the "Combined tool to identify the baseline scenario and demonstrate additionality") to establish the baseline scenario, the DOE shall consult the methodology on the application of these tools. In such cases, the guidance in the methodology shall supersede the tool. The DOE shall check each step in the procedure described in the PDD against the requirements of the methodology.  | 3                                    | DR  | OK              | OK              |
|                      | Comment: The identification of the most reasonable baseline scenario has correctly been conducted (ACM0002 prescribes the baseline as grid connected electricity production)   |                                      |     |                 |                 |
| 1.5.4.1<br>[1]<br>83 | If the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, the DOE shall, based on financial expertise and local and sectoral knowledge, determine whether all scenarios that are considered by the project participants and are supplementary to those required by the methodology, are reasonable in the context of the proposed CDM project activity and that no reasonable alternative scenario was excluded.  |                                      |     | N/A             | N/A             |
|                      | Comment: ACM0002 prescribes the baseline as grid connected electricity production  |                                      |     |                 |                 |
| 1.5.4.2<br>[1]<br>84 | The DOE shall determine whether the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used as described in the PDD. It shall ensure that documents and sources referred to in the PDD are correctly quoted and interpreted. The DOE shall cross-check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if available.  | 3                                    | DR  | OK              | OK              |
|                      | Comment: Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable.   |                                      |     |                 |                 |
| 1.5.4.3<br>[1]<br>85 | The DOE shall determine whether all applicable CDM requirements have been taken into account in the identification of the baseline scenario for the proposed CDM project activity, including "relevant national and/or sectoral policies and circumstances." Drawing on its knowledge of the sector and/or advice from local experts, the DOE shall confirm that all relevant policies and circumstances have  | 3,14<br>,17,<br>18,1<br>9,20<br>,21, | DR  | OK              | OK              |

|                      | Requirement   | Ref.                                 | MoV | Draft<br>Concl. | Final<br>Concl. |
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|                      | been identified and correctly considered in the PDD, in accordance with the guidance by the CDM Executive Board.  | 23,2<br>9,25<br>,39,<br>40,4<br>3,47 |     |                 |                 |
|                      | Comment: Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. It must be noted that grid-connected electricity generation is stringently regulated and all Power Producers tendering for capacities/connection to the grid must comply with regulations.  |                                      |     |                 |                 |
| 1.5.4.4<br>[1]<br>86 | The DOE shall determine whether the PDD provides a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity.  | 3                                    | DR  | OK              | OK              |
|                      | Comment: The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.  |                                      |     |                 |                 |
| <b>1.5.5</b>         | <b>Algorithms and/or formulae used to determine emission reductions</b>   |                                      |     |                 |                 |
| [1]<br>89            | The steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions shall comply with the requirements of the selected baseline and monitoring methodology.   | 3,6,<br>7                            | DR  | OK              | OK              |
|                      | Comment: The equations applied to calculate project emissions, baseline emissions; leakage and emission reductions are compliant with the methodology and its applicable tools.   |                                      |     |                 |                 |
| 1.5.5.1<br>[1]<br>90 | The DOE shall determine whether the equations and parameters in the PDD were correctly applied by comparing them to those in the selected approved methodology. If the methodology provides for selection between different options for equations or parameters, the DOE shall confirm that adequate justification was provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided) and that the correct equations and parameters were used, in accordance with the methodology selected.  | 3,6,<br>7                            | DR  | OK              | OK              |
|                      | Comment: All assumptions and data used by the PPs are listed in the PDD, including their references and sources.<br>All documentation used by the PPs as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD.   |                                      |     |                 |                 |
| 1.5.5.2<br>[1]<br>91 | The DOE shall verify the justification given in the PDD for the choice of data and parameters used in the equations. If data and parameters will not be monitored throughout the crediting period of the proposed CDM project activity but have already been determined and will remain fixed throughout the crediting period, the DOE shall assess that all data sources and assumptions are appropriate and that calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions. If data and parameters will be monitored on implementation and hence become available only after validation of the project activity, the DOE shall confirm that the estimates provided in the PDD for these data and parameters are reasonable. | 3,6,<br>7                            | DR  | OK              | OK              |
|                      | Comment: All values used in the PDD are considered reasonable in the context of the proposed CDM project activity.<br>The baseline methodology was applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions.<br>All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.   |                                      |     |                 |                 |
| <b>1.6</b>           | <b>ADDITIONALITY OF A PROJECT ACTIVITY</b>  |                                      |     |                 |                 |
| [1]<br>94            | The PDD shall describe how a proposed CDM project activity is additional.   | 3                                    | DR  | OK              | OK              |

|                       | Requirement   | Ref.        | MoV | Draft<br>Concl. | Final<br>Concl. |
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|                       | Comment: The PoA documentation sufficiently describes the additionality of the project in general and its first CPA in particular.  |             |     |                 |                 |
| 1.6.1<br>[1]<br>95    | The DOE shall assess and verify the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by project participants to support the demonstration of additionality. This requires the DOE to critically assess the presented evidence, using local knowledge and sectoral and financial expertise.   | 3           | DR  | OK              | OK              |
|                       | Comment: The PoA documentation describes the relevant aspects of energy generation in a reliable and credible manner.   |             |     |                 |                 |
| 1.6.2<br>[1]<br>96    | The DOE shall consider tools and documents provided by the CDM Executive Board to demonstrate the additionality of proposed CDM project activities as well as specific complementary or alternative requirements included in approved CDM methodology.  | 3           | DR  | OK              | OK              |
|                       | Comment: The additionality tool is used and no alternative/additional requirements are applicable.  |             |     |                 |                 |
| <b>1.6.1</b>          | <b>Prior consideration of the clean development mechanism</b>   |             |     |                 |                 |
| [1]<br>98             | If the project activity start date is prior to the date of publication of the PDD for stakeholder comments, it shall be demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity.   | 3,11<br>,12 | DR  | OK              | OK              |
|                       | Comment: Starting date of the PoA and 1 <sup>st</sup> CPA and prior consideration of CDM has been appropriately demonstrated and available evidence has been checked. (For PoA prior consideration UNFCCC submission is not required however the owner of the first CPA submitted its project to the UNFCCC).   |             |     |                 |                 |
| 1.6.1.1<br>[1]<br>99  | The DOE shall confirm that the start date of the project activity, reported in the PDD, is in accordance with the "Glossary of CDM terms". If the reported date is not in accordance with the glossary, the DOE shall raise a CAR to ensure that the start date is correctly reported in a revised PDD. In particular, for project activities that require construction, retrofit or other modifications, the date of commissioning cannot be considered the project activity start date.   | 3,<br>33    | DR  | OK              | OK              |
|                       | Comment: PoA starting date and CPA starting date have been appropriately selected and supported by documentary evidences.   |             |     |                 |                 |
| 1.6.1.2<br>[1]<br>100 | The DOE, in accordance with the guidance from the CDM Executive Board, shall determine whether it is a new project activity (a project activity with a start date on or after 02/08/2008) or an existing project activity (a project activity with a start date before 02/08/2008).   | 3,<br>33    | DR  | OK              | OK              |
|                       | Comment: The project is a "new project activity" according to the EB guidance.  |             |     |                 |                 |
| 1.6.1.3<br>[1]<br>101 | For a new project activity, for which the PDD has not been published for global stakeholder consultation or a new methodology proposed to the CDM Executive Board before the project activity start date, the DOE shall ensure by means of confirmation from the UNFCCC secretariat that PPs had informed the host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status. If such a notification has not been provided by the project participants within six months of the project activity start date, the DOE shall determine that the CDM was not seriously considered in the decision to implement the project activity. | 3,5,<br>11  | DR  | OK              | OK              |
|                       | Comment: For PoAs it is not required, however prior consideration confirmation to the UNFCCC was communicated on 24/08/2011.  |             |     |                 |                 |
| 1.6.1.4<br>[1]<br>102 | For an existing project activity, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, the DOE shall assess the project participant's prior consideration of the CDM through document reviews and shall satisfy following requirements:   | 3,15<br>,16 | DR  | OK              | OK              |

|                       | Requirement  | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
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|                       | <p>(a) Evidence which must indicate that the awareness of the CDM prior to the project activity start date, and that the benefits of the CDM, were a decisive factor in the decision to proceed with the project. Evidence to support this would include, inter alia, minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, of the project participant, to undertake the project as a proposed CDM project activity.</p> <p>(b) Reliable evidence from project participants which must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. Evidence to support this should include, inter alia, contracts with consultants for CDM/PDD/methodology services, Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), evidence of agreements or negotiations with a DOE for validation services, submission of a new methodology to the CDM Executive Board, publication in newspaper, interviews with DNA, earlier correspondence on the project with the DNA or the UNFCCC secretariat.</p> <p>Comment: Starting date of the project activity and prior consideration of CDM has been appropriately demonstrated and available evidence has been checked even though for PoA this is not a requirement.</p> |      |     |                 |                 |
| 1.6.1.5<br>[1]<br>103 | <p>If evidence to support the serious prior consideration of the CDM as indicated above is not available, the DOE shall determine that the CDM was not considered in the decision to implement the project activity.</p> <p>Comment:</p>   |      |     | N/A             | N/A             |
| <b>1.6.2</b>          | <b>Identification of alternatives</b>  |      |     |                 |                 |
| [1]<br>105            | <p>The PDD shall identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required.</p> <p>Comment: The approved methodology prescribes the baseline scenario.</p>   | 3    | DR  | OK              | OK              |
| 1.6.2.1<br>[1]<br>106 | <p>The DOE shall assess the list of alternatives given in the PDD and ensure that:</p> <p>(a) The list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity;</p> <p>(b) The list contains all plausible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity;</p> <p>(c) The alternatives comply with all applicable and enforced legislation.</p> <p>Comment: See 1.5.4. and 1.6.2 above.</p>  | 3    | DR  | OK              | OK              |
| <b>1.6.3</b>          | <b>Investment analysis</b>   |      |     |                 |                 |
| [1]<br>108            | <p>If the investment analysis has been used to demonstrate the additionality of the proposed CDM project activity, the PDD shall provide evidence that the proposed CDM project activity would not be:</p> <p>(a) The most economically or financially attractive alternative; or</p> <p>(b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).</p> <p>Comment: Investment analysis has been used appropriately to demonstrate the additionality of the PoA and its first CPA.</p>   | 3    | DR  | OK              | OK              |
| [1]<br>109            | <p>Project participants can show this through one of the following approaches, by demonstrating that:</p> <p>(a) The proposed CDM project activity would produce no financial or economic benefits other than CDM-related income. Document the costs associated with</p>   | 3    | DR  | OK              | OK              |

|                       | Requirement   | Ref.   | MoV | Draft<br>Concl. | Final<br>Concl. |
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|                       | <p>the proposed CDM project activity and the alternatives identified, and demonstrate that there is at least one alternative which is less costly than the proposed CDM project activity;</p> <p>(b) The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative;</p> <p>(c) The financial returns of the proposed CDM project activity would be insufficient to justify the required investment.</p>   |  |     |                 |                 |
|                       | <p>Comment: The proposed CDM PoA and its first CPA is economically or financially less attractive than at least one other credible and realistic alternative, and the financial returns of the proposed project activity would be insufficient to justify the required investment.</p>  |  |     |                 |                 |
| [1]<br>110            | <p>The DOE shall comply with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM Executive Board and with other relevant guidance, including the latest guidelines on plant load factors "guidelines for the reporting and validation of plant load factors".</p>  | 3  | DR  | OK              | OK              |
|                       | <p>Comment: The investment analysis is compliant with the respective EB guidance for the PoA and its first CPA. It must be noted that the investment analysis is the key additionality check, however in case of the IRR being higher than the benchmark barrier analysis can be used for the additionality analysis of the future CPAs.</p>  |  |     |                 |                 |
| 1.6.3.1<br>[1]<br>111 | <p>To verify the accuracy of financial calculations carried out for any investment analysis, the DOE shall:</p> <p>(a) Conduct a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices;</p> <p>(b) Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices;</p> <p>(c) Review feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants;</p> <p>(d) Assess the correctness of computations carried out and documented by the project participants;</p> <p>(e) Assess the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur and the likelihood of these conditions.</p> | 3,14<br>,17,<br>18,1<br>9,20<br>,21,<br>23,2<br>9,25<br>,39,<br>40,4<br>3,47 | DR  | OK              | OK              |
|                       | <p>Comment: The parameters used in the financial analysis were validated by comparing official sources (e.g. IRR benchmark of the electric concession law etc.), third party documents (studies or offers) and expert judgement (e.g. CAPEX of proposed project).</p>   |  |     |                 |                 |
| 1.6.3.2<br>[1]<br>112 | <p>To confirm the suitability of any benchmark applied in the investment analysis, the DOE shall:</p> <p>(a) Determine whether the type of benchmark applied is suitable for the type of financial indicator presented;</p> <p>(b) Ensure that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity;</p> <p>(c) Determine whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants involved, and determining whether the same benchmark has been applied or if there are verifiable circumstances that have led to a change in the benchmark.</p>   | 3,29   | DR  | OK              | OK              |
|                       | <p>Comment: The IRR used in the PDD was compared to the EB guidance value and the Electric Concession Law defined the 12% benchmark rate.</p>   |  |     |                 |                 |
| 1.6.3.3<br>[1]<br>113 | <p>The CDM Executive Board clarified that in cases where project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activities, DOEs are required to ensure that:</p> <p>(a) The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and</p>  |  |     | N/A             | N/A             |



