VERIFICATION / CERTIFICATION REPORT

ARAPUTANGA CENTRAIS ELÉTRICAS S. A. - ARAPUCEL - SMALL HYDROELECTRIC POWER PLANTS PROJECT, IN BRAZIL

(UNFCCC Registration Ref. No. 0530)

Monitoring Period:
1 January 2009 to 31 August 2009

REPORT NO. 2010-9191
REVISION NO. 01

DET NORSKE VERITAS

VERIFICATION / CERTIFICATION REPORT

Date of first issue: 15 June 2010	Project No.: PRJC-233515-2010-CCS-BRA
Approved by: Agnes Dudek	Organisational unit: DNV KEMA Energy and Sustainability Accredited Climate Change Services
Client: Alto Jauru Energetica S/A	Client ref.: Ricardo Rêgo

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Summary:

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions reported for the "ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project" (UNFCCC Registration Ref. No. 0530) for the period 1 January 2009 to 31 August 2009.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (version 04) of 2 April 2012 are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology ACM0002 (version 05) and the monitoring plan contained in the revised Project Design Document, version 06 of 17 December 2010.

DNV Climate Change Services AS is able to certify that the emission reductions from the "ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project" during the period 1 January 2009 to 31 August 2009 amount to 110 786 tonnes of CO_2 equivalent.

Report No.: 2010-9191	Subject Group: Environment
Report title: ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project, in Brazil	
Work carried out by: Andrea Leiroz, Fabiana Philipi, Lumír Nemecek and Gabriel Baines	
Work verified by: Agnes Dudek	

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Abbreviations

ANEEL	National Agency of Electric Energy
CAR	Corrective Action Request
CCEE	Brazilian Chamber of Electricity Energy Commercialization
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CEMAT	Electric Company of Mato Grosso State
CER	Certified Emission Reduction(s)
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
DNV	Det Norske Veritas
EQAO	Ecopart Assessoria em Negócios Empresariais Ltda.
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
INMETRO	National Institute of Metrology, Standardization and Industrial Quality.
MP	Monitoring Plan
N_2O	Nitrous oxide
ONS	National Electric System Operator
PDD	Project Design Document
PPA	Power Purchase Agreements
SEMA/MT	Environmental Agency of Mato Grosso State
SHPP	Small Hydro Power Plant
UNFCCC	United Nations Framework Convention on Climate Change
GWP	Global Warming Potential

1 INTRODUCTION

Alto Jauru Energetica S/A has commissioned DNV Climate Change Services AS (DNV) to carry out the verification and certification of emission reductions reported for the "ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project" (the project) in the period 1 January 2009 to 31 August 2009. This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.1 Objective

Verification is the periodic independent review and *ex-post* determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the "ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project" for the period 1 January 2009 to 31 August 2009.

1.2 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

1.3 Description of the project activity

Project Parties:	Brazil (host Party), Japan and United Kingdom of Great Britain and Northern Ireland (Annex I Parties)
Title of project activity:	ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project
UNFCCC registration No:	0530
UNFCCC registration date:	15 December 2006
Baseline and monitoring methodology	ACM0002 (version 05)

Project Participants:	Araputanga Centrais Elétricas S.A., Arapucel Indiavaí S.A., Arapucel Ombreiras S.A. from Brazil; The Chugoku Electric Power Co., Inc. and Sumitomo Mitsui Banking Corporation from Japan and Mitsubishi UFJ Morgan Stanley Securities Co., Ltd from United Kingdom of Great Britain and Northern Ireland
Location of the project activity:	The three small hydro power plants of Arapucel project activity are located in Jaurú river, in the municipalities of Araputanga, Indiavaí and Jaurú, state of Mato Grosso, Midwestern region of Brazil.
Project's crediting period:	1 September 2002 to 31 August 2009
Period verified in this verification:	1 January 2009 to 31 August 2009

The ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project developed by Araputanga Centrais Elétricas S.A, Arapucel Indiavaí S.A and Arapucel Ombreiras S.A (Brennand Energia Group companies) as project proponents and operators of the project, comprises of three run-of-river hydroelectric power plants operating with two Vatech Francis Turbines (SHPP Antônio Brennand), four Vatech Francis Turbines (SHPP Indiavaí) and two Alston Kaplan Turbines (SHPP Ombreiras) for generation of electricity which partly displaces electricity from the interconnected Brazilian grid.

The name of SHPP Alto Jaurú was altered to Antônio Brennand according to ANEEL Resolution /7/.

The plant was built along the Jaurú River and it is located at Araputanga, Indiavaí and Jaurú municipalities – Mato Grosso State. The installed turbine-generators set of the three hydro powers (Alto Jaurú, Indiavaí and Ombreiras) have a total installed electricity generation capacity of 75.96 MW.

The net electricity supplied to the grid is measured by CEMAT (Centrais Elétricas do Mato Grosso) which is the local energy company. The CCEE (Brazilian Chamber of Electricity Energy Commercialization) controls and monitors the electricity available in the grid.

The project activity is the installation of three new grid-connected renewable power plants, the project reduces GHG emissions by displacing electricity that would otherwise have been generated in the existing interconnected grid.

1.4 Methodology for determining emission reductions

According to the applied methodology ACM0002 version 05 /18/, the emission reductions for the project are determined as the difference between the baseline emissions, project emissions and leakage:

$ER_y = BE_y - PE_y - L_y$

PE_y and L_y are considered as to be zero as stated in the registered PDD /19/ and validation report /16/. Therefore, the emission reductions are accounted as:

$ER_y = BE_y = EG_y \times EF_y$

Where:

EF_y is the emission factor of the grid to which the project is connected, and was determined and validated *ex-post* as 0.3231 tCO_2/MWh and will be updated annually during the first crediting period.

EG_y is the net electricity generation delivered to the grid, which is determined by the electricity exported to the grid minus the electricity imported from the grid.

2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

i) Review of project documentation /1/ - /13/;

ii) The net electricity supplied by the project to the grid which is multiplied with a grid baseline combined emission factor of 0.3231 tCO_2e/MWh /3/;

iii) The actual installed capacity of the 75.96 MW hydro power plant to ensure the conformance with the descriptions in the registered PDD /19/ ;

Verification team

				Type of involvement					
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit	Reporting	Supervision of work	Technical review	TA 1.2 competence
Team leader (Verifier) until 30 November 2011	Leiroz	Andrea	Brazil	✓		✓	✓		✓
Team leader (Verifier) from 1 December 2011 onwards	Baines	Gabriel	Brazil	✓		✓	✓		✓
GHG Auditor	Philipi	Fabiana	Brazil	✓	✓	✓			
Expert	Nemecek	Lumír	Czech Republic	✓					✓
Technical reviewer	Dudek	Agnes	Norway					✓	✓

Duration of verification

Monitoring report publication:	21 May 2010
Preparations:	From 8 June 2010 to 10 June 2010
On-site verification:	From 12 July 2010 to 13 July 2010
Reporting, calculation checks and QA/QC:	From 15 July 2010 to 13 June 2012

2.1 Review of documentation

The monitoring report, version 01 dated 4 May 2010 /1/, has been made publicly available on the CDM website. In addition to the monitoring report, the verification has been performed based on the review of the following documentation provided by the project participants:

- Monitoring report for the period issued on 4 May 2010 (version 01) and revised on 2 April 2012 (version 03) /1/;
- The registered PDD, including the monitoring plan and the corresponding validation report /19/ /16/;
- The previous verification report /17/;
- The approved baseline and monitoring methodology ACM0002 version 05 /18/ applied by the project;
- Request for approval of changes accepted on 29 September 2011 /19/ , due to change in the installed capacity of the project activity compared to the information available in the original registered PDD.
- Other information and references relevant to the project activity's resulting emission reductions /4/ - /6/.

During the desk review, DNV has applied standard auditing techniques to assess the quality of information provided. The following activities were performed:

- A review of the data and information presented /2/ /3/ /4/ /5/ to verify their completeness;
- A review of the monitoring plan /19/ and monitoring methodology /18/, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures; and
- An evaluation of data management and the quality assurance and quality control system /12/ /13//19/ in the context of their influence on the generation and reporting of emission reductions.

2.2 Site visit

On 12 – 13 July 2010, DNV visited the three hydro power plants (SHPPs Antônio Brennand, Indiavaí and Ombreiras) located at Araputanga, Indiavaí and Jaurú municipalities, Mato Grosso State, Brazil and performed interviews with the project participants. The key personnel of the project /26/ - /32/ were interviewed or assisted the verification team.

During the on-site assessment, DNV has applied standard auditing techniques to assess the quality of information provided. The following aspects of the CDM project activity have been verified:

- The implementation and operation of the CDM project activity as per the registered PDD ;
- The information flow for generating, aggregating and reporting of the monitoring parameters; and
- The operational and data collection procedures are implemented in accordance with the revised monitoring plan in the PDD.

Further, the following activities were performed:

- A cross-check between information provided in the monitoring report /1/ and data from other sources /5/ /6/;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD /19/ and the selected methodology /18/;
- A review of calculations and assumptions made in determining the GHG data and emission reductions /2/ /3/; and
- An identification that quality control and quality assurance procedures /12/ /13/ /19/ in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The data presented in the monitoring report was assessed by review of the detailed project documentation and production records, as well as by interviews with personnel at Alto Jauru Energetica S/A , and observation of collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results; to verify the correct application of the approved monitoring methodology and the determination of the emission reductions.

In addition, all parameters required by the monitoring methodology ACM0002 version 05 /18/, and the management system were assessed during the site visit.

2.3 Reporting of findings

A corrective action request (CAR) is issued, where:

i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

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

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

Three CARs and two CLs were raised and have been adequately addressed by the project participants (refer to Appendix A). No FAR was observed in this periodical verification.

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the "ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project" for the period 1 January 2009 to 31 August 2009.

3.1 Remaining issues, FARs from previous validation / verification

The remaining FAR 1 issued on the previous verification audit /17/ was converted on a CAR 1 and correctly solved by the project participant /19/ . Its assessment is described in Appendix A.

3.2 Project implementation

As part of the site visit DNV was able to confirm that the project implementation is in accordance with the project description contained in revised PDD of 17 December 2010 /19/.

The verification team confirmed through visual inspection and document review that all physical features of the proposed CDM project activity including data collection systems and storage systems have been implemented in accordance with the registered PDD. DNV confirmed during the on-site visit that the CDM project is completely operational. DNV confirmed that a request for approval of changes has been requested to CDM Executive Board and approved on 29 September 2011 . Changes approved in the request were:

- operational capacity of the SHPP Antônio Brennand was increased from 20 MW to 21.96 MW ;

- The total installed capacity of the project considering the three SHPPs was also altered in consequence of the increase in the installed capacity of the Antônio Brennand plant, from 74 MW to 75.96 MW ;

- Rotational speed of the turbines was corrected or added respectively to the revised PDD /19/ for all plants. At SHPP Indiavaí four generators with a lower power rating (7.78 MVA) were installed instead of two generators (17.5 MW) as foreseen in the registered PDD /19/.

The project is a hydro power plant, located at Araputanga, Indiavaí and Jaurú municipalities, Mato Grosso State, Brazil.

The project was implemented in three phases and the operations started, prior to its CDM registration on 15 December 2006, as described below. The selected monitoring period 1 January 2009 to 31 August 2009 is within the first crediting period of 1 September 2002 to 31 August 2009.

The project's installation capacity is 75.96 MW. The SHPP Antonio Brennand installed capacity is 21.96 MW consisting of 2 sets of 10.307 MW Francis turbines horizontal axis manufactured by VaTech Hydro Brasil and the associated 10.98 MW (12.20 MVA * cos phi 0.90) generators type Toshiba TAKL, manufactured by Toshiba do Brasil S.A, as DNV confirmed in the site visit of 12 and 13 July 2010. The first unit started operation on 13 September 2002 and the second one on 30 September 2002 /10/.
The SHPP Indiavaí installed capacity is 28 MW consisting of 4 sets of 7.5 MW Francis turbines horizontal axis manufactured by VaTech Hydro Brasil and the associated 7.0 MW (7.78 MVA * cos phi 0.90) generators with type Toshiba TAKL, manufactured by Toshiba do

Brasil S.A., as DNV confirmed in the site visit of 12 and 13 July 2010. The first unit started operation on 1 August 2003, the second unit on 3 August 2003. According to the PDD this phase entered in operation in July 2004, while in the monitoring report it entered in operation in 1 August 2003. PDD was registered with this mistake. ANEEL's document /10/ confirms this and all previous verifications are in line with the correct date, the same as in ANEEL's document /10/. The third unit started operation in 13 October 2003 and the fourth unit on 22 August 2003 /10/.

The SHPP Ombreira installed capacity is 26 MW consisting of 2 sets of 13.5 MW Kaplan turbines type S and the associated 13.05 MW (14.50 MVA * cos phi 0.90) generators type SOH 333/59/24, all of which are manufactured by Alstom Power Brasil Ltda, as DNV confirmed in the site visit of 12 and 13 July 2010 . The first unit started operation on 22 July 2005 and the second one on 28 July 2005 /10/.

The details of the turbines and generators with respect to installation and capacity have been verified to be consistent with description indicated in the revised PDD /19/. The actual implementation of the project during this verification period was verified in terms of name plate capacities of each turbine and generator, monitoring equipment and their accuracy levels.

The net electricity is supplied to the Brazilian South-Southeast-Midwest grid under the Power Purchase Agreements (PPA) /14/. The principal electricity meter P and backup meter B were installed at Jaurú substation. All meters are bidirectional with 0.2S accuracy, all of which are used for both measuring the electricity exported to and imported from the grid. The electricity meters are locked to guarantee the integrity of the instruments. This is in line with the PDD monitoring plan.

3.3 Information (data and variables) provided in the monitoring report that is different from that stated in the registered PDD

The electricity generation reported in this monitoring period is 342 921 MWh in the period from 1 January 2009 to 31 August 2009 (i.e. 243 days). The expected generation for 1 January 2009 to 31 August 2009 (for 243 days) in the registered PDD was 330 639 MWh /19/. The values were calculated as: PDD states 87 156 tCO2e for 2009, with an emission factor of 263.6 kgCO2e/MWh, hence, generation is 330 639 MWh. Difference between expected and actual generation is 3.7%, higher than expected. The variation is deemed to be within a reasonable range due to the natural variation of rain /20/.

Apart from the difference in expected and actual emission reductions and the grid emission factor (the grid emission factor is calculated *ex-post* and a different value has been considered in the monitoring period), other information (data and variables) stated in monitoring report are consistent with the revised PDD /19/.

3.4 Compliance of monitoring plan with monitoring methodology

DNV is able to confirm that the monitoring plan contained in the registered PDD of 17 December 2010 /19/ is in accordance with the approved methodology applied by the project activity, i.e. ACM0002 (version 05) /18/.

3.5 Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the revised PDD of 17 December 2010 /19/.

All parameters stated in the validated monitoring plan are monitored and reported appropriately. The monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, aggregation, to recording, calculation and reporting) for these parameters is provided in the monitoring report. The information flow for each parameter is further verified in the following sections. DNV confirms that neither a revision nor a deviation to the monitoring plan has been requested to CDM Executive Board.

3.5.1 Monitoring parameters

According to the monitoring plan of the registered PDD, there are 5 parameters that need to be monitored:

- EG_y - Electricity generation of the project delivered to grid;
- EF_y - CO_2 emission factor of the grid;
- $EF_{OM,y}$ - CO_2 operating margin emission factor of the grid;
- $EF_{BM,y}$ - CO_2 build margin emission factor of the grid. .
- λ_y - Fraction of time during which low cost/ must-run sources are on the margin

The following tables are related to the measured parameters in the monitoring plan / methodology:

	Assessment/ Observation
Data / Parameter: (as in monitoring plan of PDD):	EG_y - Electricity generation of the project delivered to grid
Measuring frequency:	15-minutes-measurement.
Reporting frequency:	Monthly recording.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
Type of monitoring equipment:	Electricity meters bi-directional type located at the Jaurú's substation. The energy meters are specified by the energy distribution company and approved by ONS /21/ and CCEE. Each power plant has a pair of SL7000 meter manufactured by Actaris Metering Systems, as DNV confirmed in the site visit. Therefore, there are six meters at the project plants. In addition, there is another pair of meters ION8300 located at Jaurú substation: principal and other one used as a backup meter. Only CEMAT has access to the meters located at the substation. Meters located at the plant measures the gross electricity and the meters located at the substation measures the net electricity. Therefore, meters located at the substation are used for the electricity commercialization and for the purpose of emission reduction

	calculation. Jaurú substation: Type: ION8300 Quantity: 2 (principal and backup) Serial number: PS-0601A094-01 (principal) and PS-0601A087-01 (backup). SHPP Ombreiras: Type: SL7000 Quantity: 2 (principal and backup) Serial number: 36008987 (principal) and PS-36008988 (backup). SHPP Antonio Brennand: Type: SL7000 Quantity: 2 (principal and backup) Serial number: 36016991 (principal) and PS-36016992 (backup). SHPP Indiavaí: Type: SL7000 Quantity: 2 (principal and backup) Serial number: 36008989 (principal) and PS-36008990 (backup).
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	The accuracy of equipment used for monitoring is not stated in the PDD. However, the accuracy of 0.2S represent good monitoring practise. According to the calibration certificates /4/: - the average error found for the meters located at the Jaurú substation was 0.0396% to the principal meter and 0.0218% to the backup meter, which is within the 0.2S limit. - The average error found for the meters located at SHPP Ombreiras was 0.047% to the principal meter and 0.060% to the backup meter, which is within the 0.2S limit. - The average error found for the meters located at SHPP Antonio Brennand was 0.010% to the principal meter and 0.030% to the backup meter, which is within the 0.2S limit. The average error found for the meters located at SHPP Indiavaí was 0.090% to the principal meter and 0.090% to the backup meter, which is

	within the 0.2S limit.
Calibration frequency /interval:	Once every 2 years according to ONS procedures /21/.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not established in PDD. However, the monitoring report refers to a 2 years calibration interval, which is the interval required by ONS /21/, representing good monitoring practice.
Company performing the calibration:	Brennand Group is responsible for the calibration of the six plant meters and CEMAT is responsible for the calibration of the SE Jauru meters. Brennand Group hired CEMAT to calibrate also the six plant meters /4/. CEMAT energy standard is calibrated annually by INMETRO /22/.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes.
Does the validity of the calibration(s) cover the whole reporting period? Show all calibration dates relevant for the reporting period	Yes, calibrations are valid for the whole reporting period /4/. Date of the last calibration of Jauru Substation meters: 26 February 2008 -Validity: 26 February 2010 Date of the last calibration of SHPP Ombreiras meters: 15 April 2008 -Validity: 15 April 2010 Date of the last calibration of SHPP Antônio Brennand meters: April 2008 -Validity: 15 April 2010 Date of the last calibration of SHPP Indiavaí meters: 15April 2008 -Validity: 15 April 2010
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in the MR /1/ was cross-checked with CEMAT monthly energy generation report /6/ and Brennand internal energy control /5/. DNV confirm that the data provided in the MR are in accordance with the evidence reviewed.
How were the values in the monitoring report verified?	The amount of electricity delivered to the grid by the project activity is available on CCEE's website /23/ and CEMAT's report /6/. All the data is in compliance with the figures stated in the monitoring report. DNV is able to confirm that the calculation process and the conclusion are correct.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct	Yes. The amount of energy invoiced is checked by CEMAT. The monitoring report and the CERs calculations, based on CEMAT energy

transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	generation reports, are prepared and double checked by Alto Jauru Energetica S/A and Brennand Energia in order to ensure QA/QC procedures (described in Section 3.7). The CERs calculations are based on CEMAT energy generation reports, all of them assessed by DNV during the verification audit. Meters located at the Jauru substation (principal and backup) measure the gross electricity dispatched to the grid by SHPPs Antonio Brennand, Indiavaí and Ombreiras. For the determination of the electricity delivered to the grid by each power utility it is used ONS procedures /21/. According to it /21/, although each power plant of the project activity has two pair of energy meters, the electricity delivered by the power plants is the one measured at the connection point (Jauru substation) and are calculated by CEMAT considering the losses in transmission (divided among the producers of the same connection point). Project participants can compare the electricity exported by the power plants calculated and informed by CEMAT /6/ with the total energy measurements /5/ taken in the pairs of energy meters located at each power plant, which are controlled in real time. The energy is measured continually and recorded every 15 minutes by the power meters and the operators of PCH Antônio Brennand, PCH Ombreiras and PCH Indiavaí take note of the power meter readings once a day. The collected data (including the power meter readings) is used in electronic spreadsheets /2/ for power generation and for internal control, which were cross-checked by DNV with the daily reports of the electricity delivered to the grid (Brennand Energia) /5/ and with CEMAT's monthly reports of energy invoiced for the period /6/. The internal generation records are systematically compared to the amount of electricity registered, based on the readings records of the power meters owned and administered by CEMAT. This data is constantly monitored and cross-checked by Brennand Energia's team in order to guarantee quality assurance, transparency and quality

	control of data records. The electricity generation data, including the electric energy dispatched to the grid and the electricity from the grid consumed by the project activity, both based on the readings records of the electricity meters, are used to calculate the emissions reductions of the project activity as well as for the elaboration of the monitoring report.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan of PDD):	$\boldsymbol{EF}_y$ - CO_2 emission factor of the grid;
Measuring frequency:	Yearly
Reporting frequency:	Yearly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	There is no equipment needed for monitoring this parameter.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no equipment needed for monitoring this parameter, thus accuracy determination is not applicable.
Calibration frequency /interval:	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Company performing the calibration:	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Does the validity of the calibration(s) cover	There is no equipment needed for monitoring

the whole reporting period? Show all calibration dates relevant for the reporting period	this parameter, thus calibration frequency is not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, data used in the calculation of the emission factor of the grid was cross-checked with National Operator of the System data /24/ and was found to be correct.
How were the values in the monitoring report verified?	Data presented in the calculation of the emission factor of the grid was cross-checked with National Operator of the System data /24/ and calculations were reviewed. Data and calculation were found to be correct.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data is obtained from official government data (National Operator of the System data /24/) in excel spreadsheets /3/ and DNV verified the information flow from data generation, aggregation, to recording, calculation and reporting – described in Section 3.7.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Data is obtained from official government data (National Operator of the System data /24/) covering the whole year, therefore there is no case of partial data available.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan of PDD):	$\boldsymbol{EF_{OM,y}}$ - CO_2 operating margin emission factor of the grid;
Measuring frequency:	Yearly
Reporting frequency:	Yearly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	There is no equipment needed for monitoring this parameter.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no equipment needed for monitoring this parameter, thus accuracy determination is not applicable.
Calibration frequency /interval:	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Is the calibration interval in line with the	There is no equipment needed for monitoring

monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	this parameter, thus calibration frequency is not applicable.
Company performing the calibration:	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Does the validity of the calibration(s) cover the whole reporting period? Show all calibration dates relevant for the reporting period	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, data used in the calculation of the operating margin emission factor of the grid was cross-checked with National Operator of the System data /24/ and was found to be correct.
How were the values in the monitoring report verified?	Data presented in the calculation of the operating margin emission factor of the grid was cross-checked with National Operator of the System data /24/ and calculations were reviewed. Data and calculation were found to be correct.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data is obtained from official government data (National Operator of the System data /24/) in excel spreadsheets /3/ and DNV verified the information flow from data generation, aggregation, to recording, calculation and reporting – described in Section 3.7.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Data is obtained from official government data (National Operator of the System data /24/) covering the whole year, therefore there is no case of partial data available.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan of PDD):	$\boldsymbol{EF_{BM,y}}$ - CO_2 build margin emission factor of the grid.
Measuring frequency:	Yearly
Reporting frequency:	Yearly

Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	There is no equipment needed for monitoring this parameter.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no equipment needed for monitoring this parameter, thus accuracy determination is not applicable.
Calibration frequency /interval:	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Company performing the calibration:	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Does the validity of the calibration(s) cover the whole reporting period? Show all calibration dates relevant for the reporting period	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, data used in the calculation of the build margin emission factor of the grid was cross-checked with National Operator of the System data /24/ and was found to be correct.
How were the values in the monitoring report verified?	Data presented in the calculation of the build margin emission factor of the grid was cross-checked with National Operator of the System data /24/ and calculations were reviewed. Data and calculation were found to be correct.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data is obtained from official government data (National Operator of the System data /24/) in excel spreadsheets /3/ and DNV verified the information flow from data generation, aggregation, to recording, calculation and reporting – described in Section 3.7.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring	Data is obtained from official government data (National Operator of the System data /24/) covering the whole year, therefore there is no case of partial data available.

plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	

	Assessment/ Observation
Data / Parameter: (as in monitoring plan of PDD):	λ_y - Fraction of time during which low cost/ must-run sources are on the margin
Measuring frequency:	Yearly
Reporting frequency:	Yearly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	There is no equipment needed for monitoring this parameter.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	There is no equipment needed for monitoring this parameter, thus accuracy determination is not applicable.
Calibration frequency /interval:	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Company performing the calibration:	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
Does the validity of the calibration(s) cover the whole reporting period? Show all calibration dates relevant for the reporting period	There is no equipment needed for monitoring this parameter, thus calibration frequency is not applicable.
If applicable, has the reported data been cross-checked with other available data?	Yes, data used in the calculation of the fraction of time during which low cost/ must-run sources are on the margin was cross-checked with National Operator of the System data /24/ for the same period of this monitoring period and was found to be correct.
How were the values in the monitoring report verified?	Data presented in the calculation of the fraction of time during which low cost/ must-run

	sources are on the margin was cross-checked with National Operator of the System data /24/ and calculations were reviewed. Data and calculation were found to be correct.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data is obtained from official government data (National Operator of the System data /24/) in excel spreadsheets /3/ and DNV verified the information flow from data generation, aggregation, to recording, calculation and reporting – described in Section 3.7.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Data is obtained from official government data (National Operator of the System data /24/) covering the whole year, therefore there is no case of partial data available.

Calibration records and accreditation certificates /22/ have been provided to the verification team. DNV is able to confirm that the meters were calibrated covering this monitoring period as per the registered PDD.

The emission reductions were correctly calculated using the net electricity supplied to the grid. The CM emission factor, expressed in tCO_2e/MWh, was calculated ex-post as 0.3231 for the Brazilian South-Southeast-Midwest interconnected system, based on public available data for the year of 2009 /24/.

The monitoring period is from 1 January 2009 to 31 August 2009. The grid emission factor of the Brazilian South-Southeast-Midwest grid was applied for the entire monitoring period, as defined in the registered PDD /19/.The calculations are based on electricity generation data provided by the National Operator System (ONS) /24/ for the electricity generated in the grid in the year 2009. DNV confirmed the data source is reliable, and cross-checked the calculation and result, which are correct.

The OM emission factor ($EF_{grid,OM,y}$),the BM emission factor ($EF_{grid,BM,y}$) and the fraction of time during which low cost/ must-run sources are on the margin (λ_y) are calculated *ex-post* for the South-Southeast-Midwest grid: calculated respectively as 0.5979 tCO_2e/MWh , 0.0484 tCO_2e/MWh and 40.98%, based on public available data for 2009/24/.

DNV verified the information flow (from data generation, aggregation, to recording, calculation and reporting – described in Section 3.7) for these parameters including the values in the monitoring reports /1/ and emission reductions calculation spreadsheet /2/.

3.6 Assessment of data and calculation of emission reductions

DNV confirms that appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and the assumptions, emission factors and default values that are applied in the calculation have been justified.

As stated in the section 1.4, the emission reductions ER_y by the project activity during the

monitoring period is the difference between the baseline emission, project emissions or leakage.

$ER_y = BE_y - PE_y - L_y$

3.6.1 Baseline emissions

Baseline emissions (BE_y in tCO_2) are the product of the baseline emission factor (EF_y in tCO_2/MWh) times the net electricity supplied by the project activity to the grid (EG_y in MWh).

EF_y is emission factor of the grid, which was calculated *ex-post* and will be updated annually during the first crediting period. EF_y of the proposed project in the registered PDD is 0.2636 tCO_2/MWh, which has been verified to be correct based on the availability of grid data /24/..

EG_y is the net electricity generation supplied to the grid, which is determined by the electricity supplied to the grid minus the imported electricity from the grid. The electricity exported to and imported from the grid was derived from the principal meter of Jauru Substation in the period 1 January 2009 to 31 August 2009, which was verified by DNV and cross-checked by the CEMAT's report /6/.

Meters located at the Jauru substation (principal and backup) measure the gross electricity dispatched to the grid by SHPPs Antonio Brennand, Indiavaí and Ombreiras. For the determination of the electricity delivered to the grid by each power utility it is used ONS procedures /21/. According to it /21/, although each power plant of the project activity has two pair of energy meters, the electricity delivered by the power plants is the one measured at the connection point (Jauru substation) and are calculated by CEMAT considering the losses in transmission (divided among the producers of the same connection point). Project participants can compare the electricity exported by the power plants calculated and informed by CEMAT /6/ with the total energy measurements /5/ taken in the pairs of energy meters located at each power plant, which are controlled in real time.

The net electricity generated by the project to the grid in this reporting period is measured by the meters at the Juaru substation and shown in the following table 2 below.

Table 2 Net electricity generated to the grid by the project (MWh)as measured at the Juaru substation

Arapucel Hydroelectric Project (4th monitoring period)				
		Antonio Brennand	**Indiavaí**	**Ombreiras**
Days/Month	**Month**	**Net Electricity Generated (MWh)**	**Net Electricity Generated(MWh)**	**Net Electricity Generated (MWh)**
31	January 2009	14.636	15.265	13.289
28	February 2009	13.101	15.161	13.202
31	March 2009	14.461	18.228	15.565
30	April 2009	14.013	16.924	14.672
31	May 2009	14.516	15.508	13.533
30	June 2009	14.140	14.076	12.355

31	July 2009	14.444	14.016	12.340
31	August 2009	14.507	13.144	11.825
Total	**8 Months**	**Total**	**Total**	**Total**
243 days		113 818	122 322	106 781

The gross electricity generated by the project and the monthly plant load factor for this reporting period is measured by the meters at each SHPP and shown in the following table 3.

Table 3 Gross electricity generated (MWh) and monthly plant load factor

Arapucel Hydroelectric Project (4th monitoring period)							
		Antonio Brennand		**Indiavaí**		**Ombreiras**	
Days/Month	**Month**	**Gross Electricity Generated (MWh)**	**Plant Load Factor - PLF (%)**	**Gross Electricity Generated (MWh)**	**Plant Load Factor - PLF (%)**	**Gross Electricity Generated (MWh)**	**Plant Load Factor - PLF (%)**
31	January 2009	14 791	91%	15 426	74%	13 430	69%
28	February 2009	13 301	90%	15 393	82%	13 403	77%
31	March 2009	14 690	90%	18 516	89%	15 812	82%
30	April 2009	14 231	90%	17 187	85%	14 900	80%
31	May 2009	14 721	90%	15 727	75%	13 724	71%
30	June 2009	14 328	91%	14 264	71%	12 520	67%
31	July 2009	14 641	90%	14 207	68%	12 508	65%
31	August 2009	14 695	90%	13 315	64%	11 978	62%
Total	**8 Months**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**
243 days		115 398	90.11%	124 034	76.04%	108 275	71.49%

Hence, the emission reduction is calculated based in the Net Electricity Generated (table 2, above), as follows:

EG_y = 342 921 MWh (sum of the values , and

$BE_y = EF_y * EG_y$ = 342 921 MWh * 0.3231 tCO_2/MWh = 110 786 tCO_2e (calculations were rounded down when multiplying the energy generated of each SHP by the emission factor)

Daily reports of the electricity delivered to the grid (Brennand Energia) were assessed /5/ and cross checked with CEMAT's monthly reports of energy invoiced for the period /6/ and these were used to determine the net electricity used for the calculation of the emission reductions of the project activity.

The calculations of the emissions reductions presented in the Monitoring Report of ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project, are in accordance to the values described in the related invoices /6/, which is the most accurate, credible and official source of information.

3.6.2 Project emissions

The project emissions are regarded as zero according to the methodology ACM0002.

3.6.3 Leakage

There are no leakages that need to be considered in applying the methodology ACM0002.

3.6.4 Emission reductions

Therefore, the emission reductions in this monitoring period are:

$ER_y = BE_y - PE_y - L_y = 110\,786 - 0 - 0 =$ 110 786 tCO_2e.

The expected emission reductions for the year 2009 in the registered PDD are 87 156 tonnes of CO_2 equivalents, and hence the reported emission reductions are 27.1% than the expected.

As outlined in Section 3.3, electricity generation is 3.7% higher than the estimate in the PDD /1/. The variation is deemed to be within a reasonable range due to the natural variation of rain /20/.

However, the emission factor of the grid is calculated ex-post, and it changed from 0.2636 tCO_2/MWh in the baseline to 0.3231 tCO_2/MWh in 2009 /3/, an increase of 22.6%.

The input data for calculating the emission reductions, the calculating process and the result are complete and transparent. Therefore, DNV is able to confirm the accuracy of the emission reductions.

3.7 Quality of evidence to determine emission reductions

DNV confirms that a complete set of data for this monitoring period was available to be verified and was in accordance with the registered PDD /19/.

The energy is measured continually and recorded every 15 minutes by the power meters and the operators of PCH Antônio Brennand, PCH Ombreiras and PCH Indiavaí take note of the power meter readings once a day. The collected data (including the power meter readings) is used in electronic spreadsheets /2/ for power generation and for internal control, which were cross-checked by DNV with the daily reports of the electricity delivered to the grid (Brennand Energia) /5/ and with CEMAT's monthly reports of energy invoiced for the period /6/. The internal generation records are systematically compared to the amount of electricity registered, based on the readings records of the power meters owned and administered by CEMAT. This data is constantly monitored and cross-checked by Brennand Energia's team in order to guarantee quality assurance, transparency and quality control of data records. The electricity generation data, including the electric energy dispatched to the grid and the electricity from the grid consumed by the project activity, both based on the readings records of the electricity meters, are used to calculate the emissions reductions of the project activity as well as for the elaboration of the monitoring report.

ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project makes use of its own electricity generated to run all the equipment of the power plant. In case of emergencies, stops or lack of energy, the power plant makes use of electricity from the grid, where necessary. During the site visit on 12 and 13 July 2010, DNV was able to check that the operators of the plant keep manual and electronic records of all stops of the plants /13/.

It is important to highlight that the electricity consumed by ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project from the grid is monitored by both Brennand Energia and CEMAT. Both CEMAT and Brennand Energia electricity meters are bidirectional and CEMAT discounts from the energy dispatched to the grid by PCH Antônio Brennand, PCH Ombreiras and PCH Indiavaí the energy consumed by the three plants, indicating in its monthly report /6/ of energy invoiced just the net electricity generated. Therefore, DNV was able to verify that the emissions reductions of the project activity are indeed calculated only considering the net electricity supplied to the grid, discounting the amount of electricity consumed from the grid by the hydroelectric power plants.
DNV verified that the calibrations of the electricity meters are the responsibility of CEMAT, the owner of the grid system to which all project electricity is dispatched to. CEMAT is the only entity responsible for maintaining the power meters calibrated in accordance with national regulation and their internal procedures. It is CEMAT that decides when the power meters shall be calibrated and/or changed if necessary. The calibration certificates of the power meters of each plant were issued by CEMAT on 15 April 2008 and the one from Jaurú sub-station was also issued by CEMAT on 26 February 2008 /4/. Those certificates were provided by the project participants and assessed by DNV.
DNV was also able to identify that the manual (printed) /12/ and electronic back-up of the information regarding the CDM project activity are available in Brennand Energia's office.

All necessary documentation were collected, referenced and aggregated and were easily accessible in hard-copy and electronic format. Measurements are performed by calibrated equipment, and the key data were cross-checked with CEMAT monthly energy generation report /6/ and Brennand internal energy control /5/. No assumptions are used that have any material influence on reported emission reductions.

3.8 Management system and quality assurance

Alto Jauru Energetica S/A is responsible for the operation and maintenance of the project, the monitoring equipment and data collection. The management system for the project has been verified to be in place by DNV on site. The organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management have been properly identified and put into operation.

DNV confirms that the responsibilities and authorities in the management and operational system for monitoring and reporting are in accordance with the responsibilities and authorities stated in the registered PDD /1/ and monitoring plan.

4 CERTIFICATION STATEMENT

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions that have been reported for the "ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project*" (UNFCCC Registration Reference No. 0530) for the period 1 January 2009 to 31 August 2009.*

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project. DNV does not express any opinion on the selected baseline scenario or on the validated and registered PDD.

DNV conducted the verification on the basis of the monitoring methodology ACM0002 (version 05), the monitoring plan contained in the registered Project Design Document version 06 of 17 December 2010 and the monitoring report version 04 dated 2 April 2012. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions of the "ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project" (UNFCCC Registration Ref. No. 0530) for the period 1 January 2009 to 31 August 2009 are fairly stated in the monitoring report (version 04 dated 2 April 2012.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002 (version 05) and the monitoring plan contained in the registered PDD (version 06) of 17 December 2010.

DNV Climate Change Services AS is able to certify that the emission reductions from the "ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project" during the period 1 January 2009 to 31 August 2009 amount to 110 786 tonnes of CO_2 equivalent.

Rio de Janeiro and Oslo, 13 June 2012.

Gabriel Baines
CDM Verifier
DNV Rio de Janeiro, Brazil

Agnes Dudek
Approver,
DNV Climate Change Services AS

5 REFERENCES

Documents provided by the Project Participants that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the periodic verification conclusions, and are usually further checked through interviews with key personnel.

/1/ Alto Jauru Energetica S/A : Monitoring reports of ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project for the period 1 January 2009 to 31 August 2009, version 01 dated 4 May 2010 and version 04 dated 2 April 2012.

/2/ Alto Jauru Energetica S/A : Monthly data archiving excel sheet also having the CERs calculation, version 3 dated 3 April 2012 (CERs e Historico de Geracao_v.3_2012.04.03.xls).

/3/ Alto Jauru Energetica S/A : Emission factor calculation spreadsheet, using data from the National Electric System Operator (ONS), version 1 dated 31 January 2012.

/4/ CEMAT:

Power Meter Calibration Certificate, issued by CEMAT on 15 April 2008. Power meter model: SL7000-SL761A061, serial number: 36016991 (principal meter)/ 36016992 (back up meter) (SHPP Antônio Brennand) valid until 15 April 2010;

Power Meter Calibration Certificate, issued by CEMAT on 15 April 2008. Power meter model: SL7000-SL761A061, serial number: 36008987 (principal meter)/ 36008988 (back up meter) (SHPP Ombreiras) valid until 15 April 2010;

Power Meter Calibration Certificate, issued by CEMAT on 15 April 2008. Power meter model: SL7000-SL761A061, serial number: 36008989 (principal meter)/ 36008990 (back up meter) (SHPP Indiavaí) valid until 15 April 2010;

Power Meter Calibration Certificate, issued by CEMAT on 26 February 2008. Power meter model: ION 8300, serial number: PS-0601A094-01 (principal meter)/ PS-0601A087-01 (back up meter) (Jaurú Sub-station) valid until 26 February 2010.

/5/ Brennand Energia: Daily report RDO of electricity generated - SHPP Antônio Brennad, SHPP Ombreiras and SHPP Indiavaí to the grid from 1 January 2009 to 31 August 2009..

/6/ CEMAT: Monthly report of energy invoiced of SHPP Antônio Brennad, SHPP Ombreiras and SHPP Indiavaí from 1 January 2009 to 31 August 2009.

/7/ ANEEL resolutions regarding SHPP Antonio Brennand:

Resolution #618 issued on 25 November 2003 (regarding the change in the SHPP name from SHPP Alto Jaurú to Antonio Brennand);

Dispatch #223 issued on 17 April 2003 (regarding the increase of the installed capacity from 20.02 MW to 21.96 MW).

/8/ ANEEL resolutions regarding SHPP Ombreiras:

Resolutions #834 issued on 8 July 2005 (regarding authorized installed capacity).

/9/ ANEEL resolutions regarding SHPP Indiavaí:

Resolution #502 issued on 6 August 2003 (regarding authorized installed capacity).

/10/ ANEEL resolutions and letters regarding operation starting date.

SHPP Antonio Brennand: Letter from ANEEL confirming 13 September 2002 for the first unit and 30 September 2002 for the second unit.

SHPP Indiavaí: Letter from ANEEL confirming 1 August 2003 for the first unit, 3 August 2003 for the second unit and 22 August 2003 for the fourth unit. Resolution #743 issued on 13 October 2003 for the start of the third unit.

SHPP Ombreiras: Resolution #896 issued on 22 July 2005 for the first unit and resolution #928 issued on 28 July 2005 for the second unit.

/11/ Operational Licenses:

SHPP Antônio Brennand: Operational License number 0288/2008, issued by the Environmental Agency of Mato Grosso State (SEMA/MT) on 8 May 2008 and valid until 10 September 2009 and Operational License number 298179/2009, issued by the Environmental Agency of Mato Grosso State (SEMA/MT) on 23 September 2009 and valid until 22 September 2012.

SHPP Ombreiras: Operational License number 0289/2008, issued by the Environmental Agency of Mato Grosso State (SEMA/MT) on 8 May 2008 and valid until 10 September 2009 and Operational License number 298178/2009, issued by the Environmental Agency of Mato Grosso State (SEMA/MT) on 23 September 2009 and valid until 22 September 2012.

SHPP Indiavaí: Operational License number 0291/2008, issued by the Environmental Agency of Mato Grosso State (SEMA/MT) on 9 May 2008 and valid until 19 January 2010 and Operational License number 298564/2009, issued by the Environmental Agency of Mato Grosso State (SEMA/MT) on 1 December 2009 and valid until 30 November 2012.

