VALIDATION OPINION

FOR RENEWAL OF CREDITING PERIOD

"Rio Taquesi Hydroelectric Power Project" in Bolivia

CDM REGISTRATION NUMBER: 1031

REPORT NO. 2009-0108

REVISION NO. 01

DET NORSKE VERITAS

VALIDATION OPINION

DET NORSKE VERITAS
CERTIFICATION AS

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Date of first issue: 2009-01-27	Project No.: PRJC-10217-CCS-BRA
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Client: Hidroelétrica Boliviana S/A	Client ref.: Angel Humberto Zannier

Project Name: "Rio Taquesi Hydroelectric Power Project"
UNFCCC Ref No: 1031
Country: Bolivia
Methodology: ACM0002
Version: 8
GHG reducing Measure/Technology: "*Electricity generation from renewable sources*"
ER estimate: 188 632 t CO_2 per annum.
Size
☒ Large Scale
☐ Small Scale

In summary, it is Det Norske Veritas Certification AS (DNV) opinion that the "Rio Taquesi Hydroelectric Power Project" in Bolivia, as described in the project design document version 2.05 of 14 July 2009, meets the requirements for the renewal of the crediting period stated in the "Procedures for renewal of a crediting period of a registered CDM project" (version 05). Hence, DNV requests the renewal of the crediting period of project activity 1031 "Rio Taquesi Hydroelectric Power Project" in Bolivia.

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"Rio Taquesi Hydroelectric Power Project" in Bolivia

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Clean Development Mechanism

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VALIDATION OPINION

Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CNDC	Comite Nacional de Despacho de Carga (Load Dispatch National Committee)
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
HB	Hidroeléctrica Boliviana S.A.
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
ONS	National Electricity System Operator
PDD	Project Design Document
SIN	Sistema Interconectado Nacional (Bolivian – National Interconnected System/Grid)
UNFCCC	United Nations Framework Convention on Climate Change

VALIDATION OPINION

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VALIDATION OPINION

1 EXECUTIVE SUMMARY – VALIDATION OPINION

It is DNV's opinion that the "Rio Taquesi Hydroelectric Power Project", as described in the project design document version 2.05 of 14 July 2009, meets the requirements for the renewal of the crediting period stated in the "Procedures for renewal of a crediting period of a registered CDM project" (version 05). Hence, DNV requests the renewal of the crediting period of project activity 1031 "Rio Taquesi Hydroelectric Power Project".

2 INTRODUCTION

Hidroelétrica Boliviana S/A has commissioned Det Norske Veritas Certification AS (DNV) to perform an assessment of the continued validity of the baseline for the renewal of the crediting period of the "Rio Taquesi Hydroelectric Power Project" CDM project (UNFCCC reference number 1031) which consists of two run-of-river hydroelectric power plants:

- The Yanacachi Norte plant which is located by the Unduavi River, near the town of Yanacachi, and
- The Chojilla plant which is located by the Taquesi River, near the town of La Chojilla

The project activities first renewable crediting period was from 1 July 2002 to 30 June 2009.

This validation opinion summarises the findings of the assessment of the continued validity of the baseline.

In an e-mail sent on 29 December 2008 to the CDM Registration and Issuance Team of UNFCCC, the project participants expressed their intention to request a renewal of crediting period for the project activity.

3 SCOPE

The scope of this validation is the assessment of the continued validity of the baseline, performed on the basis of the *Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period* contained in the "Procedures for renewal of the crediting period of a registered CDM project activity" (version 05) /6/.

The findings and conclusions on the project's compliance with above procedure are recorded in this document. However, this document must be seen in conjunction with the validation report and protocol for the project (DNV Report No: 2005-1335 rev.01 dated 21 March 2007) /**8**/.

4 METHODOLOGY

The assessment consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

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

The following sections outline each step in more detail.

4.1 Desk Review of the Project Design Documentation

The following table lists the documentation that was reviewed during the assessment:

/1/ Project Design Document for the "Rio Taquesi Hydroelectric Power Project". Version PDD – RTHPP – 2.01 of 15 December 2008. UNFCCC reference number 1031.

/2/ Project Design Document for the "Rio Taquesi Hydroelectric Power Project". Version PDD – RTHPP – 2.05 of 14 July 2009. UNFCCC reference number 1031.

/3/ EB 44 Report Annex 3: Validation and Verification Manual Version 01. http://cdm.unfccc.int/EB/044/eb44_repan03.pdf

/4/ CDM-EB: Approved Consolidated Baseline and Monitoring Methodology ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 8

/5/ CDM-EB: Tool to calculate the emission factor for an electricity system. Version 01. Annex 12 of EB 35 report.

/6/ CDM EB: Procedures for Renewal of the Crediting Period of a Registered CDM Project Activity. Version 05.

/7/ Registered CDM-PDD "Project 1031: "Rio Taquesi Hydroelectric Power Project", version PDD – RTHPP - 03, of 15 September 2006.

/8/ Registered Validation Report: "Rio Taquesi Hydroelectric Power Project" in Bolivia, DNV – Det Norske Veritas – Validation Report N°. 2005-1335, Revision N°. 01, of 21 March 2007.

/9/ CDM-EB: Approved Consolidated Baseline and Monitoring Methodology ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 6.

/10/ National Load Dispatch Committee (CNDC - Comite Nacional de Despacho de Carga): http://www.cndc.bo/home/index.php.

/11/ Emission reduction spreadsheets: Annex3 PDDv2.04.xls, 07nov-08abr.xls and 08may-08oct.xls.