|                       | Requirement  | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
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|                       | <p>the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed;</p> <p>(b) The values used in the PDD and associated Annexes are fully consistent with the FSR, and where inconsistencies occur, the DOE should validate the appropriateness of the values;</p> <p>(c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.</p>  |      |     |                 |                 |
|                       | <p>Comment: FSR or similar studies are not required by Peruvian authorities.</p>   |      |     |                 |                 |
| <b>1.6.4</b>          | <b>Barrier analysis</b>  |      |     |                 |                 |
| [1]<br>115            | <p>If barrier analysis was used to demonstrate the additionality of the proposed CDM project activity, the PDD shall demonstrate that the proposed CDM project activity faces barriers that:</p> <p>(a) Prevent the implementation of this type of proposed CDM project activity;</p> <p>(b) Do not prevent the implementation of at least one of the alternatives.</p>  | 3    | DR  | OK              | OK              |
|                       | <p>The additionality was demonstrated based on the investment analysis.</p> <p>Comment: It must be noted that the investment analysis is the key additionality check, however in case of the IRR being higher than the benchmark barrier analysis can be used for the additionality analysis of the future CPAs.</p>   |      |     |                 |                 |
| 1.6.4.1<br>[1]<br>116 | <p>Issues that have a clear direct impact on the financial returns of the project activity cannot be considered barriers and shall be assessed by investment analysis. This does not refer to either:</p> <p>(a) Risk related barriers, for example risk of technical failure, that could have negative effects on financial performance, or</p> <p>(b) Barriers related to the unavailability of sources of finance for the project activity.</p>   | 3    | DR  | OK              | OK              |
|                       | <p>Comment: See 1.115 above.</p>   |      |     |                 |                 |
| 1.6.4.2<br>[1]<br>117 | <p>The DOE shall apply a two-step process to assessing the barrier analysis performed as follows:</p> <p>(a) <i>Determine whether the barriers are real.</i> The DOE shall assess the available evidence and/or undertake interviews with relevant individuals (including members of industry associations, government officials or local experts if necessary) to determine whether the barriers listed in the PDD exist. The DOE shall ensure that existence of barriers is substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics. If existence of a barrier is substantiated only by the opinions of the project participants, the DOE shall not consider this barrier to be adequately substantiated. If the DOE considers, on the basis of its sectoral or local expertise, that a barrier is not real or is not supported by sufficient evidence, it shall raise a CAR to have reference to this barrier removed from the project documentation;</p> <p>(b) <i>Determine whether the barriers prevent the implementation of the project activity but not the implementation of at least one of the possible alternatives.</i> Since not all barriers present an insurmountable hurdle to a project activity being implemented, the DOE shall apply its local and sectoral expertise to judge whether a barrier or set of barriers would prevent the implementation of the proposed CDM project activity and would not equally prevent implementation of <i>at least one of the possible alternatives</i>, in particular the identified baseline scenario.</p> | 3    | DR  | OK              | OK              |

|                       | Requirement   | Ref.               | MoV | Draft<br>Concl. | Final<br>Concl. |
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|                       | Comment: See 1.115 above.   |                    |     |                 |                 |
| <b>1.6.5</b>          | <b>Common practice analysis</b>   |                    |     |                 |                 |
| [1]<br>119            | For proposed large-scale CDM project activities, unless the proposed project type is first-of-its kind, common practice analysis shall be carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality. This is a test to complement the investment analysis (Step 2 of the additionality tool) or barrier analysis (Step 3 of the additionality tool) to confirm that the project activity is not widely observed and commonly carried out in the region.  | 3,24<br>,41,<br>42 | DR  | OK              | OK              |
|                       | <p>Comment: As a compulsory credibility-check on the investment analysis results, a common practice analysis was conducted for the first CPA.</p> <p>The CP has been conducted appropriately, including the calculation of the factors F, N<sub>all</sub>, N<sub>diff</sub>.</p>  |                    |     |                 |                 |
| 1.6.5.1<br>[1]<br>120 | The DOE shall use its local and sectoral expertise to:<br>(a) Assess whether the geographical scope (e.g. the defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology or industry type. For certain technologies, the relevant region for assessment will be local. For others, it may be transnational/global. If a region other than the entire host country is chosen, the DOE shall assess the explanation why this region is more appropriate;<br>(b) Using official sources as well as local and industry expertise, determine to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM project activities, were undertaken in the defined region;<br>(c) If similar and operational projects, other than CDM project activities, are already "widely observed and commonly carried out" in the defined region, assess whether there are essential distinctions between the proposed CDM project activity and the other similar activities. | 3                  | DR  | OK              | OK              |
|                       | Comment: The proposed first CPA is not common practice. See 1.6.5 above.  |                    |     |                 |                 |
| <b>1.7</b>            | <b>MONITORING PLAN</b>  |                    |     |                 |                 |
| [1]<br>122            | The PDD shall include a monitoring plan. This monitoring plan shall be based on the approved monitoring methodology applied to the proposed CDM project activity.   | 3,8                | DR  | OK              | OK              |
|                       | Comment: The monitoring plan is based on the approved monitoring methodology. In addition, a CME Handbook defines further details and procedures for the monitoring on the PoA and CPA levels.  |                    |     |                 |                 |
| 1.7.1<br>[1]<br>123   | The DOE shall apply a two-step process to assessing compliance with this requirement as follows:<br>(a) <i>Compliance of the monitoring plan with the approved methodology.</i> The DOE shall:<br>(i) By means of document review, identify the list of parameters required by the selected approved methodology;<br>(ii) Confirm that the monitoring plan contains all necessary parameters, that they are clearly described and that the means of monitoring described in the plan complies with the requirements of the methodology;<br>(b) <i>Implementation of the plan.</i> The DOE shall, by means of review of the documented procedures, interviews with relevant personnel, project plans and any physical inspection of the proposed CDM project activity site in accordance with paragraphs 59-62, assess whether:<br>(i) The monitoring arrangements described in the monitoring plan are feasible within the project design;<br>(ii) The means of implementation of the monitoring plan, including the data   | 3,8                | DR  | OK              | OK              |

MoV = Means of Validation, DR = Document Review, I = Interview, N/A = Not Applicable

CAR = Corrective Action Request, CL = Clarification Request, FAR = Forward Action Request

|                      | Requirement   | Ref.                      | MoV | Draft<br>Concl. | Final<br>Concl. |
|----------------------|---|---------------------------|-----|-----------------|-----------------|
|                      | management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.   |                           |     |                 |                 |
|                      | Comment: The monitoring plan is in compliance with the requirements of the methodology. In addition, a CME Handbook defines further details and procedures for the monitoring on the PoA and CPA levels.  |                           |     |                 |                 |
| <b>1.8</b>           | <b>SUSTAINABLE DEVELOPMENT</b>  |                           |     |                 |                 |
| [1]<br>125           | CDM project activities shall assist Parties not included in Annex I to the convention in achieving sustainable development.   | 3,9                       | DR  | OK              | OK              |
|                      | Comment: The host country LoA explicitly refers to the project benefits to sustainable development.   |                           |     |                 |                 |
| 1.8.1<br>[1]<br>126  | The DOE shall determine whether the letter of approval by the DNA of the host Party confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party.  | 9                         | DR  | OK              | OK              |
|                      | Comment: The host party's DNA confirmed the contribution of the project to the sustainable development of the host party.   |                           |     |                 |                 |
| <b>1.9</b>           | <b>LOCAL STAKEHOLDER CONSULTATION</b>   |                           |     |                 |                 |
| [1]<br>128           | Local stakeholders shall be invited by the PPs to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website.   | 3,19                      | DR  | OK              | OK              |
|                      | Comment: LSC has been conducted and documented appropriately by PP and FONAM.   |                           |     |                 |                 |
| 1.9.1<br>[1]<br>129  | The DOE shall, by means of document review and interviews with local stakeholders as appropriate, determine whether:<br>(a) Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited;<br>(b) The summary of the comments received as provided in the PDD is complete;<br>(c) The project participants have taken due account of any comments received and have described this process in the PDD. | 3,19                      | DR  | OK              | OK              |
|                      | Comment: The local stakeholder consultation was appropriately and adequately conducted.   |                           |     |                 |                 |
| <b>1.10</b>          | <b>ENVIRONMENTAL IMPACTS</b>  |                           |     |                 |                 |
| [1]<br>131           | Project participants shall submit documentation to the DOE on the analysis of the environmental impacts of the project activity in accordance with paragraph 37(c) of the CDM modalities and procedures.  | 3,29<br>,40,<br>17,3<br>5 | DR  | OK              | OK              |
|                      | Comment: According to the Peruvian Electric Concessions Law (Law No. 25844), for the development of hydroelectric power plants of less than 20 MW the only requirement is an Environmental certificate (DIA) based on Law to Assure the Efficient Development of Electric Generation (Law No. 28832). As a result, the PoA-s CPAs required to present a DIA.  |                           |     |                 |                 |
| 1.10.1<br>[1]<br>132 | The DOE shall confirm, by means of a document review and/or using local official sources and expertise, whether the project participants have undertaken an analysis of environmental impacts and, if required by the host Party, an environmental impact assessment.   | 3,29<br>,40,<br>17,3<br>5 | DR  | OK              | OK              |
|                      | Comment: See 1.131 above.   |                           |     |                 |                 |
| <b>2</b>             | <b>Specific validation activities</b>   |                           |     |                 |                 |
| <b>2.1</b>           | <b>BACKGROUND</b>   |                           |     |                 |                 |



|                       | Requirement   | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|-----------------------|---|------|-----|-----------------|-----------------|
| [1]<br>134            | Project participants may contract a DOE to undertake certain specific validation activities. For such validation activities, the DOE shall apply the general means of validation and reporting requirements described above as well as those described below.   |      |     |                 |                 |
| <b>2.2</b>            | <b>PROJECT DESIGN OF SMALL-SCALE CLEAN DEVELOPMENT MECHANISM PROJECT ACTIVITIES</b>   |      |     |                 |                 |
| [1]<br>135            | The DOE shall determine whether a proposed small-scale CDM project activity meets the requirements of the simplified modalities and procedures for small-scale CDM project activities.  |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| 2.2.1<br>[1]<br>136   | During its validation of a small-scale project activity, the DOE shall confirm that:<br>(a) The project activity qualifies within the thresholds of the three possible types of small-scale project activities. It may include more than one component; for example, a type III methane recovery component activity and a type I electricity component activity;<br>(b) The project activity conforms to one of the approved small-scale categories and applies the relevant tool or methodology. The DOE shall confirm that the small-scale methodologies are applied in conjunction with the general guidelines to SSC CDM methodologies, which provides guidelines on equipment capacity, equipment performance/lifetime, baseline identification for type-II/III Greenfield project activities, sampling and other monitoring-related issues;<br>(c) The project activity is not a debundled component of a large-scale project, in accordance with the rules defined in Appendix C of the simplified modalities and procedures for small-scale CDM project activities;<br>(d) Whether an assessment of the environmental impacts of the proposed CDM project activity is required by the host Party. |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| <b>2.3</b>            | <b>AFFORESTATION OR REFORESTATION PROJECT ACTIVITIES UNDER THE CLEAN DEVELOPMENT MECHANISM</b>  |      |     |                 |                 |
| <b>2.3.1</b>          | <b>General requirement</b>  |      |     |                 |                 |
| [1]<br>138            | The guidance provided in section 1 above also applies to the validation of A/R CDM project activities to the extent defined in modalities and procedures for afforestation or reforestation (A/R) CDM project activities and relevant guidance by the CDM Executive Board.  |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| 2.3.1.1<br>[1]<br>139 | In addition, the DOE shall confirm that specific requirements, as defined in the modalities and procedures for A/R CDM project activities, were followed, including:<br>(a) Project boundary for A/R CDM project activities;<br>(b) Selection of carbon pools;<br>(c) Eligibility of land;<br>(d) Approach proposed to address non permanence;<br>(e) Timing of management activities, including harvesting cycles, and verifications;<br>(f) Socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems.   |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| <b>2.3.2</b>          | <b>Project boundary for A/R CDM project activities</b>  |      |     |                 |                 |

|                       | Requirement   | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|-----------------------|---|------|-----|-----------------|-----------------|
| [1]<br>140            | The PDD shall contain a description of the project boundary that geographically delineates the proposed afforestation or reforestation CDM project activity under the control of the project participants. The proposed A/R CDM project activity may contain more than one discrete area of land.   |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| 2.3.2.1<br>[1]<br>141 | The DOE shall confirm whether the PDD contains a description of the CDM project boundary which encircles discrete areas of land planned for the proposed afforestation or reforestation CDM project activity under the control of the project participants.   |      |     |                 |                 |
|                       | Comment:  |      |     |                 |                 |
| 2.3.2.2<br>[1]<br>142 | The DOE shall, through document review and/or interviews, validate that the project participants for all areas of land planned for A/R CDM project activity:<br>(a) Have already established the control over afforestation or reforestation activities; or<br>(b) The control over afforestation or reforestation is expected to be established in accordance to the guidance specified in the EB 44 report, Annex 16.<br>The control has to include at minimum the exclusive right, defined in a way acceptable under the legal system of the host country, to perform the A/R activity with the aim of achieving net anthropogenic GHG removals by sinks. If the total number of documents to be reviewed and persons/entities to be interviewed is not less than ten, then the DOE may apply a sampling approach. |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| <b>2.3.3</b>          | <b>Selection of carbon pools</b>  |      |     |                 |                 |
| [1]<br>144            | Proposed A/R CDM project activity may account for verifiable changes in the following carbon pools within the project boundary: above-ground biomass, below-ground biomass, litter, dead wood, and soil organic carbon.   |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| 2.3.3.1<br>[1]<br>145 | The DOE shall determine whether the PDD selected the carbon pools to be considered in the proposed A/R CDM project activity in accordance with the requirements of the selected approved methodology. If the approved methodology allows for an option to exclude certain carbon pools, the DOE shall confirm that verifiable information was provided to justify the exclusion. For this, the DOE shall ensure that all documents referred to in the PDD are correctly quoted and interpreted. If relevant, the DOE shall cross check the information provided in the PDD with other available information from public sources or local experts.   |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| <b>2.3.4</b>          | <b>Eligibility of land</b>  |      |     |                 |                 |
| [1]<br>147            | Project participants shall provide evidence that the land within the planned project boundary is eligible for a proposed A/R CDM project activity following the most recent version of the "Procedures to demonstrate the eligibility of land for A/R CDM project activities".  |      |     | N/A             | N/A             |
|                       | Comment:  |      |     |                 |                 |
| 2.3.4.1<br>[1]<br>148 | The DOE shall validate, based on review of information that reliably discriminates between forest and non-forest land according to the particular thresholds adopted by the host country (exemplary sources are listed in the   |      |     | N/A             | N/A             |