/12/ Operation Manual - ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project, SHPP Antônio Brennand, SHPP Ombreiras, SHPP Indiavaí revised on 2008, issued in October 2002 by Brennand Energia.

/13/ Engeman system - managerial control system: register of periodic maintenance booked (dates and procedures), register of all maintenances performed (periodic and emergencies), SHPP Antônio Brennand, SHPP Ombreiras and SHPP Indiavaí (January – August 2009).

/14/ Alto Jauru Energetica S/A and several others – PPAs for the SHPP Antônio Brennand, SHPP Ombreiras and SHPP Indiavaí. Dates ranging from 11 November 2005 to 17 August 2008.

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

/15/ CDM Executive Board: Validation and Verification Manual. Version 1.2

/16/ TUV SUD: Validation Report – ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project.
Report 6162-09/16 Revision 1, issued on 11 May 2011. Available at:
http://cdm.unfccc.int/filestorage/H/T/E/HTE5L72XPUVBOS40FQYA16NWI3JZR9/0

530%203%20Validation%20Opinion.pdf?t=YXB8bTFtaHVhfDBZzl7E5qKEMyWoC-vVWjQp
Report 567510 Revision 2, issued on 13 June 2006. Available at:
http://cdm.unfccc.int/UserManagement/FileStorage/DONVR75JCORK3R902R6RCSXPOR675D

/17/ TUV NORD: Verification Report – 3rd Periodic - ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project, Monitoring Period: 1 January 2008 to 31 December 2008, Report No: 6162 – 09/16 V03 Date: 6 April 2010.

/18/ CDM Executive Board: Approved Methodology: ACM0002 – "Consolidated methodology for grid-connected electricity generation from renewable sources" (version 05).

/19/ Ecopart Project Design Document for ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project version 5 dated 1 June 2006 (submitted for registration). Available at:
http://cdm.unfccc.int/UserManagement/FileStorage/50ZDH4LM0NFHMVIVOKZHAT56N6FKSO

Ecopart Project Design Document for ARAPUtanga Centrais ELétricas S. A. - ARAPUCEL - Small Hydroelectric Power Plants Project version 6 dated 17 December 2010 (revised to include the change of the submitted request for approval of changes from project activity accepted on 29 September 2011). Available at:
http://cdm.unfccc.int/filestorage/U/8/S/U8S362KCTW0GIQH1Y9AZM57BN4VPEX/Arapucel%203%20Revised%20PDD.pdf?t=bTB8bHV1cml2fDAZcBH60A6n4gPd0Oj6AJ-I

/20/ National Institute of Research of the Amazon, *Convergence of the flow of moisture over the Amazon region in contrasting years 2005 (dry) and 2009 (rainy)*, version 1, dated 21 September 2010.

/21/ ONS: *Submodule 12.2 - Installation of the measurement system for invoicing*, *Sub-module 12.3 – Maintenance of the measurement system for billing/invoicing and Submodule 12.6 - Measurement configuration for invoicing*, Annex 1, revision 1.1, issued on 16 September 2010.

/22/ INMETRO, *accreditation certificate:* number DIMCI 0803/2007. Process number 070796/2006 – calibrated date 3 June 2008. Available at: http://www.inmetro.gov.br/.

/23/ CCEE: *Electric Energy Commercialization Chamber.* Assessed on 2012 and available at:
http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=2e09a5c1de88a010VgnVCM100000aa01a8c0RCRD

/24/ National Operator of the System - *Grid Procedures*, with 2009 data, available at:
www.ons.org.br/procedimentos/index.aspx

/25/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, version 2.2.1 adopted at EB63 Annex 19.

Persons interviewed during the initial verification, or persons who contributed with other information that are not included in the documents listed above.

/26/ Fábio Souza – Operation Manager – Brennand Energia

/27/ Juliano Furlan – Environmental Coordinator – Brennand Energia

/28/ Alessandro Galdino – In charge of maintenance – Brennand Energia

/29/ Celso França – In charge of installation/operation Antonio Brennand – Brennand Energia

/30/ Paulo Borges – In charge of installation/operation Ombreiras – Brennand Energia

/31/ Emer Souza - In charge of installation/operation Indiavai – Brennand Energia

/32/ Renata Freitas – Consultant – EQAO

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APPENDIX A

CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	The following text was raised as a FAR in the verification report of the last monitoring period (3rd). As it had not been fulfilled before the beginning of this monitoring period (4th), it was converted to a CAR: "The procedures for notifying and requesting approval of changes from the project activity as described in the registered PDD and associated guidelines were adopted at EB 48 and laid down in corresponding Annex 66 to the meeting report. The procedures and guidelines (Annex 66 and Annex 67 to EB48) are effective on 1 October 2009, after submission of the request for issuance for this monitoring period. Nevertheless, changes of the operational capacity of PCH Alto Jaurú occurred in 2003 need to be notified to the board as per Annex 66 EB 48 prior to submitting the request for issuance of the subsequent (4th) monitoring period."	As mentioned in the revised Monitoring Report, Project Participants have requested approval of changes from the registered PDD following the Annex 66 (EB 48) regarding discrepancies between the actual technical configuration of the small hydropower plants and the ones presented in the registered PDD. The revised PDD was accepted on 29 September 2011 and the new version of the PDD was made public available at the UNFCCC's website: <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1152891235.76/view>.	DNV assessed UNFCCC's website http://cdm.unfccc.int/Projects/DB/TUEV-SUED1152891235.76/view and confirmed that the request of approval of changes to the PDD was accepted. Therefore this CAR is closed.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 2	Monitoring plan in the registered PDD indicates that electricity of the project delivered to the grid (EG_y) will be monitored through energy metering connected to the grid and sales receipts. However, project participant did not provide the receipts of all energy sold and dispatched to the system and PPAs.	As mentioned in the project participant's response of the previous verifications, the quantity of electricity presented in the energy sales of receipt is based on the PPAs of the project and, therefore, the quantity of electricity exported to the grid by the project can be checked through CEMAT and project sponsor internal reports. However, PPs attached to this response the energy sales of receipt and PPAs.	DNV assessed the receipts of sale provided and confirmed that they were correctly used in calculating the energy delivered and consequently the calculation of the CERs of the project. Therefore this CAR is closed
CAR 3	"Guidelines on completeness check of requests for issuance" (EB 48) determines the information that a monitoring report must have. Project participant did not present in the monitoring report: meters accuracy, serial numbers, calibration dates and meters location, distance between power houses and Jaurú sub-station; plant load factor of each month in the monitoring report or emission reductions spreadsheet.	Considering comments made by DOE, information required by the Annex 68 (EB 48) was included in the revised version of the Monitoring Report (version 3). In addition, project participants withdrawal information related to changes in the registered PDD from the monitoring report. Please refer to the revised version of the document.	DNV assessed the revised monitoring report and confirmed that meters accuracy, serial numbers, calibration dates and meters location, distance between power houses and Jaurú sub-station; plant load factor of each month in the monitoring report or emission reductions spreadsheet.were correctly included. Therefore this CAR is closed

Clarification requests

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	The emission factor of the electricity system of the project was calculated by the project participants based on the South-Southeast-Midwest grid. Considering that: a) In 2008 the Brazilian DNA defined the Brazilian grid as unique, with all previous regional grids being interconnected, b) The monitoring period of this verification is January 2009 to August 2009, thus, its beginning is after the definition of the DNA in a), c) The OM and the BM emission factor of the unique grid are calculated by DNA, d) The emission factor used for the project is ex-post, as defined by the PPs in the PDD, e) The calculation of the emission factor for project used the South-Southeast-Midwest grid for both OM and BM, Project Participants calculated an OM emission factor which is not in line with the definitions of the Brazilian DNA for CDM projects, since the project will	At the time of the project validation, the delineation of the grid was not made available by the Brazilian DNA and, therefore, the PPs considered the South-Southeast-Midwest grid as the reference system for the calculation of the combined margin emission factor. The choice of the PPs at the time of the project validation was based on the argumentation presented by Bosi in "An Initial View on Methodologies for Emission Baselines: Electricity Generation Case Study" published by the International Energy Agency - IEA (2000). Detailed information related to the choice of the delineation of the grid is presented in Annex 3 "Baseline information" of the registered PDD. The delineation of the Brazilian grid was published only on May 26th, 2008 through the publication of Resolution nr. 8, which defines the "reference system" as the National Interconnected System (from the Portuguese Sistema Interligado Nacional – SIN). Although this delineation was made available before the verification starting, to the understanding of the PPs, the delineation of the grid to be considered in this last verification should be the one validated and considered in the previous verifications of the project. Furthermore,	DNV finds the given explanations are reasonable, since the calculations are in accordance to the registered PDD. Therefore this CL is closed

	replace marginal generation in the whole grid.	the project boundary and choices for the calculation of the CO_2 emission factor of the grid were discussed and defined during validation: Section B.4 - Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity (Page 27): *"The boundaries of the subsystems are defined by the capacity of transmission. The transmission lines between the subsystems have a limited capacity and the exchange of electricity between those subsystems is difficult. The lack of transmission lines forces the concentration of the electricity generated in each own subsystem. Thus the South-Southeast-Midwest interconnected subsystem of the Brazilian grid where the project activity is located is considered as a boundary".* Section E.4 - Estimated anthropogenic emissions by sources of greenhouse gases of the baseline (Page 41): *"Brazil's electric power system is geographically divided in 5 macro-regions: South (S), Southeast (SE), Midwest (CO, from the Portuguese Centro-Oeste), North (N) and Northeast (NE). Regarding the electricity system, three different electric systems supply the five macro-regions of the country….The Arapucel project is located in the State of Mato Grosso and is integrated to the South- Southeast-Midwest*	

		(S-SE-CO) connected electricity system". Considering explanations above, the CO_2 emission factor considered in this verification has not been changed.	
CL2	As verified by DNV, the database regarding the Brazilian electricity grid spreadsheet provided by the project participants does not match with the values provided by ANEEL (Agência Nacional de Energia Elétrica) on table "ONS ADO 2009" in the following points: - Daily electricity generation regarding power plant "Itaipu 60 HZ" are not in accordance with the values in the ONS 2009 table. - Power plants "UTE SOL", "COCAL" AND "PIE-RP" are considered of renewable energy, which is not in accordance with the ONS 2009 table.	Considering the DOE comments, the PPs clarify that raw data of power plants connected in the Brazilian Interconnected System ("SIN" from the Portuguese *Sistema Interligado Nacional*) are from the Electric System Operator ("ONS" from the Portuguese *Operador Nacional do Sistema Elétrico*). Furthermore, the PPs clarify the following: - CO_2 emission factor calculation was revised considering the correct values of "Itaipu 60HZ" as presented in ONS data. - "UTE SOL", "COCAL" and "PIE-RP" are presented in the ONS 2009 spreadsheet as thermal power projects; this does not mean that these projects are not renewable. According to the ANEEL's website (http://www.aneel.gov.br/aplicacoes/capacidadebrasil/GeracaoTipoFase.asp?tipo=2&fase=3), these projects are considered as renewable energy projects: - UTE SOL: gaseous waste - PIE-RP: wood residue - COCAL: sugarcane	DNV assessed the revised calculations and confirmed that daily electricity generation regarding power plant "Itaipu 60 HZ" is now in accordance with the values in the ONS 2009 table and that "UTE SOL", "COCAL" and "PIE-RP" are correctly considered in the EF calculations. Therefore this CL is closed

Forward action requests from previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 1	The procedures for notifying and requesting approval of changes from the project activity as described in the registered PDD and associated guidelines were adopted at EB 48 and laid down in corresponding Annex 66 to the meeting report. The procedures and guidelines (Annex 66 and Annex 67 to EB48) are effective on 01.10.09, after submission of the request for issuance for this monitoring period. Nevertheless, changes of the operational capacity of PCH Alto Jaurú occurred in 2003 need to be notified to the board as per Annex 66 EB 48 prior to submitting the request for issuance of the subsequent (4th) monitoring period.	The notification is currently under preparation.	Since the request for approval of changes was not approved before the monitoring report for this monitoring period was webhosted, this FAR was closed and CAR 1 above was issued.

Forward action requests from this verification

FAR ID	Forward action request	Response by Project Participants	DNV's assessment of response by Project Participants
FAR 1	No FAR was identified.		

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APPENDIX B

CURRICULA VITAE OF THE VERIFICATION TEAM MEMBERS

Andrea Leiroz

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

She has experience of around 4 years in validation and verification of numerous CDM projects in DNV, both in Brazil & abroad. Her qualification, experience in CDM demonstrates her sufficient sectoral competence in Energy Generation from renewable energy sources, Waste handling and disposal and Animal waste management.

Gabriel Baines

Mr. Gabriel Baines holds a Bachelor's Degree in Environmental Engineering, having an overall work experience of around 5 years. Prior to joining DNV, has had two and a half years experience in the aluminium industry covering the areas of production and environment. His experience also covers the fields of environmental management and management systems such as ISO 14.001.

He has experience of around 2 years in validation and verification of numerous CDM projects in DNV, both in Brazil and abroad.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in 9.1. metal production.

Fabiana Philipi

Ms. Fabiana Philipi holds a Degree in Environmental Engineering and has been working as a Greenhouse Gas – GHG Auditor in the Climate Change Services – CCS Business Area of Det Norske Veritas – DNV, since April 2009.

Since the end of 2006, Fabiana has been working with Green House Gas reduction projects. Her first experience was in the Brazilian Mercantile and Future Exchange, working with researches of the UNFCCC methodologies.

Lumír Nemecek

Mr. Lumír Nemecek holds a MSc. Degree in Energy industries. Having an overall experience of around 32 years. Prior to joining DNV having 33 years experience in nuclear, hydro, fossil-fuelled power and other renewables. He worked for large and medium size energy companies in different roles and capacities including project management, project engineering and consulting. He has acquired his experience in energy industry markets from both Subcontractor and Client Company's perspective combined with understanding of business climate and adopted practice covering:

1. Staff member of power plant during the construction - direct participation on construction and equipment installations, supervision of suppliers and designers, safety aspects of construction and operation.
2. Energy utility (10yrs) - Project preparation and project management activities, preparation and supervision of the plants technical development, site visits, supervision of suppliers installations., bidding procedures and construction preparation of new power plants, plant operations support, project management, supervision individual plants technical departments.
3. Consultancy activities in energy sector (11yrs) - feasibility studies, site visits, supervision of suppliers, supervision of installations, bidding procedures, supervision of reengineering and plant renovations, time scheduling, administrative and legal procedures during projects preparations.
4. Export/import of complete power plants, equipment and technology (5yrs) Bidding procedures, preparation and realization supervision of power facilities, project management, planning, monitoring, and reporting.

He has experience of around 2 years in validation and verification of numerous CDM projects. His qualification, industrial experience and experience in CDM demonstrate him sufficient sectorial competence in 1.1 and 1.2.

Agnes Dudek

Agnes Dudek holds a PhD Degree in applied physics. Having an overall experience of around 11 years. Prior to joining DNV having 7 years experience in scientific research covering satellite remote sensing, mesoscale weather forecast modelling and air pollution dispersion modelling and monitoring.

She has experience of around 4 years in validation and verification of numerous CDM projects.

Her qualification, research experience and experience in CDM demonstrate her sufficient sectoral competence in energy generation from renewable energy sources.

VALIDATION REPORT

BT GERADORA DE ENERGIA ELETRICA S.A.

RENEWAL OF CREDITING PERIOD OF THE

BT GERADORA DE ENERGIA ELETRICA S.A. – FERRADURA SMALL HYDRO POWER PLANT – SMALL SCALE CDM PROJECT

REPORT NO. BRAZIL-VAL/02189/2010

REVISION NO. 02

BUREAU VERITAS CERTIFICATION

62/71 Boulevard du Château

92571 Neuilly Sur Seine Cdx - France

VALIDATION REPORT

Date of first issue:	Organizational unit:
20/07/2012	Bureau Veritas Certification Holding SAS
Client:	Client ref.:
BT Geradora de Energia Elétrica S.A.	Mr. Dimas Luiz Tagliani

Summary:

Bureau Veritas Certification has performed the validation of the renewal of the crediting period of BT Geradora de Energia Elétrica S.A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project (UNFCCC Registration Number 0229), owned by BT Geradora de Energia Elétrica S.A., which is located in the municipality of Erval Seco, in the State of Rio Grande do Sul, Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline update, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the validation process is a list of Clarification and Corrective Action Requests (CL and CAR), presented in the report. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology AMS-I.D version 17 and meets the relevant UNFCCC requirements for the renewal of the crediting period.

Report No.:	Subject Group:	
BRAZIL-Val/02189/2010	CDM	**Indexing terms**

Project title:	Work approved by:
BT Geradora de Energia Elétrica S.A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project	Flavio Gomes – Global Product Manager
Work carried out by:	
Marcelo Porto - Team Leader Karina Polido - Team Member Flavia Resende - Team Member	☒ No distribution without permission from the Client or responsible organizational unit
Work verified by:	
Antonio Daraya - Internal Technical Reviewer	☐ Limited distribution

Date of this revision:	Rev. No.:	Number of pages:	
17/08/2012	02	172	☐ Unrestricted distribution

Abbreviations

ANEEL	Brazilian National Energy Agency (from the Portuguese: Agência Nacional de Energia Elétrica)
BVC	Bureau Veritas Certification
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CM	Combined Margin
CO_2	Carbon Dioxide
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
FEPAM	Rio Grande do Sul State Environmental Agency (from the Portuguese: Fundação Estadual de Proteção Ambiental)
GHG	Green House Gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NEPG	Northeast Power Grid
OM	Operating Margin
PDD	Project Design Document
PP	Project Proponent
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation & Verification Manual

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1 INTRODUCTION

BT Geradora de Energia Elétrica S.A. has commissioned Bureau Veritas Certification (BVC) to validate the renewal of the crediting period for its registered CDM Project BT Geradora de Energia Elétrica S.A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project (hereafter called “the Project”) in the municipality of Erval Seco, in the State of Rio Grande do Sul, Brazil.

This report summarizes the findings of the validation of the Project, performed on the basis of UNFCCC criteria, Procedures for renewal of the crediting period of a registered CDM project activity as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The validation of renewal of crediting period serves as assessment of validity of the baseline of project that has opted for a renewal of the crediting period. The validation is an independent third party assessment of the project baseline. In particular, the project's baseline and the monitoring plan (MP) are validated in order to confirm that the project baseline, as documented, is sound and reasonable, and meet the stated requirements and identified criteria. Assessment of validation of baseline is a requirement for all CDM projects seeking renewal of the crediting period and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

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

1.3 Validation team

The validation team consists of the following personnel:

FUNCTION	NAME	CODE HOLDER*	TASK PERFORMED
Lead Verifier	Marcelo Porto	**X Yes ☐ No**	**X DR X SV X RI**
Verifier	Karina Polido	**☐Yes X No**	**X DR ☐SV X RI**
Verifier	Flavia Resende	**☐Yes X No**	**X DR ☐SV X RI**
Technical Specialist	N.A.	**☐Yes ☐ No**	**☐DR ☐SV ☐RI**
Financial Specialist	N.A.	**☐Yes ☐ No**	**☐DR ☐SV ☐RI**
Internal Technical Reviewer (ITR)	Antonio Daraya	**X Yes ☐ No**	**X DR ☐SV X RI**
Specialist supporting ITR	N.A.	**☐Yes ☐ No**	**☐DR ☐SV ☐RI**

*DR = Document Review; SV = Site Visit; RI = Report issuance

2 METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the version 01.2 of the Clean Development Mechanism Validation and Verification Manual, issued by the Executive Board at its 55th meeting on 30/07/2010. The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The completed validation protocol is enclosed in Appendix A to this report.

2.1 Review of documents

The Project Design Document (PDD) submitted by BT Geradora de Energia Elétrica S.A. (hereafter called "the PP") and additional background documents related to the project design and baseline, i.e. Country Law, Guidelines for Completing the Project Design Document (CDM-PDD), Approved Methodology, Kyoto Protocol, Procedures for Renewal of the Crediting Period of a registered CDM Project Activity were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, BT Geradora de Energia Elétrica S.A. revised the PDD and resubmitted it on 10/08/2012.

The validation findings presented in this report relate to the project as described in the PDD version 04.1

2.2 Follow-up interviews

On 13/08/2010, BVC performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of the BT Geradora de Energia Elétrica S.A. and Ecopart Assessoria em Negócios Empresariais Ltda were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview Topics

Interviewed organization	Interview topics
BT Geradora de Energia Elétrica S.A. (the PP)	↳ Status of the project and any modifications with respect to the registered PDD; ↳ Monitoring plan; ↳ Plant's operation and maintenance; ↳ Environmental licensing;
Ecopart Assessoria em Negócios Empresariais Ltda. (the Consultant)	↳ Applicability of selected methodology; ↳ National policies and changes; ↳ Baseline of the project and its updates; ↳ Project emission sources; ↳ Emission Factors and their updates; ↳ Monitoring plan.

2.3 Resolution of clarification and corrective action requests

The objective of this phase of the validation is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

Corrective Action Requests (CAR) is issued, where:

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

(b) The CDM requirements have not been met;

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

The validation team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

To guarantee the transparency of the validation process, the concerns raised are documented in more detail in the validation protocol in Appendix A.

2.4 Internal technical review

The validation report underwent an Internal Technical Review (ITR) before requesting the renewal of crediting period of the project activity.

The ITR is an independent process performed to examine thoroughly that the process of validation has been carried out in conformance with the requirements of the validation scheme as well as internal Bureau Veritas Certification procedures.

The Lead Verifier provides a copy of the validation report to the reviewer, including any necessary validation documentation. The reviewer reviews the submitted documentation for conformance with the validation scheme. This will be a comprehensive review of all documentation generated during the validation process.

When performing an Internal Technical Review, the reviewer ensures that:

The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.

The review encompasses all aspects related to the project which includes project design, baseline, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, closure of CARs, CLs and FARs during the validation exercise, review of sample documents.

The reviewer compiles clarification questions for the Lead Verifier and Validation Team and discusses these matters with Lead Verifier.

After the agreement of the responses on the 'Clarification Request' from the Lead Verifier as well as the PP(s) the finalized validation report is accepted for further processing such as uploading on the UNFCCC webpage.

3 VALIDATION CONCLUSIONS

In the following sections, the conclusions of the validation are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Validation Protocol in Appendix A.

The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in 45 Corrective Action Requests (CARs) and 24 Clarification Requests (CLs).

The CARs and CLs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVM paragraph.

3.1 Project design document (57)

The validation team hereby confirms that the PDD complies with the latest forms of the guidance documents for completion of PDD:

- Clean Development Mechanism – Project Design Document Form (CDM-SSC-PDD), version 03 **/Ref-K/**.

- Guidelines for Completing the Simplified Project Design Document (CDM-SSC-PDD) and the Form for Proposed New Small Scale Methodologies (CDM-SSC-NM), version 05 **/Ref-L/.**

3.2 Changes in the project activity

As was observed by the validation team through documentation analysis and during site visit held on 13/08/2010, the project has been implemented in accordance with the descriptions provided in the webhosted PDD.

All changes that have been made to the different versions of the PDD during the validation Process, from the webhosted PDD version 2011.07.04 **/Ref-2/** to the final PDD version 04.1 **/Ref-9/**, have been supported by CARs and CLs opened by the DOE and have already been discussed in the Validation Protocol.

3.3 Project description (64)

The project activity BT Geradora de Energia Elétrica S.A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project was registered as a CDM Project on 22/04/2006 (CDM nr. 0229).

The project activity consist of a SHPP located in the Guarita River, in the city of Erval Seco, State of Rio Grande do Sul (South of Brazil) with 10.1 MW of total installed capacity and reservoir of 0.5335 km^2.

The DOE was able to validate the accuracy and completeness of the project description contained in the PDD version 04.1 with:

- Carrying out of site visit on 13/08/2010 by checking the identification plates of the equipment installed on site.
- Analysing documents: **/Ref-5/ and /Ref-8/.**

The first 7-year renewable crediting period is from 01/01/2004 to 31/12/2010. The PP is applying for a second crediting period started from 01/01/2011 to 31/12/2017.

The DOE hereby confirms that the project description in PDD version 04.1 **/Ref-9/** is accurate and complete in all respects and that there are no changes to the project activity/design or boundary as compared to the webhosted PDD.

3.4 Application of latest approved version of a baseline and monitoring methodology (76-77)

At the time of registration, project participant had used the methodology “Grid connected renewable electricity generation”, AMS-I.D version 7 /**Ref-A**/.

The revised PDD version 04.1 /**Ref-9**/ applies the latest available version of the same methodology “Grid connected renewable electricity generation”, AMS-I.D version 17 /**Ref-B**/. Therefore, it meets the condition that for renewal of the crediting period, the methodology that applied in the original CDM-PDD /**Ref-1**/ shall be used whenever

applicable (in accordance with paragraph 2(a) of the Procedure for renewal of crediting period of a registered CDM project activity, version 06.0 /**Ref-C**/).

The applicability of the methodology was re-assessed based on the knowledge of the project from the initial validation, subsequent verifications and the confirmation from the project participant.

The project activity meets each of the applicability conditions of the methodology as can be observed in Section B.2 of the new PDD version 04.1. It also meets all the other stipulations and limitations mentioned in the other sections of the methodology.

BVC hereby confirms the applicability of the methodology to the Project:

1) *This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:*
   - *Supplying electricity to a national or a regional grid.*

The Project is a small-hydro power plant connected to the Brazilian Interconnected System (SIN) with maximum output capacity of 10.1 MW, and which will not increase beyond 15 MW. BVC was able to validate this by a site visit performed on 13/08/2010 by checking the identification plates of the equipment installed on site.

2) *This methodology is applicable to project activities that: (a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) Involve a capacity addition; (c) Involve a retrofit of (an) existing plant(s); or (d) Involve a replacement of (an) existing plant(s).*

The Project is a new grid-connected power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant). BVC was able to validate this information with the following documents: /**Ref-1**/, /**Ref-9** and **/Ref-8/**.

3) *Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:*
   - *The project activity is implemented in an existing reservoir with no change in the volume of reservoir;*
   - *The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m^2;*
   - *The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m^2."*

The project results in a new reservoir and the power density of the project is greater than 4 W/m^2 (18.93 W/m^2). Detailed information of power density calculation is

presented in section B.6.1 of the new PDD. The following evidences were used to validate this applicability condition: installed capacity of 10.1 MW: /**Ref-1**/, /**Ref-9**/, /**Ref-8**/ and /**Ref-H**/. Reservoir area of 0.5335 km^2 was validated with /**Ref-4**/.

As per the requirements of AMS-I.D version 17, the continued validity of the baseline is assessed and the emissions which would result from the baseline scenario are updated at the start of the second and third crediting period.

The DOE hereby confirms that the selected baseline and monitoring methodology AMS-I.D version 17 **/Ref-17/** is previously approved by the CDM Executive Board, and is applicable to the project activity, which, complies with all the applicability conditions therein.

The DOE hereby confirms that, as a result of the implementation of the proposed CDM project activity, there are no greenhouse gas emissions occurring within the proposed CDM project activity boundary, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.

3.5 Validity of the original baseline or its update

As demonstrated in the PDD version 04.1, *"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"*. As per VVM paragraph 169 /**Ref-D**/ and per AMS-I.D version 17, the baseline for the Project remains the same as that in the registered (original) PDD.

With reference to version 06.0 of the "Procedure for renewal of the crediting period of a registered CDM project activity" /**Ref-C**/ and version 03.0.1 of the Methodological Tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" /**Ref-E**/, the assessment of the validity of the baseline is an assessment of the emissions, which would have resulted from that scenario. The assessment is done in steps as described below.

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

As per the requirement of the CDM Executive Board to assess the impact of new relevant national and/or sectoral policies and circumstances on the baseline following sub-steps have been used:

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

The current baseline remains the same as it was in the registered PDD. There has been no significant change in the relevant national and/ or sectoral policies since the date of earlier registered PDD till now.

However, as described in the new PDD version 04.1, the delineation of the project electricity system has changed since the Brazilian DNA (CIMGC) has published Resolution # 8 issued on 26th May, 2008 /**Ref-F**/. In this resolution, the Brazilian Interconnected Grid (a single system that covers all the five macro-geographical regions of the country: North, Northeast, South, Southeast and Midwest) is defined as the project electricity system. Therefore, the CO_2 grid emission factor calculations are not restrict to data from the South-Southeast-Midwest grid (as considered in the first crediting period), but encompasses the Brazilian Interconnected Grid (from the Portuguese Sistema Interligado Nacional – SIN). Please refer to Step 1.4 and Step 2.2 below for the calculation of the updated CO_2 grid emission factor.

No other major changes in the relevant national and/or sectoral policies were observed, therefore, the DOE confirms that the current baseline complies with all relevant mandatory national and/or sectoral policies which have come into effect after the submission of the project activity for validation and which are applicable at the time of requesting renewal of the crediting period.

Step 1.2: Assess the impact of circumstances

As per the requirement of this sub-step, it has been assessed that there were no impact of circumstances existing at the time of requesting renewal of the crediting period on the current baseline emissions.

However, as already discussed in Step 1.1 above, circumstances related to the calculation of the CO_2 emission factor have changed. Therefore, CO_2 grid emission factor calculations were reviewed for the second crediting period. Please refer also to sections B.6.1 and B.6.3 of the new PDD in its version 04.1.

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

This sub-step is not applicable, as the baseline scenario is electricity provided by the grid. As described in the new PDD version 04.1, the Brazilian Interconnected System (SIN) is composed by more than 2,400 power plants, each with specific characteristics and equipments[1]. Thus this step does not apply, since the whole system will continue to supply electricity independently of the lifetime of individual equipments.

Seeing the above, it is clear that the grid equipments as a system has a longer lifetime and will exceed the next 7-year crediting period.

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

[1] Crosschecked by the DOE by accessing the online database of the Brazilian National Agency for Electric Energy (ANEEL): http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp (accessed on 19/07/2012).

As described in the new PDD version 04.1, the CO_2 grid emission factor that was determined only at the start of the previous crediting period is not valid anymore due to the following two changes:

(1) As already described in Step 1.1 above, the project electricity system has changed and now encompasses the entire "SIN", the Brazilian Interconnected System /**Ref-F**/.

(2) The configuration of the relevant grid has changed over the years, due to constant changes in the dispatch capacity of grid-connected power plants, the national energy demand and also due to the addition of new generation sources to the grid.

As per the requirement of AMS-I.D version 17 and as defined by Step 1.4 of the Methodological Tool "Validity of the original/current baseline and to update the baseline at the renewal of a crediting period", if any of the data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, the current baseline needs to be updated for the subsequent crediting period. Hence the emission factor needs to be updated accordingly. Please refer to sub-step 2.2 below.

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

Step 2.1: Update the current baseline

As per the requirement of the sub-step, the update for baseline emissions of the second crediting period should be based on the latest approved version of the methodology applicable to the project activity.

As per AMS-I.D version 17, the baseline for the Project remains the same as that in the registered PDD as *"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"*.

Step 2.2: Update the data and parameters

As already described in Step 1.4 above, considering the changes on circumstances related to calculation of CO_2 grid emission factor, the baseline emissions were reviewed in this second crediting period following the latest version of the "Tool to calculate the emission factor for an electricity system" version 02.2.1 /**Ref-G**/. Following the six steps of this Tool, the new CO_2 grid emission factor has been calculated in the Sections B.6.1 and B.6.3 of the PDD version 04.1, as described below.

Step 1-Identify the relevant electricity systems

The Brazilian DNA has published the Resolution # 8 issued on May 26th, 2008 defining the Brazilian Interconnected Grid (the "SIN") as a single system that covers all the five macro-geographical regions of the country (North, Northeast, South, Southeast and Midwest). Hence, this delineation has been followed to calculate the

baseline emission factor of the grid.

BVC was able to verify this by crosschecking the above mentioned resolution online at: http://www.mct.gov.br/upd_blob/0024/24719.pdf (accessed on 19/07/2012).

Step 2-Choose whether to include off-grid power plants in the project electricity system (optional)
Option I: Only grid power plants are included in the calculation.

Step 3-Select a method to determine the operating margin (OM)
For the calculation of the OM emission factor, the Simple Adjusted OM was used in this project.

BVC was able to verify the applicability of this calculation method, checking the last five years electricity generation in the national grid. According to the "Tool to calculate the emission factor for an electricity system", the Simple OM method can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production. The PP demonstrates that this is not the case of the Brazilian National Grid, on which Hydro generation prevailed in the last five years. Grid generation data of the last five years were crosschecked by the DOE on National Electric System Operator (ONS) - Generation History. Available at:
http://www.ons.org.br/historico/geracao_energia.aspx (accessed on 19/07/2012).

Step 4-Calculate the operating margin emission factor according to the selected method
The data on electricity generation were obtained from the Electric System National Operator (ONS). The public information available is only the net energy generation from every Power Plant and the fuel type. As the fuel consumption is not available, the calculation of the CO_2 emission factor is done based in this fuel type and the Power Plant efficiency, following the Option A2 of the Tool.

The data source is deemed reasonable and BVC confirms that the calculation (/**Ref-10**/) is able to be replicated using the data and parameter provided in the PDD.

Step 5-Calculate the build margin (BM) emission factor
The PP adopted, on the first crediting period, in terms of vintage, the Option 1 of the Tool. According to this Option, for the second crediting period, the build margin emission factor should 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.

The calculation (/**Ref-10**/) is done using the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to the DOE, *i.e.* 2010.

The sample group of power units *m* used by the PP to calculate the build margin correctly consisted of the set of power capacity additions in the electric system that comprise 20%

of the system generation (in MWh) and that have been built most recently, since this set of plants comprises the larger annual generation.

The data source are deemed reasonable and BVC confirms that the calculation is able to be replicated using the data and parameter provided in the PDD.

Step 6-Calculate the combined margin (CM) emission factor
The PP correctly adopted the method (a) Weighted average CM, provided by the Tool, following their weighted default values for the second crediting period: w_{OM} = 0.25 and w_{BM} = 0.75.

According to Sections B.6.1 and B.6.3 of the new PDD version 04.1 and based on the calculation spreadsheet provided by PP /**Ref-6**/, the new combined margin emission factor ($EF_{grid,CM,y}$) has been calculated in accordance with equation (13) of the "Tool to calculate the emission factor for an electricity system" version 02.2.1:

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

$EF_{grid,CM,y}$ =0.2609 × 0.25 +0.1166 × 0.75= 0.1526 tCO_2/MWh

Where:
$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
w_{OM} = Weighting of operating margin emissions factor (%)
w_{BM} = Weighting of build margin emissions factor (%)

1) Baseline emissions:

$$BE_y = EG_{BL,y} \, x \, EF_{CO2,grid,y}$$

$EG_{BL,y} = EG_{facility,y}$ = 46,954 MWh/year
BE_y = 46,954MWh/year x 0.1526 tCO_2/MWh
BE_y = 7,167 tCO_2/year

Where:
BE_y = Baseline Emissions in year *y* (tCO_2)
$EG_{BL,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)
$EF_{CO2,grid,y}$ = CO2 emission factor of the grid in year *y* (t CO2/MWh)

The Project has a total installed capacity of 10.1 MW. In the new PDD version 04.1, for estimative purposes, 46,954 MWh/year was considered as the project's expected yearly quantity of net electricity generation supplied to the grid. Calculations were

based on 5.36 MW-ave assured power and 8,760 hour of operation in the year[2]. The value of 5.36 MW assured power was calculated and defined by the Brazilian National Energy Agency (ANEEL) and can be accessed online at: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/energiaassegurada.asp (accessed on 19/07/2012).[3]

2) Project Emissions:
As can be observed in Sections B.6.1 and B.6.3 of the PDD version 04.1, no project emission need to be considered from emissions from water reservoir ($PE_{HP,y}$), since the Power Density (PD) of the project activity is greater than 10 W/m^2. BVC was able to validate the PD value of 18.93 W/m^2, as described in the new PDD version 04.1, with an installed capacity of 10.1 MW /**Ref-1**/, /**Ref-8**/ and /**Ref-H**/ and a reservoir area of 0.5335 km^2 /**Ref-4**/.

3) Leakage:
No leakage has to be considered for the proposed project activity since none of the energy equipment used in this project was transferred from another activity.

4) Emission reductions:
As per baseline methodology AMS-I.D version 17, the emission reductions (ER_y) are calculated in accordance with equation (10) of this methodology:

$$ER_y = BE_y - PE_y - LE_y$$

ER_y = 7,167 tCO_2/year

Where:
ER_y = Emission reductions in year *y* (tCO_2/y)
BE_y = Baseline Emissions in year *y* (tCO_2/y)
PE_y = Project emissions in year *y* (tCO_2/y)
LE_y = Leakage emissions in year *y* (tCO_2/y)

[2] The Emission Reduction Calculation for the years 2012 and 2016 was done taking into consideration 366 days (8784 hours a year).

[3] During the 4th periodic verification, according to paragraph 2 of Annex 66 from EB 48, the DOE has determined that the actual operation of the Project did not conform with the description contained in the registered PDD version 2005.07.27B, of 05/12/2005 /**Ref-01**/. Seeing that the changes did not raise concerns with respect to aspects outlined in paragraph 10 (c) of the same Annex 66 from EB 48 and the relevant guidelines established by the Executive Board, the DOE submitted documentation in accordance with the procedure outlined in Section C of the Annex 66 from EB 48. On 02/12/2011, the changes from the Project Description in the original PDD /**Ref-01**/ were approved by the Executive Board. In summary, the installed capacity of the SHPP was wrongly described in the original PDD as 9.2 MW, instead of the correct 10.1 MW. For a detailed description regarding how this change in the project description was validated by the DOE, please refer to the Validation Opinion on changes from the project activity as described in the registered PDD (/**Ref-H**/), also available at http://cdm.unfccc.int/Projects/DB/TUEV-SUED1135874208.63/view .

The estimated amount of GHG emission reductions from the project is 50,209 tCO2e during the second crediting period (7 years) from 01/01/2011 to 31/12/2017, resulting in estimated average annual emission reductions of 7,173 tCO2e.

A spreadsheet for the calculation of the emission reductions was provided and checked to confirm the estimated emission reductions */*3/.

3.6 Monitoring plan (124)

The DOE hereby confirms that the monitoring plan complies with the requirements of the methodology.

The steps taken to assess whether the monitoring arrangements described in the monitoring plan are feasible within the project design are described in the section 3.6.1, 3.6.2 and 3.6.3 below.

The Project uses the approved monitoring methodology AMS-I.D – "Grid connected renewable electricity generation", version 17. The project involves the installation of a new grid connected small hydro power plant.

The DOE hereby confirms that the project participants are able to implement the monitoring plan.

3.6.1 Parameters determined ex-ante

The combined margin emission factor of 0.1526 tCO_2/MWh is determined ex-ante based on the most recent information available at the time of requesting for the crediting period renewal (data from 2008-2010). Please refer to 3.5 above (step 2.2) for a description how BVC was able to validate the combined margin emission factor calculations.

3.6.2 Parameters monitored ex-post

The main parameter monitored ex-post is $EG_{facility,y}$, the quantity of net electricity generation supplied by the Project to the grid in year y.

The Project has a total installed capacity of 10.1 MW, consisting of a SHPP with reservoir area of 0.5335 km^2. The electricity delivered to the grid is monitored both by the project owner (seller) as well as by the energy buyer. A Brazilian government entity CCEE - Chamber of Electric Energy Commercialization (from the Portuguese: Câmara de Comercialização de Energia Elétrica)[4] controls and monitors the electricity available on the national interconnected grid. The amount of electricity delivered to the grid by the

[4] www.ccee.org.br

project activity shall be cross-checked with the Reports issued by CCEE (records for sold electricity).

There are two meters at the Guarita Substation used for $EG_{facility,y}$ measurement. These meters are bidirectional and redundant, so that, in case the first meter fails, the second automatically replaces it. There are no transmission losses to be considered, since measurements are carried out at the output of the transmission line. In addition, the plant operator is committed to follow the procedures of calibration established by ONS (Electric System National Operator), i.e. calibration of energy meters every two years /**Ref-7**/. The company will be responsible for the maintenance of the monitoring equipment; for dealing with possible monitoring data adjustments and uncertainties; for review of reported results/data; organising and training, as appropriate, the staff in the appropriate monitoring, measurement and reporting techniques.

The data monitored and required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Therefore, three parameters are measured:

- $EG_{facilityy}$: Quantity of net electricity supplied to the grid in year y, monitored by the owner and CCEE;
- Cap_{PJ}: Installed capacity of the hydro power plant after the implementation of the project activity;
- A_{PJ}: Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity.

3.6.3 Management system and quality assurance

Operational management for the Project is comprehensively detailed in PDD version 04.1, including description of the responsibility, training, equipment details, calibration frequency, maintenance needs, meters location, process description, data collection procedures, data storage procedures and emission reduction calculation procedures. These are all elements, which ensure that the monitoring plan will be followed during the operation of the Project.

4 VALIDATION OPINION

Bureau Veritas Certification has performed a validation of renewal of the crediting period for registered CDM project BT Geradora de Energia Elétrica S.A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project (UNFCCC Registration Number 0229), located in Brazil. The validation was performed on the basis of UNFCCC criteria, procedures for renewal of the crediting period of a registered CDM project activity and also on the criteria given to provide for consistent project operations, monitoring and reporting.

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

By the construction of a small hydropower plant with an installed capacity of 10.1 MW and a reservoir area of 0.5335 km^2, renewable energy has been delivered to the Brazilian National Electricity Grid, and the project is likely to result in reductions of GHG emissions partially. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the DOE hereby confirms that the estimated amount of 50,209 tCO_2e emission reductions, during the entire 2^{nd} crediting period, is correct.