|                       | Requirement  | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|-----------------------|--|------|-----|-----------------|-----------------|
|                       | abovementioned procedures) and a site visit, that the area of land included within the project boundary is eligible for afforestation or reforestation activity.   |      |     |                 |                 |
|                       | Comment:   |      |     |                 |                 |
| <b>2.3.5</b>          | <b>Conservative choice and application of default data</b>   |      |     |                 |                 |
| [1]<br>150            | Project participants shall ensure that application of default data in estimation of the net anthropogenic GHG removals by sinks results in conservative, but not overly conservative, estimates. An acceptable method for satisfying the above-mentioned requirement is provided in the most recent version of the "Guidelines on conservative choice and application of default data in estimation of the net anthropogenic GHG removals by sinks". |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| 2.3.5.1<br>[1]<br>151 | The DOE shall review the PDD to ensure satisfactory application of "Guidelines on conservative choice and application of default data in estimation of the net anthropogenic GHG removals by sinks" in order to prevent any overestimation of reductions in anthropogenic emissions according to the provisions of the modalities and procedures for afforestation and reforestation CDM project activities.   |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| <b>2.3.6</b>          | <b>Approach proposed to address non permanence</b>   |      |     |                 |                 |
| [1]<br>153            | Project participants shall specify the approach proposed to address non permanence in accordance with paragraph 38 of the modalities and procedures for afforestation or reforestation CDM project activities.   |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| 2.3.6.1<br>[1]<br>154 | The DOE shall review the PDD to ensure an approach to address that non permanence is selected according to the provisions of the modalities and procedures for afforestation or reforestation CDM project activities.  |      |     | N/A             | N/A             |
|                       | Comment: The validation report shall describe the approach selected by the project participants to address non-permanence.   |      |     |                 |                 |
| <b>2.3.7</b>          | <b>Timing of management activities, including harvesting cycles, and verifications</b>   |      |     |                 |                 |
| [1]<br>156            | Project participants shall plan management activities, including harvesting cycles, and verifications such that a systematic coincidence of verification and peaks in carbon stocks would be avoided.  |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| 2.3.7.1<br>[1]<br>157 | The DOE shall review the forest management plan and the monitoring plan for the proposed A/R CDM project activity to ensure that a systematic coincidence of verification and peaks in carbon stocks is avoided.   |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| <b>2.3.8</b>          | <b>Socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems</b>  |      |     |                 |                 |
| [1]<br>159            | Project participants shall submit to the DOE documentation on their analysis of the socioeconomic and environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary of the proposed afforestation or reforestation project activity under the CDM.   |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |

|                       | Requirement  | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|-----------------------|--|------|-----|-----------------|-----------------|
| 2.3.8.1<br>[1]<br>160 | The DOE shall confirm, by means of a document review and/or using local official sources and expertise, whether the project participants have undertaken an analysis of the socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary.  |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| 2.3.8.2<br>[1]<br>161 | Should the above-mentioned analysis lead to conclusion that any negative impact that may be considered significant by the project participants or the host Party was detected, then the DOE shall, by means of document review, ascertain that a socio-economic impact assessment and/or an environmental impact assessment has been undertaken in accordance with relevant host Party regulations, and that the outcome of such impact assessment is summarized in the PDD. The DOE shall also ascertain that a description of the planned monitoring and remedial measures to address the negative impacts has been included in the PDD.   |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| <b>2.4</b>            | <b>PROJECT DESIGN OF SMALL-SCALE AFFORESTATION OR REFORESTATION PROJECT ACTIVITIES</b>   |      |     |                 |                 |
| [1]<br>163            | Small-scale afforestation or reforestation CDM project activities shall be validated using the requirements for afforestation or reforestation CDM project activities as described in section 2.3 above, while taking into account the simplified modalities and procedures for small-scale afforestation and reforestation CDM project activities.  |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| 2.4.1<br>[1]<br>164   | During its validation of a proposed small-scale A/R CDM project activity, the DOE shall determine whether:<br>(a) The project activity complies with the thresholds for the small-scale A/R CDM project activities;<br>(b) The project activity complies with one of the types of small-scale A/R project activities defined in Appendix B of the Annex to decision 6/CMP.1 and qualifies to apply one of the approved simplified baseline and monitoring methodology for small-scale afforestation and reforestation project activities;<br>(c) The proposed CDM project activity is not a part of a debundled large-scale A/R project activity, in accordance with the rules defined in Appendix C of the Annex to decision 6/CMP.1;<br>(d) The proposed CDM project activity was developed or implemented by low-income communities and individuals as confirmed by the host Party. |      |     | N/A             | N/A             |
|                       | Comment:   |      |     |                 |                 |
| <b>2.5</b>            | <b>PROGRAMME OF ACTIVITIES</b>   |      |     |                 |                 |
| [1]<br>165            | The CDM Executive Board has provided guidance and procedures for registering a programme of activities (PoA) as a single CDM project activity. In validating a PoA and any CDM programme activities (CPAs) proposed to be included in the PoA, the DOE shall, in general, apply the means of validation and reporting requirements described in this Manual. However, there are a number of requirements unique to PoAs for which additional instructions are provided below. The precise extent of validation required in each of these areas will need to be determined by the DOE, based on the type or PoA being validated.  |      |     | N/A             | N/A             |

|              | Requirement   | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|--------------|---|------|-----|-----------------|-----------------|
|              | Comment:  |      |     |                 |                 |
| <b>2.5.1</b> | <b>Operational and management arrangements for the PoA</b>  |      |     |                 |                 |
| [1]<br>166   | The DOE shall assess the operational and management arrangements which have been established by the coordinating/managing entity in order to determine whether these arrangements are suitable for the PoA being validated. The arrangements shall be sufficient to ensure that the coordinating/managing entity will have control of all records and information related to the implementation of individual CPAs and will be in a position to ensure that each CPA is being operated in accordance with the specific requirements of the programme. Where the DOE considers the arrangements to be unsatisfactory or insufficient, a CAR shall be raised. A request for registration shall not be submitted until the CAR has been resolved to the satisfaction of the DOE. |      |     | N/A             | N/A             |
|              | Comment:  |      |     |                 |                 |
| <b>2.5.2</b> | <b>Eligibility criteria for CPAs</b>  |      |     |                 |                 |
| [1]<br>167   | The DOE shall assess the specified eligibility criteria in the POA-DD in order to determine whether or not these criteria are sufficient to ensure that all CPAs would comply with the CDM requirements applicable to the PoA. These requirements will include, inter alia, the means of demonstrating the additionality of the CPA and the applicability of the applied methodology. The eligibility criteria represent an essential element of ensuring the smooth functioning or programmatic CDM. Therefore, the DOE may raise CARs which ensure the ease of application of the eligibility criteria.   |      |     | N/A             | N/A             |
|              | Comment:  |      |     |                 |                 |
| <b>2.5.3</b> | <b>Validation of CPAs</b>   |      |     |                 |                 |
| [1]<br>168   | The DOE shall assess any proposed CPA, which a coordinating/managing entity wishes to include in the PoA, to determine whether or not it complies with the eligibility criteria specified in the POA-DD. The means of validation to determine compliance with this requirement will be specific to the PoA. The DOE may consider a desk review of the documentation sufficient to determine compliance in certain instances. It may also consider follow-up interviews and/or site visits necessary for other types of PoA.   |      |     | N/A             | N/A             |
|              | Comment:  |      |     |                 |                 |
| <b>2.6</b>   | <b>RENEWAL OF CREDITING PERIOD</b>  |      |     |                 |                 |
| [1]<br>169   | When contracted to validate a proposed CDM project activity for a second or further crediting period, the DOE shall undertake a thorough reassessment of the validity of the original baseline or any updates thereto proposed by the project participants, and the corresponding estimation of emission reductions for the applicable crediting period, based on the latest version of the procedures for renewing the crediting period, the latest applicable version of approved methodology and the means of validation described in this Manual.   |      |     | N/A             | N/A             |
|              | Comment:  |      |     |                 |                 |
| <b>2.7</b>   | <b>CHANGES TO THE START DATE OF THE CREDITING PERIOD</b>  |      |     |                 |                 |
| [1]<br>170   | The CDM Executive Board has revised procedures for requesting post registration changes to the start date of the crediting period. The requirement for the Host Country to re-confirm that the delay in the start date of crediting period  |      |     | N/A             | N/A             |

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CAR = Corrective Action Request, CL = Clarification Request, FAR = Forward Action Request

|  | Requirement   | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|--|---|------|-----|-----------------|-----------------|
|  | will not affect project's contribution to sustainable development was removed, and that these revised procedures also contain provisions for project activities hosted in Least Developed Countries (LDCs). If project participants wish to delay the start date of the crediting period by more than one year but less than two years, and if project participants of projects hosted by a LDC wish to delay the start date of the crediting period by more than two year but less than four years, the DOE shall validate the baseline scenario in accordance with chapter V, section E, subsection 5(d) above. |      |     |                 |                 |
|  | Comment:  |      |     |                 |                 |

## Protocol 2: Methodological Requirements (incl. tools)

|  | Requirement  | Ref.                    | MoV           | Draft<br>Concl.                 | Final<br>Concl. |                      |    |                      |    |  |    |    |    |    |    |
|--|--|-------------------------|---------------|---------------------------------|-----------------|----------------------|----|----------------------|----|--|----|----|----|----|----|
| 3  | Methodology ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources - Version 12.2.0   |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| 3.1  | GENERAL APPLICABILITY  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| 3.1.1  | <p>This methodology is applicable to grid-connected renewable power generation project activities that</p> <p>(a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant)</p> <p>(b) involve a capacity addition</p> <p>(c) involve a retrofit of (an) existing plant(s)</p> <p>(d) involve a replacement of (an) existing plant(s).</p> <table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Y</td></tr><tr><td>Compliance provable?</td><td>Y</td></tr><tr><td>Compliance verified?</td><td>Y</td></tr><tr><td>Is the option correctly presented and confirmed?</td><td>Y</td></tr></table>  | Applicability checklist | Yes / No / NA | Criterion discussed in the PDD? | Y               | Compliance provable? | Y  | Compliance verified? | Y  | Is the option correctly presented and confirmed? | Y  | 3  | DR | OK | OK |
| Applicability checklist                          | Yes / No / NA  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Criterion discussed in the PDD?                  | Y  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Compliance provable?                             | Y  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Compliance verified?                             | Y  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Is the option correctly presented and confirmed? | Y  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
|  | Comment: Applicability has been confirmed.   |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| 3.1.2  | <p>Applicability Criterion 1:<br/>The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types:</p> <ul style="list-style-type: none"><li>hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir),</li><li>wind power plant/unit,</li><li>geothermal power plant/unit,</li><li>solar power plant/unit,</li><li>wave power plant/unit, or</li><li>tidal power plant/unit.</li></ul> <table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Y</td></tr><tr><td>Compliance provable?</td><td>Y</td></tr><tr><td>Compliance verified?</td><td>Y</td></tr></table>  | Applicability checklist | Yes / No / NA | Criterion discussed in the PDD? | Y               | Compliance provable? | Y  | Compliance verified? | Y  | 3  | DR | OK | OK |    |    |
| Applicability checklist                          | Yes / No / NA  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Criterion discussed in the PDD?                  | Y  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Compliance provable?                             | Y  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Compliance verified?                             | Y  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
|  | Comment: The project is aiming at building a new hydro power plant (Greenfield).   |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| 3.1.3  | <p>Applicability Criterion 2:<br/>In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use to calculate the parameter <math>EG_{PJ,y}</math>): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.</p> <table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table> | Applicability checklist | Yes / No / NA | Criterion discussed in the PDD? | NA              | Compliance provable? | NA | Compliance verified? | NA | 3  | DR | OK | OK |    |    |
| Applicability checklist                          | Yes / No / NA  |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Criterion discussed in the PDD?                  | NA   |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Compliance provable?                             | NA   |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |
| Compliance verified?                             | NA   |                         |               |                                 |                 |                      |    |                      |    |  |    |    |    |    |    |

MoV = Means of Validation, DR = Document Review, I = Interview, N/A = Not Applicable

CAR = Corrective Action Request, CL = Clarification Request, FAR = Forward Action Request



|  | Requirement   | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |                                 |               |  |    |  |    |   |    |  |    |  |    |
|--|---|------|-----|-----------------|-----------------|---------------------------------|---------------|--|----|--|----|---|----|--|----|--|----|
|  | Comment: The criterion is not applicable as the project covers a new hydro power plant (See Criterion no 1 above)   |      |     |                 |                 |                                 |               |  |    |  |    |   |    |  |    |  |    |
| 3.1.4  | Applicability Criterion 3:<br>In case of hydro power plants, one of the following conditions must apply:  | 3    | DR  | OK              | OK              |                                 |               |  |    |  |    |   |    |  |    |  |    |
|  | <table><tr><th>Applicability checklist hydro</th><th>Yes / No / NA</th></tr><tr><td>The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs.</td><td>N</td></tr><tr><td>The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m².</td><td>N</td></tr><tr><td>The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m².</td><td>Y</td></tr></table>   |      |     |                 |                 | Applicability checklist hydro   | Yes / No / NA | The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs. | N  | The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m². | N  | The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m². | Y  |  |    |  |    |
|  | Applicability checklist hydro   |      |     |                 |                 | Yes / No / NA                   |               |  |    |  |    |   |    |  |    |  |    |
|  | The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs.  |      |     |                 |                 | N                               |               |  |    |  |    |   |    |  |    |  |    |
|  | The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m².  |      |     |                 |                 | N                               |               |  |    |  |    |   |    |  |    |  |    |
|  | The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m².   |      |     |                 |                 | Y                               |               |  |    |  |    |   |    |  |    |  |    |
|  | In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m² ALL the following conditions must apply:  |      |     |                 |                 |                                 |               |  |    |  |    |   |    |  |    |  |    |
|  | <table><tr><th>Applicability checklist hydro B</th><th>Yes / No / NA</th></tr><tr><td>The power density calculated for the entire project activity using equation 5 is greater than 4 W/m².</td><td>NA</td></tr><tr><td>Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project that collectively constitute the generation capacity of the combined power plant.</td><td>NA</td></tr><tr><td>Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity.</td><td>NA</td></tr><tr><td>Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m², is lower than 15 MW.</td><td>NA</td></tr><tr><td>Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m², is less than 10% of the total installed capacity of the project activity from multiple reservoirs.</td><td>NA</td></tr></table> |      |     |                 |                 | Applicability checklist hydro B | Yes / No / NA | The power density calculated for the entire project activity using equation 5 is greater than 4 W/m².                                | NA | Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project that collectively constitute the generation capacity of the combined power plant.  | NA | Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity.  | NA | Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m², is lower than 15 MW. | NA | Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m², is less than 10% of the total installed capacity of the project activity from multiple reservoirs. | NA |
|  | Applicability checklist hydro B   |      |     |                 |                 | Yes / No / NA                   |               |  |    |  |    |   |    |  |    |  |    |
|  | The power density calculated for the entire project activity using equation 5 is greater than 4 W/m².   |      |     |                 |                 | NA                              |               |  |    |  |    |   |    |  |    |  |    |
|  | Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project that collectively constitute the generation capacity of the combined power plant.   |      |     |                 |                 | NA                              |               |  |    |  |    |   |    |  |    |  |    |
|  | Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity.  |      |     |                 |                 | NA                              |               |  |    |  |    |   |    |  |    |  |    |
| Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m², is lower than 15 MW.   | NA  |      |     |                 |                 |                                 |               |  |    |  |    |   |    |  |    |  |    |
| Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m², is less than 10% of the total installed capacity of the project activity from multiple reservoirs.   | NA  |      |     |                 |                 |                                 |               |  |    |  |    |   |    |  |    |  |    |
| Comment: There is no reservoir or regulating tank in the Project, as it involves only the construction of an intake, tunnel, low-pressure tunnel, forebay, and powerhouse a typical setup for smaller-scale hydro projects. As the applicability requires a greater than 4 W/m² power density the following can be demonstrated:<br>The 19.99MW installed capacity is associated with an indefinitely small reservoir/regulating tank/desander equalling to the surface of the intake. If the power density is calculated based on the 18MW installed capacity and the insignificant surface of the intake the resulting power density is far bigger than the required 4 W/m². |   |      |     |                 |                 |                                 |               |  |    |  |    |   |    |  |    |  |    |
| Applicability Criterion 4:<br>In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance  |   |      |     |                 |                 |                                 |               |  |    |  |    |   |    |  |    |  |    |
| 3.1.5  | 3   | DR   | OK  | OK              |                 |                                 |               |  |    |  |    |   |    |  |    |  |    |



|  | Requirement  | Ref.                    | MoV           | Draft<br>Concl.                          | Final<br>Concl. |                                  |    |   |    |                                   |   |                      |    |     |     |
|--|--|-------------------------|---------------|--|-----------------|----------------------------------|----|---|----|-----------------------------------|---|----------------------|----|-----|-----|
|  | <table><tr><td>Applicability checklist</td><td>Yes / No / NA</td></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table> <p>Comment: Not applicable. However, as explained in the compliance with applicability criteria No .3. (See 3.1.4), a power density calculation will result in a far higher than 4W/m<sup>2</sup> value.</p>  | Applicability checklist | Yes / No / NA | Criterion discussed in the PDD?          | NA              | Compliance provable?             | NA | Compliance verified?                    | NA |                                   |   |                      |    |     |     |
| Applicability checklist                  | Yes / No / NA  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Criterion discussed in the PDD?          | NA   |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Compliance provable?                     | NA   |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Compliance verified?                     | NA   |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| 3.2                                      | DESCRIPTION OF THE SOURCES AND GASES INCLUDED IN THE PROJECT BOUNDARY  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
|  | Integrate the required amount of sub-checklists for sources and gases as given by the methodology applied and comment on at least every line answered with “No”.   |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| 3.2.1                                    | <p>Baseline:<br/>CO<sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.</p> <table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Source and gas(es) discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table> <p>Comment: Grid factor calculations have been carried out in line with the methodology and applicable tool requirements.</p> | Boundary checklist      | Yes / No      | Source and gas(es) discussed in the PDD? | Y               | Inclusion / exclusion justified? | Y  | Explanation / Justification sufficient? | Y  | Consistency with monitoring plan? | Y | 3,,5,<br>6,47<br>,51 | DR | OK  | OK  |
| Boundary checklist                       | Yes / No   |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Source and gas(es) discussed in the PDD? | Y  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Inclusion / exclusion justified?         | Y  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Explanation / Justification sufficient?  | Y  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Consistency with monitoring plan?        | Y  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| 3.2.2                                    | <p>Project Activity:<br/>For geothermal power plants, fugitive emissions of CH<sub>4</sub> and CO<sub>2</sub> from non-condensable gases contained in geothermal steam.</p> <table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Source and gas(es) discussed in the PDD?</td><td></td></tr><tr><td>Inclusion / exclusion justified?</td><td></td></tr><tr><td>Explanation / Justification sufficient?</td><td></td></tr><tr><td>Consistency with monitoring plan?</td><td></td></tr></table> <p>Comment:</p>   | Boundary checklist      | Yes / No      | Source and gas(es) discussed in the PDD? |                 | Inclusion / exclusion justified? |    | Explanation / Justification sufficient? |    | Consistency with monitoring plan? |   |                      |    | N/A | N/A |
| Boundary checklist                       | Yes / No   |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Source and gas(es) discussed in the PDD? |  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Inclusion / exclusion justified?         |  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Explanation / Justification sufficient?  |  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Consistency with monitoring plan?        |  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| 3.2.3                                    | <p>Project Activity:<br/>CO<sub>2</sub> emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants.</p> <table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Source and gas(es) discussed in the PDD?</td><td></td></tr><tr><td>Inclusion / exclusion justified?</td><td></td></tr><tr><td>Explanation / Justification sufficient?</td><td></td></tr><tr><td>Consistency with monitoring plan?</td><td></td></tr></table> <p>Comment :</p>  | Boundary checklist      | Yes / No      | Source and gas(es) discussed in the PDD? |                 | Inclusion / exclusion justified? |    | Explanation / Justification sufficient? |    | Consistency with monitoring plan? |   |                      |    | N/A | N/A |
| Boundary checklist                       | Yes / No   |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Source and gas(es) discussed in the PDD? |  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Inclusion / exclusion justified?         |  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Explanation / Justification sufficient?  |  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Consistency with monitoring plan?        |  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| 3.2.3                                    | <p>Project Activity:<br/>For hydro power plants, emissions of CH<sub>4</sub> from the single or multiple reservoirs.</p> <table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Source and gas(es) discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table>  | Boundary checklist      | Yes / No      | Source and gas(es) discussed in the PDD? | Y               | Inclusion / exclusion justified? | Y  | Explanation / Justification sufficient? | Y  | Consistency with monitoring plan? | Y | 3                    | DR | OK  | OK  |
| Boundary checklist                       | Yes / No   |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Source and gas(es) discussed in the PDD? | Y  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Inclusion / exclusion justified?         | Y  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Explanation / Justification sufficient?  | Y  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |
| Consistency with monitoring plan?        | Y  |                         |               |  |                 |                                  |    |   |    |                                   |   |                      |    |     |     |

|  | Requirement   | Ref.     | MoV | Draft<br>Concl. | Final<br>Concl. |
|--|---|----------|-----|-----------------|-----------------|
|  | <p>Comment:</p> <p>The 18MW installed capacity is associated with an indefinitely small reservoir/regulating tank/desander equalling to the surface of the intake. If the power density is calculated based on the 18MW installed capacity and the insignificant surface of the intake the resulting power density is far bigger than the required 4 W/m<sup>2</sup>.<br/>However, as explained in the compliance with applicability criteria No .3 (see 3.1.4), a power density calculation will result in a far higher than 4W/m<sup>2</sup> value .<br/>Therefore, emissions of CH<sub>4</sub> are excluded.</p> |          |     |                 |                 |
| <b>3.3</b>                               | <b>DESCRIPTION OF HOW THE BASELINE SCENARIO IS IDENTIFIED AND OF THE IDENTIFIED BASELINE SCENARIO</b>   |          |     |                 |                 |
| 3.3.1                                    | If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:   |          |     |                 |                 |
|  | Baseline identification checklist   | Yes / No |     |                 |                 |
|  | Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".  | Y        |     |                 |                 |
|  | Explanation / Justification sufficient?   | Y        |     |                 |                 |
|  | Compliance provable?  | Y        |     |                 |                 |
|  | Comment:  | 3        | DR  | OK              | OK              |
| The methodology prescribes the baseline. |   |          |     |                 |                 |
| 3.3.2                                    | If the project activity is a capacity addition to existing grid-connected renewable power plant/unit, the baseline scenario is the following:   |          |     |                 |                 |
|  | Baseline identification checklist   | Yes / No |     |                 |                 |
|  | In the absence of the CDM project activity, the existing facility would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted (DATE <sub>BaselineRetrofit</sub> ). From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and no emission reductions are assumed to occur.   |          |     |                 |                 |
|  | Explanation / Justification sufficient?   |          |     |                 |                 |
|  | Compliance provable?  |          |     |                 |                 |
|  | Comment:  |          |     | N/A             | N/A             |
|  |   |          |     |                 |                 |
| 3.3.3                                    | If the project activity is the retrofit or replacement of existing grid-connected renewable power plant/unit(s) at the project site, the following step-wise procedure to identify the baseline scenario shall be applied:  |          |     |                 |                 |
|  | Step 1 realistic and credible alternative baseline scenarios for power generation   | Yes / No |     |                 |                 |
|  | Is Step 1 to identify realistic and credible alternative baseline scenarios for power generation correctly applied using the "Combined tool to identify the baseline scenario and demonstrate additionality?  |          |     |                 |                 |
|  | Do the options considered include P1, P2 and P3?  |          |     |                 |                 |
|  | Explanation / Justification sufficient?   |          |     |                 |                 |
|  | Compliance provable?  |          |     |                 |                 |
|  |   |          |     | N/A             | N/A             |

|        | Requirement  | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|--------|--|------|-----|-----------------|-----------------|
|        | <b>Step 2 Barrier Analysis</b>   |      |     |                 |                 |
|        | Is Step 2 correctly applied by using Step 2 of the "Combined tool to identify the baseline scenario and demonstrate additionality"?  |      |     |                 |                 |
|        | Explanation / Justification sufficient?  |      |     |                 |                 |
|        | Compliance provable?   |      |     |                 |                 |
|        | <b>Step 3 Investment Analysis</b>  |      |     |                 |                 |
|        | Apply an investment comparison analysis, if more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P3.   |      |     |                 |                 |
|        | Has the investment comparison analysis been applied following Step 3 of the "Combined tool to identify the baseline scenario and demonstrate additionality"?   |      |     |                 |                 |
|        | Apply a benchmark analysis, if more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P2.  |      |     |                 |                 |
|        | Has the benchmark analysis been applied following Step 3 of the "Tool for the demonstration and assessment of additionality"?  |      |     |                 |                 |
|        | Comment:   |      |     |                 |                 |
| 3.3.4  | In case of any modification or retrofit of existing facilities: Is data available to determine the historic production level?  |      |     | N/A             | N/A             |
|        | Comment:   |      |     |                 |                 |
| 3.3.5  | In case of any modification or retrofit of existing facilities: Have conservative assumptions been applied in order to estimate the point in time when the existing equipment needs to be replaced?                                  |      |     | N/A             | N/A             |
|        | Comment:   |      |     |                 |                 |
| 3.3.6  | Describe why the alternative scenarios are credible and realistic?   | 3    | DR  | OK              | OK              |
|        | Comment: The methodology prescribes the baseline. Therefore, the PDD focus is not on "baseline selection" but on "additionality".  |      |     |                 |                 |
| 3.3.7  | Can the list of alternatives considered to be complete, why? Is as baseline scenario the project activity without being registered as CDM project included?  | 3    | DR  | OK              | OK              |
|        | Comment: The additionality analysis focuses on comparing the project activity scenario with the project activity without being registered as CDM.  |      |     |                 |                 |
| 3.3.8  | In case several different facilities, technologies, outputs or services are present in the project, are separately alternative scenarios for each of them included? Have realistic combinations been considered as project scenario? |      |     | N/A             | N/A             |
|        | Comment:   |      |     |                 |                 |
| 3.3.9  | Does the project identify correctly and exclude those options not in line with regulatory or legal requirements?   |      |     | N/A             | N/A             |
|        | Comment:   |      |     |                 |                 |
| 3.3.10 | If a scenario does not comply with the mandatory laws and regulations; it is clearly demonstrated that the law and/or regulation is systematically not enforced in the country?  |      |     | N/A             | N/A             |

|        | Requirement   | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|--------|---|------|-----|-----------------|-----------------|
|        | Comment:  |      |     |                 |                 |
| 3.3.11 | Changes are required for methodology implementation in 2 <sup>nd</sup> and 3 <sup>rd</sup> crediting periods: Has the continued validity of the baseline been correctly assessed? |      |     | N/A             | N/A             |
|        | Comment:  |      |     |                 |                 |

## Tool to calculate the emission factor for an electricity system

The ACM0002 methodology requires the use of the “Tool to calculate the emission factor for an electricity system” to determine the CO<sub>2</sub> emission factor for the displacement of electricity generated by power plants in an electricity system, by calculating the “Operating Margin” (OM) and “Build Margin” (BM) as well as the “Combined Margin” (CM).