The review of the Project Design Documentation (version 04.1) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. Baseline methodology is correctly applied to calculate project and baseline emissions, leakage and emission reductions. Also, calculation of the baseline emissions is replicable using data and values listed in the PDD. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the renewal of the crediting period and provides for appropriate baseline and its update.

The validation is based on the information made available to us and the engagement conditions detailed in this report.

MARCELO ANTONIAZZI PORTO

Marcelo Porto

Antonio Daraya

Team Leader	Internal Technical Reviewer
Date: 17/08/2012	Date: 17/08/2012

5 REFERENCES

Category 1 Documents:

Documents provided by BT Geradora de Energia Elétrica S.A. that relates directly to the GHG components of the project.

/1/	BT Geradora de Energia Elétrica S. A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project, Project Design Document (ORIGINAL), version 2005.07.27B of 05/12/2005.
/2/	BT Geradora de Energia Elétrica S. A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project, Project Design Document (RENEWAL), version 2011.07.04 of 04/07/2011.
/3/	BT Geradora de Energia Elétrica S. A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project, Project Design Document (RENEWAL), version 04 of 27/02/2012.
/4/	BT Geradora de Energia Elétrica S. A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project, Project Design Document (AFTER CHANGES), version 2011.07.04 of 04/07/2011.
/5/	Operation License granted by Rio Grande do Sul State Environmental Agency (FEPAM) number 3194/2009-DL.
/6/	CERs calculation spreadsheet “Ferradura_CERs_2012.02.27_v.04”, version 04.
/7/	ONS Procedure - Sub module 12.3: maintenance of measuring system for billing, revision 1.1 of 16/09/2010.
/8/	Brazilian National Energy Atlas 2009 (3rd edition), Prepared by ANEEL. Also available online at: http://www.aneel.gov.br/visualizar_texto.cfm?idtxt=1689.
/9/	BT Geradora de Energia Elétrica S. A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project, Project Design Document (RENEWAL), version 4.1 of 10/08/2012.
/10/	Excel Sheet BR EF ex ante 2008 to 2010-def EF tool 2.2-2011.10.06

Category 2 Documents:

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

/A/	Revision to the approved baseline and monitoring methodology AMS-I.D “Grid connected renewable electricity generation”, version 7.
/B/	Approved baseline and monitoring methodology AMS-I.D “Grid connected renewable electricity generation”, version 17.

/C/	Procedure for renewal of crediting period of a registered CDM project activity, version 06.0
/D/	Clean development mechanism validation and verification manual, version 01.2
/E/	Methodological Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”, version 03.0.1
/F/	Brazilian Designated National Authority (DNA) CIMGC – Resolution # 8 of 26/05/2008, which adopts a single system as definition of a project electric system in the National Interconnected System (SIN) for purposes of CDM project activities in Brazil. Also online available at: http://www.mct.gov.br/upd_blob/0024/24833.pdf.
/G/	Tool to calculate the emission factor for an electricity system, version 02.2.1
/H/	Validation Opinion on changes from the project activity as described in the registered PDD - Report number BR.1003550, version 01, Bureau Veritas Certification, October 2011.
/I/	2010 - Brazilian Energy Balance – Ministry of Mines and Energy (MME). Also available at: https://ben.epe.gov.br/downloads/Relatorio_Final_BEN_2010.pdf.
/J/	Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories for 2006.
/K/	Clean Development Mecanism – Project Design Document Form (CDM-SSC-PDD), version 03
/L/	Guidelines for Completing the Simplified Project Design Document (CDM-SSC-PDD) and the Form for Proposed New Small Scale Methodologies (CDM-SSC-NM), version 05

Persons interviewed:

List persons interviewed during the validation or persons that contributed with other information that are not included in the documents listed above.

/a/	Mariluci Duranti (BT Geradora)
/b/	Laércio Correa (BT Geradora)
/c/	Alessandro da Silva (BT Geradora)
/d/	Renata Freitas (Ecopart)

6 CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

Mr. Marcelo Porto	BVC, Brazil	Team Leader Graduated in Electrical Engineering, with a graduate specialization in Quality Engineering and a Master's degree in Industrial Engineering. Quality management expert and auditor, he worked in the electro-electronic, mechanical, medical devices, leather and shoes industries. ISO 9001 and SA8000 auditor, he is also trained as ISO 14001 and OHSAS 18001 lead auditor. Marcelo is qualified as Lead Verifier GHG – Greenhouse Gases.

Ms. Karina Polido	BVC, Brazil	Team Member Ms. Polido has graduated in Civil Engineering with experience in management system audits. She is ISO 9001:2008 and ISO 14001:2004 Lead Auditor. Karina is also qualified as Lead Verifier GHG – Greenhouse Gases.

Mrs. Flavia Resende	BVC, Brazil	Team Member Mrs. Resende has experience on CDM projects since 2002. Master's in Urban and Environmental Policy and Planning from Tufts University (Boston, MA, US) and MBA in Environmental Management by UFRJ (Rio de Janeiro, RJ, Brazil). Currently, holds a verifier position at Bureau Veritas Brazil.

Mr. Antonio Daraya	BVC, Brazil	Internal Technical Reviewer Antonio has graduated in Chemical Engineering with a very large experience in Industrial and Environmental management in several industrial fields. He is ISO 9001:2000, ISO 14001:2004 and OHSAS 18001 Lead Auditor and has also experience in the implementation of Quality and Environmental Management Systems. Antonio is qualified as Lead Verifier GHG – Green House Gases.

APPENDIX A: BT GERADORA DE ENERGIA ELÉTRICA S.A. CDM PROJECT VALIDATION PROTOCOL

VALIDATION PROTOCOL

Table 1 Validation requirements based on the Clean Development Mechanism Validation and Verification Manual (Version 01.2)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
1. Approval			*COUNTRY A (Brazil)*	*COUNTRY B (United Kingdom of Great Britain and Northern Ireland, Japan)*		
a. Have all Parties involved approved the project activity?	VVM	44	The project activity (Project 0229) has already been approved. This is a revalidation process and in accordance with the PROCEDURES FOR RENEWAL OF THE CREDITING PERIOD OF A REGISTERED CDM PROJECT ACTIVITY (Version 05), EB 46 Annex 11, item C.5. – For the purpose of renewal of the crediting period, it is not necessary to obtain a new letter of approval from Parties involved.	**CL01**: Please, clarify the difference between the Parties listed in Table 1 of PDD version 1, Section A.3, and those listed in the CDM's project web page (http://cdm.unfccc.int/Projects/DB/TUEV-SUED1135874208.63/view).	CL01	OK
b. Has the DNA of each Party indicated as being involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval? (If yes, provide the reference of the letter of approval, any supporting documentation,	VVM	45	Refer to item 1.a.	Refer to item 1.a.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
and specify if the letter was received from the project participatn or directly from the DNA)						
c. Does the letter of approval from DNA of each Party involved:	VVM	45				
i. confirm that the Party is a Party of the Kyoto Protocol?	VVM	45.a	Refer to item 1.a.	Refer to item 1.a.	OK	OK
ii. confirm that participation is voluntary?	VVM	45.b	Refer to item 1.a.	Refer to item 1.a.	OK	OK
iii. confirm that, in the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country?	VVM	45.c	Refer to item 1.a.	Refer to item 1.a.	OK	OK
iv. Refers to the precise proposed CDM project activity title in the PDD being submitted for registration?	VVM	45.d	Refer to item 1.a.	Refer to item 1.a.	OK	OK
d. Is(are) the letter(s) of approval unconditional with respect to (i) to (iv) above?	VVM	46	Refer to item 1.a.	Refer to item 1.a.	OK	OK
e. Has(ve) the letter(s) of approval been issued by the respective Party's designated national authority (DNA) and is valid for the CDM project activity under validation?	VVM	47	Refer to item 1.a.	Refer to item 1.a.	OK	OK
f. Is there doubt with respect to the authenticity of the letter of approval?	VVM	48	Refer to item 1.a.	Refer to item 1.a.	OK	OK
g. If yes, was verified with the DNA that the letter of approval is authentic?	VVM	48	Refer to item 1.a.	Refer to item 1.a.	OK	OK
2. Participation			*PP1 (BT Geradora de Energia Elétrica S.A.)*	*PP2, PP3 and PP4 (Ecopart Assessoria em Negócios Empresariais Ltda.; The Chugoku Electric Power Co., Inc.;*		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Constellation Energy Commodities Group Inc.)		

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
a. Have all project participants been listed in a consistent manner in the project documentation?	VVM	51	Yes, in the case of PP1.	**CL02**: Please explain the changes in the list of project participants, when comparing PDD version 1 with the registered one, version 2005.07.27B.	CL02	OK
b. Has the participation of the project participants in the project activity been approved by a Party to the Kyoto Protocol?	VVM	51	Refer to item 1.a.	Refer to item 1.a.	OK	OK
c. Are the project participants listed in tabular form in section A.3 of the PDD?	VVM	52	Yes.	Yes.	OK	OK
d. Is the information in section A.3 consistent with the contact details provided in annex 1 of the PDD?	VVM	52	Yes.	**CAR01**: PDD version 1, Annex 1, does not list information for PPs The Chugoku Electric Power Co., Inc. and Constellation Energy Commodities Group Inc.	CAR01	OK
e. Has the participation of each of the project participants been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation? (Provide reference of the approval document for each of the project participants)	VVM	52	Refer to item 1.a.	Refer to item 1.a.	OK	OK
f. Are any entities other than those approved as project participants included in these sections of the PDD?	VVM	52	No.		OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
g. Has the approval of participation issued from the relevant DNA?	VVM	53	Refer to item 1.a.	Refer to item 1.a.	OK	OK
h. Is there doubt with respect to (g) above? l	VVM	53	Refer to item 1.a.	Refer to item 1.a.	OK	OK
i. If yes, was verified with the DNA that the approval of participation is valid for the proposed project participant?	VVM	53	Refer to item 1.a.	Refer to item 1.a.	OK	OK
3. Project design document						
a. Is the PDD used as a basis for validation prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website?	VVM	55	Yes. The PDD used as a basis for validation was prepared in accordance with "Clean Development Mechanism Project Design Document Form", (CDM-SSC-PDD), version 03 – in effect as of 22 December 2006.		OK	OK
b. Is the PDD in accordance with the applicable CDM requirements for completing the PDD?	VVM	56	Refer to CARs 02 to 47 and CLs 03 to 24. The reference utilized for the completeness of the PDD was the Guidelines for Completing the Simplified Project Design Document (CDM-SSC-PDD), version 05, of 14/09/2007.		CAR02 to CAR44 CL03 to CL24	OK
c. In CDM-SSC-PDD section A.1 are following provided?	EB 34	Ann 09				
i. Title of project	EB 34	Ann 09	Yes. BT Geradora de Energia Elétrica S.A. – Ferradura Small Hydro Power Plant – Small Scale CDM Project.		OK	OK
ii. Current version number and date of document	EB	Ann	Yes. Version 01, dated 06/07/2010.		OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
	34	09			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
d. In CDM-SSC-PDD section A.2 are following provided (max. one page)?	EB 34	Ann 09			
i. A brief description of the project activity covering purpose which includes the scenario existing prior to the start of project, present scenario and baseline	EB 34	Ann 09	Yes.	OK	OK
ii. Explanation how the GHG emission reductions are effected	EB 34	Ann 09	**CAR02**: PDD version 01, Section A.2, does not explain the technology being employed.	CAR02	OK
iii. The PP's view on the contribution of project activity to sustainable development	EB 34	Ann 09	Yes.	OK	OK
iv. Are there any changes/modifications compared to the webhosted PDD?	EB 34	Ann 09	N/A	OK	OK
e. In CDM-SSC-PDD section A.3 are following provided in the tabular format?	EB 34	Ann 09			
i. List of project participants and Party(ies)	EB 34	Ann 09	Refer to CL01.	CL01	OK
ii. Identification of host party	EB 34	Ann 09	Yes.	OK	OK
iii. Indication whether the Party wishes to be considered as project participant	EB 34	Ann 09	Yes.	OK	OK
f. In CDM-SSC-PDD section A.4.1 are following	EB	Ann			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
provided?	34	09			
i. Technical description, location, host party(ies) and address as required?	EB 34	Ann 09	Location, host party and address are provided. Technical description is presented in Section A.4.2, as per the Guidelines for CDM-SSC-PDD.	OK	OK
ii. Detailed physical location with unique identification of the project activity (eg. Longitude/latitude) – not to exceed one page	EB 34	Ann 09	Yes. However, year of ANEEL's resolution needs to be corrected. **CAR03**: PDD version 01, Section A.4.1.4, mentions ANEEL's Resolution 180/2000 as being from 2008, whereas it is from 2000.	CAR03	OK
iii. Are there any changes/modifications compared to the webhosted PDD?	EB 34	Ann 09	N/A	OK	OK
g. In CDM-SSC-PDD section A.4.2 are following provided	EB 34	Ann 09			
i. the list of categories of project activities as per the latest categorization of Appendix B to the simplified modalities and procedures for small-scale CDM project activities, hereafter referred to as Appendix B. (refer http://cdm.unfccc.int/methodologies/SSCmethodologies	EB 34	Ann 09	Yes. Type I – Renewable energy projects, Category I.D. – Grid connected renewable electricity generation.	OK	OK
ii. A description of how environmentally safe and sound technology and know how is being applied by the project activity interalia technology transfer to the Host Party(ies) for	EB 34	Ann 09	The technology applied is environmentally safe and sound, based on a know how that has been used for decades in the Host Party. For this reason,	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
application in the project activity			there is no transfer of technology, as it is a well known one by the Host Party.		
h. In CDM-SSC-PDD section A.4.3 is the estimation of emission reductions provided, as requested, in a tabular format?	EB 34	Ann 09	Yes. **CAR04**: PDD version 01, Section A.4.3, presents the estimated amount of emission reductions in a tabular format with some differences compared to the Guidelines for CDM-SSC-PDD. **CL03**: Please, explain the reason why the annual estimation of emission reductions in 2012 and 2016 is 5,715 tCO_2e, instead of 5,700 tCO_2e. **CAR05**: PDD version 01, Section A.4.3, incorrectly refers to sections B.1 and B.3.	CAR04 CL03 CAR05	OK
i. In CDM-SSC-PDD section A.4.4 is information regarding Public funding provided?	EB 34	Ann 09	Yes.	OK	OK
j. In CDM-SSC-PDD section A.4.5 are the following provided?	EB 34	Ann 09			
i. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity	EB 34	Ann 09	Yes.	OK	OK
ii. Indication if there is a registered small-scale project activity under the CDM or an application	EB	Ann			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
to register another small-scale project activity under the CDM	54	13			
a. With the same project participants	EB 54	Ann 13	**CAR06**: PDD version 01, Section A.4.5, does not indicate whether there is a registered SSC project activity under the CDM or an application to register another SSC project activity under the CDM with the same project participants.	CAR06	OK
b. Registered within the period of 2 years	EB 54	Ann 13	**CAR07**: PDD version 01, Section A.4.5, does not indicate whether there is a registered SSC project activity under the CDM or an application to register another SSC project activity under the CDM registered within the previous 2 years.	CAR07	OK
c. Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity under the CDM at the closest point.	EB 54	Ann 13	Yes. **CL04**: Please, adjust last paragraph of Section A.4.5, in PDD version 01, to correctly reflect the situation regarding the last criteria for determining whether a SSC project activity is a debundled component.	CL04	OK
iii. Are there any changes/modifications compared to the webhosted PDD?	EB 34	Ann 09	N/A	OK	OK
k. In CDM-SSC-PDD section B.1 is the approved baseline and monitoring methodology and version no provided?	EB 34	Ann 09	Yes. Methodology AMS-I.D. – “Grid connected renewable electricity generation” (version 16).	OK	OK
l. In CDM-SSC-PDD section B.2 are the following provided?	EB 34	Ann 09			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Justification of the choice of project activity and category?	EB 34	Ann 09	Yes.	OK	OK
ii. Demonstration that the project activity qualifies as a small-scale project activity and that it will remain under the limits of small-scale project activity types during every year of the crediting period as per the following:For Type I : the capacity of the proposed project activity will not exceed 15 MW (or an appropriate equivalent); For Type II: the annual energy savings on account of efficiency improvements will not exceed 60 GWh (or an appropriate equivalent) in any year of the crediting period; For Type III: the estimated emission reductions of the project activity will not exceed 60 ktCO2e in any year of the crediting period.	EB 34	Ann 09	The installed capacity of the project activity, as per registered PDD version 2005.07.27B, is 9.2 MW. PDD version 01, for renewal of the crediting period, Section A.4.2, states the same capacity, under the 15 MW limit of SSC project activities. **CAR08**: PDD version 01, Section B.2, does not demonstrate that the project activity will remain under the limit of SSC project activity Type I during every year of the crediting period.	CAR08	OK
m. In CDM-SSC-PDD section B.3 is the project boundary of the project activity, based on the guidance of the applciable project category, provided?	EB 34	Ann 09	**CL05**: Please, align project boundary definition with AMS-I.D. ver 16. **CL06**: Please, adjust second paragraph of Section B.3, in PDD version 01, as it may mislead someone to undertand that Guarita River is within the project boundary, which is not the case, as per the definition in AMS-I.D. ver 16.	CL05 CL06	OK
n. In CDM-SSC-PDD section B.4 are following provided?	EB 34	Ann 09	**CAR09**: PDD version 01, Section B.4, presents a title which is different from the Guidelines for CDM-	CAR09	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			SSC-PDD.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. The baseline for the proposed project activity with reference to the chosen project category	EB 34	Ann 09	**CAR10**: PDD version 01, Section B.4, does not specify the baseline as stated in AMS-I.D. ver 16. Besides, currently, there is a national interconnected grid and not an isolated South-Southeast-Midwest grid anymore. Correct all parts of PDD, accordingly.	CAR10	OK
ii. Justification of key assumptions and rationales	EB 34	Ann 09	As per EB 46 Annex 11, in its Annex 1, "Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period", *If the current baseline is not in compliance with the relevant mandatory national and/or sectoral policies […], then the current baseline needs to be updated for the subsequent crediting period.* **CAR11**: PDD version 01 does not mention the operation of 332 kW generating unit, which is operating in the project activity and generating electricity to the grid. This 3rd unit is not covered by any ANEEL's authorizations. As per EB 46 Annex 11, in its Annex 1, *If any of the data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, the current baseline needs to be updated for the*	CAR11 CAR12 CAR13 CL07	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			subsequent crediting period. **CAR12**: PDD version 01, Section B.4, Step 2, states there is no need to update the current baseline, whereas due to an installed capacity which is not valid anymore, compared to the registered PDD, "the current baseline needs to be updated for the subsequent crediting period", as per EB 46 Annex 11. - Previous installed capacity, as per registered PDD: 9.2 MW - Current installed capacity, as verified during site visit: 9.67 MW (= 2x 4,669 kW + 332 kW) **CL07**: Please, explain the difference between the annual averages of energy generation used for the ex-ante estimation of emissions reductions, comparing PDD version 01 (46,954 MWh/yr) and registered PDD version 2005.07.27B (46,305 MWh/yr). **CAR13**: PDD version 01, Section B.4, Figure 4, presents an "Avarege growth" with part of the information in Portuguese: values in "MW a.a.".		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
iii. Transparent illustration of all data used to determine the baseline emissions (variables, parameters, data sources etc)	EB 34	Ann 09	**CAR14**: PDD version 01, Section B.4, does not illustrate in a transparent manner all data used to determine the baseline emissions.	CAR14	OK
iv. Are there any changes/modifications compared to the webhosted PDD?	EB 34	Ann 09	N/A	OK	OK
o. In CDM-SSC-PDD section B.5 are following provided?	EB 34	Ann 09			
i. Explanation that the proposed project activity is additional as per options provided under attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities	EB 34	Ann 09	See CAR11 and CL07.	CAR11 CL07	OK
ii. National policies and circumstances relevant to the baseline of the proposed project activity	EB 34	Ann 09	No new relevant national and/or sectoral policies and circumstances exist.	OK	OK
iii. Evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity, if the starting date of the project activity is before the date of validation. (this is part of the large scale project guidelines. It is better to be retained)	EB 34	Ann 09	Not applicable for the renewal of the crediting period of an already registered project activity.	OK	OK
p. In CDM-SSC-PDD section B.6.1 are following provided?	EB 34	Ann 09			
i. Explanation on how the procedures, in the approved project category to calculate project emissions, baseline emissions, leakage	EB 34	Ann 09	**CAR15**: PDD version 01, Section B.6.1, refers to an incorrect version (number 15) of methodologies	CAR15 CAR16	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
emissions and emission reductions are applied to the proposed project activity.			ACM0002 and AMS-I.D. **CAR16**: PDD version 01, Section B.6.1, mentions "paragraph 14", whereas "19" is the correct one. **CL08**: Please, rewrite first paragraph, using expressions in accordance to AMS-I.D. ver 16. **CL09**: Please, correct the names of the steps of the "Tool to calculate the emission factor for an electricity system". Adjust Section B.6.1 accordingly. **CL10**: Please, clarify, in Section B.6.1, under "Project Emissions (PE_y)", that "Emissions from water reservoirs of hydro power plants" is one of the categories to which first paragraph refers to. **CAR17**: PDD version 01, Section B.6.1, in steps 5 and 6, under "Baseline Emissions", presents a second sentence which is not in accordance with the "Tool to calculate the emission factor for an electricity system" version 02 (see Option 1, page 15).	CAR17 CL08 CL09 CL10	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Clearly stating of which equations will be used in calculating emission reductions.	EB 34	Ann 09	**CAR18**: PDD version 01, Section B.6.1, presents data units for BE_y, $PE_{GP,y}$, $PE_{HP,y}$, ER_y, PE_y and LE_y which are different from what is established by AMS-I.D. ver 16. **CAR19**: PDD version 01, Section B.6.1, identifies emission factors with incomplete subscripts. **CL11**: Please, use a single symbol for multiplication operations over all sections of the PDD. Currently, three different symbols are used (x, . and *). **CL12**: Please, correct description of $FE_{EL,DD,h}$.	CAR18 CAR19 CL11 CL12	OK
iii. Explanation and justification of all relevant methodological choices, including: where the category provides different options to choose from; where the category provides for different default values	EB 34	Ann 09	**CAR20**: PDD version 01, Section B.6.1, for the calculation of $EF_{CO2,grid,y}$, does not explain nor justifies the choice between options 12(a) and 12(b) of AMS-I.D. ver 16. **CAR21**: PDD version 01, Section B.6.1, does not mention that in terms of vintage data, Option 1 had been chosen for the first crediting period, which reflects in the second one, as per the "Tool to calculate the emission factor for an electricity system" version 02.	CAR20 CAR21 CL13	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			CL13: Please, explain and justify why Option I was chosen, in Step 2, Section B.6.1, PDD version 01.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
q. In CDM-SSC-PDD section B.6.2 are following provided?	EB 34	Ann 09			
i. A compilation of information on the data and parameters that are not monitored but determined upfront so as to be available for validation	EB 34	Ann 09	**CAR22**: PDD version 01, Section B.6.2, presents parameters relevant to reservoir based hydro plants not included in Table 1 of AMS-I.D. ver 16 that, for this reason, shall be monitored following ACM0002 version 11, which shows A_{PJ} and Cap_{PJ} as data/parameters to be monitored.	CAR22	OK
ii. The actual value applied	EB 34	Ann 09	**CAR23**: PDD version 01, Section B.6.2, presents a rounded number for A_{PJ} (reservoir area), whereas the exact same number, as shown in the environmental operational license LO 3194/2009-DL, shall be used in all sections of the PDD. **CL14**: Please, clarify the difference between ANEEL's and ONS' information on the SHPP installed capacity. As per ANEEL's Resolution 446/2203 (http://www.aneel.gov.br/cedoc/res2003446.pdf), it is 9,200 kW. As per ONS' records of Type 3 Power Plants (http://www.ons.org.br/download/integracao_sin/definicao_modalidade/Modalidade.zip, file "Tipo_3_Em Operação_05_Ago_2010.pdf"), 11.0 MW.	CAR23 CL14 CL15	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			CL15: Please, provide the data books of the equipments of the three generating units installed at the plant.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
iii. Explanation and justification for the choice of the source of data	EB 34	Ann 09	**CAR24**: PDD version 01, Section B.6.2, does not justify the choice of the source of data for the installed capacity.	CAR24	OK
iv. Clear and transparent references or additional documentation in Annex 3	EB 34	Ann 09	Yes.	OK	OK
v. Where values have been measured, a description of the measurement methods and procedures (e.g. which standards have been used), indicated the responsible person/entity having undertaken the measurement, the date of measurement(s) and the measurement results	EB 34	Ann 09	N/A	OK	OK
r. In CDM-SSC-PDD section B.6.3 are following provided?	EB 34	Ann 09			
i. A transparent ex ante calculation of project emissions, baseline emissions (or, where applicable, direct calculation of emission reductions) and leakage emissions expected during the crediting period, applying all relevant equations provided in the approved methodology	EB 34	Ann 09	Yes.	OK	OK
ii. Documentation how each equation is applied, in a manner that enables the reader to reproduce the calculation	EB 34	Ann 09	**CAR25**: PDD version 01, Section B.6.3, presents some data/parameters whose identifications are different from Section B.6.1.	CAR25 CAR26 CAR27 CAR28	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			CAR26: PDD version 01, Section B.6.3, presents an incorrect power density of the plant, since its installed capacity is 9.67 MW, instead of 9.2 MW, as verified during the site visit. **CAR27**: PDD version 01, Section B.6.3, presents a sentence, under "Emission Reductions", with an expression in Portuguese. **CAR28**: PDD version 01, Section B.6.3, presents incorrect data unit for ER_y.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
iii. Additional background information and or data in Annex 3, including relevant electronic files (i.e. spreadsheets)	EB 34	Ann 09	**CAR29**: PDD version 01, Annex 3, presents two web links that lead to information in Portuguese, whereas direct links to information in English are available at the Brazilian DNA's web site.	CAR29	OK
iv. Emission reduction calculations for each component are provided separately if more than one component activity is applied	EB 34	Ann 09	There is only one component.	OK	OK
s. In CDM-SSC-PDD section B.6.4 are the results of the ex ante estimation of emission reductions for all years of the crediting period, in a tabular format, provided?	EB 34	Ann 09	**CAR30**: PDD version 01, Section B.6.4, presents a table title with an incorrect unit and Table 4 with data/parameters' units not in accordance with the Guidelines for CDM-SSC-PDD. Besides, the '*' and '**' information is not relevant.	CAR30	OK
t. In CDM-SSC-PDD section B.7.1 are following provided?	EB 34	Ann 09			
i. Specific information on how the data and parameters that need to be monitored would actually be collected during monitoring for the project activity	EB 34	Ann 09	Refer to CAR34 and CL18.	CAR34 CL18	OK
ii. For each below parameter the following information, using the table provided:	EB 34	Ann 09			
a. The source(s) of data that will be actually used for the proposed project activity (e.g. which exact national statistics). Where several sources may be used, explain and justify which data sources should be preferred	EB 34	Ann 09	**CAR31**: PDD version 01, Section B.7.1, uses a tabular format which is not in accordance with AMS-I.D. ver 16. **CAR32**: PDD version 01, Section B.7.1, uses an	CAR31 CAR32	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			identification for “Quantity of net electricity supplied to the grid in year y” which is not in accordance with Table 1 of AMS-I.D. ver 16.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. Where data or parameters are supposed to be measured, specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person/entity that should undertake the measurements and what is the measurement interval; (i) A description of the QA/QC procedures (if any) that should be applied; (ii) Where relevant: any further comment. Provide any relevant further background documentation in Annex 4.	EB 34	Ann 09	**CAR33**: PDD version 01, Section B.7.1, does not mention that a continuous monitoring of $EG_{facility,y}$ is required, as per AMS-I.D. ver 16. **CL16**: Please, rewrite description of "Value of data" for $EF_{CO2,y}$, replacing expression "while the validation". Refer to text under Option 1 of the "Tool to calculate the emission factor for an electricity system" version 02, page 15. **CL17**: Please, clarify that the choice of dispatch data analysis does not allow the ex-ante approach to determine $EF_{grid,OM,y}$.	CAR33 CL16 CL17	OK
iii. A detailed description of the monitoring plan.	EB 34	Ann 09	**CAR34**: PDD version 01, Section B.7.2, refers to monitoring plan procedures in paragraph 17 of AMS-I.D. ver 16, whereas such paragraph relates to lifetime requirements. **CAR35**: PDD version 01, Section B.7.2, refers to EG_y, whereas $EG_{facility,y}$ is the correct identification as per AMS-I.D. ver 16.	CAR34 CAR35	OK
a. The operational and management structure that the project operator will	EB	Ann	**CL18**: Please, clarify management and operational	CAR36	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
implement in order to monitor emission reductions and any leakage effects generated by the project activity	34	09	structure for monitoring, including data collection and archiving, considering all parties involved. Additionally, detail the "Area of Operations", which is shown in Item 6 of BGEE's procedure BTCC02 version 02. **CL19**: Please, explain why the main meter (position identified as "A1" in BGEE's panel at RGE's substation) has been removed. Additionally, provide CCEE's records of all measuring events, during the 4th monitoring period, of both energy meters, as per CCEE's "BOM" report ("Boletim de Ocorrência de Medição"). **CL20**: Please, provide documented evidence on the identification (model and serial number) of the energy meter that has been temporarily removed from BGEE's panel at RGE's substation. **CL21**: Please, provide documented evidence on the serial number of the backup meter, which has a warranty label numbered 28998 (position identified as "A2" in BGEE's panel at RGE's substation). **CAR36**: There is a discrepant backup energy meter serial number (90001669) shown on calibration	CL18 CL19 CL20 CL21	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			certificate CCL 050/10, compared to the serial number 90001696, which needs to be confirmed based on the response to CL21.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. The responsibilities for and institutional arrangements for data collection and archiving	EB 34	Ann 09	Refer to CAR34 and CL18. **CAR37**: PDD version 01, Section B.7.2, establishes storage requirements of monitored data not in accordance with the Guidelines for CDM-SSC-PDD.	CAR37	OK
c. Does the monitoring plan reflect good monitoring practice appropriate to the type of project activity	EB 34	Ann 09	Refer to CAR34, CAR37 and CL18.	CAR34 CAR37 CL18	OK
d. Relevant further background information in Annex 4	EB 34	Ann 09	N/A	OK	OK
u. In CDM-SSC-PDD section B.8 are following provided	EB 34	Ann 09			
i. Date of completion of the application of the methodology to the project activity study in DD/MM/YYYY	EB 34	Ann 09	Yes.	OK	OK
ii. Contact information of the person(s)/entity(ies) responsible for the application of the baseline and monitoring methodology to the project activity	EB 34	Ann 09	**CL24**: Please, clarify who – person(s)/entity(ies) – was responsible for the application of the baseline and monitoring methodology to the project activity.	CL24	OK
iii. Indicated if the person/entity is also a project participant listed in Annex 1	EB 34	Ann 09	**CAR38**: PDD version 01, Section B.8, does not indicate whether “Comissão Interministerial de Mudança Global do Clima” is a project participant listed in Annex 1.	CAR38	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
v. In CDM-SSC-PDD section C.1.1 are following provided?	EB 34	Ann 09			
i. The starting date of a CDM project activity is the earliest of the date(s) on which the implementation or construction or real action of a project activity begins/has begun (EB33, Para 76/CDM Glossary of terms/EB41, Para 67)	EB 34	Ann 09	N/A	OK	OK
ii. A description of how this start date has been determined, and a description of the evidence available to support this start date	EB 34	Ann 09	N/A	OK	OK
iii. If this starting date is earlier than the date of publication of the CDM-SSC-PDD for global stakeholder consultation by a DOE, does Section B.5 above contain a description of how the benefits of the CDM were seriously considered prior to the starting date (EB41, Para 68).? (though this is in guideline for large scale projects, it is advisable to maintain this for small scale projects as well)	EB 34	Ann 09	N/A	OK	OK
w. In CDM-SSC-PDD section C.1.2 is the expected operational lifetime of the project activity in years and months provided?	EB 34	Ann 09	Yes. 30y-0m.	OK	OK
x. In CDM-SSC-PDD section C.2 is it stated whether the project activity will use a renewable or a fixed crediting period and completed C.2.1 or C.2.2 accordingly?	EB 34	Ann 09	**CAR39**: PDD version 01, Section C.2, does not state that the project activity uses a renewable crediting period.	CAR39	OK
y. In CDM-SSC-PDD section C.2.1 is it indicated that each crediting period shall be at most 7	EB	Ann 09	Yes.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
years and may be renewed at most two times, provided that, for each renewal, a designated operational entity determines and informs the Executive Board that the original project baseline is still valid or has been updated taking account of new data where applicable?	34				
z. In CDM-SSC-PDD section C.2.1.1 are the dates in the following format: (DD/MM/YYYY) provided?	EB 34	Ann 09	Yes. **CAR40**: PDD version 01, sections C.2.1.1 and C.2.1.2, mention "first" crediting period in the sections' titles, whereas "second" is the correct period.	CAR40	OK
aa. In CDM-SSC-PDD section C.2.1.2 is the length of the first crediting period in years and months?	EB 34	Ann 09	Yes. Refer to CAR40.	CAR40	OK
bb. In CDM-SSC-PDD section C.2.2 is it indicated fixed crediting period at most ten (10) years	EB 34	Ann 09	N/A	OK	OK
cc. In CDM-SSC-PDD section C.2.2.1 are the dates in the format (DD/MM/YYYY) provided?	EB 34	Ann 09	N/A	OK	OK
dd. In CDM-SSC-PDD section C.2.2.2 is the length of the crediting period in years and months provided?	EB 34	Ann 09	N/A	OK	OK
ee. In CDM-SSC-PDD section D.1 is the documentation on the analysis of the	EB	Ann 09	**CAR41**: PDD version 01, Section D.1, presents an incorrect month for the date of ANEEL's Resolution	CAR41	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
environmental impacts, if required by Host Party, provided?	34		180/2000. **CAR42**: PDD version 01, Section D.2, presents a statement that is not part of ANEEL's Resolution 652/2003 ("[…] if the area is between 3 km^2 and 13 km^2, it should have a minimum environmental impact.").	CAR42	
ff. In CDM-SSC-PDD section E.1 are following provided?	EB 34	Ann 09			
i. The process by which comments by local stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilities comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted	EB 34	Ann 09	N/A	OK	OK
ii. The project activity is described in a manner, which allows the local stakeholders to understand the project activity, taking into account confidentiality provisions of the CDM modalities and procedures	EB 34	Ann 09	N/A	OK	OK
iii. The local stakeholder process has been completed before submitting the proposed project activity to the DOE for validation	EB 34	Ann 09	N/A	OK	OK
gg. In CDM-SSC-PDD section E.2 are following provided?	EB	Ann 09			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
	34				

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Local stakeholders that have made comments identified	EB 34	Ann 09	N/A	OK	OK
ii. A summary of these comments	EB 34	Ann 09	N/A	OK	OK
hh. In CDM-SSC-PDD section E.3 is and explanation of how due account have been taken of comments received from local stakeholders provided?	EB 34	Ann 09	N/A	OK	OK
ii. In CDM-SSC-PDD Annex 1 are following provided?	EB 34	Ann 09			
i. Contact information of project participants	EB 34	Ann 09	**CAR43**: PDD version 01, Annex 1, presents an incomplete title, compared to the Guidelines for CDM-SSC-PDD. **CAR44**: PDD version 01, Annex 1, does not list all organisations presented in Section A.3.	CAR43 CAR44	OK
ii. For each organisation listed in section A.3 the following mandatory fields: Organization, Name of contact person, Street, City, Postfix/ZIP, Country, Telephone and Fax or e-mail	EB 34	Ann 09	Yes. Except for the organisations covered by CAR44.	CAR44	OK
jj. In CDM-SSC-PDD Annex 2 is information from Parties included in Annex I on sources of public funding for the project activity which shall provide an affirmation that such funding does not result in a diversion of official development assistance	EB 34	Ann 09	No public funding is used in the project activity.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
and is separate from and is not counted towards the financial obligations of those Parties provided?					
kk. In CDM-SSC-PDD Annex 3 is the background information used in the application of the baseline methodology provided?	EB 34	Ann 09	See CAR29.	CAR29	OK
ll. In CDM-SSC-PDD Annex 4 is the background information used in the application of the monitoring methodology provided?	EB 34	Ann 09	There is no additional information in Annex 4.	OK	OK
4. Project description					
a. Does the PDD 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?	VVM	58	Refer to CAR11.	CAR11	OK
b. Is the description of the proposed CDM project activity as contained in the PDD:	VVM	59			OK
i. sufficiently covering all relevant elements?	VVM	59	Refer to CAR11.	CAR11	OK
ii. acurate?	VVM	59	Refer to CAR11. There are two 4,669 kW turbines, manufactured by Möller, in 2003. They feed mechanical energy into two 4.95 MW generators, Model SPA 900, serial numbers 118612 (generator 01) and 118613 (generator 02), manufactured by WEG, in 2003.	CAR11 CAR45 CL22 CL23	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			There is a third generating unit of 332 kW (turbine and generator with same power), manufactured by Rischbieter, serial identification TS KR 01, in 2004. The turbine is submerged, located in the dam. All three generators supply electricity to the grid. **CAR45**: PDD version 01, Section A.4.2, specifies the use of two 4.5 MW turbines, instead of the two 4,669 kW ones that were found operating, during site visit. **CL22**: Please, provide copies of the daily manual records, taken by the plant operators, of the power generation of the 332 kW generating unit, in 2010 ("registro mini central 2010"). **CL23**: Please, provide copies of the daily manual records, taken by the plant operators, of the power generation of generators 01 and 02, in 2010 ("registros grupo gerador 01 e 02"), for every single day when both generators were operating at the same time. Even when that occurred only in part of the day.		