| CHECKLIST TOPIC / QUESTION   | Ref.  | MoV*     | Draft<br>Concl                  | Final Concl |                      |   |                      |   |  |  |  |  |
|--|---|----------|---------------------------------|-------------|----------------------|---|----------------------|---|--|--|--|--|
| <b>H. Tool to calculate the emission factor for an electricity system</b>  |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| <b>H.1. Justification of the choice of the tool and why it is applicable to the project activity</b>   |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| H.1.1. Is the applied tool considered the most appropriate one?  | 3   | DR       | OK                              | OK          |                      |   |                      |   |  |  |  |  |
| Comment:   | Yes, the tool is considered the most appropriate one.   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| H.1.2. Criterion 1:<br>Is the tool used for the purpose of calculating baseline emissions where a project activity supplies electricity to a grid?   | 3,7   | DR       | OK                              | OK          |                      |   |                      |   |  |  |  |  |
| <table border="1"> <thead> <tr> <th>Applicability checklist</th> <th>Yes / No</th> </tr> </thead> <tbody> <tr> <td>Criterion discussed in the PDD?</td> <td>Y</td> </tr> <tr> <td>Compliance provable?</td> <td>Y</td> </tr> <tr> <td>Compliance verified?</td> <td>Y</td> </tr> </tbody> </table> | Applicability checklist   | Yes / No | Criterion discussed in the PDD? | Y           | Compliance provable? | Y | Compliance verified? | Y |  |  |  |  |
| Applicability checklist  | Yes / No  |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Criterion discussed in the PDD?  | Y   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Compliance provable?   | Y   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Compliance verified?   | Y   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Comment:   | The tool is used for the purpose of calculating baseline emissions where a project activity supplies electricity to a grid. |          |                                 |             |                      |   |                      |   |  |  |  |  |
| H.1.3. Criterion 2:<br>Is the tool used for the purpose of calculating baseline emissions for a project activity that results in savings of electricity that would have been provided by the grid?   |   |          | N/A                             | N/A         |                      |   |                      |   |  |  |  |  |
| <table border="1"> <thead> <tr> <th>Applicability checklist</th> <th>Yes / No</th> </tr> </thead> <tbody> <tr> <td>Criterion discussed in the PDD?</td> <td></td> </tr> <tr> <td>Compliance provable?</td> <td></td> </tr> <tr> <td>Compliance verified?</td> <td></td> </tr> </tbody> </table>    | Applicability checklist   | Yes / No | Criterion discussed in the PDD? |             | Compliance provable? |   | Compliance verified? |   |  |  |  |  |
| Applicability checklist  | Yes / No  |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Criterion discussed in the PDD?  |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Compliance provable?   |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Compliance verified?   |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Comment:   |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| H.1.4. Criterion 3:<br>Is the tool used for the purpose of calculating project and leakage emissions in case where a project activity consumes electricity from the grid or results in increase of consumption of electricity from the grid outside the project boundary?                          |   |          | N/A                             | N/A         |                      |   |                      |   |  |  |  |  |
| <table border="1"> <thead> <tr> <th>Applicability checklist</th> <th>Yes / No</th> </tr> </thead> <tbody> <tr> <td>Criterion discussed in the PDD?</td> <td>Y</td> </tr> <tr> <td>Compliance provable?</td> <td>Y</td> </tr> <tr> <td>Compliance verified?</td> <td>Y</td> </tr> </tbody> </table> | Applicability checklist   | Yes / No | Criterion discussed in the PDD? | Y           | Compliance provable? | Y | Compliance verified? | Y |  |  |  |  |
| Applicability checklist  | Yes / No  |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Criterion discussed in the PDD?  | Y   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Compliance provable?   | Y   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Compliance verified?   | Y   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Comment:   |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| <b>H.2. Description of the parameters included in the tool</b>   |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| Integrate the required amount of sub-checklists for parameters as given by the tool applied and comment on at least every line answered with “No”  |   |          |                                 |             |                      |   |                      |   |  |  |  |  |
| H.2.1. Parameter: EF <sub>grid,CM,y</sub>  | 3,7   | DR       | OK                              | OK          |                      |   |                      |   |  |  |  |  |
| Combined margin CO <sub>2</sub> emission factor for grid connected power generation in   |   |          |                                 |             |                      |   |                      |   |  |  |  |  |

| CHECKLIST TOPIC / QUESTION   |   | Ref.               | MoV*     | Draft<br>Concl                  | Final Concl |                                  |   |   |   |                                   |   |     |    |    |    |
|--|---|--------------------|----------|---------------------------------|-------------|----------------------------------|---|---|---|-----------------------------------|---|-----|----|----|----|
| year y<br>Unit: tCO <sub>2</sub> /MWh<br>Type: calculated<br><table><tr><th>Boundary checklist</th><th>Yes / No</th></tr><tr><td>Parameter discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table>   |   | Boundary checklist | Yes / No | Parameter discussed in the PDD? | Y           | Inclusion / exclusion justified? | Y | Explanation / Justification sufficient? | Y | Consistency with monitoring plan? | Y |     |    |    |    |
| Boundary checklist   | Yes / No  |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Parameter discussed in the PDD?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Inclusion / exclusion justified?   | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Explanation / Justification sufficient?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Consistency with monitoring plan?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Comment:   | Combined margin CO <sub>2</sub> emission factor for grid connected power generation in year y is calculated correctly.  |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| H.2.2. Parameter: EF <sub>grid,BM,y</sub><br>Build margin CO <sub>2</sub> emission factor for grid connected power generation in year y<br>Unit: tCO <sub>2</sub> /MWh<br>Type: calculated<br><table><tr><th>Boundary checklist</th><th>Yes / No</th></tr><tr><td>Parameter discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table>  |   | Boundary checklist | Yes / No | Parameter discussed in the PDD? | Y           | Inclusion / exclusion justified? | Y | Explanation / Justification sufficient? | Y | Consistency with monitoring plan? | Y | 3,7 | DR | OK | OK |
| Boundary checklist   | Yes / No  |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Parameter discussed in the PDD?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Inclusion / exclusion justified?   | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Explanation / Justification sufficient?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Consistency with monitoring plan?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Comment:   | Build margin CO <sub>2</sub> emission factor for grid connected power generation in year y is calculated correctly.     |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| H.2.3. Parameter: EF <sub>grid,OM,y</sub><br>Operating margin CO <sub>2</sub> emission factor for grid connected power generation in year y<br>Unit: tCO <sub>2</sub> /MWh<br>Type: calculated<br><table><tr><th>Boundary checklist</th><th>Yes / No</th></tr><tr><td>Parameter discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table>  |   | Boundary checklist | Yes / No | Parameter discussed in the PDD? | Y           | Inclusion / exclusion justified? | Y | Explanation / Justification sufficient? | Y | Consistency with monitoring plan? | Y | 3,7 | DR | OK | OK |
| Boundary checklist   | Yes / No  |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Parameter discussed in the PDD?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Inclusion / exclusion justified?   | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Explanation / Justification sufficient?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Consistency with monitoring plan?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Comment:   | Operating margin CO <sub>2</sub> emission factor for grid connected power generation in year y is calculated correctly. |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| H.2.4. Parameter: FC <sub>i,m,y</sub> , FC <sub>i,y</sub> , FC <sub>i,j,y</sub> , FC <sub>i,k,y</sub> , FC <sub>i,n,y</sub> and FC <sub>i,n,h</sub><br>Amount of fossil fuel type i consumed by power plant / unit m, j, k or n (or in the project electricity system in case of FC <sub>i,y</sub> ) in year y or hour h<br>Unit: mass or volume unit<br>Type: official publication<br><table><tr><th>Boundary checklist</th><th>Yes / No</th></tr><tr><td>Parameter discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table> |   | Boundary checklist | Yes / No | Parameter discussed in the PDD? | Y           | Inclusion / exclusion justified? | Y | Explanation / Justification sufficient? | Y | Consistency with monitoring plan? | Y | 3,7 | DR | OK | OK |
| Boundary checklist   | Yes / No  |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Parameter discussed in the PDD?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Inclusion / exclusion justified?   | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Explanation / Justification sufficient?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |
| Consistency with monitoring plan?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |     |    |    |    |

| CHECKLIST TOPIC / QUESTION   |   | Ref.               | MoV*     | Draft<br>Concl                  | Final Concl |                                  |   |   |   |                                   |   |         |    |    |    |
|--|---|--------------------|----------|---------------------------------|-------------|----------------------------------|---|---|---|-----------------------------------|---|---------|----|----|----|
| Comment:   | Amount of fossil fuel type i consumed by power plant / unit m, j, k or n (or in the project electricity system in case of FCI,y) in year y or hour h is calculated correctly.             |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| H.2.6. Parameter: EF <sub>CO2,i,y</sub><br>CO <sub>2</sub> emission factor of fossil fuel type i in year y<br>Unit: tCO <sub>2</sub> /GJ<br>Type:<br><table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Parameter discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table>   |   | Boundary checklist | Yes / No | Parameter discussed in the PDD? | Y           | Inclusion / exclusion justified? | Y | Explanation / Justification sufficient? | Y | Consistency with monitoring plan? | Y | 3,7     | DR | OK | OK |
| Boundary checklist   | Yes / No  |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Parameter discussed in the PDD?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Inclusion / exclusion justified?   | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Explanation / Justification sufficient?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Consistency with monitoring plan?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Comment:   | CO <sub>2</sub> emission factor of fossil fuel type i in year y is calculated correctly.  |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| H.2.7. Parameter: EG <sub>m,y</sub> , EG <sub>y</sub> , EG <sub>j,y</sub> , EG <sub>k,y</sub> and EG <sub>n,h</sub><br>Net electricity generated and delivered to the grid by power plant / unit m, j, k or n (or in the project electricity system in case of EGy) in year y or hour h<br>Unit: MWh<br>Type: monitored<br><table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Parameter discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table> |   | Boundary checklist | Yes / No | Parameter discussed in the PDD? | Y           | Inclusion / exclusion justified? | Y | Explanation / Justification sufficient? | Y | Consistency with monitoring plan? | Y | 3,7     | DR | OK | OK |
| Boundary checklist   | Yes / No  |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Parameter discussed in the PDD?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Inclusion / exclusion justified?   | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Explanation / Justification sufficient?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Consistency with monitoring plan?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Comment:   | Net electricity generated and delivered to the grid by power plant / unit m, j, k or n (or in the project electricity system in case of EGy) in year y or hour h is calculated correctly. |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| H.2.8. Parameter (only for dispatch data OM): EG <sub>PJ,h</sub><br>Electricity displaced by the project activity in hour h of year y<br>Unit: MWh<br>Type: monitored<br><table><tr><td>Boundary checklist</td><td>Yes / No</td></tr><tr><td>Parameter discussed in the PDD?</td><td>Y</td></tr><tr><td>Inclusion / exclusion justified?</td><td>Y</td></tr><tr><td>Explanation / Justification sufficient?</td><td>Y</td></tr><tr><td>Consistency with monitoring plan?</td><td>Y</td></tr></table>   |   | Boundary checklist | Yes / No | Parameter discussed in the PDD? | Y           | Inclusion / exclusion justified? | Y | Explanation / Justification sufficient? | Y | Consistency with monitoring plan? | Y | 3,4,5,6 | DR | OK | OK |
| Boundary checklist   | Yes / No  |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Parameter discussed in the PDD?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Inclusion / exclusion justified?   | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Explanation / Justification sufficient?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Consistency with monitoring plan?  | Y   |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| Comment:   | Electricity displaced by the project activity in hour h of year y is calculated correctly.  |                    |          |                                 |             |                                  |   |   |   |                                   |   |         |    |    |    |
| H.2.9. Parameter: (only for dispatch data OM) η <sub>m,y</sub><br>Average net energy conversion efficiency of power unit m in year y<br>Unit: -<br>Type:   |   | 3,7                | DR       | OK                              | OK          |                                  |   |   |   |                                   |   |         |    |    |    |

| CHECKLIST TOPIC / QUESTION   |   | Ref. | MoV* | Draft Concl | Final Concl |
|--|---|------|------|-------------|-------------|
| Boundary checklist   | Yes / No  |      |      |             |             |
| Parameter discussed in the PDD?  | Y   |      |      |             |             |
| Inclusion / exclusion justified?   | Y   |      |      |             |             |
| Explanation / Justification sufficient?  | Y   |      |      |             |             |
| Consistency with monitoring plan?  | Y   |      |      |             |             |
| Comment:   | Average net energy conversion efficiency of power unit m in year y is calculated correctly.   |      |      |             |             |
| H.2.10. Do the spatial and technological boundaries as verified on-site comply with the discussion provided by / indication included to the PDD?   |   | 3    | DR   | OK          | OK          |
| Comment:   | The spatial and technological boundaries of the project as verified on-site comply with the PDD.  |      |      |             |             |
| H.3. Description of how the baseline methodology procedure is identified and description of the identified baseline procedure  |   |      |      |             |             |
| H.3.1. Is every selection of options offered by the tool correctly justified and is this justification in line with the situation verified on-site?  |   | 3,7  | DR   | OK          | OK          |
| Comment:   | Choice between the options offered by the tool are correctly justified.   |      |      |             |             |
| H.3.2. Are the formulae required for the determination of the Operating Margin correctly presented, enabling a complete identification of parameter to be used and / or monitored?   |   | 3,7  | DR   | OK          | OK          |
| Comment:   | All formulae required for the determination of the Operating Margin are correctly presented.  |      |      |             |             |
| H.3.3. Is the method to calculate the Operating Margin (Simple OM, Simple Adjusted OM, Dispatch data OM, or Average OM), the most appropriated one?  |   | 3,7  | DR   | OK          | OK          |
| Comment:   | The Simple OM has been selected and it is appropriate given the host country circumstances and data availability.   |      |      |             |             |
| H.3.4. Are the formulae required for the determination of the Build Margin correctly presented, enabling a complete identification of parameter to be used and / or monitored?   |   | 3,7  | DR   | OK          | OK          |
| Comment:   | The formulae required for the determination of the Build Margin are correctly presented.  |      |      |             |             |
| H.3.5. Is the set of power units (the set of five power units that have been built most recently, or the set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently), comprising the larger annual generation? |   | 3,7  | DR   | OK          | OK          |
| Comment:   | Capacity additions included in the Build Margin emission factor calculation are appropriately selected  |      |      |             |             |
| H.3.6. Are the formulae required for the determination of the Combined Margin correctly presented, enabling a complete identification of parameter to be used and / or monitored?  |   | 3,7  | DR   | OK          | OK          |
| Comment:   | The formulae required for the determination of the Combined Margin are correctly presented.   |      |      |             |             |
| H.3.7. Are the values used for $w_{OM}$ and $w_{BM}$ correctly applied?  |   | 3,7  | DR   | OK          | OK          |
| Comment:   | The values used for $w_{OM}$ and $w_{BM}$ are correctly applied.  |      |      |             |             |
| H.3.8. Is the calculation of the operating margin and build margin emission factors documented electronically in a spreadsheet attached to the CDM-PDD. This should include all data used to calculate the emission factors  |   | 3,7  | DR   | OK          | OK          |
| Comment:   | The calculation of the Operating Margin and Build Margin emission factors are documented electronically in a spreadsheet [7]. The historic data for electricity production is available from the system operator [51] |      |      |             |             |
| H.3.9. Are the default efficiency factors for power plants used according to Annex I of the tool?  |   | 3,7  | DR   | OK          | OK          |
| Comment:   | The default efficiency factors for power plants are used according to Annex I of the tool.  |      |      |             |             |



### Protocol 3: Project Specific Requirements

There are no project specific requirements beyond those already covered by Protocol 1 and Protocol 2. In case of PoA validations, the requirements of the PoA Standard (EB 65 Annex 3) are addressed directly in the Validation Report.

|            | Requirement                          | Ref. | MoV | Draft<br>Concl. | Final<br>Concl. |
|------------|--------------------------------------|------|-----|-----------------|-----------------|
| <b>4</b>   | <b>Project specific requirements</b> |      |     |                 |                 |
| <b>4.1</b> |                                      |      |     |                 |                 |
| 4.1.1      |                                      |      |     |                 |                 |
|            | Comment:                             |      |     |                 |                 |
| 4.1.2      |                                      |      |     |                 |                 |
|            | Comment:                             |      |     |                 |                 |
| 4.1.3      |                                      |      |     |                 |                 |
|            | Comment:                             |      |     |                 |                 |
| <b>4.2</b> |                                      |      |     |                 |                 |
| 4.2.1      |                                      |      |     |                 |                 |
|            | Comment:                             |      |     |                 |                 |
| 4.2.2      |                                      |      |     |                 |                 |
|            | Comment:                             |      |     |                 |                 |
| 4.2.3      |                                      |      |     |                 |                 |
|            | Comment:                             |      |     |                 |                 |
| <b>4.3</b> |                                      |      |     |                 |                 |
| 4.3.1      |                                      |      |     |                 |                 |
|            | Comment:                             |      |     |                 |                 |
| 4.3.2      |                                      |      |     |                 |                 |
|            | Comment:                             |      |     |                 |                 |
| 4.3.3      |                                      |      |     |                 |                 |

## Protocol 4: Summary of Requests\*

\*Referring both to PoA-DD and the CPA documentation.

|                               |   |                  |
|-------------------------------|---|------------------|
| No.:                          | CL 1  | Reference: A.2.  |
| Validator request:            | The project scale and “run of river characteristics” are not in line with meth choice and eligibility criteria defined in A.4.2.2. ;A.2.(1)   |                  |
| Project participant response: | <p>Project scale:</p> <ul style="list-style-type: none"> <li>In section A.2. of the PoA-DD, it was mentioned that “small” hydroelectric power plant projects will be constructed.</li> <li>According to CDM rules, “small scale” project types are renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts.</li> <li>However, the PoA involves the construction and operation of hydroelectric power plants with an installed capacity not greater than 20MW, as defined in the eligibility criteria.</li> <li>Therefore, the term “small” has been removed from the PoA documentation to be in line with the methodology chosen and the eligibility criteria</li> </ul> <p>Run of river characteristics</p> <ul style="list-style-type: none"> <li>In section A.2. of the PoA-DD, it was mentioned that the projects are “run-of-river” hydropower plants.</li> <li>However, the PoA involves the construction and implementation of run-of-river and/or reservoir hydroelectric power plants, as defined in the eligibility criteria defined in A.4.2.2.</li> <li>Therefore, the term “run-of-river” has been removed from the PoA documentation to be in line with the methodology chosen and the eligibility criteria.</li> </ul> |                  |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 1 is closed.   | Date: 27/08/2012 |

|                               |   |                  |
|-------------------------------|---|------------------|
| No.:                          | CL 2  | Reference: A.2.  |
| Validator request:            | The fossil fuel argumentation included the unsubstantiated “expensive” statement contradicting the references to the “cheap” Camisea gas reserves in financial additionality argumentation.   |                  |
| Project participant response: | <p>Deletion of term “expensive”</p> <ul style="list-style-type: none"> <li>The term “expensive” has been removed from the fossil fuel argumentation. Justification:</li> <li>The additionality is demonstrated by establishing that in the absence of CDM, none of the implemented CPA would occur. This is done at the CPA level through the steps included in the currently latest version of the “Tool for the demonstration and assessment of additionality”. Hence, the financial argumentation for fossil fuels in section A.2. is not deemed necessary and the “term” expensive can be deleted.</li> </ul> <p>Deletion of term “expensive”</p> <ul style="list-style-type: none"> <li>The paragraph where the term “expensive” was included (under the sub-section on “Policy/measure or stated goal of the PoA) has been re-phrased to avoid unsubstantiated and inconsistent statements.</li> <li>Now, it reads as follows:<br/>“ [...] electricity generation fuelled by heavy fuel oil, diesel, coal or natural gas shall be displaced, while at the same time reducing GHG emissions and increasing the amount of energy available on the grid”.</li> </ul> |                  |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 2 is closed.   | Date: 27/08/2012 |

|                               |   |            |                                    |
|-------------------------------|---|------------|------------------------------------|
| No.:                          | CL 3  | Reference: | A.2 Annex I.; entire documentation |
| Validator request:            | The PP/CMEs name (Carbon BW Peru S.A.C) is not consistently used in the PoA documentation.  |            |                                    |
| Project participant response: | <ul style="list-style-type: none"> <li>The full name of the CME is "Carbon BW Peru S.A.C."</li> <li>In some sections the name was not consistently used (e.g. some character was missing and/or the words were not properly separated).</li> <li>The correct name "Carbon BW Peru S.A.C." has been introduced throughout the entire PoA documentation, i.e. sections A.2., A.3., A.4. and Annex 1 of the PoA-DD.</li> </ul> |            |                                    |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 3 is closed.   | Date:      | 27/08/2012                         |

|                               |   |            |             |
|-------------------------------|---|------------|-------------|
| No.:                          | CL 4  | Reference: | A.4.2.2 (b) |
| Validator request:            | The capacity threshold definition and the compliance of the technology with national standards are not elaborated.  |            |             |
| Project participant response: | <p>The capacity threshold definition and the compliance of the technology with national standards have been further elaborated and included in the eligibility criteria:</p> <p>Capacity threshold:</p> <ul style="list-style-type: none"> <li>Eligibility criterion (b) has been further elaborated in section A.4.2.2. of the PoA-DD.</li> <li>Now, it reads as follows: "Each CPA involves the construction and operation of one or several new hydro power projects [...] with a <u>total or combined installed capacity not greater than 20MW. [...]</u>"</li> </ul> <p>Compliance of the technology with national standards</p> <ul style="list-style-type: none"> <li>The compliance of the technology with national standards has been included as part of the eligibility criterion (b).as follows: "The technology and performance specifications fulfil the host country national standards".</li> <li>More details about the compliance of the technology with national standards are provided under section A.4.4.2</li> </ul> |            |             |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 4 is closed.   | Date:      | 27/08/2012  |

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| No.:                          | CL 5   | Reference: | A.4.2.2 (b) |
| Validator request:            | Clarification whether one or more HPP can exist within one CPA is needed.  |            |             |
| Project participant response: | <p>It has been clarified in section A.4.2.2. of the PoA-DD that one or more hydro power plants can exist within one CPA.</p> <p>General eligibility criterion (b) for inclusion of a CPA in the PoA reads as follows: "Each CPA involves the construction and operation of one or several new hydro power projects connected to the national/sub-national power grid".</p> <p>Moreover, as each CPA may involve one or several HPP, it has been included in the eligibility criterion (d) that prior to inclusion in the PoA, the following data must be provided to/by the CME, among other:</p> <p>Installed capacity and other relevant technical specifications of each power plant under the CPA;</p> <p>Location of the each power plant under the CPA (e.g. GPS coordinates);</p> |            |             |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 5 is closed.  | Date:      | 27/08/2012  |

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| No.:                          | CL 6  | Reference: | A.4.2.2 (g) |
| Validator request:            | Reference to the version number/latest available version of the applicable methodology is not stipulated.   |            |             |
| Project participant response: | Eligibility criterion (g) has been reformulated and reference to the version number/latest available version of the applicable methodology is stipulated. Now, it reads as follows: "Each CPA must be applicable to and need to apply the latest version of the CDM baseline and monitoring methodology "ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 13.0.0 as per validation date)." |            |             |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 6 is closed.   | Date:      | 27/08/2012  |

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| No.:                          | CL 7   | Reference: | A.2.; A.4.2.2 (i) |
| Validator request:            | Further elaboration is needed for describing the permitting process for hydropower plants in Peru.<br>References to the relevant, applicable Host Country Environmental and general permitting requirements legislation are not provided. Given the key role of the ANA's (National Water Authority) permit and its coverage of environmental and social issues it could be explicitly included in the eligibility criteria for CPAs.<br>The general regulatory environment and permitting process for hydropower plants require further clarification in Section A.2.       |            |                   |
| Project participant response: | The permitting process for hydropower plants in Peru has been further elaborated in sections A.2. and A.4.2.2.<br>A reference to the ANA (National Water Authority), stating its responsibility for allocation of water uses, compliance of service delivery commitment and economic regulation (tariffs, etc.) has been included in section A.2.<br>Moreover, it has been included as an eligibility criterion (h) that the CPAs must be "in accordance with the applicable host country Party environmental laws and/regulations". This will be assessed at the CPA level. |            |                   |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 7 is closed.  | Date:      | 27/08/2012        |

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| No.:                          | CL 8  | Reference: | A.4.3      |
| Validator request:            | The Amazon river providing huge hydropower potential does not support the logic of the argumentation for low interest in hydropower.  |            |            |
| Project participant response: | The argumentation that the Amazon River flows through Peru was intended to show the huge hydro potential of the country, as discussed in section A.2. (1).<br>The argumentation for low interest in hydropower is the low tariff faced by generators as a consequence of the low domestic price of natural gas. This is stated in section A.4.3. (ii), Since the logic of the argumentation for the low interest in hydropower is well supported in section A.4.3. (ii), the sentence "Despite the Amazon river flowing through Peru" has been deleted to avoid misinterpretations. |            |            |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 8 is closed.   | Date:      | 27/08/2012 |

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| No.:                          | CL 9  | Reference: | A.4.4.1    |
| Validator request:            | Please submit the existing documentation describing operational and management structure – including procedures / forms / staff roles & responsibilities – of the CME ( your CME Manual & CME QMS). And extend A.4.4.1 Section accordingly.<br>For example, the system and procedures how the CME addresses double-counting is not elaborated sufficiently in the PoA DD, however the 1st CPA inclusion processes, including the double counting check have been conducted appropriately.   |            |            |
| Project participant response: | A document named “Management Handbook for the Coordinating and Managing Entity (the “CME”) CarbonBW Peru S.A.C.” has been produced. Version 1.0 of the Handbook was released on 20/02/2012. It has been made available for the DOE.<br>The content of the Handbook includes the following:<br>General Management of the PoA<br>Inclusion of CDM Programme Activities (CPAs)<br>Verification and Issuance<br>Recruitment and Training Procedure for personnel<br>Release Change of the Handbook<br>Moreover, the record keeping system for each CPA under the PoA and the system/procedure to avoid double accounting have been further elaborated in section A.4.4.1 of the PoA-DD. |            |            |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 9 is closed.   | Date:      | 27/08/2012 |

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| No.:                          | CL 10   | Reference: | A.4.4.2    |
| Validator request:            | References to applicable national standards regarding electricity measurements are not elaborated sufficiently.   |            |            |
| Project participant response: | It has been included in section A.4.4.2. (ii) of the PoA-DD that “each CPA will make a cross-check of its measurement with COES meters and electricity bills”.<br>Moreover, the following footnote with information on compliance requirements of measurement equipment has been added in the aforementioned section of the PoA-DD: “See: Annex C - Operation and Measurement Equipment, page 20 of the “Technical Procedure of the Committee of Economic Operation of SINAC (PR – 20) - Verification of Compliance with Requirements for being a member of COES SINAC”.<br><a href="http://www.coes.org.pe/coes/Procedimientos/procedimiento_n20.pdf">http://www.coes.org.pe/coes/Procedimientos/procedimiento_n20.pdf</a> (accessed 09/11/11).<br>Therefore, references to applicable national standards regarding electricity measurements have been further elaborated. |            |            |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 10 is closed.  | Date:      | 27/08/2012 |

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| No.:                          | CL 11   | Reference: | B.1        |
| Validator request:            | Stating date of the PoA is outside of the first Commitment Period of the Kyoto Protocol.  |            |            |
| Project participant response: | The starting date of the PoA is the date of registration, which is the date of submitting a complete request for registration (EB 59, Annex 12). It is anticipated that the starting date of the PoA will be 07/01/2013<br>This new intended starting date of the PoA has been included in Section B.1 of the PoA-DD. |            |            |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 11 is closed.  | Date:      | 27/08/2012 |

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| No.:                          | CL 12   | Reference: | D.1.       |
| Validator request:            | Reference to the BADEN HPP PoA National Conference held on 21 January 2012 is not elaborated (submit documentary evidence)  |            |            |
| Project participant response: | <p>Since each CPA operates within a geographically defined boundary and within the host country, local stakeholder consultation is done on a CPA level. This will ensure that the stakeholders actually affected by the project activity are adequately informed and consulted. However, a conference has also been conducted to inform about the PoA at the national level. This national conference was held the 20/01/2012 and its documentation will be made available to the DOE upon request".</p> <p>This information has been included in section D.1 of the PoA-DD .</p> |            |            |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 12 is closed.  | Date:      | 27/08/2012 |

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| No.:                          | CL 13  | Reference: | E.2        |
| Validator request:            | Clarification to the each applicability criteria of the methodology are required with respect to the "greenfield" nature of the PoA.   |            |            |
| Project participant response: | <p>A reference to the applicability conditions in version 13.0.0 of ACM0002 has been included in the PoA-DD, section E.2, Table 1.</p> <p>The aforementioned Table provides a clear comparison of CPAs' characteristics and applicability conditions of version 13.0.0 of ACM0002.</p> |            |            |
| Validator conclusion:         | The PoA-DD and CPA DD have been amended and therefore CL 13 is closed.   | Date:      | 27/08/2012 |

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| No.:                          | CL 14  | Reference: | E.5.1, CPA DD B.3 |
| Validator request:            | The reference to "Feed in tariff" in the sensitivity analysis does not appropriately describe Peruvian electricity revenues consisting of more than one element.   |            |                   |
| Project participant response: | <p>Section E.5.1. of the PoA-DD and section B.3. of the CPA-DD contain the explanation of the sensitivity analysis.</p> <p>According to the UNFCCC "Guidance on the Assessment of Investment Analysis" (version 5) variables that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation while carrying out the sensitivity analysis. Therefore, four main variables are considered in the sensitivity analysis: CAPEX, OPEX, Plant load factor and Electricity Sales Prices.</p> <p>Reference to "feed in tariff" has been deleted from the aforementioned sections of the design documents. Instead, reference to "electricity sales prices" has been included to better reflect the Peruvian electricity revenues consisting of more than one element and to meet the requirement that the variable constitutes more than 20% of total project revenues.</p> <p>The financial analysis was performed by modifying the "electricity sales prices" (not the feed-in tariff) by up to +/-10%, and assessing the impact on the project IRR.</p> |            |                   |
| Validator conclusion:         | The PoA-DD and CPA DD have been amended and therefore CL 14 is closed.   | Date:      | 27/08/2012        |

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| No.:               | CL 15  | Reference: | E.5.1 |
| Validator request: | As the latest version of the Additionality Tool fully incorporates the earlier „Guidelines on Common Practice“ reference to the guidelines is no longer appropriate. |            |       |