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iii. providing the reader with a clear understanding of the nature of the proposed CDM project activity?	VVM	59	Yes.	OK	OK
iv. Are there any changes/modifications compared to the webhosted PDD?	VVM	59	N/A	OK	OK
c. Is the proposed CDM project activity in existing facilities or or utilizing existing equipments?	VVM	60	The proposed CDM project activity has already been validated and is under the process for renewal of its crediting period. It is in existing facilities and utilizes existing equipments.	OK	OK
d. Is the CDM project activity one of the following types:	VVM	60			
i. Large scale?	VVM	60	No.	OK	OK
ii. Non-bundled small scale projects with emission reductions exceeding 15,000 tonnes per year?	VVM	60	No.	OK	OK
iii. Bundled small scale projects, each with emission reductions not exceeding 15,000 tonnes?	VVM	60	No.	OK	OK
e. If yes to (c) and (d) above, was a physical site inspection conducted to confirm that the description in the PDD reflects the proposed CDM project activity, unless other means are specified in the methodology?	VVM	60	The site was inspected on 12-13/08/2010.	OK	OK
f. If yes to (d.iii) above, was the number of physical site visits base on samping?	VVM	60	N/A	OK	OK
g. If yes is the sampling size appropriately justified through statistical analysis?	VVM	60	N/A	OK	OK
h. For other individual proposed small scale CDM project activities with emission reductions not	VVM	61	The site was inspected on 12-13/08/2010.	OK	OK

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exceeding 15,000 tonnes per year, was a physical site inspection conducted?					
i. For all other proposed CDM project activities not referred to in paragraphs 59 – 61, was a physical site inspection conducted?	VVM	62	N/A	OK	OK
j. If no, was it appropriately justified?	VVM	62	N/A	OK	OK
k. Does the proposed CDM project activity involve the alteration of an existing installation or process?	VVM	63	N/A	OK	OK
l. If yes, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation?	VVM	63	N/A	OK	OK
5. Baseline and monitoring methodology					
a. General requirement					
a. Do the baseline and monitoring methodologies selected by the project participants comply with the methodologies previously approved by the CDM Executive Board?	VVM	65	Yes. Methodology AMS-I.D. ver 16.	OK	OK
b. Is the selected methodology applicable to the project activity?	VVM	66	Refer to (5.b.a) below.	-	-
c. Had the PP correctly applied the selected methodology?	VVM	66	Refer to (5.b.c) below.	-	-
d. Had the selected methodology been correctly applied with respect to project boundary?	VVM	67	Refer to (5.c) below.	-	-
e. Had the selected methodology been correctly applied with respect to baseline identification?	VVM	67	Refer to (5.d) below.	-	-
f. Had the selected methodology been correctly	VVM	67	Refer to (5.e) below.	-	-

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
applied with respect to Algorithms and/or formulae used to determine emission reductions?					
g. Had the selected methodology been correctly applied with respect to additionality?	VVM	67	Refer to (6) below.	OK	OK
i. Has the general guidance to the small scale CDM methodologies, information on additionality (attachment A to appendix B) been applied correctly?	AMS	I.D	N.a.	OK	OK
h. Had the selected methodology been correctly applied with respect to monitoring methodology?	VVM	67	Refer to (7) below.	OK	OK
b. Applicability of the selected methodology to the project activity					
a. Is the selected baseline and monitoring methodology, previously approved by the CDM Executive Board, applicable to the project activity including that the used version is valid?	VVM	68	Yes.	OK	OK
b. Has the DOE applied specific guidance provided by the CDM Executive Board in respect to the applicable approved methodology?	VVM	69	Yes.	OK	OK
c. Is the methodology correctly quoted?	VVM	70	Yes.	OK	OK
d. Are the applicability conditions of the methodology met?	VVM	71	Yes.	OK	OK
i. Does the project activity comprises renewable energy generation units, such as photovoltic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to a national or a regional grid? Note: Project activities that displace electricity from an electricity distribution system that is or would	AMS	I.D	Yes.	OK	OK

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have been supplied by at least one fossil fuel fired generating unit shall apply AMS-I.F.					
ii. Has the project participant provided justification in line with the applicabiltiy of methodology with respect to Table 2 of approved methodology ?	AMS	I.D	Yes.	OK	OK
iii. Does the project activity involve i. install a new power plant at site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); ii. involve a capacity addition iii. involve a retrofit of (an) existing plant(s) or iv. involve a replacement of (an) existing plant(s)	AMS	I.D	New power plant	OK	OK
iv. For Hydro power plants with reservoirs, does it satisfy at least one of the following conditions (a) the project activity is implemented in an exisitng reservoir with no change in the volume of reservoir (b) the project activity is implemented in an exisitng reservoir, where the volume of reservoir is increased and the power density of the project activity, is greater than 4 W/m2 (c) the project activity results in new reservoirs and the power density of the power plant is greater than 4 W/m2.	AMS	I.D	(c)	OK	OK

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v. Is the following guideline followed: (a) If the new unit has both renewable and non-renewable components (eg., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. (b) If the new unit co-fires fossil fuels, the capacity of the entrie unit shall not exceed the limit of 15 MW.	AMS	I.D	n.a.	OK	OK
vi. Is the following guideline followed: Combined heat and power (co-generation) systems are not eligible under this category	AMS	I.D	n.a.	OK	OK
vii. Is the following guideline followed: In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct6 from the existing	AMS	I.D	n.a.	OK	OK
viii. Is the following guideline followed: In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	AMS	I.D	n.a.	OK	OK
e. Is the project activity expected to result in emissions other than those allowed by the methodology?	VVM	71	No.	OK	OK

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f. Is the choice of the methodology justified?	VVM	71	Yes.	OK	OK
g. Have the project participants shown that the project activity meets each of the applicability conditions or the approved methodology?	VVM	71	Refer to (5.b.c) above	-	-
h. Have the project participants shown that the project activity meets each of the applicability conditions of any tool or other methodology component referred to the methodology?	VVM	71	Yes.	OK	OK
i. Is the DOE, based on local and sectoral knowledge, aware that comparable information is available from sources other than that used in the PDD?	VVM	71	Yes.	OK	OK
j. If yes, was the PDD cross checked against the other sources to confirm that the project activity meets the applicability conditions of the methodology? (provide the reference to these choices)	VVM	71	Yes. Environmental licenses and ANEEL's resolutions relevant to the operation of the plant.	OK	OK
k. Can a determination regarding the applicability of the selected methodology to the proposed CDM project activity be made?	VVM	72	Yes.	Ok	OK
l. If no, clarification of the methodoloy was requested, in accordance with the guidance provided by the CDM Executive Board?	VVM	72	N/A	OK	OK
m. If answer to (5.b.d) above is "no", revision or deviation from the methodology was requested, in accordance with the guidance provided by the CDM Executive Board?	VVM	73	N/A	OK	OK
n. If yes to (5.b.l) and (5.b.m) above, a request for registration was submited before the CDM	VVM	74	N/A	OK	OK

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Executive Board has approved the proposed deviation or revision?					
c. Project boundary					
a. Does the PDD 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?	VVM	78	Refer to CL05 and CL06.	CL05 CL06	OK
i. Does the physical, geographical site of the renewable generation?	AMS	I.D			
b. Is the delineation in the PDD of the project boundary correct and include identification of all locations, processes and equipment including secondary equipment and associated processes such as logistics etc.?	VVM	79	Refer to CL05 and CL06.	CL05 CL06	OK
c. Does the delineation in the PDD of the project boundary meet the requirements of the selected baseline?	VVM	79	Refer to CL05 and CL06.	CL05 CL06	OK
d. Have changes been made to the project boundary in comparison to the webhosted PDD. If yes please comment on the reason for the changes.	VVM	79	N/A	OK	OK
e. Have all sources and GHGs required by the methodology been included within the project boundary?	VVM	79	Yes.	OK	OK
f. Does the methodology allow project participant to choose whether a source or gas is to be included within the project boundary?	VVM	78	No.	OK	OK

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g. If yes, have the project participants justified that choice?	VVM	79	N/A	OK	OK
h. If yes, is the justification provided reasonable? (provide reference to the supporting documented evidence provided by the project participants)	VVM	79	N/A	OK	OK
d. Baseline identification					
a. Does the PDD 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?	VVM	81	Refer to CAR10.	CAR10	OK
b. Has any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied?	VVM	82	Yes.	OK	OK
i. Is the following guideline followed: Is the project activity new grid-connected renewable power plant/unit and hence the baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources.	AMS	I.D	Yes.	OK	OK
ii. Is the baseline emissions calculated as the product of electrical energy baseline EGBL, y expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission	AMS	I.D	Yes.	OK	OK

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BE y = EG BL y* EF CO2 grid y					
iii. Is the Emission Factor calculated in a transparent and conservative manner as follows: (a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the .Tool to calculate the Emission Factor for an electricity system.. OR (b) The weighted average emissions (in t CO2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used. Calculations shall be based on data from an official source (where available) and made publicly available.	AMS	I.D	(A)	OK	OK
i. Is the following guideline followed: - In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. - If the recovered methane is used for electricity generation for supply to a grid then the baseline shall be calculated in accordance with paragraphs below else use other applicable type I methodologies such as AMS-IA or AMS-	AMS	I.D	n.a.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
I.F. - If the recovered methane is used for heat generation or cogeneration it is eligible under category I.C.					
ii. Is the following guideline followed for project activities that involve retrofits or replacements of an existing facility for renewable energy generation: - The baseline scenario is the continuing operation of the existing plant. - The methodology uses historical electricity generation data to determine the electricity generation of the existing plant in the baseline scenario, assuming that the historical situation observed prior to the implementation of the project activity would continue. In the absence of the CDM project activity, the existing facility would continue to provide electricity to the grid BL retrofit y EG, at historical average levels EGhistorical, y until the time at which the electrical generation facility would be likely to be replaced or retrofitted in the absence of the CDM project activity ($DATE_{BaselineRretrofit}$). From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and baseline electricity production is assumed to equal the project.s	AMS	I.D	n.a.	OK	OK

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net electricity production and no emission reductions are assumed to occur.					
iii. Is the following guideline followed for Retrofit/capacity addition of hydro, solar, wind, geothermal, wave and tidal plants: - Use of standard deviation for calculating baseline elecricity generation. - A minimum of 5 years (60 months) (excluding abnormal years) of historical generation data is required in the case of hydro facilities and for other facilities a minimum of 3 years (36 months) data is required. - In the case that 5 years of historical data are not available - e.g., due to recent retrofits or exceptional circumstances8 - a new methodology or methodology revision shall be proposed. - In the case of wind, solar, wave or tidal power plants, the electricity produced by the added power plant(s) or unit(s) could be directly metered and used to determine EG BL,y. provided that the electricity produced by the added power plant(s) or unit(s) addition is separately metered. - Project activities for capacity addition in hydro or geothermal shall use equation 3 replacing	AMS	I.D	n.a.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
subscript .retrofit. with .capacity addition.					
iv. Is the following guideline followed for Retrofit renewable energy units other than hydro, solar, wind, geothermal, wave and tidal plants: Baseline emissions are calculated as: $BE_{retrofit,CO2,y} = (EG_{PJ,retrofit,y} - EG_{BL,retrofit,y}) * EF_{CO2}$ EG historical - A minimum of 3 years of data is required. In the case that 3 years of historical data are not available 9- e.g., due to recent retrofits or exceptional circumstances - a new methodology or methodology revision shall be proposed	AMS	I.D	n.a.	OK	OK
v. Is the requirements concerning demonstration of the remaining lifetime of the replaced equipment met as described in the general guidelines to SSC methodologies? Note: If the remaining lifetime of the affected systems increases due to the project activity, the crediting period shall be limited to the estimated remaining lifetime, i.e., the time when the affected systems would have been replaced in the absence of the project activity.	AMS	I.D	n.a.	OK	OK
vi. Is the following guideline followed for Capacity addition with renewable energy units other than	AMS	I.D	n.a.	OK	OK

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hydro, solar, wind, geothermal, wave and tidal plants: - The baseline scenario is the existing facility that 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 ($DATE_{BaselineRetrofit}$). - If the existing units shut down, are derated, or otherwise become limited in production, the project activity should not get credit for generating electricity from the same renewable resources that would have otherwise been used by the existing units (or their replacements).					
vii. Does project activity involve co-firing ? If yes, the quantities and types of biomass and biomass to fossil fuel ratio to be used during crediting period is explained and documented transparently and presented in PDD ? Are exante estimation of these values provided in the PDD ?	AMS	I.D	n.a.	OK	OK
c. Does the selected methodology require 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?	VVM	82	Yes. ACM0002 version 11 ("Consolidated baseline methodology for grid-connected electricity generation from renewable sources") and the "Tool to calculate the emission factor for an electricity system" (version 02).	OK	OK

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d. If yes, was the methodology consulted on the application of thes tools? (In such cases, the guidance in the methodology shall supersede the tool.)	VVM	82	Yes.	OK	OK
e. Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario?	VVM	83	No.	OK	OK
f. If yes, are all scenarios that are considered by the project participants and are supplementary to those required by the methodology reasonable in the context of the proposed CDM project activity?	VVM	83	N/A	OK	OK
g. Has any reasonable alternative scenario been excluded?	VVM	83	N/A	OK	OK
h. Is the baseline scenario identified reasonably supported by:	VVM	84	N/A	OK	OK
i. Assumptions?	VVM	84	N/A	OK	OK
ii. Calculations?	VVM	84	N/A	OK	OK
iii. Rationales?	VVM	84	N/A	OK	OK
i. Are the documents and sources referred to in the PDD correctly quoted and interpreted?	VVM	84			
j. Was the information provided in the PDD cross checked with other verifiable and credible sources, such as local expert opinion, if available? (idendify the sources)	VVM	84	Refer to CL14.	CL14	OK
k. Have all applicable CDM requirements been taken into account in the identification of the baseline scenario for the proposed CDM project activity?	VVM	85	Yes.	OK	OK

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l. Have all relevant policies and circumstances been identified and correctly considered in the PDD, in accordance with the guidance by the CDM Executive Board?	VVM	85	Yes.	OK	OK
m. Does the PDD provide 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?	VVM	86	Yes.	OK	OK
e. Algorithms and/or formulae used to determine emission reductions					
a. Do the steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring?	VVM	89	Yes.	OK	OK
b. Have the equations and parameters in the PDD been correctly applied with respect those in the select approved methodology?	VVM	90	Yes.	OK	OK
i. Have project emissions considered as described in recent version of AMS.I.D followed for: - Emissions related to the operation of geothermal power plants; - Emissions from water reservoirs of hydro power plants.	AMS	I.D	n.a.	OK	OK
ii. Is leakage considered, if the energy generating	AMS	I.D	n.a.	OK	OK

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equipment is transfereed from another activity					
iii. Is emission reduction calculated as per equation ER y = BE y − PE y − LE y	AMS	I.D	Yes.	OK	OK
c. Does the methodology provide for selection between different options for equations or parameters?	VVM	90	Yes.	OK	OK
d. If yes, has adequate justification been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided)?	VVM	90	No. Refer to CAR20, CAR21 and CL13.	CAR20 CAR21 CL13	OK
e. If yes, have correct equations and parameters been used, in accordance with the methodology selected?	VVM	90	Refer to (5.e.b) above	-	-
f. Will data and parameters be monitored throughout the crediting period of the proposed CDM project activity?	VVM	91	Yes.	OK	OK
g. If no, and these data and parameters will remain fixed throughout the crediting period, are all data sources and assumptions:	VVM	91			
i. Appropriate and correct?	VVM	91	N/A	OK	OK
ii. Applicable to the proposed CDM project activity?	VVM	91	N/A	OK	OK
iii. Resulting in a conservative estimate of the emission reductions?	VVM	91	N/A	OK	OK
h. Will data and parameters be monitored on implementation and hence become available only after validation of the project activity?	VVM	91	No.	OK	OK
i. If yes, are the estimates provided in the PDD for	VVM	91	N/A	OK	OK

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these data and parameters reasonable?					
6. Additionality of a project activity					
a. Does the PDD describe how a proposed CDM projet activity is additional?	VVM	94	N/A	OK	OK
b. Has the project participant used the "Tool for the demonstration and assessment of additionality"? (if yes go to item "d")	VVM	94	N/A	OK	OK
c. Has the project participant provided an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:	VVM	94	N/A	OK	OK
i. Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions?	VVM	94	N/A	OK	OK
ii. Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions?	VVM	94	N/A	OK	OK
iii. Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions?	VVM	94	N/A	OK	OK
iv. Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or	VVM	94	N/A	OK	OK

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capacity to absorb new technologies, emissions would have been higher?					
d. Were the following steps of the tool to assess additionality used:	EB 39	Ann 10			
v. Identification of alternatives to the project activity?	EB 39	Ann 10	N/A	OK	OK
vi. Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible?	EB 39	Ann 10	N/A	OK	OK
vii. Barriers analysis?	EB 39	Ann 10	N/A	OK	OK
viii. Common practice analysis?	EB 39	Ann 10	N/A	OK	OK
e. In step 1 (i) have all the sub-steps as below been followed?	EB 39	Ann 10			
i. Sub-step 1a: Define alternatives to the project activity	EB 39	Ann 10	N/A	OK	OK
ii. Sub-step 1b: Consistency with mandatory laws and regulations	EB 39	Ann 10	N/A	OK	OK
f. Have the following alternatives been included while defining alternatives as per sub-step 1a?	EB 39	Ann			

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		10			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. (a) The proposed project activity undertaken without being registered as a CDM project activity;	EB 39	Ann 10	N/A	OK	OK
ii. (b) Other realistic and credible alternative scenario(s) to the proposed CDM project activity scenario that deliver outputs services or services with comparable quality, properties and application areas, taking into account, where relevant, examples of scenarios identified in the underlying methodology;	EB 39	Ann 10	N/A	OK	OK
iii. (c) If applicable, continuation of the current situation (no project activity or other alternatives undertaken).	EB 39	Ann 10	N/A	OK	OK
g. Has the project participant included the technologies or practices that provide outputs or services with comparable quality, properties and application areas as the proposed CDM project activity and that have been implemented previously or are currently being introduced in the relevant country/region?	EB 39	Ann 10	N/A	OK	OK
h. Has the outcome of Step 1a: Identified realistic and credible alternative scenario(s) to the project activity done correctly? Please briefly mention the outcome.	EB 39	Ann 10	N/A	OK	OK
i. Is the alternative(s) in compliance with all mandatory applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution.?	EB 39	Ann 10	N/A	OK	OK

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j. If an alternative does not comply with all mandatory applicable legislation and regulations, has it been shown that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that noncompliance with those requirements is widespread in the country?	EB 39	Ann 10	N/A	OK	OK
k. Has the outcome of Step 1b: Identified realistic and credible alternative scenario(s) to the project activity that are in compliance with mandatory legislation and regulations taking into account the enforcement in the region or country and EB decisions on national and/or sectoral policies and regulations done correctly? Please state the outcome.	EB 39	Ann 10	N/A	OK	OK
l. Has PP selected Step 2 (Investment analysis) or Step 3 (Barrier analysis) or both Steps 2 and 3?	EB 39	Ann 10	N/A	OK	OK
m. In step 2, have all the sub-steps as below been followed?	EB 39	Ann 10		OK	OK
i. Sub-step 2a: Determine appropriate analysis method;	EB 39	Ann 10	N/A	OK	OK
ii. Sub-step 2b: Option I. Apply simple cost analysis;	EB 39	Ann 10	N/A	OK	OK

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iii. Sub-step 2b: Option II. Apply investment comparison analysis;	EB 39	Ann 10	N/A	OK	OK
iv. Sub-step 2b: Option III. Apply benchmark analysis;	EB 39	Ann 10	N/A	OK	OK
v. Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III);	EB 39	Ann 10	N/A	OK	OK
vi. Sub-step 2d: Sensitivity analysis (only applicable to Options II and III).	EB 39	Ann 10	N/A	OK	OK
n. In sub-step 2a has the determination of appropriate method of analysis done as per the guidance as below?	EB 39	Ann 10			
i. Simple cost analysis if the CDM project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than CDM related income (Option I).	EB 39	Ann 10	N/A	OK	OK
ii. Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III). Specify option used with justification.	EB 39	Ann 10	N/A	OK	OK
o. Has the below guideline followed for sub-step 2b Option I. Apply simple cost analysis? Document the costs associated with the CDM project activity and the alternatives identified in Step1 and demonstrate that there is at least one alternative which is less costly than the project activity.	EB 39	Ann 10	N/A	OK	OK

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p. Has the below guideline followed for sub-step 2b Option II. Apply investment comparison analysis? Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service most suitable for the project type and decision-making context. Please specify	EB 39	Ann 10	N/A	OK	OK
q. Has the below guideline followed for Sub-step 2b: Option III. Apply benchmark analysis?	EB 39	Ann 10	N/A	OK	OK
i. Identify the financial/economic indicator, such as IRR, most suitable for the project type and decision context.	EB 39	Ann 10	N/A	OK	OK
ii. When applying Option II or Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer. Only in the particular case where the project activity can be implemented by the project participant, the specific financial/economic situation of the company undertaking the project activity can be considered.	EB 39	Ann 10	N/A	OK	OK
iii. Discount rates and benchmarks shall be derived from: (a) Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial)	EB 39	Ann 10	N/A	OK	OK

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expert or documented by official publicly available financial data; (b) Estimates of the cost of financing and required return on capital (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds' required return on comparable projects; (c) A company internal benchmark (weighted average capital cost of the company), only in the particular case referred to above in 2. The project developers shall demonstrate that this benchmark has been consistently used in the past, i.e. that project activities under similar conditions developed by the same company used the same benchmark; (d) Government/official approved benchmark where such benchmarks are used for investment decisions; (e) Any other indicators, if the project participants can demonstrate that the above Options are not applicable and their indicator is appropriately justified. Please specify benchmark and justify.					
r. Has the below guideline followed for Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III)?	EB 39	Ann 10			
i. Calculate the suitable financial indicator for the proposed CDM project activity and, in the case of Option II above, for the other alternatives. Include all relevant costs (including, for	EB 39	Ann 10	N/A	OK	OK

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example, the investment cost, the operations and maintenance costs), and revenues (excluding CER revenues, but possibly including inter alia subsidies/fiscal incentives, ODA, etc, where applicable), and, as appropriate, non-market cost and benefits in the case of public investors if this is standard practice for the selection of public investments in the host country.					
ii. Present the investment analysis in a transparent manner and provide all the relevant assumptions, preferably in the CDM-PDD, or in separate annexes to the CDM-PDD.	EB 39	Ann 10	N/A	OK	OK
iii. Justify and/or cite assumptions.	EB 39	Ann 10	N/A	OK	OK
iv. In calculating the financial/economic indicator, the project's risks can be included through the cash flow pattern, subject to project-specific expectations and assumptions.	EB 39	Ann 10	N/A	OK	OK
v. Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated.	EB 39	Ann 10	N/A	OK	OK
vi. Present in the CDM-PDD a clear comparison of the financial indicator for the proposed CDM activity.Please specify details for above.	EB 39	Ann 10	N/A	OK	OK
s. Has the below guideline followed for Sub-step 2d: Sensitivity analysis (only applicable to Options II	EB 39	Ann	N/A	OK	OK

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and III)? Include a sensitivity analysis that shows whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions.		10			
t. Has the outcome of Step 2 clearly mentioned with justification?	EB 39	Ann 10	N/A	OK	OK
u. In step 3: Barrier analysis have all the sub-steps as below been followed?	EB 39	Ann 10		OK	OK
i. Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project activity;	EB 39	Ann 10	N/A	OK	OK
ii. Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity).	EB 39	Ann 10	N/A	OK	OK
v. Has the below guideline followed for Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project?	EB 39	Ann 10			
i. (a) Investment barriers: For alternatives undertaken and operated by private entities: Similar activities have only been implemented with grants or other non-commercial finance terms. No private capital is available from domestic or international capital markets due to real or perceived risks associated with investment in the country where the proposed CDM project activity is to be implemented, as	EB 39	Ann 10	N/A	OK	OK

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demonstrated by the credit rating of the country or other country investments reports of reputed origin.					
ii. (b) Technological barriers: Skilled and/or properly trained labour to operate and maintain the technology is not available in the relevant country/region, which leads to an unacceptably high risk of equipment disrepair and malfunctioning or other underperformance; Lack of infrastructure for implementation and logistics for maintenance of the technology, Risk of technological failure: the process/technology failure risk in the local circumstances is significantly greater than for other technologies that provide services or outputs comparable to those of the proposed CDM project activity, as demonstrated by relevant scientific literature or technology manufacturer information, The particular technology used in the proposed project activity is not available in the relevant region.	EB 39	Ann 10	N/A	OK	OK
iii. (c) Barriers due to prevailing practice: The project activity is the “first of its kind”.	EB 39	Ann 10	N/A	OK	OK
iv. (d) Other barriers, preferably specified in the underlying methodology as examples.	EB 39	Ann 10	N/A	OK	OK
w. Has the outcome from Step 3a clearly mentioned in PDD?	EB 39	Ann	N/A	OK	OK

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x. Has the below guideline followed for Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity)?	EB 39	Ann 10			
i. If the identified barriers also affect other alternatives, explain how they are affected less strongly than they affect the proposed CDM project activity. In other words, demonstrate that the identified barriers do not prevent the implementation of at least one of the alternatives. Any alternative that would be prevented by the barriers identified in Sub-step 3a is not a viable alternative, and shall be eliminated from consideration.	EB 39	Ann 10	N/A	OK	OK
ii. Provide transparent and documented evidence, and offer conservative interpretations of this documented evidence, as to how it demonstrates the existence and significance of the identified barriers and whether alternatives are prevented by these barriers.	EB 39	Ann 10	N/A	OK	OK
iii. The type of evidence to be provided should include at least one of the following: (a) Relevant legislation, regulatory information or industry norms; (b) Relevant (sectoral) studies or surveys (e.g. market surveys, technology studies, etc) undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc;	EB 39	Ann 10	N/A	OK	OK

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(c) Relevant statistical data from national or international statistics; (d) Documentation of relevant market data (e.g. market prices, tariffs, rules); (e) Written documentation of independent expert judgments from industry, educational institutions (e.g. universities, technical schools, training centres), industry associations and others. Please specify.					
y. Has the outcome from Step 3 clearly mentioned in PDD?	EB 39	Ann 10	N/A	OK	OK
z. In step 4: Common practise analysis have all the sub-steps as below followed?	EB 39	Ann 10			
i. Sub-step 4a: Analyze other activities similar to the proposed project activity;	EB 39	Ann 10	N/A	OK	OK
ii. Sub-step 4b: Discuss any similar Options that are occurring.	EB 39	Ann 10	N/A	OK	OK
aa. Has the below guideline followed for Sub-step 4a: Analyze other activities similar to the proposed project activity? Provide an analysis of any other activities that are operational and that are similar to the proposed project activity. Other CDM project activities are not to be included in this analysis. Provide documented evidence and, where relevant, quantitative information. On the basis of that analysis, describe whether and to	EB 39	Ann 10	N/A	OK	OK

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which extent similar activities have already diffused in the relevant region.					
bb. Has the below guideline followed for Sub-step 4b: Discuss any similar Options that are occurring? If similar activities are identified, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed project activity is financially/economically unattractive or subject to barriers. This can be done by comparing the proposed project activity to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the proposed project activity cannot use or did not face the barriers to which the proposed project activity is subject. In case similar projects are not accessible, the PDD should include justification about non-accessibility of data/information.	EB 39	Ann 10	N/A	OK	OK
cc. Has the outcome from Step 4 clearly mentioned in PDD?	EB 39	Ann 10	N/A	OK	OK
dd. Has it been proved that the porject is additional?	EB 39	Ann 10	N/A	OK	OK
ee. Has the PP demonstrated additionality by	EB	Ann	N/A	OK	OK

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explaining Investment barrier, Access-to-finance barrier, Technological barrier, Barrier due to prevailing practice or other barriers?	35	34			
ff. If Investment barrier has been explained, is it demonstraed that financilly more viable alternative to the project activity would have led to higher emissions? Please explain.	EB 35	Ann 34	N/A	OK	OK
gg. If Access-to-finance has been explained, is it demonstraed that the project activity could not access appropriate capital without consideration of the CDM revenues? Please explain.	EB 35	Ann 34	N/A	OK	OK
hh. If Technological barrier has been explained, is it demonstraed that a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertinity or low market share of the new technology adopted for the project activity and so would have led to higher emissions? Please explain.	EB 35	Ann 34	N/A	OK	OK
ii. If prevailing practise barrier has been explained, is it demonstrated that the prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions? Please explain.	EB 35	Ann 34	N/A	OK	OK
jj. If other barrier has been explained, is it demonstrated that Other barriers such as institutional barriers or limited information, managerial resources, organizational capacity, or	EB 35	Ann 34	N/A	OK	OK

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capacity to absorb new technologies would prevent the project activity any way?					
kk. Have the project participants identifed the most relevant barrier?	EB 35	Ann 34	N/A	OK	OK
ll. Have the project participants provided transparent and documented third party evidence such as national/international statistics, national/provincial policy and legislation, studies/surveys by independent agencies etc. to demonstrate the most relevant barrier? Please explain.	EB 35	Ann 34	N/A	OK	OK

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a. Prior consideration of the clean development mechanism					
a. Is the project ativity start date prior to the date of publication of the PDD for stakeholder comments?	VVM	98	N/A	OK	OK
b. If yes, were the CDM benefits considered necessary in the decision to undertake the project as a proposed CDM project activity?	VVM	98	N/A	OK	OK
c. Is the start date of the project activity, reported in the PDD, in accordance with the "Glossary of CDM terms", which states that "The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins."?	VVM	99	N/A	OK	OK
d. Does the project activity require construction, retrofit or other modifications?	VVM	99	N/A	OK	OK
e. If yes, is it ensured that the date of commissioning cannot be considered as the project activity start date?	VVM	99	N/A	OK	OK
f. Is it a new project activity (a project activity with a start date on or after 02 August 2008) or an existing project activity (a project activity with a start date before 02 August 2008)?	VVM	100	N/A	OK	OK
g. For a new project, for which 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, had the PP informed the Host Party DNA and/or the UNFCCC secretariat in writing of the	VVM	101	N/A	OK	OK

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commencement of the project activity and of their intention to seek CDM status? (Provide reference to such confirmation from host Party DNA and/or UNFCCC secretariat).					
h. For an existing project activity, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, are the following evidences provided:	VVM	102			
ii. evidence that must indicate that 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, including, inter alia:	VVM	102	N/A	OK	OK
a. 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?	VVM	102	N/A	OK	OK
iii. reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation, including, inter alia:	VVM	102	N/A	OK	OK
a. contract with consultants for CDM/PDD/methodology services?	VVM	102	N/A	OK	OK
b. Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with	VVM	102	N/A	OK	OK

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multilateral financial institutions or carbon funds)?					
c. evidence of agreements or negotiations with a DOE for validation services?	VVM	102	N/A	OK	OK
d. submission of a new methodology to the CDM Executive Board?	VVM	102	N/A	OK	OK
e. publication in newspaper?	VVM	102	N/A	OK	OK
f. interviews with DNA?	VVM	102	N/A	OK	OK
g. earlier correspondence on the project with the DNA or the UNFCCC secretariat?	VVM	102	N/A	OK	OK
h. Has the chronology of events including time lines been appropriately captured and explained/detailed in the PDD?	VVM	102	N/A	OK	OK
b. Identification of alternatives					
a. Does the approved methodology that is selected by the proposed CDM project activity prescribe the baseline scenario and hence no further analysis is required?	VVM	105	Yes.	OK	OK
b. If no, does the PDD identify credible alternatives to the project activity in order to determine the most realistic baseline scenario?	VVM	105	N/A	OK	OK
c. Does the list of alternatives given in the PDD esure that:	VVM	106		OK	OK
i. 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?	VVM	106	N/A	OK	OK

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ii. 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?	VVM	106	N/A	OK	OK
iii. the alternatives comply with all applicable and enforced legislation?	VVM	106	N/A	OK	OK
c. Investment analysis					
a. Has investment analysis been used to demonstrate the additionality of the proposed CDM project activity?	VVM	108	Yes.	OK	OK
b. If yes, does the PDD provide evidence that the proposed CDM project activity would not be:	VVM	108			
i. the most economically or financially attractive alternative?	VVM	108	N/A	OK	OK
ii. economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs)?	VVM	108	N/A	OK	OK
c. Was this shown by one of the following approaches?	VVM	109			
i. The proposed CDM project activity would produce no financial or economic benefits other than CDM-related income. Document the costs associated with 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.	VVM	109	N/A	OK	OK

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ii. The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative.	VVM	109	N/A	OK	OK
iii. The financial returns of the proposed CDM project activity would be insufficient to justify the required investment.	VVM	109	N/A	OK	OK
d. Is the period of assessment limited to the proposed crediting period of the CDM project activity?	EB 51	Ann 58	N/A	OK	OK
e. Does the project IRR and equity IRR calculations reflect the period of expected operation of the underlying project activity (technical lifetime), or - if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period?	EB 51	Ann 58	N/A	OK	OK
f. Does the IRR calculation include the cost of major maintenance and/or rehabilitation if these are expected to be incurred during the period of assessment?	EB 51	Ann 58	N/A	OK	OK
g. Do the project participants justify the appropriateness of the period of assessment in the context of the underlying project activity, without reference to the proposed CDM crediting period?	EB 51	Ann 58	N/A	OK	OK
h. Does the cash flow in the final year include a fair value of the project activity assets at the end of the assessment period?	EB 51	Ann 58	N/A	OK	OK
i. Has the fair value been calculated in accordance	EB	Ann	N/A	OK	OK

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with local accounting regulations where available, or international best practice?	51	58			
j. Does the fair value calculations include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets?	EB 51	Ann 58	N/A	OK	OK
k. Was depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV)?	EB 51	Ann 58	N/A	OK	OK
l. Has taxation been included as an expense in the IRR/NPV calculation in cases where the benchmark or other comparator is intended for post-tax comparisons?	EB 51	Ann 58	N/A	OK	OK
m. Are the input values used in all investment analysis valid and applicable at the time of the investment decision taken by the project participant?	EB 51	Ann 58	N/A	OK	OK
n. Is the timing of the investment decision consistent and appropriate with the input values?	EB 51	Ann 58	N/A	OK	OK
o. Are all the listed input values been consistently applied in all calculations?	EB 51	Ann 58	N/A	OK	OK
p. Does the investment analysis reflect the economic decision making context at point of the decision to recomence the project in the case of	EB 51	Ann 58	N/A	OK	OK

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project activities for which implementation ceases after the commencement and where implementation is recommenced due to consideration of the CDM?					
q. Have project participants supplied the spreadsheet versions of all investment analysis?	EB 51	Ann 58	N/A	OK	OK
r. Are all formulas used in this analysis readable and all relevant cells be viewable and unprotected?	EB 51	Ann 58	N/A	OK	OK
s. In cases where the project participant does not wish to make such a spreadsheet available to the public has the PP provided an exact read-only or PDF copy for general publication?	EB 51	Ann 58	N/A	OK	OK
t. In case the PP wishes to black-out certain elements of the publicly available version, is it justifiable?	EB 51	Ann 58	N/A	OK	OK
u. Was the cost of financing expenditures (i.e. loan repayments and interest) included in the calculation of project IRR?	EB 51	Ann 58	N/A	OK	OK
v. In the calculation of equity IRR, has only the portion of investment costs which is financed by equity been considered as the net cash outflow?	EB 51	Ann 58	N/A	OK	OK
w. Has the portion of the investment costs which is financed by debt been considered a cash outflow in the calcualtion of equity IRR? (this is not allowed)	EB 51	Ann 58	N/A	OK	OK
x. Was a pre-tax benchmark be applied?	EB 51	Ann	N/A	OK	OK

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y. In cases where a post-tax benchmark is applied, is actual interest payable taken into account in the calculation of income tax?	EB 51	Ann 58	N/A	OK	OK
z. In such situations, was interest calculated according to the prevailing commercial interest rates in the region, preferably by assessing the cost of other debt recently acquired by the project developer and by applying a debt-equity ratio used by the project developer for investments taken in the previous three years?	EB 51	Ann 58	N/A	OK	OK
aa. In cases where a benchmark approach is used is the applied benchmark appropriate to the type of IRR calculated?	EB 51	Ann 58	N/A	OK	OK
bb. Has local commercial lending rates or weighted average costs of capital (WACC) selected as appropriate benchmarks for a project IRR?	EB 51	Ann 58	N/A	OK	OK
cc. Has required/expected returns on equity selected as appropriate benchmark for an equity IRR?	EB 51	Ann 58	N/A	OK	OK
dd. In case benchmarks supplied by relevant national authorities selected is it applicable to the project activity and the type of IRR calculation presented?	EB 51	Ann 58	N/A	OK	OK
ee. In the cases of projects which could be developed by an entity other than the project participant is the benchmark applied based on publicly available data sources which can be clearly validated?	EB 51	Ann 58	N/A	OK	OK
ff. Have internal company benchmarks/expected	EB	Ann	N/A	OK	OK

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returns (including those used as the expected return on equity in the calculation of a weighted average cost of capital - WACC) been applied in cases where there is only one possible project developer?	51	58			
gg. In such cases, have these values been used for similar projects with similar risks, developed by the same company or, if the company is brand new, would have been used for similar projects in the same sector in the country/region?	EB 51	Ann 58	N/A	OK	OK
hh. Has a minimum clear evidence of the resolution by the company's Board and/or shareholders been provided to the effect as above?	EB 51	Ann 58	N/A	OK	OK
ii. Has a thorough assessment of the financial statements of the project developer - including the proposed WACC - to assess the past financial behavior of the entity during at least the last 3 years in relation to similar projects been conduted?	EB 51	Ann 58	N/A	OK	OK
jj. Does the risk premiums applied in the determination of required returns on equity reflect the risk profile of the project activity being assessed, established according to national/international accounting principles? (It is not considered reasonable to apply the rate general stock market returns as a risk premium for project activities that face a different risk profile than an investment in such indices.)	EB 51	Ann 58	N/A	OK	OK
kk. Has an investment comparison analysis and not	EB	Ann	N/A	OK	OK

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a benchmark analysis used when the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services?	51	58			
ll. Have variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues been subjected to reasonable variation (positive and negative) and the results of this variation been presented in the PDD and be reproducible in the associated spreadsheets?	EB 51	Ann 58	N/A	OK	OK
mm. Have a corrective action been raised for a variable to be included in the sensitivity analysis which constitute less than 20% and have a material impact on the analysis ?	EB 51	Ann 58	N/A	OK	OK
nn. Is the range of variations selected is reasonable in the project context?	EB 51	Ann 58	N/A	OK	OK
oo. Do the variations in the sensitivity analysis at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances?	EB 51	Ann 58	N/A	OK	OK
pp. In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative, is an assessment done of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions	EB 51	Ann 58	N/A	OK	OK

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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?					
qq. Was the plant load factor defined ex-ante in the CDM-PDD according to one of the following options:	EB 51	Ann 58			
i. The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval?	EB 51	Ann 58	N/A	OK	OK
ii. The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company)?	EB 51	Ann 58	N/A	OK	OK
rr. Was 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 conducted?	VVM	111	N/A	OK	OK
ss. Were the parameters cross-checked agains third-party or publicly available sources, such as invoices or price indices?	VVM	111	N/A	OK	OK
tt. Were feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants reviewed?	VVM	111	N/A	OK	OK
uu. Was the correctnes of computations carried out	VVM	111	N/A	OK	OK

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and documented by the project participants assessed?					
vv. Was the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions assessed?	VVM	111	N/A	OK	OK
ww. Is the type of benchmark applied is suitable for the type of financial indicator presented?	VVM	112	N/A	OK	OK
xx. Do any risk premiums applied determining the benchmark reflect the risks associated with the project type or activity?	VVM	112	N/A	OK	OK
yy. To determine this, was it assessed whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by:	VVM	112			
iii. assessing previous investment decisions by the project participants involved?	VVM	112	N/A	OK	OK
iv. determining whether the same benchmark has been applied?	VVM	112	N/A	OK	OK
v. determining if there are verifiable circumstances that have led to a change in the benchmark?	VVM	112	N/A	OK	OK
zz. Did the project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activities?	VVM	113	N/A	OK	OK
xx. If yes:	VVM	113			

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i. has the FSR 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 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?	VVM	113	N/A	OK	OK
ii. Are the values used in the PDD and associated annexes fully consistent with the FSR?	VVM	113	N/A	OK	OK
iii. If not, was the appropriateness of the values validated?	VVM	113	N/A	OK	OK
iv. On the basis of its specific local and sectoral expertise, is confirmation 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?	VVM	113	N/A	OK	OK
d. Barrier analysis					
a. Has barrier analysis been used to demonstrated the additionality of the proposed CDM project activity?	VVM	115	Yes.	OK	OK
b. If yes, does the PDD demonstrate that the proposed CDM project activity faces barriers that:	VVM	115			
i. prevent the implementation of this type of proposed CMD project activity?	VVM	115	N/A	OK	OK

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ii. do not prevent the implementation of at least one of the alternatives?	VVM	115	N/A	OK	OK
c. Are there any issues that have a clear direct impact on the financial returns of the project activity, other than: risk related barriers, for example risk of technical failure, that could have negative effects on the financial performance; or barriers related to the unavailability of sources of finance for the project activity? {If yes, these issues cannot be considered barriers and shall be assessed by investment analysis. [Refer to (6.c) above]}	VVM	116	N/A	OK	OK
d. Were the barriers determined as real by:	VVM	117			
i. assessing the available evidence and/or undertaking 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?	VVM	117	N/A	OK	OK
ii. ensuring 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?	VVM	117	N/A	OK	OK
iii. Is existence of a barrier substantiated only by the opinions of the project participants? (If yes, this barrier cannot be considered as adequately substantiated)	VVM	117	N/A	OK	OK

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e. Were the barriers determined as preventing the implementation of the project activity but not the implementation of at least one of the possible alternatives by applying 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 *at least one of* the possible alternatives, in particular the identified baseline scenario?	VVM	117	N/A	OK	OK
e. Common practice analysis					
a. Is this a proposed large-scale, or first-of-its kind small-scale project activity?	VVM	119	No.	OK	OK
b. If yes, was common practice analysis carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality?	VVM	119	N/A	OK	OK
c. Was it assessed whether the geograpphical scope (e.g. 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 technologis the relevatn region for assessment will be local and for others it may be transnational/global.	VVM	120	N/A	OK	OK
d. Was a region other than the entire host country chosen?	VVM	120	N/A	OK	OK
e. If yes, was the explanation why this region is more appropriate assessed?	VVM	120	N/A	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
f. Using official sources and local and industry expertise, was it determined to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM project activities, have been undertaken in the defined region?	VVM	120	N/A	OK	OK
g. Are similar and operational projects, other than CDM project activities, already ”widely observed and commonly carried out” in the defined region?	VVM	120	N/A	OK	OK
h. If yes, was it assessed whether there are essential distinctions between the proposed CDM project activity and the other similar activities?	VVM	120	N/A	OK	OK
7. Monotoring plan					
a. Does the PDD include a monitoring plan?	VVM	122	Yes. Refer to CARs 23-25, 32-36 and 38, and CLs 14-18.	CAR22 to CAR24 CAR31 to CAR35 CAR37 CL14 to CL18	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. Is this monitoring plan based on the approved monitoring methodology applied to the proposed CDM project activity?	VVM	122	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37 CL14 to CL18	OK
c. Were the list of parameters required by the the selected methodology identified?	VVM	123	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
				CL14 to CL18	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
d. Does the monitoring plan contains all necessary parameters?	VVM	123	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37 CL14 to CL18	OK
e. Are the parameters clearly described?	VVM	123	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
				CL14 to CL18	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
f. Does the means of monitoring described in the plan comply with the requirements of the methodology?	VVM	123	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37 CL14 to CL18	OK
g. Have all relevant parameters been monitored as indicated in the table of the methodology? State any deviations/omissions.	AMS	I.D	Yes.	OK	OK
h. Has the CO2 emission factor of the grid electricity measured either by Combined Margin or by the Weighted Average emission?	AMS	I.D	Yes.	OK	OK
i. Has the CO2 emission factor of fossil fuel type i measured as per the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion."	AMS	I.D	Yes.	OK	OK
j. Has the Net calorific value of fossil fuel type i measured as per the "Tool to calculate project or a leakage CO2 emissions from fossil fuel	AMS	I.D	Yes.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
combustion".					
k. Has the Quantity of fossil fuel consumed in year y measured as per the "Tool to calculate project or a leakage CO2 emissions from fossil fuel combustion".	AMS	I.D	Yes.	OK	OK
l. Has the Quantity of net electricity supplied to the grid in year y measured using energy meters.	AMS	I.D	Yes.	OK	OK
m. Is the quantity of net electricity supplied to the grid in year y monitored/recorded - Continuous monitoring, hourly measurement and at least monthly recording? Notes on measurement method: - Calibration should be undertaken as prescribed in the relevant paragraph of General Guidelines to SSC Methodologies. - If applicable, measurement results shall be cross checked with records for sold/purchased electricity (e.g., invoices/receipts) - The net electricity export/supplied to a grid is the difference between the measured quantities of the grid electricity export and the import. If applicable, cross check net electricity supplied to a grid as gross energy generation in the project activity power plant minus the auxiliary/station electricity consumption, technical losses and electricity import from the grid to the project power plant measured at the grid	AMS	I.D	Yes.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
interface/connection used for billing purposes					
n. Is the Quantity of biomass consumed in year y monitored/recorded Continuously or estimate using annual energy/mass balance? Notes on measurement method: - Use mass or volume based measurements. - Adjust for the moisture content in order to determine the quantity of dry biomass. - And/or perform an annual energy/mass balance that is based on purchased quantities and stock. - For projects consuming biomass and fossil fuel to produce electricity, a specific energy consumption11 of each type of fuel (biomass or fossil) to be used should be specified ex ante. The consumption of each type of fuel (biomass or fossil)shall be monitored. If fossil fuel is used, the electricity generation metered should be adjusted by deducting the electricity generation from fossil fuels using the specific energy consumption and the quantity of fossil fuel consumed The amount of electricity generated using biomass fuels calculated then shall be compared with the amount of electricity generated calculated using specific energy consumption and amount of each type of biomass fuel used. The lower of the two values should be used to calculate emission reductions	AMS	I.D	n.a.	ok	ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
o. Is the Moisture content of the biomass residues monitored atleast on a monthly basis?	AMS	I.D	n.a.	ok	ok
p. Is the weighted average of the moisture content calculated for each monitoring period and used in the calculations? Notes on measurement method: On-site measurements In case of dry biomass, monitoring of this parameter is not necessary	AMS	I.D	n.a.	ok	ok
q. Is Net calorific value of biomass residue type k monitored annually? Notes on measurement method: Measurement in laboratories according to relevant national/international standards. Measure the NCV based on dry biomass. Check the consistency of the measurements by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements	AMS	I.D	n.a.	ok	ok
r. Is the Standard deviation of the annual average historical net electricity generation delivered to	AMS	I.D	n.a.	ok	ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the grid by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity calculated from data used to establish Eghistorical?					
s. Is the parameters relevant to reservoir based hydro and geothermal plants monitored following the most recent version of ACM0002?	AMS	I.D	Yes.	OK	OK
t. Are the monitoring arrangements described in the monitoring plan feasible within the project design?	VVM	123	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37 CL14 to CL18	OK
u. Does the monitoring plan provide details regarding calibration of monitoring equipments/ instruments or does it include zero check as a substitute for calibration? (zero check can not be considered as a substitute for calibration).	EB 24	37			
v. Are the following means of implementation of the	VVM	123	Refer to 7a.	CAR22	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
monitoring plan sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified:				to CAR24 CAR31 to CAR35 CAR37 CL14 to CL18	
i. data management procedures?	VVM	123	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37 CL14 to	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
				CL18	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. quality assurance procedures?	VVM	123	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37 CL14 to CL18	OK
iii. quality control procedures?	VVM	123	Refer to 7a.	CAR22 to CAR24 CAR31 to CAR35 CAR37	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
				CL14 to CL18	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
8. Sustainable development					
a. Does the CDM project activity assists Parties not included in Annex I to the Convention in achieving sustainable development?	VVM	125	Yes.	OK	OK
b. Does the letter of approval by the DNA of the host Party confirm the contribution of the proposed CDM project activity to the sustainable development of the host Party?	VVM	126	Yes.	OK	OK
9. Local stakeholder consultation					
a. Were local stakeholders (public, including individuals, groups or communities affected, of likely to be affected, by the proposed CDM project activity or actions leading to the implementation of such an activity) invited by the PPs to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website?	VVM	128	N/A	-	-
b. Have comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity been invited?	VVM	129	N/A	-	-
c. Is the summary of the comments received as provided in the PDD complete?	VVM	129	N/A	-	-
d. Have the project participants taken due account of any comments received and described this process in the PDD?	VVM	129	N/A	-	-
10. Environmental impacts					
a. Have the project participants submitted documentation on the analysis of the	VVM	131	Not applicable for the renewal of the crediting	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
environmental impacts of the project activity?			period, since at this time, the plant is already operating, as authorized by the environmental operational licenses of the plant (LO 3194/2009-DL, valid until 28/06/2013) and of its transmission line (LO 2726/2008-DL, valid until 27/05/2012). Such environmental operational licenses are only granted once the organisation has successfully gone through the previous steps an assessment and analysis of the environmental impacts.		
b. Have the project participants undertaken an analysis of environmental impacts?	VVM	132	Refer to 10a.	OK	OK
c. Does the host Party require an environmental impact assessment?	VVM	132	Refer to 10a.	OK	OK
d. If yes, have the project participants undertaken an environmental impact assessment?	VVM	132	Refer to 10a.	OK	OK

Table 2 Specific validation activities

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1. Project design of small-scale clean development mechanism project activities *(delete this table if the project activity is not a small scale project activity)*					
a. Does the proposed small-scale project activity meet the requirements of the simplified modalities and procedures for small-scale CDM project activities?	VVM	135	Yes.	OK	OK
b. Does the project activity qualify within the thresholds of the three prossble types of small scale project activities? [Type (i) project activities: renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts; Type (ii) project activities: energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 15 gigawatt hours per year; Type (iii) project activities: other project activities that both reduce anthropogenic emissions by sources and directly emit less than 15 kilotonnesof carbon dixide equivalent annually.]	VVM	136	Yes. The small-scale project activity whose crediting period is being renewed is a Type (i) project activities: renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts.	OK	OK
c. Does the project activity conform to one of the approved small-scale categories?	VVM	136	Yes. Type I – Renewable energy projects, Category I.D. – Grid connected renewable electricity generation.	OK	OK
d. Does the project activity apply the relevant tool and methodology?	VVM	136	Refer to (5.b.g) above	-	-
e. Are the small-scale methodologies applied in conjunction with the general guidance to the	VVM	136	Yes.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
methodologies, which provides guidance on equipment capactiy, equipment performance, sampling and other monitoring-related issues?					
f. Is the project activity a debundled component of a large-scale project, i.e., is there a registered small-scael CDM project activity or an application to register another CDM project actifity: (a) with the same project participants; (b) in the same project category and technology/measure; and (c) registered within the previous 2 years; and (d) whose project boundary is within 1 km of the proposed boudary of the proposed small-scale activity at the closest point?	VVM	136	Refer to CAR06, CAR07 and CL04.	CAR06 CAR07 CL04	OK
g. Is and assessment of the environmental impacts of the proposed CDM project activity required by the host Party?	VVM	136	6.c	-	-
h. Is the project additional?	VVM	137	Refer to 6.c above	-	-

Table 3 Indicative Simplified Baseline and Monitoring Methodologies for selected small-scale CDM project activity categories - AMS I.D.

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
1. Technology/measure					
1.1. Does the project comprise renewable energy technologies that supply electricity to a grid?	-		Yes. The project comprises hydro energy generation units that supply electricity to an electricity distribution system, that would have been supplied by at least one fossil fuel fired generation unit.	OK	OK
2. Boundary					
2.1. Does the project boundary encompass the physical, geographical site of the renewable generation source?	-		Refer to CL05 and CL06.	CL05 CL06	OK
3. Baseline					
3.1. Did the project participants identify the most plausible baseline scenario among all realistic and credible alternatives(s)?	-		Yes. The baseline of the project related to the generation of renewable energy connected to the grid is the KWh produced by the renewable generating unit multiplied by an emission coefficient (measured in tones of CO2e/KWh) calculated in a transparent and conservative manner, according to a combined margin (CM), resulting from the combination of operating margin (OM) and build margin (BM),	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			according to the procedures prescribed in the "Tool to calculate the emission factor for an electricity system". $BE_y = EG_{BL,y} \times EF_{CO2,grid,y}$		
3.2. Were the emission reductions calculations based on data from an official source and made publicly available?			Yes. The emission reductions of the project are calculated based in the operating margin emission factor and the build margin emission factor, supplied by the Brazilian DNA - Designated National Authority.	OK	OK
4. Monitoring					
4.1. Does the monitoring consist of metering the quantity of electricity generated?	-		Yes. Based on the Methodology AMS I.D, the monitoring consists of metering the amount of electricity supplied to the grid by the project activity.	OK	OK

Table 4 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion

CAR01: PDD version 1, Annex 1, does not list information for PPs The Chugoku Electric Power Co., Inc. and Constellation Energy Commodities Group Inc.	VVM 52	The information about the PPs Chugoku Electric Power Co., Inc. and Constellation Energy Commodities Group Inc. were included in the Annex 1 according to the Modalities of Communication available in the UNFCCC website. Please refer to the second version of the PDD Second response: The only change in the Modalities of Communication dated on 03/08/2007 was the contact person. However, the information presented in the Annex 1 of the PDD was corrected. Please refer to the third version of the PDD. Third response: The name of PP Constellation Energy Commodities Group Inc. was corrected in Annex 1. Please refer to the fourth version of the PDD.	First analysis: PDD Version 02, Annex 1, lists The Chugoku Electric Power Co., Inc. and Constellation Energy Commodities Group Inc. However, Chugoku's information is in accordance with communication dated 15/01/2007, whereas it has been updated in 03/08/2007. *CAR01 is not closed.* Second analysis: PDD version 3, Annex 1, has been updated. However, the name of PP Constellation Energy Commodities Group Inc. included in Annex 1 is not correct yet. **CAR01 is not closed.** Third analysis: The name of PP Constellation Energy Commodities Group Inc. has been corrected. This CAR is closed.

CAR02: PDD version 01, Section A.2, does not explain the technology being employed.	EB 34 Ann 09	This information was included in the Section A.2. Please refer to the second version of the PDD. Second response: The third paragraph in section A.2 was corrected. Please refer to the third version of the PDD.	First analysis: PDD Version 02, Section A.2, third paragraph, makes reference to A.2, whereas A.4.2 is likely to be the correct section to be referenced. *CAR02 is not closed.* Second analysis: The reference to Section A.4.2 has been corrected. **CAR02 is closed.**
CAR03: PDD version 01, Section A.4.1.4, mentions ANEEL's Resolution 180/2000 as being from 2008, whereas it is from 2000.	EB 34 Ann 09	The date of the ANEEL's resolution was corrected. Please refer to the second version of the PDD;	The identification of ANEEL's Resolution 180/2000 has been corrected. **CAR03 is closed.**

CAR04: PDD version 01, Section A.4.3, presents the estimated amount of emission reductions in a tabular format with some differences compared to the Guidelines for CDM-SSC-PDD.	EB 34 Ann 09	The table 3 was corrected according to the Guidelines for CDM-SSC-PDD. Please refer to the second version of the PDD. Second response: The tabular format of the estimated amount of emission reductions has been adjusted to be in accordance with the Guidelines for CDM-SSC-PDD. Please refer to the third version of the PDD.	First analysis: The tabular format of the estimated amount of emission reductions has been adjusted to be in accordance with the Guidelines for CDM-SSC-PDD. However, the '*' and '**" information is not relevant. The use of '*' and '**' also occurs in CERs spreadsheets version 02, <Table 3 – Baseline>. *CAR04 is not closed.* Second analysis: The use of "*" and "**" was disregarded in the PDD version 03 and in CERs spreadsheet version 03, <Table 3 – Baseline>. **CAR04 is closed.**
CAR05: PDD version 01, Section A.4.3, incorrectly refers to sections B.1 and B.3.	EB 34 Ann 09	The referenced section has been corrected. Please refer to the second version of the PDD.	Incorrect reference to sections B.1 and B.3 has been corrected. **CAR05 is closed.**
CAR06: PDD version 01, Section A.4.5, does not indicate whether there is a registered SSC project activity under the CDM or an application to register another SSC project activity under the CDM with the same project participants.	EB 34 Ann 09	This information was included in the Section A.4.5. Please refer to the second version of the PDD.	PDD Version 02, Section A.4.5, indicates that the project activity does not meet the criteria to be deemed a debundled component of a large project activity. **CAR06 is closed.**

CAR07: PDD version 01, Section A.4.5, does not indicate whether there is a registered SSC project activity under the CDM or an application to register another SSC project activity under the CDM registered within the previous 2 years.	EB 34 Ann 09	As mentioned in the CAR 06 above, this information was included in the Section A.4.5. Please refer to the second version of the PDD.	PDD Version 02, Section A.4.5, indicates that the project activity does not meet the criteria to be deemed a debundled component of a large project activity. **CAR07 is closed.**
CAR08: PDD version 01, Section B.2, does not demonstrate that the project activity will remain under the limit of SSC project activity Type I during every year of the crediting period.	EB 34 Ann 09	As mentioned in the Section B.2 of the PDD "*The project activity comprises the implementation of a small-hydro power plant connected to the grid with maximum output capacity of 9.2 MW, and which will not increase beyond 15 MW*".	PDD Version 02, Section B.2, states the output capacity of the hydro power plant will not increase beyond 15 MW. **CAR08 is closed.**
CAR09: PDD version 01, Section B.4, presents a title which is different from the Guidelines for CDM-SSC-PDD.	EB 34 Ann 09	The title of the Section B.4 was corrected. Please refer to the second version of the PDD.	PDD Version 02 presents the correct title for Section B.4 **CAR09 is closed.**
CAR10: PDD version 01, Section B.4, does not specify the baseline as stated in AMS-I.D. ver 16. Besides, currently, there is a national interconnected grid and not an isolated South-Southeast-Midwest grid anymore. Correct all parts of PDD, accordingly.	EB 34 Ann 09	The baseline was included according to the methodology AMS-I.D (version 16). In addition, the Brazilian interconnected grid was corrected. Please refer to the second version of the PDD.	The baseline, as stated in AMS-I.D. ver 16, has been included in PDD Version 02, Section B.4. Grid identification has also been corrected. **CAR10 is closed.**

CAR11: PDD version 01 does not mention the operation of 332 kW generating unit, which is operating in the project activity and generating electricity to the grid. This 3rd unit is not covered by any ANEEL's authorizations.	EB 34 Ann 09	The description of the small turbine was included in the Section A.4.2. Project Participants clarify that the project was designed considering this small turbine. Please refer to the Project Design (from the Portuguese "*Projeto Básico*") – Chapters 4 and 6. This Project Design was approved by the Brazilian Power Regulatory Agency (from the Portuguese *Agência Nacional de Energia Elétrica – ANEEL*). Project Design and ANEEL's approval is attached to this response. Second response: - The description of the submerged turbine was corrected; - The manufacturer of the submerged turbine was corrected; - In fact, Chapter 4 of the Project Design does not mention the small turbine. However, this chapter shows the river flow studies used in Chapter 6, which is mentioned the small turbine. The river flow calculation present in Chapter 4 is important to determine the capacity of the equipment. - As mentioned above, the Chapter 4 presents the river flow studies in the Guarita River. According with these studies, the project owner can dimension the capacity of the plant. As presented in Chapter 6, the river flow available at the point where the small turbine is installed,	First analysis: PDD Version 02, Section A.4.2, mentions the 332 kW generating unit. However: - A "submerged synchronous turbine" is mentioned, while the data book of the third generating unit states there is an induction generator, which is asynchronous; - WEG is mentioned as one of the manufacturers, while the data book only shows Rischbieter Engenharia; - PPs refer to Chapter 4 of the project design of the hydro power plant, whereas such chapter does not address the "small" turbine; - Chapter 6 refers to a 0.222 MW turbine, instead of to a 0.332 MW one; and - ANEEL's approval to which PPs refer does not make it clear such 332 kW generating unit has been approved. Further detailed explanation is required. Additionally, CERs spreadsheets version 02, <Table 2 – Project Description>, does not specify the generator of the 332 kW generating unit. *CAR11 is not closed.*

		defines an installed capacity of 0.222 MW. For this reason, the TAG of the small turbine was corrected to reflect the real power of the equipment, according to net head and river flow. As can be seen in the document "Justificativa potência_2011.03.03.pdf" attached to this response, considering these two variables and their values present at the dam, the turbine capacity is equal to 0.2 MW. For this reason, the value presented in the Section A.4.2 was corrected. Please refer to the third version of the PDD. - In fact, the ANEEL resolution does not mention the smaller turbine. As mentioned above, Project Participants clarify that the project was designed considering this small turbine and was presented to ANEEL. However, BT Geradora de Energia Elétrica S.A. requests to ANEEL the correction of the resolution. The letter with the request for correction of the resolution was registered in ANEEL on April 5th, 2011. Please refer to the letter attached to this response. In addition, the smaller turbine description was included in the CERs spreadsheet. Please refer to the third version of the PDD and spreadsheets.	<u>Second analysis:</u> In PDD Version 03, Section A.4.2: - The description of the submerged turbine has been corrected. - The manufacturer of the submerged turbine has been corrected. - Reference to Chapter 4 has been clarified. - Reference to 0.222 MW in Chapter 6 has been clarified. - PPs have presented a letter sent to ANEEL, requesting the update of its approval on the number of generating unit. CERs spreadsheets version 03, <Table 2 – Project Description>, has been specified the generator of the 332 kW generating unit. **CAR11 is closed.**

CAR12: PDD version 01, Section B.4, Step 2, states there is no need to update the current baseline, whereas due to an installed capacity which is not valid anymore, compared to the registered PDD, "the current baseline needs to be updated for the subsequent crediting period", as per EB 46 Annex 11. - Previous installed capacity, as per registered PDD: 9.2 MW - Current installed capacity, as verified during site visit: 9.67 MW (= 2x 4,669 kW + 332 kW)	EB 34 Ann 09	According to the Step 2 presented in the Procedures for Renewal of the Crediting Period of a Registered CDM Project Activity (version 5), "*This step is only applicable if any of the Steps 1.1, 1.2, 1.3 and/or 1.4 showed that the current baseline needs to be updated*". As can be seen in the PDD, there are no new relevant national and/or sectoral policies and/or circumstances in the electricity generation sector applicable to the project activity since the project starting date. In addition, small hydropower plants still represent less than 3% of the Brazilian electric matrix and remaining technical lifetime of the equipment is not less than the end of the crediting period. Therefore, the baseline scenario is still valid in this renewal of the crediting period. However, the estimated emission reductions were updated considering the CO_2 emission factor published by the Brazilian DNA. Please refer to the new version of the PDD (version 2). PPs clarify that the installed capacity of the project does not affect the baseline or the emission reduction calculation, since the estimated emission reductions presented in the registered PDD (first crediting period) were calculated based on the energy assured of the project.	Clarification by the PPs has been accepted as well as PDD revised due to the notification presents correct turbines capacity. **CAR12 is closed.**

		Therefore, no alterations were needed in the electricity generation of the project.	
CAR13: PDD version 01, Section B.4, Figure 4, presents an "Avarege growth" with part of the information in Portuguese: values in "MW a.a.".	EB 34 Ann 09	The figure was corrected. Please refer to the second version of the PDD. Second response: The figure was correct. Please refer to the third version of the PDD.	First analysis: Expression "a.a.", in Portuguese, has been replaced by its English equivalent. However, the word "avarege" is still incorrect. *CAR13 is not closed.* Second analysis: The word "avarege" has been corrected. **CAR13 is closed.**

CAR14: PDD version 01, Section B.4, does not illustrate in a transparent manner all data used to determine the baseline emissions.	EB 34 Ann 09	The baseline emissions are described in the section B.6. “Emission reductions”. Second response: The main parameters used to determine the baseline emissions were included in section B.4 as per the Guidelines for CDM-SSC-PDD. In addition, a reference to the section B.6.1, where is presented all the data and parameters used to determine the baseline emissions, was included. Please refer to third version of the PDD.	First analysis: The following requirement, for B.4, from the Guidelines for CDM-SSC-PDD, has not been met yet: “Illustrate in a transparent manner all data used to determine the baseline emissions (variables, parameters, data sources etc.)”. *CAR14 is not closed.* Second analysis: All data used to determine the baseline emissions has been illustrated in a transparent manner. **CAR14 is closed.**

CAR15: PDD version 01, Section B.6.1, refers to an incorrect version (number 15) of methodologies ACM0002 and AMS-I.D.	EB 34 Ann 09	The version of the methodologies ACM0002 and AMS-I.D. were corrected. Please refer to the second version of the PDD. Second response: The version of the methodology ACM0002 was corrected for the most recent version available (12.2.0). In addition, the versions of AMS-I.D. (version 17) and the Tool to calculate the emission factor for an electricity system (2.2.1) were updated. Please refer to the third version of the PDD.	First analysis: PDD Version 02, Section B.6.1, refers to the latest approved versions of ACM0002 and AMS-I.D. However, at the time of submission of PDD Version 01 to the DOE, the previous version (11) of ACM0002 was the valid one. *CAR15 is not closed.* Second analysis: In PDD Version 03, Section B.6.1, the version of ACM0002, AMS-I.D and Tool to calculate the emission factor for an electricity system has been updated. **CAR15 is closed.**

CAR16: PDD version 01, Section B.6.1, mentions "paragraph 14", whereas "19" is the correct one.	EB 34 Ann 09	The mention in the Section B.6.1 was corrected. Please refer to the second version of the PDD. Second response: In the new version of the AMS-I.D. methodology is "paragraph 20". For this sense, the CERs spreadsheet and PDD were revised. Please refer to the third version of the documents.	First analysis: PDD Version 02, Section B.6.1, correctly refers to paragraph 19 of AMS-I.D. ver 16. However, CERs spreadsheets version 02, <Table 4 – Project Emission>, Line 4, still mentions incorrect paragraph. *CAR16 is not closed.* Second analysis: The mention of paragraph has been corrected. **CAR16 is closed.**
CAR17: PDD version 01, Section B.6.1, in steps 5 and 6, under "Baseline Emissions", presents a second sentence which is not in accordance with the "Tool to calculate the emission factor for an electricity system" version 02 (see Option 1, page 15).	EB 34 Ann 09	Steps 5 and 6 were corrected. Please refer to the new version of the PDD (version 2).	Incorrect sentences have been corrected in PDD Version 02, Section B.6.1. **CAR17 is closed.**

CAR18: PDD version 01, Section B.6.1, presents data units for BE_y, $PE_{GP,y}$, $PE_{HP,y}$, ER_y, PE_y and LE_y which are different from what is established by AMS-I.D. ver 16.	EB 34 Ann 09	The data units present in the Section B.6.1 was corrected. Please refer to the second version of the PDD. Second response: CERs spreadsheet was revised. Please refer to the third version of the CERs spreadsheet.	First analysis: PDD Version 02, Section B.6.1, presents correct data units for BE_y, $PE_{GP,y}$, $PE_{HP,y}$, ER_y, PE_y and LE_y. However, CERs spreadsheets version 02 still needs to be aligned with PDD Version 02. *CAR18 is not closed.* Second analysis: The Section B.6.1 of PDD and CERs spreadsheets has been corrected. **CAR18 is closed.**
CAR19: PDD version 01, Section B.6.1, identifies emission factors with incomplete subscripts.	EB 34 Ann 09	The subscripts were corrected according to AMS-I.D. Please refer to the second version of the PDD. Second response: The subscripts were corrected. Please refer to the third version of the PDD.	First analysis: Please, refer to Equation 14 of the Tool to calculate the emission factor for an electricity system version 02. *CAR19 is not closed.* Second analysis: The subscripts of emission factors in the PDD, Section B.6.1, have been completed. **CAR19 is closed.**

CAR20: PDD version 01, Section B.6.1, for the calculation of $EF_{CO2,grid,y}$, does not explain nor justifies the choice between options 12(a) and 12(b) of AMS-I.D. ver 16.	EB 34 Ann 09	This information was included in the Section B.6.1 of the PDD. Please refer to the second version of the PDD. Second response: The section B.6.1 of the PDD was updated considering the new version of the Tool to calculate the emission factor for an electricity system (version 2.2.1). It's important to mention that with the revision of this tool, the ex-ante option for the emission factor was chosen. All the rationale is presented in the sections B.6.1 and B.6.3 of the PDD (version 3).	First analysis: PDD Version 02, Section B.6.1, states option 12(a) has been chosen to calculate the emission factor. However, it does not yet explain nor justifies such choice. *CAR20 is not closed.* Second analysis: PDD Version 3, Section B.6.1, has been justified the choice of option. **CAR20 is closed.**

CAR21: PDD version 01, Section B.6.1, does not mention that in terms of vintage data, Option 1 had been chosen for the first crediting period, which reflects in the second one, as per the "Tool to calculate the emission factor for an electricity system" version 02.	EB 34 Ann 09	The PDD was reviewed (version 2) considering the Options available in step 5 of the "Tool to calculate the emission factor for an electricity system". Second response: Option 1 is mentioned in the Section B.6.1 of the PDD as the chosen one. In addition, as mentioned above, the emission factor was update considering the revision in the tool to calculate de emission factor. Please refer to the third version of the PDD.	First analysis: PDD Version 02, Section B.6.1, does not yet mention that in terms of vintage data, Option 1 had been chosen for the first crediting period (refer to p.15 of version 02 of the Tool to calculate the emission factor for an electricity system). *CAR21 is not closed.* Second analysis: PDD Version 3, Section B.6.1, has been mentioned that in terms of vintage data, Option 1 had been chosen. **CAR21 is closed.**

CAR22: PDD version 01, Section B.6.2, presents parameters relevant to reservoir based hydro plants not included in Table 1 of AMS-I.D. ver 16 that, for this reason, shall be monitored following ACM0002 version 11, which shows A_{PJ} and Cap_{PJ} as data/parameters to be monitored.	EB 34 Ann 09	The parameter was included in the section B.7.1 according to ACM0002 (version 12). Please refer to the second version of the PDD. Second response: The versions of the methodologies were updated. The other corrections were made, as follow: - The values applied to A_{PJ} and CAP_{PJ} were corrected according to the international standard format; - The value of A_{PJ} was revised; - Reservoir area was removed from section B.6.2; - The data units were corrected in the CERs spreadsheet. Please refer to the third version of the PDD and CERs spreadsheet.	First analysis: PPs refer to ACM0002 Version 12, which was not the latest version at the time of submission of PDD Version 01 to the DOE. PDD Version 02, Section B.7.1, includes A_{PJ} and Cap_{PJ} as "data and parameters monitored". However: - "values applied" are not in accordance with the international standard format; - value of A_{PJ} needs to be revised, as per CAR23; - "Reservoir Area" must be removed from B.6.2; and - Cap_{PJ} and A_{PJ} data unit must be corrected in CERs spreadsheets version 02. *CAR22 is not closed.* Second analysis: PDD Version 3, Section B.7.1 has been corrected as follow: - "values applied" are in accordance with the international standard format; - value of A_{PJ} was revised; - "reservoir area" was removed from B.6.2. - CERs spreadsheets version 3 has been corrected. **CAR22 is closed.**

CAR23: PDD version 01, Section B.6.2, presents a rounded number for A_{PJ} (reservoir area), whereas the exact same number, as shown in the environmental operational license LO 3194/2009-DL, shall be used in all sections of the PDD.	EB 34 Ann 09	The reservoir area was corrected according to environmental license. Please refer to the second version of the PDD. Second response: The corrections were made. Please, refer to the third version of the PDD.	First analysis: Not all corrections of A_{PJ} value have been made yet. *CAR23 is not closed.* Second analysis: All corrections of A_{PJ} value have been made. **CAR23 is closed.**
CAR24: PDD version 01, Section B.6.2, does not justify the choice of the source of data for the installed capacity.	EB 34 Ann 09	This information was included. Please refer to the second version of the PDD.	PDD Version 02, Section B.6.2, justfies the choice of the source of data for the installed capacity. **CAR24 is closed.**
CAR25: PDD version 01, Section B.6.3, presents some data/parameters whose identifications are different from Section B.6.1.	EB 34 Ann 09	The parameters were corrected in the section B.6.3. Please refer to the second version of the PDD. Second response: The section B.6.3 was revised considering the new version of the "*Tool to calculate the emission factor for an electricity system*", version 2.2.1. Please refer to the third version of the PDD.	First analysis: PDD Version 02, Section B.6.3, still needs to be corrected regarding $EF_{BM,2009}$. *CAR25 is not closed.* Second analysis: PDD Version 32, Section B.6.3, has been corrected regarding $EF_{BM,2010}$. **CAR25 is closed.**

CAR26: PDD version 01, Section B.6.3, presents an incorrect power density of the plant, since its installed capacity is 9.67 MW, instead of 9.2 MW, as verified during the site visit.	EB 34 Ann 09	The power density was corrected according the installed capacity of equipments. Please refer to the second version of the PDD and CER spreadsheet. Second response: CERs spreadsheet was corrected. Please refer to the third version of the CERs spreadsheet. Third response: The data unit was corrected. Please refer to the fourth version of the spreadsheet.	First analysis: PDD Version 02 has been revised. However, CERs spreadsheets version 02 still needs correction. *CAR26 is not closed.* Second analysis: CERs spreadsheets version 03 has been revised. However, the data unit regarding Nominal Power of generators still need to be corrected. **CAR26 is not closed.** Third analysis: Data unit regarding Nominal Power of generators has been corrected. The CAR is closed.

CAR27: PDD version 01, Section B.6.3, presents a sentence, under “Emission Reductions”, with an expression in Portuguese.	EB 34 Ann 09	Please, revise the CAR. No expression in Portuguese is present in the section B.6.3 (under “Emissions Reductions”).	PDD Version 01, Section B.6.3, presented as last sentence of the section “When applying the results presented above in **Erro! Fonte de referência não encontrada.**7 of section B.6.1 we have:”. Such sentence, in PDD Version 02, Section B.6.3, is correct. **CAR27 is closed.**
CAR28: PDD version 01, Section B.6.3, presents incorrect data unit for ER_y.	EB 34 Ann 09	The data unit was corrected. Please refer to the second version of the PDD.	PDD version 02, Section B.6.3, presents correct data unit for ER_y. **CAR28 is closed.**

CAR29: PDD version 01, Annex 3, presents two web links that lead to information in Portuguese, whereas direct links to information in English are available at the Brazilian DNA's web site.	EB 34 Ann 09	The Project Participants would like to stress that anyone can change the language on the Brazilian DNA website. Anyway, the Annex 3 of the PDD and the CER calculation spreadsheet were revised. Please refer to the second version of the documents. Second response: Considering the new version of the "*Tool to calculate the emission factor for an electricity system*", version 2.2.1, and the change in the emission factor, the link was removed and the reference to the sections B.6.1. and B.6.3 was included. Please refer to the third version of the PDD.	First analysis: PDD Version 02, Annex 03, presents two web links that lead to information in English. However, second link needs correction, as it is a duplication of the first one. *CAR29 is not closed.* Second analysis: PDD Version 03, Annex 03, has been corrected. **CAR29 is closed.**
CAR30: PDD version 01, Section B.6.4, presents a table title with an incorrect unit and Table 4 with data/parameters' units not in accordance with the Guidelines for CDM-SSC-PDD. Besides, the '*' and '**' information is not relevant.	EB 34 Ann 09	The unit was corrected and the data/parameters' units were corrected according to the Guidelines for CDM-SSC-PDD. In addition, the '*' and '**' was excluded. Please refer to the second version of the PDD.	PDD Version 02, Section B.6.4, presents the correct tabular format. **CAR30 is closed.**

CAR31: PDD version 01, Section B.7.1, uses a tabular format which is not in accordance with AMS-I.D. ver 16.	EB 34 Ann 09	The tabular format is in accordance with the AMS-I.D (version 16) and the Guidelines for Completing the Simplified Project Design Document (CDM-SSC-PDD), version 05. Second response: The tabular format presented in the Section B.7.1 was corrected. Please refer to the third version of the PDD.	First analysis: The table shown in the Guidelines for CDM-SSC-PDD are to be followed in case the relevant methodologies do not specify any tabular format for monitored data/parameters. As AMS-I.D. Version 16 and ACM0002 Version 11 present data and parameters to be monitored in specific tabular formats, such formats are to be used. *CAR31 is not closed.* Second analysis: PDD version 03, Section B.7.1, has been corrected. **CAR31 is closed.**
CAR32: PDD version 01, Section B.7.1, uses an identification for "Quantity of net electricity supplied to the grid in year y" which is not in accordance with Table 1 of AMS-I.D. ver 16.	EB 34 Ann 09	The parameter was corrected according to AMS-I.D (version 16). Please refer to the second version of the PDD.	PDD Version 02, Section B.7.1, presents a correct identification for "Quantity of net electricity supplied to the grid in year y". **CAR32 is closed.**

CAR33: PDD version 01, Section B.7.1, does not mention that a continuous monitoring of $EG_{facility,y}$ is required, as per AMS-I.D. ver 16.	EB 34 Ann 09	This information is already present in the Section B.7.1. The $EG_{facility,y}$ will be monitored through the hourly measurement and monthly recording. Second response: The parameter was corrected. Please refer to the third version of the PDD.	First analysis: PDD Version 02, Section B.7.1, does not yet mention that a continuous monitoring of $EG_{facility,y}$ is required (refer to AMS-I.D. Version 16, Table 1, "monitoring/recording frequency" column. *CAR33 is not closed.* Second analysis: PDD Version 03, Section B.7.1, has been corrected. **CAR33 is closed.**
CAR34: PDD version 01, Section B.7.2, refers to monitoring plan procedures in paragraph 17 of AMS-I.D. ver 16, whereas such paragraph relates to lifetime requirements.	EB 34 Ann 09	The paragraph was corrected. Please refer to the second version of the PDD.	PDD Version 02, Section B.7.2, does not refer anymore to incorrect paragraph. **CAR34 is closed.**
CAR35: PDD version 01, Section B.7.2, refers to EG_y, whereas $EG_{facility,y}$ is the correct identification as per AMS-I.D. ver 16.	EB 34 Ann 09	The parameter was corrected. Please refer to the second version of the PDD.	PDD Version 02, Section B.7.2, correctly refers to $EG_{facility,y}$. **CAR35 is closed.**

CAR36: There is a discrepant backup energy meter serial number (90001669) shown on calibration certificate CCL 050/10, compared to the serial number 90001696, which needs to be confirmed based on the response to CL21.	EB 34 Ann 09	The serial number present in the calibration certificate was correct by the responsible for the calibration (LACTEC – *Instituto de Tecnologia para Desenvolvimento*). In addition, as seen during the site visit, the calibration seal present in the backup meter corresponds to the same certificate (CCL 050/10). Please refer to calibration certificate CCL 050/10 (A) attached to this response.	The serial number of the backup energy meter, on calibration certificate CCL 050/10, has been corrected by LACTEC, the laboratory that carried out the calibration. A revised certificate has been issued: CCL 050/10 (A). **CAR36 is closed.**

CAR37: PDD version 01, Section B.7.2, establishes storage requirements of monitored data not in accordance with the Guidelines for CDM-SSC-PDD.	EB 34 Ann 09	Monitoring frequency of the "quantity of net electricity supplied to the grid" parameter was corrected in the new version of the PDD (version 2). In addition, as already presented in the PDD, "*data monitored and required for verification and issuance will be kept for two years after the end of the crediting period*". Please, refer to section B.7.2 of the PDD. Second response: The last paragraph of the section B.7.2 was corrected in accordance with CDM-SSC-PDD. Please refer to the third version of the PDD	First analysis: As per the Guidelines for CDM-SSC-PDD Version 05, Section B.7, "[...] data monitored and required for verification and issuance are to be kept for a minimum of two years after the end of the crediting period **or the last issuance of CERs for this project activity, whichever occurs later**". So the storage requirements in last paragraph of PDD Version 02, Section B.7.2, are not yet in accordance with the guidelines above. *CAR37 is not closed.* Second analysis: The storage requirements in last paragraph of PDD Version 03, Section B.7.2, have been corrected. **CAR37 is closed.**

CAR38: PDD version 01, Section B.8, does not indicate whether "Comissão Interministerial de Mudança Global do Clima" is a project participant listed in Annex 1.	EB 34 Ann 09	As mentioned in the Section B.8 of the PDD, "*Comissão Interministerial de Mudança Global do Clima*" is the Brazilian DNA and the responsible for determining the baseline emission factor. However, to avert mistakes, PPs decides to withdraw this entity. Please refer to the second version of the PDD.	PDD Version 02, Section B.8, does not mention "Comissão Interministerial de Mudança Global do Clima" anymore. **CAR38 is closed.**

CAR39: PDD version 01, Section C.2, does not state that the project activity uses a renewable crediting period.	EB 34 Ann 09	According to "Rules of procedure of the Executive Board of the clean development mechanism" – Decision 4/CMP.1, paragraph 29: "*(a) A maximum of seven years which may be renewed at most two times, provided that, for each renewal, a designated operational entity determines and informs the Executive Board that the original project baseline is still valid or has been updated taking account of new data where applicable* *(b) A maximum of 10 years with no option of renewal*". Thus, since the project has a crediting period of 7 year, means that the same uses a renewable crediting period. Second response: This information was included in the section C.2. Please refer to the third version of the PDD.	First analysis: As per the Guidelines for CDM-SSC-PDD Version 05, Section C.2, the PPs are required to "state whether the project activity will use a renewable or a fixed crediting period [...]". PDD Version 02, Section C.2, does not yet state the project activity is using a renewable crediting period. *CAR39 is not closed.* Second analysis: PDD Version 03, Section C.2, has been corrected. **CAR39 is closed.**
CAR40: PDD version 01, sections C.2.1.1 and C.2.1.2, mention "first" crediting period in the sections' titles, whereas "second" is the correct period.	EB 34 Ann 09	The sections were corrected. Please refer to the second version of the PDD.	PDD Version 02, sections C.2.1.1 and C.2.1.2, mention the second crediting period. **CAR40 is closed.**

CAR41: PDD version 01, Section D.1, presents an incorrect month for the date of ANEEL's Resolution 180/2000.	EB 34 Ann 09	The month for the date of ANEEL's Resolutions was corrected. Please refer to the second version of the PDD.	PDD Version 02, Section D.1, presents the correct date for ANEEL's Resolution 180/2000. **CAR41 is closed.**
CAR42: PDD version 01, Section D.2, presents a statement that is not part of ANEEL's Resolution 652/2003 ("[…] if the area is between 3 km^2 and 13 km^2, it should have a minimum environmental impact.").	EB 34 Ann 09	The paragraph was revised. Please refer to the second version of the PDD.	PDD Version 02, Section D.2, presents a text which is in accordance with ANEEL's Resolution 652/2003. **CAR42 is closed.**
CAR43: PDD version 01, Annex 1, presents an incomplete title, compared to the Guidelines for CDM-SSC-PDD.	EB 34 Ann 09	The title present in the Annex 1 of the PDD is the same that specified in the Guidelines for CDM-SSC-PDD.	PDD Version 02, Annex 1, presents a title which is in accordance with p.16 of the Guidelines for CDM-SSC-PDD. So, **CAR43 is closed.** Note: p.6 of such guidelines presents a title for Annex 1 which includes the expression "proposed small scale".
CAR44: PDD version 01, Annex 1, does not list all organisations presented in Section A.3.	EB 34 Ann 09	The organizations were included in the Annex 1. Please refer to the second version of the PDD.	PDD Version 02, Annex 1, lists all organisations presented in Section A.3. **CAR44 is closed.**

CAR45: PDD version 01, Section A.4.2, specifies the use of two 4.5 MW turbines, instead of the two 4,669 kW ones that were found operating, during site visit.	VVM 59	In fact, there are slight differences between the nominal power of turbines presented in the previous PDD and equipment tags, probably related to roundness. However, PPs call attention to the fact that electricity generated by the project and, consequently, estimated emission reductions are based on the energy assured of the project. Therefore, this difference does not affect the baseline emission or emission reduction calculations. In addition, this slight difference does not impact additionality, methodology or scale of the project since quantity of electricity delivery to the grid did not change. Considering explanations above, the PDD was reviewed (version 2) to review the installed capacity of the project.	The PDD revised due to the notification presents correct turbines capacity. **CAR45 is closed.**

CL01: Please, clarify the difference between the Parties listed in Table 1 of PDD version 1, Section A.3, and those listed in the CDM's project web page (http://cdm.unfccc.int/Projects/DB/TUEV-SUED1135874208.63/view).	VVM 44	The only difference between the Parties listed in the Table 1 of the PDD and the UNFCCC website is the name of Ecopart Assessoria em Negócios Empresariais Ltda. former Ecoinv Global Ltda. See the articles of association attached to this response. The Letter of Approval from United Kingdom of Great Britain and Northern Ireland concerning Ecopart Assessoria em Negócios Empresariais Ltda. was request. The necessary documentation for the inclusion of the above mentioned company as a project participant to the proposed project activity will be made available to the DOE by the time of its submission of the request for registration. Second response: The inclusion of Japan, represented by The Chugoku Electric Power, Co. Inc. and United Kingdom of Great Britain and Northern Ireland represented by Constellation Energy Commodities Group Inc. was performed after project registration regarding credit commercialization. The documents referents to inclusion of new project participants (Modalities of Communication) are public available in the project website <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1135874208.63/view>.	First analysis: PPs have not explained yet the inclusion of Japan and United Kingdom of Great Britain and Northern Ireland as new Parties involved. *CL01 is not closed.* Second analysis: The difference between the Parties listed in Table 1 of PDD version 3, Section A.3, and those listed in the CDM's project web page (http://cdm.unfccc.int/Projects/DB/TUEV-SUED1135874208.63/view) has been clarified. **CL01 is closed.**