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| Project participant response: | Reference to the definition of “different technologies” under paragraph 4 of the “Guidelines on Common Practice Analysis”, version 1.0 was included in section E.5.1. of the PoA-DD. As version 06.0.0 of the “Tool for the demonstration and assessment of additionality” ( EB 65 Annex 21 ) fully incorporates the content of the aforementioned Guidelines on Common Practice, its reference is no longer appropriate and has been deleted from section E.5.1.of the PoA-DD. |                  |
| Validator conclusion:         | The PoA-DD and CPA DD have been amended and therefore CL 15 is closed.  | Date: 27/08/2012 |

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| No.:                          | CL 16  | Reference: E.7.1 |
| Validator request:            | Provisions for special cases of electricity delivery and measurements (i.e. shared transformers and transmission lines) are not elaborated.  |                  |
| Project participant response: | Provisions for special cases (i.e. shared transformers and transmission lines) have been included in section E.7.1. of the PoA-DD as follows:<br>“If the transformer and transmission line are shared by other power plants not included in the CPA, the quantity of net electricity generation supplied by the project plant/unit to the grid in year y will be extracted from the following measurements:<br>Information provided by COES based in common electricity meters;<br>Measurement of the electricity of each plant immediately before the transformer and transmission line.<br>This will guarantee that all projects connected to a common transformer and transmission line at the same conditions consider the same transformer and transmission line losses.”<br>Hence, provisions for special cases of electricity delivery and measurements have been further elaborated. |                  |
| Validator conclusion:         | The PoA-DD and CPA DD have been amended and therefore CL 16 is closed.   | Date: 27/08/2012 |

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| No.:                          | CL 17   | Reference: E.7.1 |
| Validator request:            | The area of the reservoir includes a reference to the 1st CPA.  |                  |
| Project participant response: | A reference to the specific area of the reservoir of the 1st CPA was incorrectly included in the description of parameter APJ, under section E.7.1. of the PoA-DD. Therefore, the aforementioned reference has been deleted from the PoA-DD as it should only contain generic information for all CPAs to be included under this PoA. |                  |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 17 is closed.  | Date: 27/08/2012 |

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| No.:                          | CL 18  | Reference: E.7.2 |
| Validator request:            | Data calibration section does not have sufficient reference to the national standards and host country requirements related to measurement equipment and its calibration.  |                  |
| Project participant response: | The following corrections have been made in section E.7.2. of the PoA-DD:<br>Reference to “data calibration” has been replaced by “measurement device calibration” to be more specific. Reference to “manufacturer’s requirements” has been deleted. Instead, “host country” requirements have been included to be more comprehensive.<br>Reference to “technology and performance specifications of the host national standards” has been included. |                  |



Moreover, the following footnote has been included to elaborate further the measurement device calibration:  
The installed electronic measuring system should have mass storage and an accuracy of class 0.2 or higher. : "See: Annex C - Operation and Measurement Equipment, page 20 of the "Technical Procedure of the Committee of Economic Operation of SINAC (PR – 20) - Verification of Compliance with Requirements for being a member of COES SINAC".  
[http://www.coes.org.pe/coes/Procedimientos/procedimiento\\_n20.pdf](http://www.coes.org.pe/coes/Procedimientos/procedimiento_n20.pdf) (accessed 09/11/11).

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| Validator conclusion: | The PoA-DD and CPA DD have been amended and therefore CL 18 is closed. | Date: 27/08/2012 |
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| No.:                          | CL 19  | Reference: E.8   |
| Validator request:            | Relationship to the project/PP of the author of the baseline study and monitoring plan is not defined.   |                  |
| Project participant response: | Responsible entity of the application of the baseline study and monitoring methodology is: Perspectives GmbH.<br>It has been stated that Perspectives GmbH is not a project participant. |                  |
| Validator conclusion:         | The PoA-DD has been amended and therefore CL 19 is closed.   | Date: 27/08/2012 |

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| No.:                          | CL 20   | Reference: CPA DD A.4. |
| Validator request:            | Clarify that if the "desander" is considered as the "reservoir" and its parameters are used to calculate power density.   |                        |
| Project participant response: | For calculation purposes of the 1st CPA, the data given for the desander will be used for calculating the reservoir power density.<br>A footnote with the previous explanation has been included in section A.4. of the CPA-DD. |                        |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 20 is closed.  | Date: 27/08/2012       |

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| No.:                          | CL 21  | Reference: CPA DD A.4., B.6.1. |
| Validator request:            | Clarify the layout of the transmission line(s) and the substation(s) potentially serving more than one HPP. The implications for measuring electricity supplied by the HPPs and measured at the substation needs to be further elaborated. In case Tingo Maria" substation is the location of the SEIN meter this needs to be clarified as well.   |                                |
| Project participant response: | A clarification of the layout of the transmission lines and substations has been included in section A.4. of the CPA-DD.<br>The implications for measuring electricity in case the substations and transmission lines are shared by other power plants not included in the CPA has been further elaborated in section B.6.1. of the CPA-DD.<br>Figure 2 (section A.4. of the CPA-DD) and Figure 7 (section B.6.1.) have been adjusted accordingly. |                                |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 21 is closed.   | Date: 27/08/2012               |

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| No.:               | CL 22  | Reference: CPA DD A.4.1.1 |
| Validator request: | The use the official name of the host country is required. |                           |



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| Project participant response: | The official name in Spanish (República del Perú) has been included in section A.4.1.1. of the CPA-DD.<br>This is in line with the name used in section A.4.1.1. of the PoA-DD. |                  |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 22 is closed.  | Date: 27/08/2012 |

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| No.:                          | CL 23   | Reference: CPA DD A.4.1.2 |
| Validator request:            | Six digits behind the degree in decimal geographical coordinates are sufficient.  |                           |
| Project participant response: | Decimal geographical coordinates of the CPA are included in section A.4.1.2. (Table 2) of the CPA-DD.<br>According to DOE suggestion, only six digits have been considered for the CPA coordinates in section A.4.1.2. (Table 2) of the CPA-DD. |                           |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 22 is closed.  | Date: 27/08/2012          |

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| No.:                          | CL 24   | Reference: CPA DD A.4.2.1, B.2 |
| Validator request:            | Update the stating date of the CPA in line with present planning and progress.  |                                |
| Project participant response: | Starting date of the CPA is the expected date of financial closing. It has been updated according to the latest planning (28/02/2013).<br>This is in line with the definition of starting date determination according to the UNFCCC's "Glossary of CDM terms": <a href="http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf">http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf</a> |                                |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 24 is closed.  | Date: 27/08/2012               |

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| No.:                          | CL 25  | Reference: CPA DD B.2. |
| Validator request:            | The documentary evidence of the inclusion agreement (i.e. signed version) shall be submitted.  |                        |
| Project participant response: | The inclusion agreement for the CPA El Carmen for the EN BADEN Large-Scale Hydro PoA was signed between CarbonBW Peru S.A.C. and Generación Andina S.A.C. on 02/02/2012. The inclusion agreement has been provided to the DOE. |                        |
| Validator conclusion:         | The requested statement [10] has been submitted therefore CL 25 is closed.   | Date: 27/08/2012       |

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| No.:                          | CL 26  | Reference: CPA DD B.3 |
| Validator request:            | The Peruvian Electric Concession Law (Law N° 25844) defines a post-tax benchmark IRR for electricity projects.<br>Please elaborate on the MINEM regulations resulting in the 12% IRR benchmark used for energy projects since the energy concession act's introduction in 1992. Please refer to the studies and investment project documentation, including energy CDM projects, confirming the correctness of the 12% benchmark.<br>The project IRR post-tax nature is not elaborated.                                      |                       |
| Project participant response: | A comprehensive explanation of studies and investment project documentation confirming the correctness of the 12% benchmark has been included in section B.3. of the CPA-DD. An excerpt of the explanation is shown below:<br>The 12% discount rate is established by the government in the Electric Concession Law as the reference rate to evaluate investments in the power sector. This rate has also emerged in several studies as well as in official governmental decisions related to project investment evaluation. |                       |

The 12% rate appeared officially for the first time in December 1992 with the issuance of the ECL as the opportunity cost of investment for new additions to the system in order to forecast and determine the regulated tariff in Peru.

In May 2005, the Ministry of Economy and Finance issued the Technical report 085-2005-EF/68.1 regarding the evaluation of projects in the electric sector. This report establishes that the discount rate is 12% for private sector project evaluation. Later on, the Ministry of Economy and Finance issued in 2007 Decree 015-2007, Terms of reference for feasibility studies for rural electrification in Peru. The Decree stipulates that for private sector investment evaluation a 12% discount rate should be used for rural electrification projects, which include both renewable and non-renewable generation.

Even independent studies, such as one performed by the World Bank in 2009 confirm the use of 12% as a benchmark for investment decisions in the sector.

Recently, the National Fund for the Financing of state Entrepreneurial Activity (FONAFE), which is responsible for the management of the State companies, has confirmed that 12% has been used for evaluation of private investments, including those in the electric sector.

The project IRR post-tax nature has been stated throughout section B.3. of the CPA-DD.

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| Validator conclusion: | The CPA-DD has been amended and therefore CL 26 is closed. | Date: 27/08/2012 |
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| No.:                          | CL 27  | Reference: CPA DD B.3 |
| Validator request:            | Clarify the exact date of assessment of financial parameters (29/09/2011).   |                       |
| Project participant response: | <p>A pre-feasibility study of El Carmen Hydropower Plant was developed in July 2011 assessing the technical and economic feasibility of the Project. The Project applied for a power purchase agreement (PPA) at the same time, which was awarded in September 2011. However, final financial closure is not expected until February 2013, after potential inclusion of the CPA under the PoA. The starting date of the CPA is the aforementioned expected date of financial closing.</p> <p>Since the starting date of the CPA is a particular day in the future (28/02/2013), the basis for the financial analysis of the CPA is the pre-feasibility study.</p> <p>Therefore, the investment data and financial analysis of the El Carmen Hydropower Plant CPA has been conducted with parameters valid at the date when the pre-feasibility study was finished, in July 2011.</p> |                       |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 27 is closed. See FAR 1 related to the checking of financial closure date (28/02/2013) situation re. financing costs.   | Date: 27/08/2012      |

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| No.:               | CL 28  | Reference: CPA DD B.3 |
| Validator request: | Further justification and evidence to be provided why Monzon River hydrological data is applicable and relevant for the Pampayacu river. |                       |

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| Project participant response: | <p>The pre-feasibility study finished in July 2011, considers a hydrological study using data from more than 30 years from measurements at the Monzon River. Explanation is provided below:<br/>The intake site of the CPA is located at the El Carmen river and the discharge site is located at the Monzon river.</p> <p>The first hydrological measurement station in the Pampayacu River (also known as the El Carmen River) was installed in July 2011. Therefore, it is deemed more appropriate and accurate to use data from a hydrological measurement station located in the Monzon River and to extrapolate the data according to Pampayacu River parameters, inter alia: water temperature and precipitation. The data from the Monzon River were acquired to the National Service of Meteorology and Hydrology in Peru (SENAMHI) and include data from more than 30 years of measurements.</p> <p>The explanation above has been included as a footnote in section B.3. of the CPA-DD.</p> |                  |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 28 is closed.   | Date: 27/08/2012 |

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| No.:                          | CL 29  | Reference: CPA DD B.3 |
| Validator request:            | Provide the detailed calculations showing the 2.17% TDL.   |                       |
| Project participant response: | <p>The calculation of transmission losses is provided in the report "Determination of Generated Energy: Central Hidroeléctrica 8 de Agosto - El Carmen – Nueva Esperanza", elaborated by Jorge Pineda. This calculation has been verified by an external calculation. Details are as follows:<br/>The report estimates transmission losses of 2.17064 % between SE 8 de Agosto and SE Tingo Maria (60 km distance, as shown in Figure 7 of the CPA-DD).<br/>However, from a conservative point of view an assumption of 2% transmission losses has been included in the CPA-DD's calculations.<br/>The aforementioned report has been made available to the DOE.</p> |                       |
| Validator conclusion:         | The requested statement [37] has been submitted; as the therefore CL 29 is closed.   | Date: 27/08/2012      |

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| No.:                          | CL 30   | Reference: CPA DD B.3 |
| Validator request:            | Provide the source of the CER price and the method by which CER revenue is calculated for the project.  |                       |
| Project participant response: | <p>Two CER prices have been considered, as explained below:<br/>10.22 EUR - Spot market price as per the average of July 2011 (the date of finalization of the pre-feasibility study), derived from Bluenext.<br/>5.5 EUR - Price calculated in accordance with the pricing formula agreed upon considering the spot market price as per the average of July 2011 (the date of finalization of the pre-feasibility study) derived from Bluenext.<br/>The aforementioned information has been included in Table 5 of the CPA-DD.</p> |                       |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 30 is closed.  | Date: 27/08/2012      |

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| No.:               | CL 31  | Reference: CPA DD B.3 |
| Validator request: | Table 5 does not contain all parameters defined in the "Guidance on the Assessment of Investment Analysis" as provided by the CDM Executive Board. |                       |

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|                               | (e.g. the national standards for depreciation for civil works (33 years) and equipment (10 years) for hydropower projects; exchange rate for EUR/USD on 29/09/2011)  |                  |
| Project participant response: | According to the parameters defined in the Guidance on the Assessment of Investment Analysis", the following parameters are included in "Table 5- Assumption parameters for the financial analysis": Generation capacity, Net electricity generation per year and supplied to the SEIN, Firm capacity, Energy committed, Energy committed tariff, Electricity tariff, Capacity tariff, Load factor, Transmission losses, CAPEX, Insurance costs, Overhauling costs every 5 years, Discount rate, CER price, Water Tariff, Contribution to OSINERGMIN, Contribution to COES, Income Tax, Depreciation – Civil Works, Depreciation – Machinery & Equipment, Distribution of income to workers and Exchange Rate.<br>Exchange rate value (1.4308 USD/EUR) provided by www.oanda.com as per the average of July 2011(the date of finalization of the pre-feasibility study) has been included. |                  |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 31 is closed.   | Date: 27/08/2012 |

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| No.:                          | CL 32   | Reference: CPA DD B.3 |
| Validator request:            | Table 6 contains multiple factor analysis for sensitivity analysis not the required analysis for the key cost/revenue factors.  |                       |
| Project participant response: | According to the UNFCCC "Guidance on the Assessment of Investment Analysis" (version 5): Only variables that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation and the results of this variation should be presented in the PDD and be reproducible in the associated spreadsheets.<br>As a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances.<br>Therefore, the financial analysis include in section B.3. of the CPA-DD has been performed by modifying 4 parameters (CAPEX, OPEX, electricity sales price and plant load factor) by up to +/-10%, and assessing the impact on the project IRR. The results shown in table 6 of the CPA-DD have been simplified accordingly.<br>From a conservative point of view, an analysis of the required values of these parameters to surpass the benchmark has also been carried out. As it can be inferred from the values included in Table 8 of the CPA-DD, the values of the parameters to surpass the benchmark are not deemed realistic under current or future circumstances. An explanation of why these values are not deemed realistic has been included at the end of section "Sub-step 2d: Sensitivity analysis".<br>In conclusion, the sensitivity analysis conducted in section B.3. of the CPA-DD confirms that the Project is not financially attractive for private investors and its successful implementation requires the assistance of the CDM revenues. As a result, the Project is considered additional under Step 2. |                       |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 32 is closed.  | Date: 27/08/2012      |

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| No.:                          | CL 33  | Reference: CPA DD B.3 |
| Validator request:            | The CPA PDD does not include the values of the identified parameters with which the project IRR exceed the benchmark and the possibility of this occurring.  |                       |
| Project participant response: | The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis.<br>According to the UNFCCC "Guidance on the Assessment of Investment Analysis" (ver. 5):<br>In cases where a scenario will result in the project activity passing the benchmark or becoming |                       |

the most financially attractive alternative the DOE shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity.