CL02: Please explain the changes in the list of project participants, when comparing PDD version 1 with the registered one, version 2005.07.27B.	VVM 45	The other Project Participants listed in the project website was included after the registration date. It's important to mention that the entities included after the registration are the buyer of the CERs issued by the project activity. These changes can be seen in the Modalities of Comunication and Annex 2 (Add Project Participant) in the project website. Second response: The letter of approval for Ecopart Assessoria em Negócios Empresariais Ltda. is available in the Project website <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1135874208.63/view>.	First analysis: PPs have explained the changes in the list of project participants. However, there is no letter of approval for Ecopart Assessoria em Negócios Empresariais Ltda, from United Kingdom of Great Britain and Northern Ireland. *CL02 is not closed.* Second analysis: The letter of approval for Ecopart Assessoria em Negócios Empresariais Ltda, from United Kingdom of Great Britain and Northern Ireland has been evidenced. **CL02 is closed.**
CL03: Please, explain the reason why the annual estimation of emission reductions in 2012 and 2016 is 5,715 tCO_2e, instead of 5,700 tCO_2e.	EB 34 Ann 09	Was considered, in the annual estimation of emission reductions, the leap year for 2012 and 2016. For this reason, the difference in comparison with the other years.	The existence of leap years in 2012 and 2016 justifies the emission reductions difference. **CL03 is closed.**

CL04: Please, adjust last paragraph of Section A.4.5, in PDD version 01, to correctly reflect the situation regarding the last criteria for determining whether a SSC project activity is a debundled component.	EB 34 Ann 09	The paragraph was corrected according to CAR 6 and CAR 7. Please refer to the second version of the PDD.	Last paragraph of Section A.4.5, PDD Version 02, has been adjusted and now indicates that the project activity does not meet the criteria to be deemed a debundled component of a large project activity. **CL04 is closed.**
CL05: Please, align project boundary definition with AMS-I.D. ver 16.	EB 34 Ann 09	The definition was corrected according to the methodology. Please refer to the second version of the PDD.	The definition of the project boundary has been aligned with AMS-I.-D. Version 16. **CL05 is closed.**
CL06: Please, adjust second paragraph of Section B.3, in PDD version 01, as it may mislead someone to understand that Guarita River is within the project boundary, which is not the case, as per the definition in AMS-I.D. ver 16.	EB 34 Ann 09	The paragraph was revised according to the methodology AMS-I.D (version 16). Please refer to the second version of the PDD.	Second paragraph of Section B.3, PDD Version 02, has been revised in order to avoid misunderstanding that Guarita River could be within the project boundary. **CL06 is closed.**

CL07: Please, explain the difference between the annual averages of energy generation used for the ex-ante estimation of emissions reductions, comparing PDD version 01 (46,954 MWh/yr) and registered PDD version 2005.07.27B (46,305 MWh/yr).	EB 34 Ann 09	The data used for annual average of energy generation in the second crediting period is based in assured energy established by ANEEL (Resolution nr. 446) multiplied by the number of total hours of operation in the year (equivalent to 8760 hours). The assured energy for the project established by ANEEL is available in the website: <http://www.aneel.gov.br/cedoc/res2003446.pdf>. Second response: The assured energy of 5.13 MW on average refers to the installed capacity of 7.5 MW. However, according to the ANEEL Resolution 446/2003, the Project Design was revised and the installed capacity of the plant was increased to 9.2 MW. Consequently, the energy assured was revised to 5.36 MW on average. According to the registered PDD the estimative for the energy generation "*...is based on the defined firm capacity of 46,305 MWh officially defined for the project*". For the second crediting period, PP's clarify that the official value of 5.36 MW on average will be used to estimate de emissions reductions.	First analysis: PPs are requested to further clarify the difference, since the former value of assured energy (5.13 MW, on average), stated in ANEEL's Resolution 446/2003, do not lead to 46,305 MWh/yr. *CL07 is not closed.* Second analysis: The difference between the annual averages of energy generation used for the ex-ante estimation of emissions reductions comparing PDD version 03 (46,954 MWh/yr) and registered PDD version 2005.07.27B (46,305 MWh/yr) has been explained. **CL07 is closed.**

CL08: Please, rewrite first paragraph of the section B.6.1, using expressions in accordance to AMS-I.D. ver 16.	EB 34 Ann 09	The paragraph was rewrite according to AMS.I.D. Please refer to the second version of the PDD.	First paragraph of Section B.6.1, PDD Version 02, has been rewritten, in accordance with AMS-I.D. Version 16. **CL08 is closed.**
CL09: Please, correct the names of the steps of the "Tool to calculate the emission factor for an electricity system". Adjust Section B.6.1 accordingly.	EB 34 Ann 09	The names of the steps were corrected according to the "Tool to calculate the emission factor for an electricity system". Please refer to the second version of the PDD.	The names of the steps of the Tool to calculate the emission factor for an electricity system have been corrected in PDD Version 02. **CL09 is closed.**
CL10: Please, clarify, in Section B.6.1, under "Project Emissions (PE_y)", that "Emissions from water reservoirs of hydro power plants" is one of the categories to which first paragraph refers to.	EB 34 Ann 09	The topic "*Emissions from water reservoirs of hydro power plants*" is inserted under the "*Project Emissions (PE_y)*". However, the numbering was included for better identification.	As "Emissions from water reservoirs of hydro power plants" is inserted under "Project Emissions (PE_y), including numbering for better identification, **CL10 is closed.**
CL11: Please, use a single symbol for multiplication operations over all sections of the PDD. Currently, three different symbols are used (x, . and *).	EB 34 Ann 09	It's important to mention that both methodologies (AMS.I.D and ACM0002) and the "*Tool to calculate the emission factor for an electricity system*" present different symbols. Anyway, the symbol for multiplication operations was modified. Please refer to the second version of the PDD.	Single symbol for multiplication operations have been used. **CL11 is closed.**
CL12: Please, correct description of $EF_{EL,DD,h}$.	EB 34 Ann 09	The description of $EF_{EL,DD,h}$ was corrected, Please refer to the second version of the PDD.	PDD Version 02 presents correct description of $EF_{EL,DD,h}$. **CL12 is closed.**

CL13: Please, explain and justify why Option I was chosen, in Step 2, Section B.6.1, PDD version 01.	EB 34 Ann 09	OM and BM emission factors were calculated by the Brazilian DNA and the only values publicly available is the average of CO_2 emission factor in tCO_2/MWh: - BM annually and - OM monthly, daily and hourly. Methods are not explicit available. According to 43rd EB meeting: "*DOEs may request the DNA for an opportunity to assess that the 'tool to calculate the emission factor for an electricity system' was correctly applied in calculating the grid emission factors at the offices of the DNA, observing their specific requirements, including confidentiality and non-removal of data from their offices*". Considering the 43rd EB meeting clarification, a meeting was held between DOEs and the Brazilian DNA in the beginning of 2009 year. In this meeting, Brazilian DNA explained methods/options choose during the EF calculation. Therefore, there is no explanation or justification from the PPs' side for the options chosen for the EF calculation.	First analysis: It is to be mentioned that for dispatch data analysis, applicable method for calculating the operating margin emission factor in the case of this project activity, no off-grid plants are considered as part of the project electricity system. The fact that the Brazilian DNA calculates the operating and build margins emission factors does not void the requirement, from the Guidelines for CDM-SSC-PDD Version 05, that all relevant methodological choices must be explained and justified. *CL13 is not closed.* Second analysis: The chosen of Option I, in Step 2, Section B.6.1, PDD version 03, has been explained and justified. **CL13 is closed.**

		Second response: The emission factor was revised according the new version of the "*Tool to calculate the emission factor for an electricity system*". Please refer to the third version of the PDD and EF spreadsheet calculation.	
CL14: Please, clarify the difference between ANEEL's and ONS' information on the SHPP installed capacity. As per ANEEL's Resolution 446/2203 (http://www.aneel.gov.br/cedoc/res2003446.pdf), it is 9,200 kW. As per ONS' records of Type 3 Power Plants (http://www.ons.org.br/download/integracao_sin/definicao_modalidade/Modalidade.zip, file "Tipo_3_Em Operação_05_Ago_2010.pdf"), 11.0 MW.	EB 34 Ann 09	The commercialization agent (Electra Energy) contacted the ONS in September 14th to clarify the difference present in the website. In October 18th, ONS informed that installed capacity of the plant was corrected. This change can be found on the ONS website after the next update. Please refer to the email sent by ONS to Fernanda Santos Brasil (Electra Energy) informing the alteration in the ONS' website.	ONS's information on the SHPP installed capacity has been corrected and is now in line with ANEEL. **CL14 is closed.**
CL15: Please, provide the data books of the equipments of the three generating units installed at the plant.	EB 34 Ann 09	See the data books of the equipments attached to this response.	Data books of all three generating units have been provided. **CL15 is closed.**

CL16: Please, rewrite description of "Value of data" for $EF_{CO2,y}$, replacing expression "while the validation". Refer to text under Option 1 of the "Tool to calculate the emission factor for an electricity system" version 02, page 15.	EB 34 Ann 09	The description was corrected according the "Tool to calculate the emission factor for an electricity system". Please refer to the second version of the PDD. Second response: The sections B.6.2 and B.7.1 were revised according to the new version of the "*Tool to calculate the emission factor for an electricity system*". Please refer to the third version of the PDD.	First analysis: Please, clarify that the submission is "to the DOE", as per the Tool to calculate the emission factor for an electricity system Version 02. *CL16 is not closed.* Second analysis: $EF_{CO2,y}$ has been removed from Section B.7.1 of PDD v03, since it is determined *ex ante* for the second crediting period. **CL16 is closed.**
CL17: Please, clarify that the choice of dispatch data analysis does not allow the ex-ante approach to determine $EF_{grid,OM,y}$.	EB 34 Ann 09	According to the "*Tool to calculate the emission factor for an electricity system*", version 02, the dispatch data analysis OM emission factor is determined based on the grid power units that are actually dispatched at the margin during each hour *h* where the project is displacing grid electricity. This approach is not applicable to historical data, and, thus, requires anuual monitoring of $EF_{grid,OM-DD,y}$.	In Section B.7.1, of PDD Version 02, PPs have clarified that the choice of dispatch data analysis does not allow the *ex-ante* calculation of the emission factor. **CL17 is closed.**

CL18: Please, clarify management and operational structure for monitoring, including data collection and archiving, considering all parties involved. Additionally, detail the "Area of Operations", which is shown in Item 6 of BGEE's procedure BTCC02 version 02.	EB 34 Ann 09	RGE – Rio Grande Energia (a company responsible for energy distribution in the north-northeast of Rio Grande do Sul State) informs the total electricity generated by the project in a month to the project owner and the commercialization agent – Electra Energy. The project owner informs the electricity generated by the plant to CCEE (through the Electra Energy). This information was included in the second version of the Monitoring Report. The operation sector is represented by the Electra Energy. Electra Energy receives the generation records by RGE, makes the registration in the CCEE system, sends to BT Geradora the generation values and ME001 Reports and stores these records. Second response: The operations programmer belongs to the commercialization agent Electra Energy. As mentioned above, Electra is responsible for receives the generation records, make the registration in the CCEE system, send the generation report (ME001) to BT Geradora and store these records in the SHP database. For more details, please refer to the file "BT_Esclarecimento sobre procedimento BT.zip" attached to this response. Third response:	First analysis: It is not yet clear to which organization the operations programmer belongs to (see last bullet under the responsibilities of the Operations Area). *CL18 is not closed.* Second analysis: PPs are requested to present a revised and updated version of BT Geradora's internal procedure BTCC02. *CL18 is not closed.* Third analysis: BT Geradora's internal procedure BTCC has been revised. Identified as BTCC03, version 03, dated 01/03/2012. This CL is closed.

		Please refer to the new version of the BT Geradora's internal procedure BTCC02, attached to this response.	
CL19: Please, explain why the main meter (position identified as "A1" in BGEE's panel at RGE's substation) has been removed. Additionally, provide CCEE's records of all measuring events, during the 4th monitoring period, of both energy meters, as per CCEE's "BOM" report ("Boletim de Ocorrência de Medição").	EB 34 Ann 09	According to the ELO' Report, attached to this response, the security panel showed a defect during operation and therefore was removed. Thus, the period in which only the backup meter operated corresponds: 06/08/2010 to 23/08/2010. It's important to mention that, for the last monitored period, there was no occurrence and therefore no CCEE's "BOM" report wasn't generated. Please refer to the Elo' Report and the "print screen" of CCEE website attached to this response.	Explanation has been provided on why the main meter had been removed*. The period during which only the backup meter operated is from 06/08/2010 until 23/08/2010*. There were no additional events with the energy meters, during 4th monitoring period**. Source of information: * ELO's technical report on meter #90001661, dated 23/08/2010 ** CCEE's Energy Data Collection System (Maintenance Notification Module) **CL19 is closed.**

CL20: Please, provide documented evidence on the identification (model and serial number) of the energy meter that has been temporarily removed from BGEE's panel at RGE's substation.	EB 34 Ann 09	Please refer to the ELO' Report with the model (ELO 2180) and serial number (90001661) attached to this response.	Based on ELO's technical report, dated 23/08/2010, on meter #90001661, it has been confirmed the identification of the energy meter that had been temporarily removed from BGEE's panel at RGE's substation. **CL20 is closed.**

CL21: Please, provide documented evidence on the serial number of the backup meter, which has a warranty label numbered 28998 (position identified as "A2" in BGEE's panel at RGE's substation).	EB 34 Ann 09	See the registration data of the PCH in the CCEE (from the Portuguese *Câmara de Comercialização de Energia Elétrica*) attached to this response, where are the serial numbers of the energy meters. Second response: As can be seen during the site visit, the backup energy meter presents a label of LACTEC (*Instituto de Tecnologia para Desenvolvimento*), the responsible for the calibration of the energy meters. This label shows the date of the calibration (25/03/2010) and the number of certificate (CCL050/10). The same information is present in the certificate of calibration of the backup energy meter. However, there is a difference in the serial number present in the certificate CCL050/10. This difference was due to a mistake by LACTEC. However, the certificate was corrected and follows attached to this response.	First analysis: No documented evidence has been provided yet on the serial number of the backup meter, which has a warranty label numbered 28998. *CL21 is not closed.* Second analysis: LACTEC's calibration label and relevant certificate evidence serial number 90001696. Note: LACTEC is an accredited laboratory under RBC (the Brazilian Calibration Network). **CL21 is closed.**

CL22: Please, provide copies of the daily manual records, taken by the plant operators, of the power generation of the 332 kW generating unit, in 2010 ("registro mini central 2010").	VVM 59	Please refer to the daily manual record attached to this response. It's important to mention that, according to the daily manual records for the year 2008 and 2009 (seen during the site visit) and the 2010' records attached to this response, the generation unit did not operated.	Copies of the daily manual records of the power generation of the third generating unit has been provided. **CL22 is closed.**
CL23: Please, provide copies of the daily manual records, taken by the plant operators, of the power generation of generators 01 and 02, in 2010 ("registros grupo gerador 01 e 02"), for every single day when both generators were operating at the same time. Even when that occurred only in part of the day.	VVM 59	Please refer to the daily manuals records of generators 01 and 02 (for the year 2010) attached to this response.	Copies of the daily manual records of the power generation of generating units 01 and 02 have been provided. **CL23 is closed.**

CL24: Please, clarify who – person(s)/entity(ies) – was responsible for the application of the baseline and monitoring methodology to the project activity.	EB 34 Ann 09	This information is present in the Section B.8 of the PDD. Anyway, Ecopart Assessoria em Negócios Empresariais Ltda. is the responsible for the application of the baseline and monitoring methodology to the project activity. Second response: More detail was included in the Section B.8. Please refer to the third version of the PDD.	First analysis: PDD Version 02, Section B.8, does not yet clearly state that Ecopart Assessoria em Negócios Empresariais Ltda. is the "responsible for the application of the baseline and monitoring methodology to the project activity", as required by the Guidelines for CDM-SSC-PDD Version 05. *CL24 is not closed.* Second analysis: In PDD Version 03, Section B.8, the person(s)/entity(ies) responsible for the application of the baseline and monitoring methodology to the project activity has been clearly stated. **CL24 is closed.**

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

Final

""Central Energética do Rio Pardo Cogeneration Project ("CERPA")"
in
Brazil

Validation Opinion N° 2010-BQ-MD-22

Revision N° 1.1

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

Project Title:	Country:	CDM Registration Reference N°:
"Central Energética do Rio Pardo Cogeneration Project ("CERPA")	Brazil	0209
Client:	**Client contact:**	
CERPA – Central Energética Rio Pardo Ltda	Mr. Sylvio Ortega	
Report No.:	**Revision:**	**Date of this report:**
2010-BQ-MD-22	1.1	16/05/2011
Approved by (Final Report – DCI Director approval):		**Date of approval:**
Roberto Cavanna		17/05/2011

Methodology

Number:	Version:	Title:	Scale	SS(s):
ACM0006	10.1 of 30/07/2010	"Consolidated methodology for electricity generation from biomass residues in power and heat plants"	Large	01

RINA Services S.p.A. (RINA), commissioned by CERPA – Central Energética Rio Pardo Ltda, has performed the validation for renewal of the crediting period for the registered project activity ""Central Energética do Rio Pardo Cogeneration Project ("CERPA") in Brazil.

In conclusion, it is RINA's opinion that the project meets the requirements for the renewal of the crediting period stated in the "Procedures for renewal of the crediting period of a registered CDM project activity" (version 05, EB 46 - Annex 11) and the approved methodology ACM0006, version 10.1 of 30/07/2010. The original baseline of the first crediting period is confirmed to be still valid.

Hence RINA requests the renewal of the crediting period of the project activity ""Central Energética do Rio Pardo Cogeneration Project ("CERPA")" in Brazil.

Work carried out by:

Geisa Maria Principe Branco Saettoni, Thaís de Lima Carvalho, Américo Varkulya Jr

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Work verified by (Final Report – CRT person responsible approval)

Paolo Teramo

Keywords:

Climate Change, Kyoto Protocol, Clean Development Mechanism, Validation

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

Abbreviations

ANEEL	"*Agência Nacional de Energia Elétrica*" - Brazilian Electric Energy Agency
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH_4	Methane
CIFOR	Center for International Forestry Research
CIMGC	"*Comissão Interministerial de Mudança Global do Clima*" (Interministerial Commission on Global Climate Change)
CL	Clarification Request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CRT	Coordination and Technical Control Staff
DCI	Certification Division of RINA Services Spa
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
ONS	"*Operador Nacional do Sistema Elétrico*"- National Electric System Operator (National dispatch center)
PDD	Project Design Document
PE	Project Emission
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SIN	"*Sistema Interligado Nacional*" - National Interconnected System
SS(s)	Sectoral Scope(s)
UNFCCC	United Nations Framework Convention on Climate Change
ÚNICA	"*União da Indústria de Cana-de-Açúcar*" – Brazilian Sugarcane Industry Union
VVM	Validation and Verification Manual

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

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VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

1 INTRODUCTION

CERPA – Central Energética Rio Pardo Ltda has commissioned RINA to carry out the validation of the updated PDD version 02 of 29/04/2011 /8/ for the CDM project activity “”Central Energética do Rio Pardo Cogeneration Project (“CERPA”)” project in Brazil for the renewal of the crediting period for this project. The second renewable crediting period for the project ends on 30/04/2017.

This report summarizes the findings from the validation of the updated PDD of the project, performed on the basis of UNFCCC criteria for CDM, as well as criteria given by the “Procedure for renewal of the crediting period of a registered CDM project activity (version 05, EB 46 - Annex 11).

1.1 Objective

The objective of the Validation is to have an independent evaluation of the updated PDD’s compliance with relevant UNFCCC requirements and host Party criteria to confirm that the original project baseline was updated taking into account of new data where applicable. In particular, the project’s baseline, monitoring plan and the project’s compliance with relevant UNFCCC requirements and host Party criteria are validated in order to confirm the correctness of the application of the approved baseline methodology, ACM0006, “”Consolidated methodology for electricity generation from biomass residues in power and heat plants”” version 10.1 of 30/07/2010, for the determination of the continued validity of the baseline/or its update, and estimation of the emission reductions for the applicable crediting period, from 01/05/2010 or the renewal date of this project activity, whichever is later, to 30/04/2017, reported for the “”Central Energética do Rio Pardo Cogeneration Project (“CERPA”)” project in Brazil.

1.2 Scope

The validation scope is to review the updated PDD against the UNFCCC criteria for CDM.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

This validation opinion is also to be seen in conjunction with the validation report and protocol submitted at the time of requesting registration of the project (DNV Validation Report No. 2005-0635, revision no. 02 of 23/12/2005 /28/).

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

2 METHODOLOGY

Validation was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Manual, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The validation of the updated PDD is consequence of the verification activity which consisted of the following three phases:

- Document review
- Follow-up actions;
- The resolution of outstanding issues and the issuance of the final validation opinion report.

The validation opinion is issued within nine to six months prior to the date of expiration of the current crediting period.

The following sections outline each step in more detail.

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

2.1 Document Review

The updated PDD version 02 of 29/04/2011 /8/, in particular the applicability of the methodology, the baseline determination, the emission reduction calculations provided in the form of a spreadsheet, "CERPA_second_period_calculation scenario 18_CERs_v2_20110429.xls", version 2 dated 29/04/2011 /24/ and the documents listed in the table below, were reviewed during the validation.

/1/	Ecopart Assessoria em Negócios Empresariais Ltda: CDM-PDD for project activity "Central Energética do Rio Pardo Cogeneration Project ("CERPA") in Brazil, version 01 of 13/12/2010.
/2/	CDM Executive Board: Validation and Verification Manual, version 01.2 of 30/07/2010.
/3/	CDM Executive Board: Baseline and monitoring methodology "ACM0006", ""Consolidated methodology for electricity generation from biomass residues in power and heat plants"", version 10.1 of 30/07/2010.
/4/	Ecopart Assessoria em Negócios Empresariais Ltda: CER´s Spreadsheet Calculation "CERPA_second period_calculation CERs_20101213 v1.xls", version 01 of 13/12/2010 .
/5/	Ecoinvest carbon Assessoria Ltda.: CDM-PDD for project activity "Central Energética do Rio Pardo Cogeneration Project ("CERPA") in Brazil, version 4b of 21/12/2005.
/6/	CDM Executive Board: Baseline and monitoring methodology AM0015, "Bagasse-based cogeneration connected to an electricity grid" version 01 of 22/09/2004.
/7/	CDM Executive Board: "Procedures for Renewal of the Crediting Period of a Registered CDM Project Activity", version 05 of 25/03/2011, EB 46 - Annex 11.
/8/	Ecopart Assessoria em Negócios Empresariais Ltda: CDM-PDD for project activity "Central Energética do Rio Pardo Cogeneration Project ("CERPA") in Brazil, version 02 of 29/04/2011 (*latest updated PDD version*).
/9/	Ministry of Science and Technology / MCT Interministerial Commission on Global Climate Change – CIMGC: Resolution # 8, dated 26/05/2008. Available at <http://www.mct.gov.br/index.php/content/view/72738.html>, accessed on 15/03/2011 (only in Portuguese).
/10/	Ministry of Science and Technology / MCT Interministerial Commission on Global Climate Change – CIMGC: emission factor data, available at <http://www.mct.gov.br/index.php/content/view/307492.html>, accessed on 15/03/2011 (English version).
/11/	CDM Executive Board: ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 12.1.0 of 17/09/10.
/12/	CDM Executive Board: "Tool to calculate the emission factor for an electricity system", version 2.1, dated 15/04/2011.
/13/	Equipalcool Sistemas Ltda.:"Letter demonstrating the lifetime of boiler employed by project activity", dated 16/02/2011.
/14/	NG Metalúrgica Ltda: "Letter demonstrating the lifetime of steam turbines employed by the project activity", dated 23/02/2011.
/15/	E-mail from Dedini S/A Indústria de Base: "eficiência caldeiras" (*boilers efficiency*), dated 20/08/2008, sent by Mr. Flavio Maltempi Ferreira.
/16/	Usina da Pedra: "Spreadsheet Data Collection Measurement (from Portuguese - Planilha de Coleta de Dados da Medição) Document number RQ-CER-001-1, version 3, dated 30/07/2008.
/17/	Usina da Pedra ; Operational Procedure : CERPA´s Data Collection (from Portuguese – Coleta de Dados da CERPA) , Document number PO-CER-008-1, version 05, dated 13/05/2010.
/18/	Usina da Pedra; Operational Procedure: Monthly Energy Data Collection (from portuguese Coleta de Dados Mensal de Energia) Document number PO-CER-007-1, version 03, dated 13/05/2010.
/19/	Usina da Pedra, Standard Procedure: CERPA´s Monitoring System (From Portuguese *Sistema de Monitoramento da CERPA*) Document number NP-CER-001-1, version 06, dated 12/01/2011.
/20/	Usina da Pedra Operational Procedure: Sampling and Analysis for Determining Sugarcane Sucrose Content (from Portuguese: *Amostragem de cana e análise para determinação de teor de sacarose*) Document number PO-LAB-001-1, version 4, dated 11/09/2009.

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

/21/	Specification of Test Method: Determination Sugarcane's Moisture, bagasse and Filter Cake (from Portuguese: *Determinação da Umidade da cana, bagaço e torta de filtro*) Document number MT-LAB-011-1, version 4, dated 23/06/2010.
/22/	Usina da Pedra: Spreadsheet ("*bagaço% cana.xls*") with an example of the calculation of the percentage of bagasse on sugar cane and print screen of the program employed on this calculation, dated 04/04/2011.
/23/	Sugarcane Technology Center: Determination of Low Heat value and High Heat Value (from Portuguese – *Determinação do Poder Calorífico Superior e Inferior*), document number CTC-LA – MT6-008, version 2, dated 07/05/2010.
/24/	Ecopart Assessoria em Negócios Empresariais Ltda: CER´s Spreadsheet Calculation "CERPA_second_period_calculation scenario 18_CERs_v2_20110429.xls", version 2 dated 29/04/2011.
/25/	Tecnosugar; Flow diagram pants "Balance of direct steam, sugarcane bagasse and electric Energy – phase 2", revision 5, dated 16/07/2009.
/26/	Brazilian Electric Energy Agency - ANEEL Decree # 129, dated 24/02/2011.
/27/	Brazilian Electric Energy Agency - ANEEL Resolution # 394, dated 23/07/2002.
/28/	DNV: Validation Report No. 2005-0635, revision 02 of 23/12/2005.
/29/	Ministry of Science and Technology – MCT Interministerial Commission on Global Climate Change – CIMGC: Notes of explanation (emission factor), available at <http://www.mct.gov.br/upd_blob/0024/24834.pdf>, accessed on 09/05/2011 (English version).
/30/	TUV NORD "Central Energética do Rio Pardo Cogeneration Project (CERPA)", Final Verification Report - 4th Period, Report No: 6314 – 09/133, dated 12/01/2011.
/31/	USDA Foreign Agriculture Service: GAIN Report – Brazil Biofuels Annual 2010 (prepared by Sergio Barros), dated 30/07/2010. Available at <http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Biofuels%20Annual_Sao%20Paulo%20ATO_Brazil_8-11-2010.pdf>, accessed on 15/03/2011 (in English).
/32/	CIFOR: Info Brief #35 – December 2010 - The role of national governance systems in biofuel development. Available at <http://www.cifor.cgiar.org/publications/pdf_files/infobrief/3308-infobrief.pdf>, accessed on 15/03/2011 (in English).
/33/	CTC: CTC Study, revision 0 - Determinação da eficiência elétrica das usinas brasileiras para produção exclusiva de açúcar e/ou etanol (*Reference plants efficiency study*), dated 17/05/2010. Available at <http://www.ctcanavieira.com.br/site/media/Usina_Referencia_MDL_r0a.pdf>, accessed on 15/03/2011 (in Portuguese).
/34/	Única – brochure "Sugarcane industry in Brazil" and presentation "Sugarcane in Brazil: The Sustainable Expansion" - World Biofuels Market Congress, 18/03/2009 Brussels. Available at <http://www.unica.com.br/multimedia/publicacao/Default.asp?sqlPage=2), accessed on 15/03/2011 (in English).
/35/	CDM Executive Board - "Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of crediting period" – Annex 1, version 05 of 25/03/2009 (EB 46 - Annex 11).
/36/	CDM Executive Board: "Combined tool to identify the baseline scenario and demonstrate additionality", version 3.0 dated 15/04/2011.
/37/	CDM Executive Board: DNA's information. Available at http://cdm.unfccc.int/DNA/index.html, accessed on 15/03/2011 (in English).
/38/	CDM Executive Board: CERPA Project's information – Project participants / LoA's. Available at http://cdm.unfccc.int/Projects/DB/DNV-CUK1135325819.41/view, accessed on 15/03/2011 (in English).
/39/	References related to Brazilian mills not using fossil fuel in their sugar and/or bioethanol production process and bagasse storage: - UNICA: Statement that all energy utilized in the Brazilian mills industrial process is generated from firing of bagasse (biomass residues from their sugar and/or bioethanol production). Available at http://www.unica.com.br/content/show.asp?cntCode=%7b0C8534A8-74A7-4952-8280-C5F6FB9276B7, accessed on 15/03/2011 (in Portuguese);

	- Centro Nacional de Referência em Biomassa – CENBIO *(Biomass National Reference Center)*: *Green house gases emissions in the production and use of ethanol from sugarcane in Brazil: The 2005/2006 averages and a prediction for 2020* - Article from Isaias C. MACEDO, Joaquim E.A. SEABRA and João E.A.R. SILVA, published in BIOMASS AND BIOENERGY periodical. Available at http://cenbio.iee.usp.br/download/publicacoes/macedo_et_al-balance2020.pdf, accessed on 15/03/2011 (in English).

2.2 Follow-up actions

On 09/02/2011, RINA visited the project's site, located at Serrana Municipality, to resolve questions and issues identified during the document review of the updated PDD related to the renewable crediting period from 01/05/2010 or the renewal date of this project activity, whichever is later, to 30/04/2017.

The key personnel interviewed and the main topics of the interviews are summarized in the table below.

	Date	Name and Role	Organization	Topic
/a/	09/02/2011	Adriana Berti / Technical Analyst	EQAO (former Ecoinvest & former Ecopart)	Review estimated emission reductions and project emissions calculations (assumptions, calculations, sources). Check the reference plant. Reliability of internal and external data). Evidences of the historic data of energy generation; Evidences regarding operational parameters of boilers and steam turbines included in the project activity
/b/	09/02/2011	Eduardo Brondi / Responsible by CDM	CERPA	Assessment of the project and installation of all equipment as described by the PDD (project-equipment/s specifications and operational lifetime/s evidences). Metering equipment accuracy / calibration-maintenance procedures-frequency / supporting evidences-records (processes and equipments/instruments involved - possible leakages). Confirm the existing installed capacity of equipments at the facility, and equipments of the project activity. Check assured energy/ operation lifetime, and project participant. PPA contracts;
/c/	09/02/2011	Daniel G. / Engineering Manager	Usina da Pedra	
/d/	09/02/2011	Agenor Branco Jr / Manager	Usina da Pedra	
/e/	09/02/2011	Matheus Carvalho / Manager	Usina da Pedra	
/f/	10/02/2011	Wanderlei Monta / Development Coordinator	Usina da Pedra	Position and role of each person in the GHG data management process clearly defined/implemented (correct implementation of the GHG Management and operational system). Operating staff competence and the risks for inappropriate operation and data collection procedures of the project. Check the procedures identified for training of monitoring personnel/ training records. All required and/or relevant routine processes (procedures-instructions-records), and documentations for
/g/	10/02/2011	Amanda Ap. Valdente / Human Resources Analyst	Usina da Pedra	

				proper application. Information flows for generating, aggregating/collating and reporting the selected monitored parameters.

2.3 Resolution of outstanding issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to RINA's positive validation opinion for the renewal of the crediting period.

2.4 Internal quality control

All the revisions of the validation opinion before being submitted to the client were subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent RINA instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

2.5 Validation team and the technical reviewer(s)

The validation team and the technical reviewers consist of the following personnel:

Role	Last Name	First Name	Country
Team Leader CDM	Principe Branco Saettoni	Geisa Maria	Brazil
CDM Validator / Technical expert	Varkulya Jr	Américo	Brazil
CDM Validator	De Lima Carvalho	Thaís	Brazil
Technical Reviewer	Valoroso	Rita	Italy
Technical Reviewer	Teramo	Paolo	India

3 VALIDATION FINDINGS

The findings of the validation related to the project, as described in the updated PDD version 02 of 29/04/2011 /8/, are stated in Appendix A of this report.

3.1 Project activity details

Project UNFCCC reference	0209
Date of registration	09/03/2006
Title of the project activity	"Central Energética do Rio Pardo Cogeneration Project ("CERPA")
Methodology(ies)	ACM0006, version 10.1 of 30/07/2010 - "Consolidated methodology for electricity generation from biomass residues in power and heat plants"
Renewable crediting period	From 01/05/2010 or the renewal date of this project activity, whichever is later, to 30/04/2017

The project increased the efficiency and the capacity of the previous bagasse based cogeneration system used to generate steam and electricity for internal consumption by the installation of a high-pressure boiler and a multiple stage backpressure turbine coupled with two new 15 MW generators that provided an additional 30 MW generation capacity to the previously installed capacity of 10 MW. The installed total generation capacity is equal to 24 MW and is calculated considering the plant load factor and the operational season period (Installed capacity * Plant load factor * months of operation/months of the year = 40 MW * 0.9 * 8/12).

According to the "Procedures for Renewal of the Crediting Period of a Registered CDM Project Activity" /7/, project participant notified the Secretariat of their intention to request a renewal of a crediting period of the

registered CDM project activity within the required nine to six months period (deadline date = 31/10/2009), prior the date of expiration of the current (first) crediting period, but the selected DOE was informed afterwards (after the deadline date) and therefore the project participant shall not be entitled to the issuance of certified emission reductions for the period from the expiration date of the current (first) crediting period until the date on which the second crediting period is deemed renewed.

During the site visit, all equipments of this project activity were verified and their operational conditions are in line with table 2-5 on Section "2.5 - Technical Project Description" described on the latest available Final Verification Report /31/ and in line with Section A.4.3 of PDD version 2 /8/. Beyond the operational conditions, the following characteristics of CDM project's equipments were verified:

Boiler

Manufacturer: EQUIPALCOL Sistemas;

Boiler type: 150 V-2-S;

Manufactured in 2002;

Manufacturing number: 068-02;

Steam nominal production: 150 t/hour;

Maximum steam production: 165 ton/hour;

Operational pressure: 65 kgf/cm^2;

Temperature 480 ^{o}C.

Generator – TG 4

Manufacturer: Toshiba;

Serial number: 012021001;

Installed Capacity: 18,750 kVA;

Power Factor; 0,8.

Manufactured in 10/2002 (refurbished in 03/2010 - installed power not modified)

Steam turbine of TG 4

Manufacturer – NG Metalúrgica Ltda;

Model: H3/630S;

Installed Power: 17,300 kW;

Inlet pressure: 66 kgf/cm^2;

Extraction pressure: 2,5 kgf/cm^2;

Outlet pressure: 0.19 kgf/cm^2;

Order number: 4.1.0186;

Temperature: 475 ^{o}C;

Manufactured in 12/2002.

Generator – TG 3

Manufacturer: Toshiba;

Serial number: 012021000;

Installed Capacity: 18,750 kVA;

Power Factor; 0,8;

Manufactured in 10/2002 (refurbished in 03/2010 - installed power not modified).

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Steam turbine of TG 3

Manufacturer – NG Metalúrgica Ltda;

Model: H3/630S;

Installed Power: 17,000 kW;

Inlet pressure: 63 kgf/cm^2;

Outlet pressure: 1.5 kgf/cm^2;

Order number: 4.1.0188;

Temperature: 475 ^{o}C;

Manufactured in 12/2002.

3.2 Participation requirements

The project's host Party is Brazil and the Annex I Parties are United Kingdom of Great Britain and Northern Ireland and The Netherlands. Brazil, United Kingdom of Great Britain and Northern Ireland and The Netherlands fulfill the requirements to participate in the CDM. All parties involved in this project activity have ratified the Kyoto protocol and established a DNA as the participating requirements for CDM under the Kyoto Protocol.

Brazil ratified the Kyoto Protocol on 23/08/2002 and established as DNA the Interministerial Commission on Global Climate Change, as per the UNFCCC website /37/.

United Kingdom of Great Britain and Northern Ireland ratified the Kyoto Protocol on 31/07/2002 and established as DNA the Global Carbon Markets and The Netherlands ratified the Kyoto Protocol on 31/07/2002 and established as DNA the Ministry of Infrastructure and the Environment, as per the UNFCCC website /37/.

The project participants are CERPA – Central Energética Rio Pardo Ltda from Brazil, Ecopart Assessoria em Negócios Empresariais Ltda, from United Kingdom of Great Britain and Northern Ireland[1], and BHP – Billiton Marketing AG from The Netherlands. All participants are private entities. The project participants are correctly listed in table A.3 of the PDD and the information is consistent with the contact details provided in Annex 1 of the PDD version 02 of 29/04/2011 /8/. Project participants and parties (host and other parties) are also in line with the ones currently presented in the UNFCCC site /38/.

3.3 Application of latest approved version of a baseline and monitoring methodology.

The project was originally registered as a CDM project, based on version 01 of the approved baseline methodology AM0015 - "Bagasse-based cogeneration connected to an electricity grid" /6/ of 22/09/2004, with a renewable (7 years) crediting period, from 01/05/2003 to 30/04/2010.

The updated PDD, version 02 of 29/04/2011 /8/, applies version 10.1 of 30/07/2010 of the approved consolidated baseline and monitoring methodology ACM0006, "Consolidated methodology for electricity generation from biomass residues in power and heat plants" /3/ and all sections related to the baseline, estimated emission reductions and the monitoring plan were updated as per the applied methodology. This procedure is line with paragraph 2 (b) of the "Procedures for Renewal of the Crediting Period of a Registered CDM Project Activity" /7/, once the original baseline methodology AM0015 was withdraw and replaced by the consolidated methodology ACM0006, after the registration of the CDM project activity.

[1] The project participant Ecopart Assessoria em Negócios Empresariais Ltda. is a company based in Brazil, which holds a CER account in the UK Greenhouse Gas Emissions Trading Scheme Registry and became a project participant in the project through this country approval in order to use its CER account.

3.4 Assessment of the validity of the original/current baseline and to update the baseline at the renewal of a crediting period.

RINA assessed the validity of the original baseline scenario or its update and the corresponding estimation of emission reductions for the second crediting period based on the methodological tool "Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of crediting period" /35/, the approved consolidated baseline and monitoring methodology ACM0006 version 10.1 /3/ and the means of validation described in the VVM /2/.

The following steps have been applied to evaluate whether the current baseline is still valid for the next crediting period (from 01/05/2010 or the renewal date of this project activity, whichever is later, to 30/04/2017) and to update the baseline in case that the current baseline is not valid anymore for the next crediting period.

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

RINA has assessed the impact of new relevant national and/or sectoral policies and circumstances on the baseline, using the following Sub-steps.

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

RINA confirms, through the assessment of public information /31/ /32/ and its local experience, that there have been no changes in the relevant national and/or sectoral regulations since the previous crediting period.

Step 1.2: assess the impact of circumstances

When the project activity was registered (09/03/2006), the Brazilian emission factor was calculated based on data published by the Brazilian DNA and provided by ONS (National Electric System Operator) and considering the South-Southeast-Midwest regions (subsystems). After project's registration, the Brazilian DNA, (CIMGC) in its 43rd Meeting, on 29/04/2008 /29/, "*decided to adopt a **SINGLE SYSTEM** as the pattern for CDM projects using the tool for calculating emission factors associated with the ACM0002 methodology to estimate their greenhouse gas reductions*", and also pointing out "*the expansion of electricity transmission support between the subsystems will promote gradual reductions in transmission constraints and will enable a project implemented in a given subsystem to produce benefits in the other subsystems of the SIN*". Furthermore, the Interministerial Commission on Global Climate Change (CIMGC) through its Resolution # 8 /9/, dated 26/05/2008, and with effect on the date of its publication, decided:

"Art. 1st – Adopt the single system comprised of the union of National Interconnected System (NIS) subsystems as a definition of the "Project Electric System" for any Clean Development Mechanism (CDM) project activity connected to the NIS, supplying or using electricity from the grid, and applying the ACM0002 and AMS-I.D. methodologies and/or the "Tool to calculate the emission factor for an electricity system" approved by the CDM Executive Board.

Sole paragraph - This definition, when applicable, shall be extended to any other methodologies dealing with project activities connected to the grid that come to be approved by the CDM Executive Board, unless expressed otherwise in a deliberation by this Commission".

Therefore, for the second period, the Brazilian grid emission factor was updated based on the latest published available OM and BM emission factors of the Brazilian National Interconnected System, which are calculated by the Brazilian DNA (CIMGC) /10/ according to the "Tool to calculate the emission factor for an electricity system" and considering the National Interconnected System - SIN (North, Northeast, South and Southeast-Midwest), as stated in the Resolution # 8 /9/.

Step 1.3: assess whether the continuation of the use of current baseline equipment(s) is technically possible.

PDD version 02 of 29/04/2011 /8/, applied the approved consolidated baseline and monitoring methodology ACM0006 version 10.1 of 30/07/2010 /3/. Project participants properly applied the scenario 18 of ACM0006 that defines the situation that would have occurred in the absence of the project activity, as follows:

"The project activity involves the replacement of an existing biomass residue fired power and heat plant by a new biomass residue fired power and heat plant. The replacement increases the power generation capacity. In the absence of the project activity, the existing plant would also be replaced by a new biomass residue fired power and heat plant (referred to as .reference plant.), however, this reference plant would have a lower

efficiency of electricity generation than the project plant (e.g. by using a low-pressure boiler instead of a high-pressure boiler). The same type and quantity of biomass residues as in the project plant would be used in the reference plant. Consequently, the power generated by the project plant would in the absence of the project activity be generated (a) in the reference plant and since power generation is larger in the project plant than in the reference plant. (b) partly in power plants in the grid. The new project plant has the same technical lifetime as the reference plant. The heat generated by the project plant would in the absence of the project activity be generated in the reference plant".