Under all sensitivity analysis scenarios, the CPA's project IRR does not increase beyond 11 % without CDM revenues and thus the profitability is still below the benchmark. However, from a conservative point of view, an analysis of the required values of these parameters to surpass the benchmark has also been carried out. These values are presented in Table 7 of the CPA-DD.

Following the UNFCCC Guidance, it has been stated that the values of the parameters to surpass the benchmark are not deemed realistic under current or future. This assessment is also included in section B.3.

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| Validator conclusion: | The CPA-DD has been amended and therefore CL 33 is closed. | Date: | 27/08/2012 |
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| No.:                          | CL 34   | Reference: | CPA DD B.3 |
| Validator request:            | The Common Practice analysis does not list all factors required in Step 2 and Step 3 of the analysis (i.e. the commercial operation start date of the analysed units; CDM status, type of fuel)   |            |            |
| Project participant response: | <p>Section B.3. includes the so-called Common Practice Analysis. Table 8 of the CPA-DD shows the power plants delivering an output (MW) within the applicable range which have started commercial operation before the start date of the project (February 2013).</p> <p>Table 8 now includes all factors required in Step 2 and Step 3 of the Common Practice analysis:</p> <ul style="list-style-type: none"> <li>• Name of power plant,</li> <li>• Capacity (MW),</li> <li>• Fuel,</li> <li>• CDM Project (Yes/No), and</li> <li>• Year of commercial operation start</li> </ul> |            |            |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 34 is closed.  | Date:      | 27/08/2012 |

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| No.:                          | CL 35  | Reference: | CPA DD B.5.2 |
| Validator request:            | Calculated value contain a typo of mixed digits (EGPJ,y = EGfacility,y = 55,145 MWh/y)   |            |              |
| Project participant response: | <p>The correct value of the net electricity generation per year and supplied to the SEIN is 55,154, as estimated by the pre-feasibility study (July 2011). This value is in accordance with the business case.</p> <p>Therefore, value of EGPJ,y = EGfacility,y has been corrected to 55,154 MWh/yr.</p> |            |              |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 35 is closed.   | Date:      | 27/08/2012   |

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| No.:                          | CL 36   | Reference: | CPA DD D.2 |
| Validator request:            | The date of the local consultation workshop in Maravillas to be checked & corrected.  |            |            |
| Project participant response: | <p>Table 7 (section D.2.) contains information regarding the local consultation workshops (location, assistance and date).</p> <p>The local consultation workshop in Maravillas was held on 11/09/2011.</p> <p>The date of the local consultation workshop in Maravillas included in Table 7 has been</p> |            |            |

corrected accordingly

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| Validator conclusion: | The CPA-DD has been amended and therefore CL 36 is closed. | Date: | 27/08/2012 |
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| No.:                          | CL 37  | Reference: | A.4.4.1, CPA DD D.4 |
| Validator request:            | Elaborate on the criteria used by the CME to define the financial contribution to social purposes on the CPA level (i.e. in what circumstance financial contributions are provided for local communities; the level of this contribution in case it is applicable).<br>Social Investment Plan content, contribution value breakdown and total volume to be updated.  |            |                     |
| Project participant response: | The following information has been included in section D.4. of the CPA-DD:<br>The Project will provide support for the construction of the school of Chipaco;<br>The tax transfer to the region is established by law and represents 1.00 % of the Project's revenues. At this stage it is not possible to calculate the exact amount that will be transferred to the region;<br>A social investment plan is going to be financed with parts of the revenues obtained by selling the CERs generated by the Project. The social investment plan is listed in FONAM's Local Stakeholder Consultation report. The commitments of the social investment plan for the Project foresees that 320,000 S./ (Peruvian Nuevo Sol) will be distributed to the region during the first 7 years of obtained revenues from the sales of CERs generated by the Project. |            |                     |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 37 is closed.   | Date:      | 27/08/2012          |

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| No.:                          | CL 38  | Reference: | PoA DD Annex 2, CPA DD Annex 2 |
| Validator request:            | Provide documentary evidence (signed statement) that PoA and the 1st CPA will not make use of any public funding or ODA.   |            |                                |
| Project participant response: | Documentary evidence (signed statement) that neither the PoA nor the 1st CPA will make use of any public funding or ODA has been provided to the DOE.<br>Moreover, a template for this documentary evidence has been designed. That way, further CPAs will sign the same statement before its inclusion under the PoA. |            |                                |
| Validator conclusion:         | The PoA-DD and CPA-DD have been amended and therefore CL 38 is closed.   | Date:      | 27/08/2012                     |

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| No.:                          | CL 39   | Reference: | CPA DD ( specific and generic) |
| Validator request:            | Please update the CPA in line with the PoA changes (i.e. eligibility criteria,; measurement setup options)  |            |                                |
| Project participant response: | The CPA has been updated in line with all PoA changes. Specifically, the following sections of the CPA-DD have considered the changes in the PoA-DD: A.1. (date and version), A.2. (name of the host country), A.3. (correct name of the CPA developer), A.4. (sharing of substations/transmission lines by several power plants), B.2. (eligibility criteria), B.3. (version of Tools referred, justification of selected benchmark, B.4. (sources and gases included/excluded from the boundary), B.5. (data and parameters available at validation), B.6. (parameters to be monitored), C.3. (host Party laws/regulations on environmental impact assessment). |            |                                |
| Validator conclusion:         | The CPA-DD has been amended and therefore CL 39 is closed.  | Date:      | 27/08/2012                     |

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| No.: | CL 40 | Reference: | Entire documentation |
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| Validator request:            | The UNFCCC Secretariat has published its first PoA CC and IRC checklists on 3 May ( <a href="http://cdm.unfccc.int/Reference/Procedures/reg_check05.pdf">http://cdm.unfccc.int/Reference/Procedures/reg_check05.pdf</a> , <a href="http://cdm.unfccc.int/Reference/Procedures/reg_check06.pdf">http://cdm.unfccc.int/Reference/Procedures/reg_check06.pdf</a> ) against which the updated PoA documents need to be checked.   |                  |
| Project participant response: | Both the PoA-DD and the CPA-DD are consistent with the items listed in the "Information and Reporting Checklist" for PoA Request for Registration under:<br>Section 1.1. - Part I. Programme of Activities (PoA-DD);<br>Section 1.2. - Part II. Generic Component Project Activity (Generic CPA-DD);<br>Section 1.3. - Part III. Specific Component Project Activity (CPA-DD);<br>Both the PoA-DD and the CPA-DD are consistent with the items listed in the "Completeness Check Checklist" for PoA Request for Registration. |                  |
| Validator conclusion:         | The PoA-DD and CPA-DD have been amended and therefore CL 40 is closed.  | Date: 27/08/2012 |

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| No.:                          | CAR 1   | Reference: A.4.2.2, CPA B.2. |
| Validator request:            | Eligibility criteria is not fully compliant with EB 65 Annex 3 as the applicable standard approved on 25 November 2011, the date of the PoA DD submission to the DoE for validation. Paragraph 14. of EB 65 Annex 3 lists the eligibility criteria.   |                              |
| Project participant response: | Eligibility criteria have been amended to be fully compliant with EB 65 Annex 3. Moreover, reference to the 'STANDARD FOR DEMONSTRATION OF ADDITIONALITY, DEVELOPMENT OF ELIGIBILITY CRITERIA AND APPLICATION OF MULTIPLE METHODOLOGIES FOR PROGRAMME OF ACTIVITIES', Version 01.0 (EB 65, Annex 3), has been included. |                              |
| Validator conclusion:         | The PoA-DD and CPA-DD have been amended and therefore CAR 1 is closed.  | Date: 27/08/2012             |

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| No.:                          | CAR 2   | Reference: A.4.3, CPA |
| Validator request:            | The use of the latest applicable version of the "Tool for the demonstration and assessment of additionality" is mandatory for all CPAs. Therefore, for the first CPA version 6.0 of the Tool is applicable. |                       |
| Project participant response: | For the first CPA-DD, version 06.0.0 of the "Tool for the demonstration and assessment of additionality" (EB 65, Annex 21) has been applied. The CPA-DD has been updated accordingly.                       |                       |
| Validator conclusion:         | The PoA-DD and CPA-DD have been amended and therefore CAR 2 is closed.  | Date: 27/08/2012      |

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| No.:                          | CAR 3   | Reference: E.3, E.6.2, B.5.2 of the CPA |
| Validator request:            | Project activity emission sources (Table 2) are not in line with project activity/methodology. The reservoir methane emissions depending of the power density of the reservoir as assessed on CPA level is not elaborated and referred to the applicable EB 23 decision defining the default factor of 90 kgCO <sub>2</sub> e/MWh.  |   |
| Project participant response: | Table 2 of the PoA-DD has been modified to include emissions sources included in or excluded from the project boundary in line with project activity/methodology (for hydro power plants, emissions of CH <sub>4</sub> from the reservoir).<br>Reference to default emission factor for emissions from reservoirs of hydro power plants has been included (90 kgCO <sub>2</sub> e/MWh, as per EB 23 decision, Annex 5, page 1: <a href="http://cdm.unfccc.int/EB/023/eb23_repan5.pdf">http://cdm.unfccc.int/EB/023/eb23_repan5.pdf</a> ). |   |
| Validator conclusion:         | The PoA-DD and the generic CPA-DD have been amended and therefore CAR 3 is closed.  | Date: 27/08/2012                        |

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| No.:                          | CAR 4  | Reference: E.6.2 |
| Validator request:            | 1st CPA project specific details are listed in the PoA DD.   |                  |
| Project participant response: | The PoA-DD should only contain generic information for all CPAs to be included under this PoA. Therefore, references to the 1st CPA have been deleted from the following sections of the PoA-DD:<br>Section E.3. (emissions sources included in or excluded from the project boundary);<br>Section E.6.2. (calculation of power density of the project activity PD and mention to El Carmen in the calculation of EGPJ,y sub-section); |                  |



Section E.7.1. (reference to the specific area of the reservoir of the 1st CPA was incorrectly included in the description of parameter APJ)

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| Validator conclusion: | The PoA-DD has been amended and therefore CAR 4 is closed. | Date: | 27/08/2012 |
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| No.:                          | CAR 5  | Reference: | E.6.3      |
| Validator request:            | The E.6.3. Section "Data and parameters that are to be reported in CDM-CPA-DD form" does not contain all required parameters (i.e. operating margin) to establish the combined margin grid factor. Moreover, elaborate the way how the grid emission factor calculation is updated annually for the purposes of (a) monitoring and for (b) new CPA inclusions using (1) publicly available and (2) requested data from COES if applicable.   |            |            |
| Project participant response: | <p>The following data and parameters have been included in section E.6.3 of the CPA-DD: APJ and EFRes.</p> <p>Therefore, E.6.3. Section "Data and parameters that are to be reported in CDM-CPA-DD form" now includes all required parameters as per:</p> <p>"ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 13.0.0 of EB 65, Annex 16), and</p> <p>"Tool to calculate the emission factor for an electricity system" (version 02.2.1 of EB 63 Annex 19)</p> <p>According to the "Tool to Calculate the Emission Factor for an Electricity System (Version 02.2.1)", in terms of vintage of data, project participants have chosen option 1.</p> <p>For the first crediting period, the BM emission factor is calculated ex-ante based on the most recent information available on units already built for sample group, m, at the time of CPA-DD submission to the DOE for Validation.</p> <p>For the second crediting period, the BM emission factor will be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE.</p> <p>For the third crediting period, the BM emission factor calculated for the second crediting period will be used.</p> <p>This option does not require monitoring of the emission factor during the crediting period and this statement is included in the PDD.</p> |            |            |
| Validator conclusion:         | The CPA-DD has been amended and therefore CAR 5 is closed.   | Date:      | 27/08/2012 |

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| No.:                          | CAR 6   | Reference: | 1st CPA    |
| Validator request:            | The 1st CPA DD does not include project IRR with and without CER revenues.  |            |            |
| Project participant response: | <p>In Section B.3 (Sub-step 2c) the values of post-tax project IRR with and without considering the sale of CERs have been included:<br/> Project IRR without CERs sales = 9.62%;<br/> Project IRR with CERs sales = 10.82%;<br/> On the one hand, this shows that the post-tax IRR of the CPA without CER revenue is below the post-tax benchmark IRR (12%). Since the Project has a less favourable indicator (lower project IRR) than the benchmark, the project activity cannot be considered as financially attractive.<br/> On the other hand, this shows that the revenue from the CER sales would greatly improve the financial feasibility of the Project, providing an incentive to overcome existing barriers.</p> |            |            |
| Validator conclusion:         | The CPA-DD has been amended and therefore CAR 6 is closed.  | Date:      | 27/08/2012 |

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| No.:                          | FAR 1  | Reference: | 1st CPA B.3. |
| Validator request:            | The 1st CPA starting date is the financial closure for hydropower investment which is expected by the beginning of 2013 (28/02/2013). As the CPA starting date is in the future, the then available investment analysis shall be checked whether it still supports the claim that the project IRR is below the validated benchmark. This FAR, based on the 1st CPA, is in line with VVM paragraph 37 as it does not relate to the CDM requirements for registration. |            |              |
| Project participant response: |  |            |              |
| Validator conclusion:         | n/a  | Date:      |              |