Thus, in summary, in the absence of the project activity, electricity generation would be from the reference plant and from the power plants connected to the grid.

Regarding the equipments employed by project activity, project participants provided a letter from Equipalcool Sistemas Ltda (boiler manufacturer), dated 16/02/2011, signed by Mr. Carlos Henrique Dalmazo (Mechanical Engineer) confirming that the lifetime of boilers achieve 25 years /13/, since properly operated. Also the steam turbines manufacturer ´s, NG Metalúrgica Ltda, provided a letter dated 23/02/2011, signed by Mr. Matheus C. Franhani (Project Engineer) and Mr. José A. Mari (Engineer Manager) confirming that the lifetime of steam turbines achieves 20 years /14/.

The reference plant would have a lower efficiency of electricity generation than the project plant and the new project plant would have the same technical lifetime as the reference plant and therefore this step is not applicable.

Step 1.4: assessment of the validity of the data and parameters.

The registered PDD version 4b, dated 21/12/2005 /5/ presented the baseline calculation (baseline emissions) in line with the baseline methodology AM0015 /5/, multiplying the surplus of electric energy produced by project activity and delivered to Brazilian national grid, by the Brazilian grid emission factor (measured in kg CO_2e/kWh).

At the second crediting period, baseline emissions were updated as per ACM0006 version 10.1 of 30/07/2010 /3/. The net quantity of increased electricity generation is determined based on the average net efficiency of electricity generation in the reference plant and the average net efficiency of electricity generation in the project plant after project implementation and the baseline emissions are the result of this net quantity of increased electricity generation multiplied by the updated Brazilian grid emission factor.

For the first crediting period, the combined margin (CM) emission factor, applying the Simple Adjusted method, was calculated *ex ante* as the weighted average (W_{OM} = 0.5 and W_{BM} = 0.5) of the operating margin (OM) and build margin (BM) emission factors, based on data published by the Brazilian DNA and provided by ONS (National Electric System Operator) and considering the South-Southeast-Midwest regions (subsystems).

The Brazilian grid emission factor estimated (*ex ante*) at the start of the first crediting period is not longer valid and thus has to be updated and the PDD version 02 of 29/04/2011 /8/ is using the latest EF grid data (2009 data), which was available at the time of the start of the validation of the renewal of the crediting period (December 2010). Therefore, for the second crediting period, the *ex ante* estimative for the Brazilian grid emission factor was calculated using the latest available emission factor (2009) of the Brazilian grid system for 2009 (CM=0.1214 tCO_2/MWh - average OM=0.2476 tCO_2/MWh and BM=0.0794 tCO_2/MWh), made publicly available by the Brazilian DNA /10/, and considering the National Interconnected System - SIN (North, Northeast, South and Southeast-Midwest). Moreover, the Brazilian grid emission factor for the second crediting period was correctly calculated, using the proper weighted average (W_{OM} = 0.25 and W_{BM} = 0.75), as required by Tool to calculate the emission factor for an electricity system.

Data was checked against the Brazilian DNA web site (Base year 2009) /10/ and found correct.

The combined margin emission factor ($EF_{grid,CM,y}$) will be calculated/updated *ex post* using the publicly available CO_2 emission factors for the build margin and the operating margin, that are provided by the Brazilian DNA. CO_2 emission factors for the build margin and the operational margin for electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System Operator (ONS).

Step 2: update the current baseline and the data and parameters.

Step 2.1: update the current baseline.

The PDD version 4b, dated 21/12/2005 /5/ was registered applying the approved baseline methodology AM0015 - "Bagasse-based cogeneration connected to an electricity grid" /6/ version 01 of 22/09/2004 and the baseline emissions were calculated multiplying the surplus of electric energy produced by project activity and delivered to Brazilian national grid, by the Brazilian grid emission factor (measured in kg CO_2e/kWh). As already mentioned in the previous step, the Brazilian grid emission factor for the second crediting period was updated.

APPLICABILITY

The baseline methodology ACM0006, version 10.1 of 30/07/2010 was correctly applied to the project activity. The project activity consists on the installation of a new biomass residue cogeneration plant, which replaces an existing cogeneration plant that fires the same type of biomass residue as in the project plant. Moreover, the project activity also contemplates the following criteria of the applied baseline methodology:

- No other biomass types than biomass residues are used in the project plant – it was verified during the site visit that boilers employed by the project activity only burn sugarcane bagasse generated from the sugarcane crushing process at the project site;

- The implementation of the project shall not result in an increase of the processing capacity of sugarcane – it was demonstrated on PDD version 2 and confirmed by RINA /34/ that possible increases on sugarcane capacity occurs only due to market conditions and not due to the implementation of the project activity;

- The biomass residues used by the project facility is not be stored for more than one year – the surplus of sugarcane bagasse after the ending of crops season is employed in the start up of the sugar mill in the next season, in a period of less than one year, as verified and confirmed during the site visit through proper records;

- No significant energy quantities, except from transportation or mechanical treatment of the biomass residues, are required to prepare the biomass residues for fuel combustion – it was verified during the site visit that the sugarcane bagasse does not present any chemical or mechanical treatment before being burnt in the project activity boilers.

The updated PDD, version 02 of 29/04/2011 /8/, submitted for the renewal of crediting period applies the approved baseline methodology ACM0006, ""Consolidated methodology for electricity generation from biomass residues in power and heat plants"" version 10.1 of 30/07/2010 /3/ and the "Combined tool to identify the baseline scenario and demonstrate additionality" /36/. Therefore, the original baseline scenario (as per AM0015) was updated to the ACM0006 baseline scenario 18. According to this methodology, the baseline scenario and the baseline emission calculation depends on realistic and credible alternatives, which are determined regarding:

- How power would be generated in the absence of the CDM project activity;

- What would happen to the biomass residues in the absence of the project activity;

- In case of cogeneration projects: how the heat would be generated in the absence of the project activity.

Below follows RINA's assessment of the above alternatives, considering all power, heat and biomass baseline scenarios:

➢ *How power would be generated in the absence of the CDM project activity*

P1: The proposed project activity not undertaken as a CDM project activity – this alternative is not applicable in case of renewal of crediting period;

P2: The continuation of power generation in an existing biomass residue fired power plant at the project site, in the same configuration, without retrofitting and fired with the same type of biomass residues as (co-)fired in the project activity – as the project activity involves the increase on power generation, as presented on registered PDD, it would not be possible to consider the employment of the existing power plant with the same configuration;

P3: The generation of power in an existing plant, on-site or nearby the project site, using only fossil fuels – it was verified during the site visit that there is no generation based on fossil fuel at the project site;

P4: The generation power in the grid – considered plausible alternative to the project activity – in case of project activity did not delivery the surplus of electricity to the grid, such amount of energy would be supplied by Brazilian Interconnected grid;

P5: The installation of a new biomass residue fired power plant, fired with the same type and with the same annual amount of biomass residues as the project activity, but with a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project plant and therefore with a lower power output than in the project case – considered a plausible alternative to the project activity;

P6: The installation of a new biomass residue fired power plant that is fired with the same type but with a higher annual amount of biomass residues as the project activity and that has a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project activity. The power output is the same as in the project case – the new plant would process the same amount (not higher) of biomass residues (bagasse) as in the project activity and the core business of the company (sugar mill) is the production of sugar and bioethanol, to which the production of biomass residues is related, and not the power generation - any possible future increase in biomass residues availability would be due to the natural expanding business (production increase of sugar and/or bioethanol) and not because of the implementation of the CDM project;

P7: The retrofitting of an existing biomass residue fired power, fired with the same type and with the same annual amount of biomass residues as the project activity, but with a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project plant and therefore with a lower power output than in the project case – the retrofitting of the existing biomass power plants, keeping the same operational parameters and the same annual biomass consumption would not be able to achieve the increase of electricity generation presented on registered PDD;

P8: The retrofitting of an existing biomass residue fired power that is fired with the same type but with a higher annual amount of biomass residues as the project activity and that has a lower efficiency of electricity generation (e.g. an efficiency that is common practice in the relevant industry sector) than the project activity. – alternative not applicable to the project activity due to the same reason presented to alternative P7;

P9: The installation of a new fossil fuel fired captive power plant at the project site. – it was verified during the site visit that there is no generation based on fossil at the project site and Brazilian sugar mills do not use to fire fossil fuel in their sugar and/or bioethanol production process /39/;

P10: The installation of a new single- (using only biomass residues) or co-fired (using a mix of biomass residues and fossil fuels) cogeneration plant with the same rated power capacity as the project activity power plant, but that is fired with a different type and/or quantity of fuels (biomass residues and/or fossil fuels). The project activity plant burns only bagasse (biomass residues) – not applicable alternative, the new plant would process the same amount (not lower) of biomass residues (bagasse) as in the project activity and the core business of the company (sugar mill) is the production of sugar and bioethanol, to which the production of biomass residues is related, and not the power generation - any possible future increase in biomass residues availability would be due to the natural expanding business (production increase of sugar and/or bioethanol) and not because of the implementation of the CDM project;

P11: The generation of power in an existing fossil fuel fired cogeneration plant co-fired with biomass residues, at the project site. – Alternative not applicable - it was verified during the site visit that there is no generation based on fossil fuel at the project site (the project activity plant burns only bagasse -biomass residues) and Brazilian sugar mills do not use to fire fossil fuel in their sugar and/or bioethanol production process /39/.

- ***In case of cogeneration projects: how the heat would be generated in the absence of the project activity***

H1: The proposed project activity not undertaken as a CDM project activity - this alternative is not applicable in case of renewal of crediting period;

H2: The proposed project activity (installation of a cogeneration power plant), fired with the same type of biomass residues but with a different efficiency of heat generation (e.g. an efficiency that is common practice in the relevant industry sector) - considered plausible alternative to the project activity;

H3: The generation of heat in an existing cogeneration plant, on-site or nearby the project site, using only fossil fuels – it was verified during the site visit that there is no generation based on fossil at the project site and Brazilian sugar mills do not use to fire fossil fuel in their sugar and/or bioethanol production process /39/;;

H4: The generation of heat in boilers using the same type of biomass residues – the boilers employed on pre project power plant are not able to produce the amount of steam required by project activity;

H5: The continuation of heat generation in an existing cogeneration plant, fired with the same type of biomass residues as in the project activity, and implementation of the project activity, not undertaken as a CDM project activity, at the end of the lifetime of the existing plant – the boilers in the pre-project plant do not have the capacity to generate the same amount of heat for the process as the boilers of the project activity and the proposed project activity not undertaken as a CDM project activity is not a plausible alternative;

H6: The generation of heat in boilers using fossil fuels – alternative not applicable to the project activity due to same reason presented on alternative H3;

H7: The use of heat from external sources, such as district heat - alternative not applicable to the project activity due to same reason presented on alternative H3;

H8: Other heat generation technologies (e.g. heat pumps or solar energy) – there is not another source/technology for heat generation at the project site;

H9: The installation of a new single- (using only biomass residues) or co-fired (using a mix of biomass residues and fossil fuels) cogeneration plant with the same rated power capacity as the project activity power plant, but that is fired with a different type and/or quantity of fuels (biomass residues and/or fossil fuels). The project activity plant burns only bagasse (biomass residues) – not applicable alternative, the baseline plant would have a lower - and not the same- rated power capacity, since it would not export electricity to the grid, and would use the same annual amount (not lower) of biomass residues (bagasse) as in the project activity - as the core business of the company (sugar mill) is the production of sugar and bioethanol, to which the production of biomass residues is related, and not the power generation - any possible future increase in biomass residues availability would be due to the natural expanding business (production increase of sugar and/or bioethanol) and not because of the implementation of the CDM project.;

H10: The generation of power in an existing fossil fuel fired cogeneration plant co-fired with biomass residues, at the project site.– alternative not applicable to the project activity due to same reason presented on alternative H3.

- ***What would happen to the biomass residues in the absence of the project activity.***

B1: The biomass residues are dumped or left to decay under mainly aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields – not applicable to the project activity once the sugarcane bagasse was always used for energy purposes by Brazilian sugar mills /39/ and, as verified and confirmed during the site visit through proper records, the surplus of sugarcane bagasse after the ending of crops season is employed in the start up of the sugar mill in the next season, in a period of less than one year;

B2: The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to deep landfills with more than 5 meters. This does not apply to biomass residues that are stock-piled or left to decay on fields - alternative not applicable to the project activity due to same reason presented on alternative B1;

B3: The biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes. - alternative not applicable to the project activity due to same reason presented on alternative B1;

B4: The biomass residues are used for heat and/or electricity generation at the project site. – plausible alternative to the project activity – CERPA project uses only bagasse as biomass residues (*a by-product of the production of sugar and/or bioethanol*);

B5: The biomass residues are used for power generation, including cogeneration, in other existing or new grid-connected power plants – as the common practice in Brazil, the sugar mills employee the bagasse generated from sugar cane crushed at the mill to obtaining energy for their internal consumption;

B6: The biomass residues are used for heat generation in other existing or new boilers at other sites – alternative not applicable to the project activity due to same reason presented on alternative B5;

B7: The biomass residues are used for other energy purposes, such as the generation of biofuels - alternative not applicable to the project activity due to same reason presented on alternative B5;

B8: The biomass residues are used for non-energy purposes, e.g. as fertilizer or as feedstock in processes (e.g. in the pulp and paper industry) - alternative not applicable to the project activity due to same reason presented on alternative B5.

Therefore, from the above, it can be depicted that the combination of the baseline scenarios P4 and P5, H2 and B4 indicates and confirms that scenario 18 is the most plausible baseline scenario.

All the alternatives described by project participants on PDD version 02 of 29/04/2011 are in compliance with all current relevant mandatory national and/or sectoral policies.

Step 2.2: update the data and parameters.

As already mentioned (step 1.4), the Brazilian emission factor was correctly calculated (updated) for this second crediting period.

As result of the application of the approved baseline methodology (ACM0006) in this second crediting period, project participants included on PDD version 02 the parameter $\varepsilon_{el,\ reference\ plant}$ (*Average net energy efficiency of electricity generation in the .reference plant that would be installed in the absence of the CDM project activity*) as a parameter available at validation (not monitored). The value of this parameter was defined as equal to 0.036 and this value was confirmed by RINA in a CTC Study /33/.

PARAMETERS AVAILABLE AT VALIDATION

* $\mathbf{EF_{BMgrid,y}}$ = 0.0794 tCO_2/MWh - CO_2 build margin emission factor for grid electricity during the year y;

* $\mathbf{EF_{OMgrid,y}}$ = 0.2473 tCO_2/MWh - CO_2 operating margin emission factor for grid electricity during the year y;

Note: $\mathbf{EF_{grid,y}}$ *= 0.1214 tCO_2/MWh - CO_2 emission factor for grid electricity during the year y - calculated ex-ante using the available* $\mathbf{EF_{BMgrid,y}}$ *and* $\mathbf{EF_{OMgrid,y}}$ *parameters (latest OM and BM emission factors made publicly available by the Brazilian DNA) with the following weighted average:* W_{OM} *= 0.25 and* W_{BM} *= 0.75.*

* $\varepsilon_{el,\ reference\ plant}$ – 0.0363 MWh_{el} / Mwhbiomass (in case of scenario 18, $\varepsilon_{el,\ reference\ plant} = \varepsilon_{el,\ baseline\ plant}$) - Average net energy efficiency of electricity generation in the reference plant that would be installed in the absence of the CDM project activity.

3.5 Monitoring

The project applies the approved monitoring methodology ACM0006 “”Consolidated methodology for electricity generation from biomass residues in power and heat plants”” version 10.1 of 30/07/2010 /3/, which replaced the original methodology AM0015 “Bagasse-based cogeneration connected to an electricity grid” version 01, of 22/09/2004 /6/, associated with the approved monitoring methodology “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 12.1.0.

The monitoring plan is in accordance with the applied monitoring methodologies and will give opportunity for real measurement of achieved emission reductions.

RINA has checked all the parameters presented in the monitoring plan against the requirements of the methodologies and no deviations relevant to the project activity have been found.

RINA confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported *ex post* and verified.

3.5.1 Monitored data for project emission

There are no project emissions (PE_y = 0) associated to this project activity (please see section 3.5.4) and thus no data has to be monitored.

3.5.2 Monitored data for leakage

Leakage emissions were not verified (Ly=0) as there is no diversion of biomass residues from other uses to the project plant as a result of the project activity as there is no diversion of biomass residues from other uses to the project plant as a result of the project activity and biomass residues (bagasse) are produced inside the project boundary and there is no transportation. Therefore, no data has to be monitored.

3.5.3 Monitored data for baseline emissions

The following parameters were included in PDD version 2, dated 29/04/2011:

- **$EG_{project\ planty}$** (MWh) - Net quantity of electricity generated in the project plant during the year y – as verified during the site visit it will be measured based on energy meters connected to project plant and cross checked with receipts from electricity sales and/or declaration from the buyer. During the site visit, the following procedures of energy measurement were verified:
  - ✓ Quality Register , Subject: Spreadsheet Data Collection Measurement /16/;
  - ✓ Operational Procedure PO-CER-008-1 - monitoring of energy generation /17/;
  - ✓ Operational Procedure PO-CER-007-1 - registering and publishing of energy readings /18/;
  - ✓ CERPA´s Monitoring System NP-CER-001-1/19/.
- **EG_y (MWh)** – Net quantity of increased electricity generation as a result of the project activity during the year y - calculated according to equation 2, in PDD's section B.6.1 {scenario 18 ACM0006 version 10.1 of 30/07/2010formula (16)} - CERPA will measure the quantity of exported electricity, the quantity of electricity consumed internally. This data will be monitored by the project proponent through energy meters and double checked by CCEE registration and reports of generated energy.
- **$BF_{bagasse,y}$ -** Quantity of bagasse combusted in the project plant during the year y) – On-site indirect measurements - Monitored continuously through an annual energy balance and adjusted (calculated) based on the percentage of fiber in cane and of bagasse in fiber (Adjusted for the moisture content in order to determine the quantity of dry biomass - laboratory results and plant program /22/). During the site visit, the following procedures related to bagasse measurement adopted by CERPA were verified:
  - ✓ Operational Procedure PO-LAB-001-1, which describes on its item 7 the formula applied on calculation of fiber /20/;
  - ✓ Specification of Test Method: Determination Sugarcane's Moisture, bagasse and Filter Cake /21/;
  - ✓ Spreadsheet with an example of the calculation of the percentage of bagasse on sugar cane /22/.
- **NCV_k** (GJ/ton) - Net calorific value of bagasse (dry biomass basis)- the measurement is done according to procedures defined by the Sugarcane Technological Center (CTC from Portuguese – Centro de Tecnologia Canavieira) - taking at least three samples for each measurement, every six months - Consistency of the measurements will be checked by comparing the measurement results with measurements from previous years, relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC:
  - ✓ Document number CTC-LA –MT6-008. (CTC is an important reference of the sugar-based ethanol in Brazil) /23/.
- **Moisture content of the biomass residues** – The moisture content will be continuously monitored for each batch of biomass of homogeneous quality. The weighted average will be calculated for each monitoring period and used in the calculations - mean values calculated at least annually - this parameter applies the following procedure:
  - ✓ Specification of Test Method: Determination Sugarcane's Moisture, bagasse and Filter Cake /21/

3.5.4 Estimation of the GHG emissions for the renewal crediting period

The total GHG emission reductions from the "Central Energética do Rio Pardo Cogeneration Project ("CERPA") are estimated to be 79,649 tCO_2e during the second renewable crediting period, starting from

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01/05/2010 or the renewal date of this project activity, whichever is later, to 30/04/2017 and resulting in an annual average emission reductions of 11,378 tCO_2e / year.

PROJECT EMISSIONS: as per ACM0006 version 10.1 of 30/07/2010, none of the following project emissions sources were identified:

- CO_2 emissions from transportation of biomass residues to the project site (PE_{Ty}) – as biomass residues (bagasse) are produced inside the project boundary and there is no transportation;
- CO_2 emissions from on-site consumption of fossil fuels due to the project activity (PE_{FFy}) - it was verified during the site visit that there is no generation based on fossil at the project site and Brazilian sugar mills do not use to fire fossil fuel in their sugar and/or bioethanol production process /39/;
- CO_2 emissions from electricity consumption – the project activity supplies all internal consumption needs (self sufficient);
- CH_4 emissions from the combustion of biomass residues ($PE_{Biomass}$,$CH_{4,y}$) - it is assumed that this possible emission source is very small and there is no uncontrolled burning or decay of biomass residues in the baseline scenario;
- CH_4 emissions from waste water CO_2 emissions from consumption of electricity ($PE_{EC,y}$) – the bagasse do not suffers any waste water (chemical) or mechanical treatement, as verified during the site visit.

LEAKAGE: As per ACM0006 version 10.1 of 30/07/2010, the main potential source of leakage consists on an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity. Leakage emissions are equal to zero (Ly=0) as there is no diversion of biomass residues from other uses to the project plant as a result of the project activity and biomass residues (bagasse) are produced inside the project boundary and there is no transportation.

Emission reductions due to the displacement of electricity are calculated by multiplying the net quantity of increased electricity generated with biomass residues as a result of the project activity with the CO_2 baseline emission factor for the electricity displaced due to the project.

The net quantity of increased electricity generation is determined based on the average net efficiency of electricity generation in the reference plant and the average net efficiency of electricity generation in the project plant after project implementation and the baseline emissions are the result of this net quantity of increased electricity generation multiplied by the updated Brazilian grid emission factor.

For the first crediting period, the combined margin (CM) emission factor, applying the Simple Adjusted method, was calculated *ex ante* as the weighted average (W_{OM} = 0.5 and W_{BM} = 0.5) of the operating margin (OM) and build margin (BM) emission factors, based on data published by the Brazilian DNA and provided by ONS (National Electric System Operator) and considering the South-Southeast-Midwest regions (subsystems).

The Brazilian grid emission factor estimated (*ex ante*) at the start of the first crediting period is not longer valid and thus has to be updated and the PDD version 02 of 29/04/2011 /8/ is using the latest EF grid data (2009 data), which was available at the time of the start of the validation of the renewal of the crediting period (December 2010). Therefore, for the second crediting period, the *ex ante* estimative for the Brazilian grid emission factor was calculated using the latest available emission factor (2009) of the Brazilian grid system for 2009 (CM=0.1214 tCO_2/MWh - average OM=0.2476 tCO_2/MWh and BM=0.0794 tCO_2/MWh), made publicly available by the Brazilian DNA /10/, and considering the National Interconnected System - SIN (North, Northeast, South and Southeast-Midwest). Moreover, the Brazilian grid emission factor for the second crediting period was correctly calculated, using the proper weighted average (W_{OM} = 0.25 and W_{BM} = 0.75), as required by Tool to calculate the emission factor for an electricity system.

The average net energy efficiency of electricity in the project plant ($\varepsilon_{el,project\ plant}$) is calculated as the division of the net electricity generation in the year ($EG_{project\ plant,y}$ =118,656 MWh) by the amount of bagasse fired (energy units - Bagasse NCV * Bagasse consumption = 2.04 MWh/ton * 337,082 Metric tones) and equals to 0.1726.

RINA assessed all data sources used to determine emission reductions and confirms that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the updated PDD. The

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

GHG emission reduction calculations, presented in the spreadsheet “CERPA_second_period_calculation scenario 18_CERs_v2_20110429.xls” /24/, were verified by RINA and found correct, conservative and applicable to the proposed CDM project activity, therefore resulting in a conservative estimate of the emission reductions.

4 VALIDATION OPINION

RINA Service Spa (RINA) has performed a validation of the updated PDD (version 02 of 29/04/2011) for the project activity “”Central Energética do Rio Pardo Cogeneration Project (“CERPA”)” in Brazil CDM Registration Reference N° 0209. The validation of the updated PDD has performed for the second renewal crediting period (from 01/05/2010 or the renewal date of this project activity, whichever is later, to 30/04/2017) and is based on the information made available to us.

RINA has performed this validation on the basis of the following documents:

- Procedures for renewal of the crediting period of a registered CDM project activity (EB46 Annex 11 of 25 March 2009);
- Clean Development Mechanism Validation and Verification version 01.2 of 30/07/2010;
- Approved baseline and monitoring methodology ACM0006, version 10.1 of 30/07/2010 - “”Consolidated methodology for electricity generation from biomass residues in power and heat plants” (which replaced the withdraw baseline and monitoring methodology AM0015 version 01).

It is RINA’s opinion that the project meets the requirements for the renewal of the crediting period stated in the “Procedures for renewal of the crediting period of a registered CDM project activity”.

Hence RINA requests the renewal of the crediting period of the project activity “”Central Energética do Rio Pardo Cogeneration Project (“CERPA”)” in Brazil.

Brazil, 16/05/2011

Geisa Maria Principe Branco Saettoni

CDM Team Leader

RINA Brazil

Genova, 17/05/2011

Paolo Teramo

Authorized officer signing for the DOE

RINA Services S.p.A.

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

APPENDIX A

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

TABLE 2 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Corrective action and/ or clarification requests	Response by project participants	Validation Conclusion
~~**CAR 1**~~ The "Figure 6 - Electricity Grid – Operation units. Source: BIG - ANEEL, 2010" on Section B.4., page 20 of PDD indicates that the installed capacity of power plants from sugar cane bagasse represents 5,10 % of the power plants in operation in Brazil. The table 2, described on page 20, section B.5., sub step 1.1 indicates that the installed capacity of sugar cane power plants represents 3,38%. Project participants are requested to clarify the difference between the figure 6 and table 2. Moreover provide evidences related to the mentioned values.	Figure 6 and Table 2 were updated considering the most recent data available at ANNEL website: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/OperacaoCapacidadeBrasil.asp According to ANEEL, the installed capacity of power plants from sugar cane bagasse represents 5.17% of Brazilian energy matrix. Please, refer to section B.4 and B.5 of the second version of the PDD in order to access the revised information.	The PDD version 2, dated 29/04/2011 /8/ was revised accordingly. This CAR is closed.
~~**CAR 2**~~ Project participants described on section B.4 sub step 2b, page 20 of PDD that "…According to Dedini, a manufacturer of boilers, the efficiency of a low-pressure boiler with pressure of 42 kgf/cm2 is similar to the efficiency of a 66 kgf/cm2 boiler, while the efficiency of a 21 kgf/cm2 boiler is lower…". Project participants are requested to provide evidences related to this information obtained from Dedini manufacturer an also demonstrate that the similarity between boiler efficiencies are also applicable to boilers employed by project activity.	Please refer to the attached documents, where Dedini informed EQAO team about this efficiency and similarity. As well as Dedini boilers characteristics. Dedini provided an expert opinion, as suggested by the VVM (paragraph 84, 85 and 145 of Means of Validation EB55 Annex 1).	The mentioned communication from Dedini manufacturer and the evidence demonstrating that Dedini´s boiler efficiencies are applicable to boilers employed by project activity was provided /24/ and found adequate. This CAR is closed.
~~**CAR 3**~~ The section B.6.3 of PDD presents information in Portuguese (page 34 and page 35). Project participants are requested to revise the PDD and provide all texts and information in English.	Section B.6.3 was revised. Please, refer to the second version of the PDD.	The PDD version 2 was revised accordingly. This CAR is closed.
~~**CAR 4**~~ On section B.4, sub-step 2b of PDD, project participants described that the project activity corresponds to scenario 18 of baseline and	Please check version 2 of the PDD. Section B.6.1 and B.6.3 were revised providing formula to calculate scenario 18, as described in section B.4. Check also the second version of the calculation	The PPD version 2 was revised accordingly. Project participants provided the spreadsheet "CERPA_second_period_calculation scenario 18_CERs_v2_20110429", correctly applying

Corrective action and/ or clarification requests	Response by project participants	Validation Conclusion
monitoring methodology ACM0006, version 10, applied to renewal of crediting period of "Central Energética do Rio Pardo Cogeneration Project ("CERPA") – SECOND CREDITING PERIOD" The section B.6.1 of the same PDD and spreadsheet with CERs calculations "CERPA_second period_calculation CERs_20101213 v1.xls" applies the formula of scenario 13 of ACM 0006, version 10. Project participants are requested to revise the PDD and the spreadsheet (if applicable) and also provide evidences related to all assumption applied on CERs calculation.	spreadsheet with scenario 18 calculation. All the information presented in the PDD and the spreadsheet is provided in the flow diagram and attached document. Please check the enclosure.	scenario 18 of ACM0006 version 10 for CERs calculation. This CAR is closed.
~~**CAR 5**~~ PDD section B.7.2 must mention the monitoring frequency of all monitored parameters.	The monitoring frequency of the monitored parameters was included in section B.7.2. Please, refer to the second version of the PDD.	The PDD version 2 was revised accordingly. The procedures related to measurement of parameters were provided. This CAR is closed.
~~**CAR 6**~~ Project participants are requested to include on section B.7.2 of PDD the procedures related to the control and calculation of sugarcane bagasse to be burnt by the boilers of project activity.	The burnt bagasse is monitored analytically through the difference of the bagasse directed to the stock and the daily processes cane (from the milling process, that comprises the milling of sugar cane per hour times the monitoring of % Fiber/cane – provided by Pol and Brix analysis – such as provided by CONSECANA). In summary, the amount of produced bagasse from the milling process minus the bagasse to the stock, it is given analytically the amount of burnt bagasse in CERPA.	The calculation and related procedures were included on section B.7.2, as requested. This CAR is closed.
~~**CL 1**~~ The website http://www.aneel.gov.br/aplicacoes/capacidadebrasil/CombustivelListaUsinas.asp?classe=Biomassa&combustivel=13&fase=3, accessed on December 2010 described on page 36 of PDD is not available. In case of website	The website link <http://www.aneel.gov.br/aplicacoes/capacidadebrasil/CombustivelListaUsinas.asp?classe=Biomassa&combustivel=13&fase=3> was revised. Please, refer to the second version of the PDD and in order to accesses the website copy and paste the link in the internet browser.	The website http://www.aneel.gov.br/aplicacoes/capacidadebrasil/CombustivelListaUsinas.asp?classe=Biomassa&combustivel=13&fase=3 was revised and it is available on PDD version 2 page 49. The file "FSP-2007.10.17-Termeletricas dominam leilao de energia.pdf" related to the

VALIDATION OPINION FOR RENEWAL OF THE CREDITING PERIOD

Corrective action and/ or clarification requests	Response by project participants	Validation Conclusion
(http://www1.folha.uol.com.br/fsp/opiniao/fz1001200801.htm) presented on Section B.5, step 1.1, of PDD, the new mentioned by project participants is available only to subscribers of the newspaper or website. Project participants are requested to provide evidences of the information related to the mentioned websites.	The "Folha" editorial is attached to this response.	mentioned newspaper article was provided. This CL is closed.
~~CL2~~ It was verified, during the site visit that the equipments (boilers and steam turbines) of a power plant that operates next to CDM project activity were replaced by more efficient equipments. Project participants are requested to provide evidences demonstrating that the operation of such power plant does not impact on the operation of CDM project activity.	It is shown in the flow diagram designed by TECNOSUGAR (third company of engineering dedicated to the sugarcane sector that aims to bring to clients planning and technology solutions). CERPA boiler (# 1 – Existing boiler in purple) has no connection to the rest of the boilers as well as the energy equipments with the other boilers and turbo-generators. The PP also stresses that there are 2 different companies dealing with those 2 different projects, as can be seen in the ANEEL Dispatch of the newest project whose owner is CPFL Bio Pedra S.A. (different from Central Energética Rio Pardo Ltda.) Please find the enclosure.	The flow diagram provide by project participants "Balance of direct steam, sugarcane bagasse and electric Energy – phase 2, revision 5 ,dated 16/07/2009 elaborated by Tecnosugar /25/ (file "Issue 3 and 6_Balanço_CERPA_2011_REV5.pdf"), demonstrates that the operation of project activity's is not affected by the operation of the retrofitted power plant that operates next to CDM project activity. According to the provided flow diagram, CERPA power plant will consume 68.18 tons of bagasse/hour and it will produce a total power of 24.25 MW (6.25 MW for internal consumption and 18.00 MW for export to the grid). It was also verified and confirmed, based on ANEEL Decree # 129, dated 24/02/2011 /26/, that the new power plants (next to CDM project activity) are owned by CPFL Bio Pedra S.A. CERPA power plant, as described in ANEEL's Resolution # 394, dated 23/07/2002 /27/, is owned by Central Energética do Rio Pardo Ltda – CERPA. This CL is closed.

RINA

CERTIFICATO DI QUALIFICA GHG
GHG QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Geisa Maria Principe Branco Saettoni**
è qualificato come[1]: *is qualified as:*	**CDM-TEC, CDM-VAL, CDM-VER, CDM-TL, VCS-VAL, VCS-VER, VCS-TL, GS-VAL, GS-VER, GS-TL, SCS-VAL, SCS-VER, SCS-TL, CDM-FIN-EXP**
per le seguenti aree tecniche: for the following technical areas:	**1.2, 13.1**

AREA TECNICA ***TECHNICAL AREA***	**CODICE RINA** **RINA CODE**	**SCOPO SETTORIALE** ***SECTORAL SCOPE***	**CODICE RINA** **RINA CODE**
2-Energy generation from renewable energy sources	TA 1.2	1	1
1-Waste handling and disposal	TA 13.1	13	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	27-08-2009	-
1	25-03-2010	Annual revision
2	18-10-2010	Changes in certificate module
3	17-03-2011	Changes due to new accreditation standard

Il Responsabile di Schema
Scheme Manager

Il Resp. Tecnico della Divisione
Head of CRT

[1] Legend:

VAL:	Validator	CDM: Clean Development Mechanism
VER:	Verifier	VCS : Verified Carbon Standard:
TEC:	Technical Expert	GS: Gold Standard
TL:	Team Leader	SCS: Social Carbon Standard
TEC-FIN:	Financial Expert	JI: Joint Implementation
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GHG QUALIFICATION CERTIFICATE

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è qualificato come[1]: *is qualified as:*	**CDM-TEC, CDM-VAL, CDM-VER, CDM-TL, CDM-FIN-EXP, VCS-VAL, VCS-VER, VCS-TL, GS-VAL, GS-VER, GS-TL, SCS-VAL, SCS-VER, SCS-TL**
per le seguenti aree tecniche: for the following technical areas:	**1.2**

AREA TECNICA ***TECHNICAL AREA***	**CODICE RINA** **RINA CODE**	**SCOPO SETTORIALE** ***SECTORAL SCOPE***	**CODICE RINA** **RINA CODE**
2-Energy generation from renewable energy sources	TA 1.2	1	1

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	19-08-2009	-
1	14-12-2009	Changes in module structure
2	23-04-2010	Annual Revision
3	18-10-2010	Changes in certificate module
4	17-03-2011	Changes due to new accreditation standard

Il Responsabile di Schema
Scheme Manager

Il Resp. Tecnico della Divisione
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GHG QUALIFICATION CERTIFICATE

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è qualificato come[1]: *is qualified as:*	**CDM-TEC, CDM-VAL, CDM-VER, CDM-FIN-EXP GS-VAL, GS-VER SCS-VAL, SCS-VER**
per le seguenti aree tecniche: for the following technical areas:	**1.1, 13.1**

AREA TECNICA ***TECHNICAL AREA***	**CODICE RINA** **RINA CODE**	**SCOPO SETTORIALE** ***SECTORAL SCOPE***	**CODICE RINA** **RINA CODE**
1-Thermal energy generation from fossil fuel and biomass including thermal electricity from solar	TA 1.1	1	1
1-Waste Handling and Disposal	TA 13.1	13	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	30-01-2009	-
1	04-05-2009	Annual Revision
2	14-12-2009	Changes in module structure
3	27-04-2010	Annual Revision
4	18-10-2010	Changes in certificate module
5	17-03-2011	Changes due to new accreditation standard

Il Responsabile di Schema
Scheme Manager

Il Resp. Tecnico della Divisione
Head of CRT

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GHG QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: *We declare that Mr/Mrs/Ms:*	**Rita Valoroso**
è qualificato come[1]: *is qualified as:*	**CDM-TEC, CDM-VAL, CDM-VER, CDM-TL, CDM-FIN-EXP VCS-VAL, VCS-VER, VCS-TL GS-VAL, GS-VER, GS-TL SCS-VAL, SCS-VER, SCS-TL**
per le seguenti aree tecniche: for the following technical areas:	**1.2, 13.1**

AREA TECNICA ***TECHNICAL AREA***	**CODICE RINA** **RINA CODE**	**SCOPO SETTORIALE** ***SECTORAL SCOPE***	**CODICE RINA** **RINA CODE**
2-Energy generation from renewable energy sources	TA 1.2	1	1
1-Waste Handling and Disposal	TA 13.1	13	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE ***REVISION***	**DATA** ***DATE***	**MOTIVAZIONI PER LA REVISIONE** ***REASON FOR THE REVISION***
0	18-01-10	-
1	03-05-10	Annual Revision
2	18-10-10	Changes in certificate module
3	04-01-11	Removed TAs taken through the ETS/EPD verifications/validations
4	17-03-11	Changes due to new accreditation standard

Il Responsabile di Schema
Scheme Manager

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Head of CRT

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RINA

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GHG QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra: **Paolo Teramo**
We declare that Mr/Mrs/Ms:

è qualificato come[1]: **CDM-TEC, CDM-VAL, CDM-VER**
is qualified as: **VCS-VAL, VCS-VER**
GS-VAL, GS-VER

per le seguenti aree tecniche: **1.1, 4.4, 5.1, 8.2, 10.2, 11.1, 13.1**
for the following technical areas:

AREA TECNICA *TECHNICAL AREA*	**CODICE RINA** **RINA CODE**	**SCOPO SETTORIALE** *SECTORAL SCOPE*	**CODICE RINA** **RINA CODE**
1-Thermal energy generation from fossil fuels and biomass including thermal electricity from solar	TA 1.1	1	1
4-Refinery	TA 4.4	4	4
1-Chemical process industries	TA 5.1	5	5
2-Oil and gas industry, coal mine methane recovery and use	TA 8.2	8	8
2-Oil and gas industry, coal mine methane recovery and use	TA 10.2	10	10
1- Chemical process industries	TA 11.1	11	11
1-Waste Handling and Disposal	TA 13.1	13	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE *REVISION*	**DATA** *DATE*	**MOTIVAZIONI PER LA REVISIONE** *REASON FOR THE REVISION*
0	31-01-2008	-
1	27-05-2009	Annual revision
2	25-09-2009	Added validation qualification
3	13-11-2009	Added qualification in C103
4	14-12-2009	Changes in module structure
5	06-05-2010	Annual revision
6	18-10-2010	Changes in certificate module
7	04-01-2011	Removed TAs taken through ETS/EPD verifications/validations
8	17-03-2011	Changes due to new accreditation standard

Il Responsabile di Schema
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VERIFICATION REPORT RIALMA COMPANHIA ENERGÉTICA III S.A.

VERIFICATION OF THE RIALMA COMPANHIA ENERGÉTICA III S/A. – SANTA EDWIGES III SMALL HYDRO POWER PLANT – SMALL SCALE CDM PROJECT

REPORT NO. BRAZIL-VER/ BR.0999758

REVISION NO. 02

BUREAU VERITAS CERTIFICATION

62/71 Boulevard du Château
92571 Neuilly Sur Seine Cdx - France

Date of first issue:	Organizational unit:
10/07/2012	Bureau Veritas Certification Holding SAS
Client:	**Client ref.:**
Rialma Companhia Energética III S.A.	Ms. Nathalia Caiado

Summary:
Bureau Veritas Certification has made the 1st periodic verification of the Rialma Companhia Energética III S/A – Santa Edwiges III Small Hydro Power Plant – Small Scale CDM Project, CDM Registration Reference Number 2165, project of Rialma Companhia Energética III S/A located in Buritis River, between the municipalities of Mambaí and Buritinópolis, state of Goiás, Midwestern region of Brazil, and applying the methodology AMS-I.D version 12, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.
The verification scope is defined as a periodic independent review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.
The first output of the verification process is a list of Clarification, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.
In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is already generating GHG emission reductions. The GHG emission reduction is calculated without material misstatements, and the emission reductions verified totalize 45,341 tons of CO_2e for the monitoring period.
Our opinion relates to the project's GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents.

Reporting period	:	07/08/2009 to 31/03/2012
Baseline emissions	:	45,341 t CO_2 equivalents.
Project emissions	:	0 t CO_2 equivalents.
Leakage emissions	:	0 t CO_2 equivalents.
Emission Reductions	:	45,341 t CO_2 equivalents

Report No.:	Subject Group:
BRAZIL-ver/BR.0999758	CDM
Project title:	
Rialma Companhia Energética III S/A – Santa Edwiges III Small Hydro Power Plant – Small Scale CDM Project	
Work carried out by:	
Marco F. Prauchner – lead verifier Rubens Ferreira – verifier Karina Polido – verifier	
Internal Technical Review carried out by:	
Guilherme Lefèvre	

Date of this revision:	Rev. No.:	Number of pages:
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Indexing terms

Work approved by:
Flavio Gomes (Global Product Manager)

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List of Abbreviations

- ANEEL: Brazilian National Agency for Electric Energy (from the Portuguese: Agência Nacional de Energia Elétrica)
- CCEE: Electric Power Commercialization Chamber (from the Portuguese: Câmara de Comercialização de Energia Elétrica)
- ONS: National Electric System Operator (from the Portuguese: Operador Nacional do Sistema)
- RBC: Brazilian Calibration Network (from the Portuguese: Rede Brasileira de Calibração)
- SHPP – Small Hydro Power Plant
- SIN – Brazilian National Interconnected Electricity System (from the Portuguese: Sistema Interligado Nacional)

1 INTRODUCTION

Rialma Companhia Energética III S/A has commissioned Bureau Veritas Certification to verify the emissions reductions of its CDM project Rialma Companhia Energética III S/A – Santa Edwiges III Small Hydro Power Plant – Small Scale CDM Project (hereafter called "the project") at Buritis River, between the municipalities of Mambaí and Buritinópolis, state of Goiás, Midwestern region of Brazil.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

In carrying out its verification work, the DOE shall ensure that the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures.

Based on the applicable requirements of paragraph 62 of the CDM modalities and procedures, this assessment shall:

(a) Ensure that the project activity has been implemented and operated as per the registered PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;

(b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of CERs and verifiable and in accordance with applicable CDM requirements;

(c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;

(d) Evaluate the data recorded and stored as per the monitoring methodology.

1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may

provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 GHG Project Description

This CDM Project consists of the construction and operation of a grid-connected Small Hydro Power Plant called SHPP Santa Edwiges III. The Project is located in the Midwest of Brazil, in the Goiás State. This run-of-river SHPP has an installed capacity of 11.6 MW with two turbines and two generators and has a small reservoir of 0.64 km^2.

According to the registered PDD /**Ref-4**/, the project activity reduces emissions of greenhouse gas (GHG) by avoiding electricity generation by fossil fuel sources (and CO_2 emissions), which would be generated (and emitted) in the absence of the project.

As could be assessed by the "Verifier 1" during site visit held on 16/06/2011 (at the office) and 17/06/2011 (at the power plant), the plant is currently operating in accordance with registered PDD, i.e. no modifications in major equipments have taken place since the CDM project activity was registered.

1.4 Verification Team

The verification team consists of the following personnel:

FUNCTION	NAME	CODE HOLDER*	TASK PERFORMED
Lead Verifier	Marco F. Prauchner	**X Yes ☐ No**	**XDR ☐SV XRI**
Verifier 1	Rubens Ferreira	**X Yes ☐ No**	**XDR XSV XRI**
Verifier 2	Karina Polido	**☐Yes X No**	**XDR ☐SV XRI**
Technical Specialist	N.A.	**☐Yes ☐ No**	**☐DR ☐SV ☐RI**
Internal Technical Reviewer (ITR)	Guilherme Lefèvre	**X Yes ☐ No**	**XDR ☐SV XRI**
Specialist supporting ITR	N.A.	**☐Yes ☐ No**	**☐DR ☐SV ☐RI**

*DR = Document Review; SV = Site Visit; RI = Report issuance

2 METHODOLOGY

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01.2 of the Clean Development

Mechanism Validation and Verification Manual, issued by the Executive Board at its 55th meeting on 30/07/2010. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The verification of the project documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted to the DOE. Qualitative information comprises information on internal management controls, calculation procedures, procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

The monitoring report submitted by the project participant was also web hosted on the UNFCCC-CDM web site on 16/05/2011 and thus, was available in the public domain.

In addition to the monitoring documentation provided by the project participants, the DOE reviews:

(a) The registered PDD, including the monitoring plan and the corresponding validation report /**Ref-4**/ and **/Ref-5/**;

(b) Previous verification report **/N.A/**;

(c) Previous monitoring reports **/N.A/**;

(d) The Revised Monitoring Plan **/Ref-6/** the Validation Opinion on a Revision in Monitoring Plan **/Ref-7/** and its impact on the current verification;

(e) The applied monitoring methodology /**Ref-B**/;

(f) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board **/Ref-C/, /Ref-D/, /Ref-E/, /Ref-F/** and **/Ref-G/**;

(g) Any other information and references relevant to the project activity's resulting emission reductions (e.g. IPCC reports, data on electricity generation in the national grid or laboratory analysis and national regulations) /**Ref-H**/, **/Ref-I/** and **/Ref-J/**.

2.2 Follow-up Interviews

On 16/06/2011 (at the office) and 17/06/2011 (at the power plant), Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Rialma Companhia Energética III S.A. and Ecopart Assessoria em Negócios Empresariais Ltda were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Rialma Companhia Energética III S.A.	➢ Technical Equipment and Operation ➢ Monitoring Plan ➢ Monitored Data ➢ Data uncertainty and residual risks ➢ GHG Calculation ➢ Environmental Impacts ➢ Compliance with National Laws and Regulations
Ecopart Assessoria em Negócios Empresariais Ltda	➢ Technical Equipment and Operation ➢ Monitoring Plan ➢ Monitored Data ➢ Revised monitoring Plan ➢ Data uncertainty and residual risks ➢ GHG Calculation ➢ Project emissions ➢ Environmental Impacts ➢ Compliance with National Laws and Regulations

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

Findings established during the initial verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CAR) is issued, where:

(a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;

(b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;

(c) Issues identified in a FAR during validation or previous verifications to be verified during verification have not been resolved by the project participants.

Forward Action Requests (FAR) are issued, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

The verification team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

2.4 Internal Technical Review

The verification report underwent a Internal Technical Review (ITR) before requesting issuance of CERs for the project activity.

The ITR is an independent process performed to examine thoroughly that the process of verification has been carried out in conformance with the requirements of the verification scheme as well as internal Bureau Veritas Certification procedures.

The Lead Verifier provides a copy of the verification report to the reviewer, including any necessary verification documentation. The reviewer reviews the submitted documentation for conformance with the verification scheme. This will be a comprehensive review of all documentation generated during the verification process.

When performing an Internal Technical Review, the reviewer ensures that:

The verification activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.

The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the verification exercise, review of sample documents.

The reviewer compiles clarification questions for the Lead Verifier and Verification Team and discusses these matters with Lead Verifier.

After the agreement of the responses on the 'Clarification Request' from the Lead Verifier as well as the PP(s) the finalized verification report is accepted for further processing such as uploading on the UNFCCC webpage.

3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 11 Corrective Action Requests, 05 Clarification Requests, and 0 (zero) Forward Action Requests.

The CARs, CLs and FARs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVM paragraph.

3.1 Remaining issues from previous validation/verification

All CARs and CLs raised were successfully closed during the validation stage of the project activity, and no remaining issues were left.

3.2 Project implementation in accordance with the registered project design document (198)

The implementation status of the project is as follows:

CDM registry was achieved on 07/08/2009 and this is the Project's first periodic verification and comprises the monitoring period: 07/08/2009 –

31/03/2012. As per ANEEL Ordinance #19 /**Ref-10**/, SHPP Santa Edwiges III is operational since 08/01/2009.

The project has a 7 year crediting period, renewable two times. The first crediting period is from 07/08/2009 to 06/08/2016. The total Emission Reductions forecasted for this period are 168,007 tCO_2e, as described in Section A.4.3 of the registered PDD.

During this first periodic verification, a revision in the monitoring plan was sought by project participants. As can be observed on the CDM/UNFCCC website*, this revised monitoring plan was approved on 09/04/2012.

In the present verification (1st periodic verification), there is no increase in the emissions reductions claimed (45,341 tCO_2e), compared to the estimated in the registered PDD (24,001 tCO_2e/year) /**Ref-4**/, considering an equivalent period (from 07/08/2009 to 31/03/2012). As electricity generation is dependent on river flow, some variations such as this can be expected.

The actual operation of the proposed project activity is as described in the registered PDD. As observed by the verification team during an on-site visit held on 16/06/2011 (at the office) and 17/06/2011 (at the power plant), all physical features of this CDM project activity, as described in the registered PDD, are in place and the project participants has operated the project activity as per the registered PDD. This was confirmed through interviews with project participants during site visit and document review **/Ref-3/, /Ref-4/**, **/Ref-6/**, **/Ref-7/**, **/Ref-9/** and **/Ref-10/.** The DOE concludes, therefore, that the Project's implementation remains in accordance with the registered PDD, as well as the revised monitoring plan.

Information provided in the Monitoring Report version 3 /**Ref-3**/ is in accordance with that stated in the registered PDD and in the revised monitoring plan. Further analysis of monitored parameters as reported in the Monitoring Report compared to those estimated in the PDD is developed in section 3.4 of this report.

3.3 Compliance of the monitoring plan with the monitoring methodology (203)

The necessary revision to the monitoring plan (as per EB 58 Meeting Report, paragraph 84, 26/11/2010 /**Ref-G**/) has been sought and approved by the CDM Executive Board on 09/04/2012.

* http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218634643.54/view (accessed on 01/06/2012).

3.4 Compliance of monitoring with the monitoring plan (206)

Monitoring has been carried out in accordance with the monitoring plan contained in the accepted revised monitoring plan.

The DOE hereby confirms that the revised monitoring plan and the applied methodology have been properly implemented and are being followed by the project participants.

The parameters required by the monitoring plan and the way the Verification Team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values in the monitoring reports) are described below:

(i) Baseline emission parameters

Regarding data generation, aggregation and recording:

According to the registered PDD, baseline emissions are calculated following the methodology AMS-I.D in its version 12, by multiplying the baseline emission factor (EF_y) with the electricity supplied to the grid by the Project (EG_y). Still according to the registered PDD, since the *ex-ante* method was chosen for EF_y calculations, only the electricity dispatched to the grid by the Project will be monitored for the baseline emissions calculation during the project verification. Data unit of this parameter is MWh. Also according to the Revised Monitoring Plan, 100% of the data will be monitored; measurements will be made every 5 minutes and it will be recorded on a monthly basis.

According to the revised monitoring plan, approved by the UNFCCC on 09/04/2012, monitoring of EG_y is based on the amount of electricity generated by the renewable technology. This amount of energy was monitored by the project owner, as well as by CCEE (the Chamber of Electrical Energy Commercialization). CCEE is an independent agency that manages the commercialization of electric energy in Brazil and keeps the official records for sold energy[*].

Still according to the revised monitoring plan, the amount of electricity generated by SHPP Santa Edwiges III is monitored by specific meters at the Santa Edwiges III Substation located between the project site, and Alvorada do Norte Substation, where the electricity dispatched by SHPP Santa edwiges III is accounted within two other SHPPs: Santa Edwiges I and Santa Edwiges II.

[*] CCEE is a not-for-profit, private, civil organization company in which Agents are gathered in three Categories: Generation, Distribution, and Commercialization. The purpose of CCEE is to carry out the wholesale transactions and commercialization of electric power within the National Interconnected System, for both Regulated and Free Contracting Environments and for the spot market. In addition, CCEE is in charge of financial settlement for the spot market transactions. (Source: http://www.ccee.org.br, accessed on 01/06/2012).

This measuring system (please refer also to figure 2 in Section C of the MR version 3) enables CCEE to compute the net electricity generation delivered to the grid by each power plant individually, computing transmission losses, in accordance with ONS grid procedures "Submodule 12.6: Measurement configuration for invoicing", "Section 5: Measurement Settings for invoicing"[*] /**Ref-H**/. Total energy exported to the grid by the SHPP Santa Edwiges III is a result of the application of an algorithm that takes into account transmission losses and individual meters' readings, as described in the revised monitoring plan and in Section C of the Monitoring Report version 3.

Once energy losses are accounted and the data consistency is verified, CCEE issues an official report named CB002 that indicate, per week, the amount of electricity dispatched during a certain month, in which is based the GHG emission reductions calculation.

The DOE was able to verify that the actual monitoring of the electricity delivered to the grid by the Project is in compliance with the registered PDD and the Revised Monitoring Plan by analyzing the Monitoring Report version 3 and related documentation **/Ref-H/**, **/Ref-7/** and **/Ref-12/**) and by interviews/observations carried out during site visit. Moreover, the Monitoring Report version 3 states that the electricity dispatched to the grid is verified and monitored by a two party verification process: the energy dispatched to the grid is monitored by project owner, as well as by CCEE, fully in compliance with the revised monitoring plan.

Regarding calculating and reporting:

According to the applied methodology AMS-I.D version 12 and the registered PDD, the baseline emissions are calculated by multiplying the relevant grid emission factor (tCO_2/MWh) by the amount of electricity generated and delivered to the grid (MWh). During the monitored period, the Project has generated and dispatched to the grid a total of 160,444 MWh, already considering the discount of 0.2% from September 2011 to October 2011, following the provisions of paragraph 4(a) of the "Guidelines for assessing compliance with the calibration frequency requirements" /**Ref-C**/, due the fact that the recalibration date of both energy meters (principal and backup) of the Alvorada do Norte Substation were delayed.

The Monitoring Report applies a fixed *ex-ante* validated emission factor for project activities for the Brazilian South-Southeast-Midwest interconnected grid, in accordance with the registered PDD. As shown in Section D.1 of Monitoring Report version 3, the *ex-ante* emission factor of the relevant grid is 0.2826 tCO_2/MWh.

[*] Available at http://www.ons.org.br/ (accessed on 01/06/2012).

(ii) Project emission parameters

According to the registered PDD, project emission is not considered.

(iii) Leakage parameters

According to the registered PDD, leakage is not considered.

(iv) Management and operational system

During site visit and through interviews, the DOE was able to confirm that the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the registered PDD and the Revised Monitoring Plan.

Also, the DOE was able to confirm that the accuracy of equipment used for monitoring is in accordance with the relevant guidance provided by the CDM Executive Board, more specifically, paragraph 08 of EB 52, Annex 60 **/Ref-C/.** There are two energy meters (main and a backup) installed at the Santa Edwiges III Substation and two energy meters (main and backup) at the Alvorada do Norte Substation (please refer to figure 2 in Section C of the Monitoring Report version 3), from which CCEE remotely collects the readings of the electricity that is being dispatched to the grid by the project activity:

Description		***Number***	***Last Calibration Certificate # - Date***	***Re-calibration Certification # - Date***
SHPP Santa Edwiges III	Principal	PT-0711A900-01	DC-SLM-0075/08 – 15/10/2008	DC-SLM-0077/10 – 22/09/2010
	Back-up	PT-0711A418-01	DC-SLM-0076/08 – 15/10/2008	DC-SLM-0076/10 – 22/09/2010
Alvorada do Norte Substation	Principal	PS-0510A013-01*	DC SLM 0177/07 - 08/10/2007	Substituted on 09/09/2009
		PT-0905A133-01	Operational from 09/09/2009 on	DC-SLM-0160/09 - 08/09/2009 DC-SLM-00096/11 – 19/10/2011
	Back-up	PS-0410A148-01	DC SLM 0184/07 – 25/09/2007	Substituted on 14/10/2008
		PT-0804A390-01	Operational from 14/10/2008 0077/08 – 14/10/2008	Substituted on 09/09/2009
		PT-0905A314-01	Operational from 09/09/2009 on	DC-SLM-0161/09 – 08/09/2009 DC-SLM-00095/11 –

* This meter is operational since 29/05/2008 when substituted the energy meter PS-0410A145-01.

				19/10/2011

Calibration procedure (entity responsible for calibration, calibration frequency and accuracy of calibration equipment) was assessed and was found to be in accordance with specifications of national standards: ONS (National Electric System Operator), in Sub-module 12.3 – Maintenance of measurement system for invoicing **/Ref-I/**. Calibration of meters is made every 2 years, as required by ONS.

Also, copies of calibration certificates were presented to the DOE **/Ref-13/, /Ref-14/, /Ref-15/** and **/Ref-16/**. These calibration certificates are signed by the responsible calibration entity and show that measuring equipment was calibrated for the entire monitored period in accordance with the specification of national standards mentioned above. All calibrations have been carried out by CELG Distribuição S/A, which is accredited under the Brazilian Calibration Network (RBC certificate 410 **/Ref-11/**)[*].

Due the fact that the recalibration date of both energy meters (principal and backup) of the Alvorada do Norte Substation were delayed, a discount of 0.2% from September 2011 to October 2011 was considered, following the provisions of paragraph 4(a) of the "Guidelines for assessing compliance with the calibration frequency requirements" /**Ref-C**/.

Seeing the above, the verification team concluded that monitoring has been carried out in accordance with the Revised Monitoring Plan of the registered PDD.

3.5 Assessment of data and calculation of greenhouse gas emission reductions (209)

A complete set of data for the specified monitoring period is available.

The following actions were taken to ensure that the most conservative assumption theoretically possible has been made:

To crosscheck the values contained in Table 4 of Section E.1 of the Monitoring Report version 3 (electricity exported to the grid by the plant over the monitores period) /**Ref-3**/, the DOE had access to the official CCEE reports (CB002 Reports) for the entire monitored period **/Ref-12/**, downloaded from CCEE's online platform (SINERCON). 100% of the data

[*] Founded in 1980, RBC consists of laboratories accredited by INMETRO (The National Institute of Metrology, Standardization and Industrial Quality). RBC brings together expertise and skills related to industries, universities and technological institutes, qualified to perform calibration services. Accreditation provides a mechanism to demonstrate that laboratories make use of a quality system that have technical competence to perform calibration services and ensure the ability to obtain results in accordance with methods and techniques known nationally and internationally. (source: http://www.normalizacao.cni.org.br/metrologia_rbc.htm, accessed on 01/06/2012)

has been verified (crosschecked) with the CCEE CB002 Reports. All CB002 Reports were downloaded and no discrepancy was found between data contained in the Monitoring Report version 3 and the CCEE CB002 Reports.

Following the provisions of EB 52, Annex 60 **/Ref-C/**, a discount was applied to the energy generated by the plant from September 2011 to October 2011. The maximum permissible error in the calibration test was applied (paragraph 4a of the guidelines) in the SHPP Santa Edwiges III energy generation. The calculation of the final energy generation (i.e. already considering the discount as per the guidelines) is presented in CERs Calculation Spreadsheet, version 3 /**Ref-8**/ and is considered in Table 4 of Section E.1 of the Monitoring Report version 3 /**Ref-3**/.

Appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed. Additionally, the estimated annual emission reductions in the PDD are deemed appropriate and the difference to the verified value is deemed reasonable.

Appropriate methods and formulae for calculating baseline emissions have been followed. Project emissions and leakage are zero according to the applicable methodology AMS-I.D version 12 **/Ref-B/**. The CERs Calculation Spreadsheet, version 3 /**Ref-8**/ provided by PP describes the baseline emissions and emission reductions calculation in accordance with the relevant methodology, the registered PDD and the Revised Monitoring Plan.

Additionally, the estimated annual emission reductions in the registered PDD are deemed appropriate and the Monitoring Report version 3, in its Section E.6, explains the difference from estimated value in the registered PDD and the actual achieved emission reductions.

The actual achieved emission reductions of this 1st monitoring period (45,341 tCO_2e) are 28.8% lower than the projections in the CERs Calculation Spreadsheet, version 3 (63,653 tCO_2e) /**Ref-8**/. This performance below expectations is due to normal river flow variations.

The assumptions, emission factors and default values that were applied in the calculations have been justified.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the 1st periodic verification of the Rialma Companhia Energética III S/A – Santa Edwiges III Small Hydro Power Plant – Small Scale CDM Project in Brazil, which applies the methodology AMS-I.D version 12. The verification was performed based on the requirements set

by the CDM and relevant guidance provided by CMP and the CDM Executive Board.

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

The management of Rialma Companhia Energética III S.A. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring Plan indicated in the registered PDD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report version 3 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as described in validated and registered project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions

Bureau Veritas Certification can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, Bureau Veritas Certification confirms the following statement:

Reporting period: from 07/08/2009 to 31/03/2012

Baseline emissions	:	45,341	t CO_2 equivalents.
Project emissions	:	0	t CO_2 equivalents.
Leakage emissions	:	0	t CO_2 equivalents
Emission Reductions	:	45,341	t CO_2 equivalents.

03/08/2012

Guilherme Lefèvre
Internal Technical Reviewer

03/08/2012

Marco F. Prauchner
Lead Verifier

5 REFERENCES

Category 1 Documents:
Documents provided by Rialma Companhia Energética III S/A that relate directly to the GHG components of the project.

/1/ Monitoring Report, version 1, 06/05/2011.
/2/ Monitoring Report, version 2, 30/06/2011.
/3/ Monitoring Report, version 3, 30/05/2012.
/4/ Rialma Companhia Energética III S/A – Santa Edwiges III Small Hydro Power Plant – Small Scale CDM Project – Registered PDD, version 14.b, 01/06/2009.
/5/ Rialma Companhia Energética III S/A – Santa Edwiges III Small Hydro Power Plant – Small Scale CDM Project – Validation Report, prepared by TÜV SÜD, Report number 1106678, revision 2b, 27/07/2009.
/6/ Rialma Companhia Energética III S/A – Santa Edwiges III Small Hydro Power Plant – Small Scale CDM Project – Revised Monitoring Plan, approved 09/04/2012.
/7/ Rialma Companhia Energética III S/A – Santa Edwiges III Small Hydro Power Plant – Small Scale CDM Project – Validation Opinion on a Revision in Monitoring Plan, prepared by BVC, Report number BVC/BRAZIL/MP Change/BR. 0999623, version 03.
/8/ CERs Calculation Spreadsheet “SE_III_CERs_2012.05.30_v.3”, version 3, 30/05/2012.
/9/ Operation License – LO, License GUS Nr. 385/2008, dated 27/04/2010.
/10/ ANEEL Ordinance # 19, dated 07/01/2009: “Authorizes the start of operations of SHPP Santa Edwiges III” on 08/01/2009.
/11/ RBC Certificate CELG – number 410 – validity 23/06/2012
(from:
http://www.inmetro.gov.br/laboratorios/rbc/detalhe_laboratorio.asp?num_certificado=410&area=ELETRICIDADE)
/12/ CCEE – CB002 Reports. Monthly Reports of energy dispatch to the grid by SHPP Santa Edwiges III, according to CCEE monitoring.
/13/ Calibration Certificate DC-SLM-0076/10 - 22/09/2010, Prepared by CELG - Distribuição S/A
/14/ Calibration Certificate DC-SLM-0077/10 - 22/09/2010, Prepared by CELG - Distribuição S/A
/15/ Calibration Certificate DC-SLM-00095/11 - 19/10/2011, Prepared by CELG - Distribuição S/A
/16/ Calibration Certificate DC-SLM-00096/11 - 19/10/2011, Prepared by CELG - Distribuição S/A

Category 2 Documents:
Background documents related to the design and/or methodologies employed in the design or other reference documents.

/A/ Clean Development Mechanism Validation and Verification Manual, version 01.2.

/B/ SSC-CDM Methodology AMS-I.D “Grid connected renewable electricity generation”, version 12.

/C/ Guidelines for assessing compliance with the calibration frequency requirements, version 01, EB 52 - ANNEX 60.

/D/ Guidelines for completing the monitoring report form (CDM-MR), version 01, EB 54 - ANNEX 34.

/E/ Guidelines on completeness check of requests for issuance, version 01, EB 48 - ANNEX 68.

/F/ Thresholds and criteria for the eligibility of hydroelectric power plants with reservoirs as CDM project activities, EB 23 - ANNEX 05.

/G/ Executive Board of the Clean Development Mechanism fifty-eighth meeting report version 01.1, from 26 November 2010, Ref: CDM-EB-58.

/H/ ONS – National Electric System Operator – Procedure 12.6 “Configuration of billing measurements”, version 1, 05/08/2009.

/I/ ONS – National Electric System Operator – Procedure 12.3 “Maintenance of measuring system for billing purposes”, version 1.1, 16/09/2010.

/J/ 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme - IPCC, 2006.

Persons interviewed:

List persons interviewed during the verification or persons that contributed with other information that are not included in the documents listed above.

/1/ Bruna Marigheto (Ecopart)

/2/ Nathália Caiado (Rialma)

6. CURRICULA VITAE OF THE DOE'S VERIFICATION TEAM MEMBERS

Bureau Veritas Certification – GHG Lead Verifier
Marco F. Prauchner – He is graduated in Mechanical Engineering with experience in Quality and Environmental management in mechanical, plastic and chemical industries. He is ISO 9001:2008 and ISO 14001:2004 Lead Auditor and has also experience in the implementation of Environmental Management Systems. Marco is qualified as Lead Verifier GHG – Green House Gases.

Bureau Veritas Certification – GHG Verifier
Rubens da Silva Ferreira – He is graduated in Chemical Engineering with experience in Quality and Environmental management in glass industries. He is ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 Lead Auditor and has also experience in the implementation of Environmental Management Systems. Rubens is qualified as Lead Verifier GHG – Green House Gases.

Bureau Veritas Certification – GHG Verifier
Karina Polido - She is graduated in Civil Engineering with experience in management system audits. She is ISO 9001:2008 and ISO 14001:2004 Lead Auditor. Karina is also qualified as Lead Verifier GHG – Green House Gases.

Bureau Veritas Certification – Internal Technical Reviewer
Guilherme Lefèvre - He is graduated in Law and has a Master of Science degree (MSc) in Environmental Science. He has experience in GHG Programs, both compulsory and voluntary. Guilherme has vast experience in the development and analysis of CDM, VCS, Social Carbon and CCBS projects. Guilherme trained as a lead auditor in the fields of environment (ISO 14001) is qualified as Lead Verifier GHG – Green House Gases.

APPENDIX A: RIALMA COMPANHIA ENERGÉTICA III S/A CDM PROJECT VERIFICATION PROTOCOL

VERIFICATION PROTOCOL

Table 1 Verification requirements based on the Clean Development Mechanism Validation and Verification Manual (Version 01.2)

	CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1 Project implementation in accordance with the registered project design document						
a	Are all physical features of the proposed CDM project activity proposed in the registered PDD in place?	VVM	196	Yes.	OK	OK
b	Have the project participants operated the proposed CDM project activity as per the registered PDD?	VVM	196	Yes.	OK	OK
c	Was an on-site visit conducted?	VVM	196	Yes, on 16/06/2011 (at the office) and 17/06/2011 (at the office).	OK	OK
d	If not, justify the rationale of the decision.	VVM	196	N/A	OK	OK
e	Does the implementation or operation of CDM project activity conform with the description contained in the registered PDD?	VVM	197	Yes.	OK	OK
f	If not, which are the potential impacts due to these changes, according to the relevant guidelinesestablished by the Executive Board (EB48-§73)?	VVM	197	N.A.	OK	OK
g	Was anotification or a request for approval of changes from the project activity as described in theregistered PDD submited prior to the conclusion of the verification/certification for the	VVM	197	N.A.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
corresponding?					
2 Compliance of the monitoring plan with the monitoring methodology					
a Is the validated monitoring plan in accordance with the approved methodology applied by the proposed CDM project activity?	VVM	200	Yes. EG_y is the only data/parameter monitored. EF_y was calculated *ex-ante*. CAR 01: According the MR v.01 Section C: "There are four meters in the project: two at the power plant and two at the substation. Meters located at the power plant collect the total energy produced by Santa Edwiges III (gross energy) and meters located at the substation collect the energy dispatched to the grid (net energy)." During the site visit was observed that the two meters located at the substation (Alvorado do Norte) are connected also with two others hydro plants (Santa Edwiges I and II), this should be specified on the MR, also please specify that this situation does not provides anychanges in the monitoring system since the validation of this project. A request for revision of the monitoring plan should be done.	CAR01	OK
b If no, was a request for revision of the monitoring plan was done? (The DOE may request for revision of the monitoring plan covering the monitoring period under verification, for approval by the CDM Executive Board)	VVM	201	See CAR 01.	CAR01	OK
c Are there any monitoring aspects of the project activity that are not specified in the methodology, particularly in the case of small-scale	VVM	202	No. All aspects of the project activity are specified in the methodology.	OK	OK

	CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
	methodologies (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?					
3 Compliance of monitoring with the monitoring plan						
a	Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	VVM	205	Yes.	OK	OK
b	Have the previous monitoring reports been reviewed?	VVM	205	Yes.	OK	OK
c	Where applicable, has the impact of revision in the monitoirng plan on the current verification been reviewed ?	VVM	205	Refer to CAR 01	CAR01	OK
d	Does the registered/approved monitoring plan have any description of an illustration to calculate net electricity supplied to the grid by the project activity ?	VVM	205	No.	OK	OK
e	If yes to (d) above, has the verification team verified /confirmed the validity of such illustration with supporting documents ?	VVM	205	N.A.	OK	OK
f	Have all parameters stated in the monitoring plan, the applied methodology and relevant CDM Executive Board decisions been sufficiently monitored and updated as applicable, including:	VVM	205	See 3.b.i, 3.b.ii, 3.b.iii and 3.b.iv.	OK	OK
	i Project emission parameters?	VVM	205	According to the applicable methodology, project emissions by the project activity are zero.	OK	OK
	ii Baseline emission parameters?	VVM	205	Refer to **CAR 02 and CAR 03**	CAR02 CAR03	OK OK
	iii Leakage parameters?	VVM	205	According to the applicable methodology, leakage emissions by the project activity are zero.	OK	OK

	CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
	iv Validation of entire procedure of apportioning, if applicable	VVM	205	Refer to CAR 01	CAR01	OK
	v Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?	VVM	205	Yes.	OK	OK
g	Is the accuracy of equipment used for monitoring in accordance with the relevant guidance provided by the CDM Executive Board and are equipment controlled and calibrated in accordance with the monitoring plan?	VVM	205	Yes.	OK	OK
	i Are monitoring results consistently reccorded as per approved frequency?	VVM	205	Yes.	OK	OK
	ii Have quality assurance and quality control procedures been applied in accordance with the monitoring plan monitoring plan?	VVM	205	Yes.	OK	OK
	iii Has the verification team confirmed whether the applicability and correct implementation of any procedure that replaces direct calibration of meters, and any procedure that leads to calculation of parameters used in the ER determination ?	VVM	205	**CL 04:** For the energy meters PT-0711A900-01 and PT-0711A418-01, provide evidence that CELG is accredited under RBC (from the Portuguese, Rede Brasileira de Calibração) in the date of the equipments calibration, or, in case it is not, provide CELG's documented calibration procedure and the evidences of traceability of the calibration standard(s) used. **CL 05:** For the energy meters PS-0510A013-01, PS-0410A148-01 and PT-0804A390-01 provide evidence that CELG is accredited under RBC (from	CL04 CL05	OK OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			the Portuguese, Rede Brasileira de Calibração) in the date of the equipments calibration, or, in case it is not, provide evidence that the calibration was conducted in accordance with national standards.		
4 Assessment of data and calculation of greenhouse gas emission reductions					
a Is a complete set of data for the specified monitoring period is available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the DOE shall opt to either make the most conservative assumption theoretically possible in finalizing the verification report, or raise a request for deviation prior to submitting request for issuance, if appropriate).	VVM	208	Refer to **CAR 02 and CAR 03**	CAR02 CAR03	OK OK
b Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	VVM	208	Yes.	OK	OK
c Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	VVM	208	Yes.	OK	OK
d Have any assumptions used in emission calculations been justified?	VVM	208	N.A.	OK	OK
e Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	VVM	208	Yes.	OK	OK

Table 2 Resolution of Corrective Action / Forward Action / Clarification Requests.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
CAR 01: ACCORDING THE MR V.01 SECTION C: "THERE ARE FOUR METERS IN THE PROJECT: TWO AT THE POWER PLANT AND TWO AT THE SUBSTATION. METERS LOCATED AT THE POWER PLANT COLLECT THE TOTAL ENERGY PRODUCED BY SANTA EDWIGES III (GROSS ENERGY) AND METERS LOCATED AT THE SUBSTATION COLLECT THE ENERGY DISPATCHED TO THE GRID (NET ENERGY)." DURING THE SITE VISIT WAS OBSERVED THAT THE TWO METERS LOCATED AT THE SUBSTATION (ALVORADO DO NORTE) ARE CONNECTED ALSO WITH TWO OTHERS HYDRO PLANTS (SANTA EDWIGES I AND II), THIS SHOULD BE SPECIFIED ON THE MR, ALSO PLEASE SPECIFY THAT THIS SITUATION DOES NOT PROVIDES ANYCHANGES IN THE MONITORING SYSTEM SINCE THE VALIDATION OF THIS PROJECT. A REQUEST FOR REVISION OF THE MONITORING PLAN SHOULD BE DONE.	VVM 200	Please refer to the monitoring plan revised attached to this response. In addition, the monitoring plan in the second verification report was revised according to the new monitoring plan.	First Answer – 15/07/2011: In order to approve the response to the CAR 01 a request for revision of the monitoring plan should be done and approved by the UNFCCC. CAR 01 is still open. The revision of the monitoring plan is approved on April 09th, 2012. **CAR 01 is closed.**
CAR 02: The value to the month of April 2011 related to the Energy Generation of Santa Edwiges III, should be updated.	EB48 9e	This value was updated. Please refer to the second version of the Monitoring Report.	First Answer – 15/07/2011: All the values referred to the mont of April 2011 was updated on the spreadsheet SEIII_CERs_2011.06.30_v.2.xls, and on the

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
			MR v.2. **CAR 02 is closed.**
CAR 03: The value to the month of August 2008 should be reviewed, since the monitoring period start on day 07 and the presented value cover all the month.	**1.** EB48 **2.** 9e	**3.** The value was corrected. Please refer to the second version of the Monitoring Report. Second response: The value was corrected according the official report issued by CCEE (with hourly measurement). Please refer the new version of the Monitoring Report and CCEE Report, attached to this response.	First Answer – 15/07/2011: It is incorrect to determine the value to the month of August as a proportion. CAR 03 is still open. The amount of energy generated during the period from 7 to 31 August 2009 is now informed in accordance with the official source CCEE. The MR V 03 is updated. **CAR 03 is closed.**
CAR 04: Please use the term "monitoring period" and not "verification".	EB54 Ann34 Part II	The term was substituted as requested. Please refer to the second version of the Monitoring Report.	First Answer – 15/07/2011: The MR v.2 was amended. **CAR 04 is closed.**
CAR 05: According the UNFCCC webpage http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218634643.54/view the project participants are: Rialma Companhia Energética III S.A. and Ecoinvest Carbon Brasil Ltda.	EB54 Ann34 Section A.2	The only difference between the Parties listed in the Table 1 of the PDD and the UNFCCC website is the name of Ecopart Assessoria em Negócios Empresariais Ltda. former EcoinvestCarbon Brasil Ltda. See the	First Answer – 15/07/2011: The files "2a alt do ctto social_Ecopart Assessoria_Ltda_01 06 2008" and "Ecopart_3a Alteração de Contrato Social" were cross-checked by the DOE.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		articles of association attached to this response. The inclusion of Ecopart Assessoria em Negócios Empresariais Ltda through a letter of approval from United Kingdom of Great Britain and Northern Ireland is not concluded yet. The necessary documentation for the inclusion of the above mentioned company as a project participant to the proposed project activity will be made available to the DOE by the time of its submission of the request for issuance.	The DOE will wait to the submission of the request for issuance to close this CAR. CAR 05 is still open. The UNFCCC website is updated, and informs the PP as in the MR. **CAR 05 is closed.**
CAR 06: The presented coordinates on the MR v.01 are related to one of the Dam coordinates, according to the approves PDD.	EB54 Ann34 Section A.3	For simplicity, the coordinates present in the monitoring report were replaced by the coordinates of the power house. Please refer to the second version of the Monitoring Report.	First Answer – 15/07/2011: The coordinates were amended on the MR v.02 and are in accordance with the registered PDD. **CAR 06 is closed.**
CAR 07: During the site visit was observed that the type of the meters is ION 8600, but the certification of calibration indicates ION 8600C. Also on the MR v.01 the principal meter appears as ION 8600C while the back-up appears as ION 8600.	EB54 Ann34 Section C	According to the specifications of the manufacturer, there are available 3 models of the meter ION8600: ION 8600A, ION8600B and ION8600C. The difference between the models is related to the configurations, such as: - ION8600A: memory of 10 MB;	First Answer – 15/07/2011: The source: http://www.powerlogic.com/literature/3000BR0603R1009_ION8600.pdf was cross checked by the DOE. The PP explanation is correct.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		- ION8600B: memory of 4 MB; - ION8600C: memory of 2 MB. More details, please refer to the ION8600 Brochure available at Schneider' website: <http://www.powerlogic.com/literature/3000BR0603R1009_ION8600.pdf. It's important to mention that the serial number of the meter didn't change and is the same present in the calibration certification and in the equipment.	**CAR 07 is closed.**
CAR 08: Include the description of the equipment (meter) used to monitor the EG_y.	EB54 Ann34 Section D (2.)	The description of the meters is present in the Section C and a mention to this section was already present in the section D.2. However, the description was included in the Section D.2, as requested. Please refer to the second version of the monitoring report.	First Answer – 15/07/2011: The MR v.2 was amended. **CAR 08 is closed.**
CAR 09: On Section E.1. the units to the emission coefficient, the $EF_{OM,y}$ and the $EF_{BM,y}$ appears as kg CO_{2e}/MWh, whiel on Section D.1. all these parameters appears as tCO_2/MWh.	EB54 Ann34 Section E.1	The units present in the section E.1 are in accordance with the methodology AMS.I.D (version 12). The units present in the section D.1 are in accordance with the registered PDD. Hence, modifications were not made in the monitoring report.	First Answer – 15/07/2011: The DOE agrees with the PP explanation. **CAR 09 is closed.**
CAR 10: According the registered PDD the data	EB54	The data was corrected. Please refer	First Answer – 15/07/2011:

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
from 2004 to 2006 were used to calculate the emission factor of the grid and not the data from 2002 to 2004 as stated on the MR v.01.	Ann34 Section E.1	to the second version of the Monitoring Report.	The MR v.2 was amended. **CAR 10 is closed.**
CAR 11: PPs are extending the final date of this monitoring period, from 30/04/2011 to 31/03/2012. This CAR is being raised to request PPs to update MR, calculation spreadsheets and supporting documents, accordingly, as well as to allow such change in the dates of this monitoring period, undergoing verification, to be requested to the UNFCCC Secretariat, in accordance to EB 41 paragraph 78.	EB 41 Paragraph78	The Monitoring Report and calculation spreadsheet were updated. Please refer to the third version of the documents. The evidences for the additional period follows attached to this response.	The documents have been updated and UNFCCC allowed with the extending of the final date of this monitoring period as was verified in the webpage: http://cdm.unfccc.int/Projects/DB/TUEV-SUED1218634643.54/view. **CAR 11 is closed.**
CL 01: Please include the complete starting date (D/M/Y) of operation of the project activity.	EB54 Ann34 Section B.1 (1.)	The complete date was included. Please refer to the second version of the Monitoring Report.	First Answer – 15/07/2011: Section B.1. was amended with the complete starting date of operation of the project activity: 08 January 2009. **CL 01 is closed.**
CL 02: Please clarify why the Alvorada do Norte Substation energy meters were replaced by new ones.	EB54 Ann34 Section C	The meters were replaced because of equipment failure and, consequently, loss of communication with the CCEE. As mentioned in the Monitoring Report, the new energy meter were calibrated before the expiration calibration date of the former equipments, respecting the	First Answer – 15/07/2011: The DOE agrees with the PP explanation. Furthermore the CCEE controls all electricity dispatched to the grid and contractually assures, for the buyer, that the electricity sold is appropriately delivered to the grid.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
		two year maximum limit established by ONS – the Brazilian Electric System National Operator.	**CL 02 is closed.**
CL 03: Please clarify why the parameter **COEF i/j,y, imports** listed on the approved PDD was not listed on the MR. v.01.	EB54 Ann34 Section D	This parameter was included. Please refer to the second version of the Monitoring Report.	First Answer – 15/07/2011: The MR v.2 was amended, the parameter **COEF i/j,y, imports**now appears as listed on the registered PDD. **CL 03 is closed.**
CL 04: For the energy meters PT-0711A900-01 and PT-0711A418-01, provide evidence that CELG is accredited under RBC (from the Portuguese, Rede Brasileira de Calibração) in the date of the equipments calibration, or, in case it is not, provide CELG's documented calibration procedure and the evidences of traceability of the calibration standard(s) used.	VVM 205	As requested by the DOE, find attached the file "CELG_RBC.pdf" which states that *CELG Distribuição S.A – Setor de Laboratório e Medição* is accredited under the *RBC* since June, 23rd 2008. The date of CELG accreditation is previous to the calibration of the metres PT-0711A900-01 and PT-0711A418-01, which were calibrated on October, 15th 2008 and on September, 22nd 2010.	The DOE checked the information, and confirms that CELG is accredited under RBC since June 23rd, 2008, with the accreditation certificate # 410. **CL 04 is closed.**
CL 05: For the energy meters PS-0510A013-01, PS-0410A148-01 and PT-0804A390-01 provide evidence that CELG is accredited under RBC (from the Portuguese, Rede Brasileira de Calibração) in the date of the equipments calibration, or, in case it is not, provide evidence that the calibration was	VVM 205	As mentioned in CL 04 above, *CELG Distribuição S.A – Setor de Laboratório e Medição* is accredited under *RBC* since June, 23rd 2008. Concerning the meter PT-0804A390-01, it started operating on October,	The DOE assessed: - the information provided, and confirms that CELG is accredited under RBC since June 23rd, 2008, with the accreditation certificate # 410. - the standards calibration certificates

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
conducted in accordance with national standards.		14th 2008, *i.e.*, after the date in which CELG was accredited under RBC. onsidering the other meters – PS-0510A013-01 and PS-0410A148-01 – which were calibrated in 2007, see the calibration certificates of the standard used ("CELG_CertificadoPadrão PTS3.3_2007.05.22.pdf and CEMIG_Certificado de calibração padrão RD 33_2006.11.07.zip) attached to this response. These standards are calibrated in accordance with national standards.	used in the calibration of the energy meters, and confirms that they are calibrated in accordance with national standards. **CL 05 is closed.**