/12/ Superintendence of Electricity, acting as the Regulatory Authority, has granted HB the Generation License in the form of an Administrative Resolution to construct the project:

- Superintendencia de Electricidad. Sistema de regulación sectorial. Resolution SSDE n° 052/97. 2 May 1997,
- Superintendencia de Electricidad. Sistema de regulación sectorial. Resolution SSDE n° 057/98. 24 March 1998,
- Superintendencia de Electricidad. Sistema de regulación sectorial. Resolution

SSDE n° 094/98. 18 May 1998,

- Superintendencia de Electricidad. Sistema de regulación sectorial. Resolution SSDE-SSSB n° 001/2000. 24 January 2000.

/13/ Renewal of the Environmental License # 021103-05-DIA-001-08 on August 2008.

The main changes between the PDD version PDD – RTHPP – 2.01 and the PDD version PDD – RTHPP – 2.05 submitted for the renewal of the crediting period are:

- The updated PDD gives more detailed explanation of the emission reductions calculation;
- The updated PDD gives an improved description of the monitoring plan.

4.2 Follow-up Interviews with Project Stakeholders

On 06 February 2009, DNV performed telephone interviews and had e-mail correspondences with the project stakeholders to confirm selected information and to resolve issues identified in the document review.

The main topics of the interviews are summarized in the table below.

	Date	Name	Organization	Topic
/14/	06-Feb-09	Ricardo Michel	Hidroelétrica Boliviana S/A	• Monitoring plan • Emission reductions estimation

4.3 Resolution of Outstanding Issues

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

Findings established during the assessment can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

i) mistakes have been made with a direct influence on project results;
ii) CDM and/or methodology specific requirements have not been met; or
iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

The requests for clarifications identified during the validation and the resolution of these requests for clarifications are documented in Appendix A.

4.4 Internal Quality Control

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

4.5 Validation Team

				Type of involvement					
Role/Qualification	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator/ technical team leader	Leiroz	Andrea	Brazil	√	√	√			
Technical Reviewer (draft & Final)	Kakaraparthi	Venkata Raman	India					√	

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

5 VALIDATION FINDINGS

The findings of the assessment are stated in the following sections. The results from the validation are documented in more detail in the validation protocol in Appendix A.

The final findings relate to the project design as documented and described in the revised project design document of 14 July 2009 /2/.

5.1 Application of latest approved version of baseline and monitoring methodology

The project activity was registered as a CDM project applying the "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" ACM0002 version 6 /9/. For the renewal of crediting period, the project applies version 8 of the ACM0002 methodology, which is the latest version currently available /4/.

5.2 Validity of the original baseline or its update

The project includes two run-of-river hydroelectric power plants, i.e. the Chojlla and Yanacachi Norte plants. The total installed capacity of the project activity is 89.5 MW. Both plants deliver energy to the Bolivian National Interconnected Grid (SIN grid).

As typical run-of-river hydroelectric power plants that involve a low-level diversion dam and are usually located on swift flowing streams, these hydroelectric power plant projects consist of only small reservoirs (the total reservoir area is less than 3 km^2). The power density is much greater than 10 W/m^2, and the project stores water for only short periods of time.

The installed capacity of the Chojlla Plant (upstream in the Taquesi river) is 38.4 MW and the plant is composed of a diversion weir, with an impounding capacity of 110 000 m^3, a 3.6 km tunnel, a 1.2 km long penstock and one Francis turbine-generator. The installed capacity of the Yanacachi Norte Plant (downstream in the Unduavi river) is 51.1 MW and the plant has a weir and a daily regulation reservoir of 45 000 m^3 connected to a 3.7 km long tunnel through a 400 m long covered canal. The penstock is 1.2 km long and the plant has one Francis turbine-generator.

The electricity generated by these two plants is dispatched to the SIN Grid and monitored by the Dispatch Load National Committee (CNDC - Comite Nacional de Despacho de Carga). The baseline as per the original registered PDD of version PDD - RTHPP dated 15 September was electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by addition of new generation sources.

The Superintendence of Electricity, acting as the Regulatory Authority, has granted HB the Generation License in the form of an Administrative Resolution to construct the project, the Resolution SSDE 052/97, later modified by Resolutions SSDE 057/98, SSDE 094/98 and SSDE-SSSB-001/2000 /12/. The latter was granted jointly with the Superintendence of Basic Water Services. As the project uses small reservoirs and can be considered run-of-river, no significant impacts were identified.

The "Rio Taquesi Hydroelectric Power Project" have been granted the Environmental License # 021103-05-DIA-002-98 issued by the Environmental and Natural Resources Unit within the City Hall of La Paz on 1998 which was valid until 2008. Hidroelétrica Boliviana S/A requested the renewal of the Licence (#021103-05-DIA-001-08) on August 2008 /13/.

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

As stated in the revised PDD submitted for renewal of crediting period, the power generation in the National Interconnected grid (SIN) is still dominated by fossil fuel power. Hence, in the absence of the project activity electricity would still have been generated in the existing fossil fuel power plants or by the addition of new fossil fuel power plants. DNV was able to confirm the dominance of fuel-fired power plants through historical information on capacity additions in the Bolivian interconnected grid /10/.

There are no new national/sectoral policies/legislation/circumstances that could affect the baseline scenario during the renewal of the crediting period. As stated in the PDD, a National Development Plan to encourage and allow the Bolivian State to be a regulator or policy marker only was approved. The Bolivian State handed over its former responsibilities as a power services provider, as did in other sectors as well, allowing private companies to participate in the electricity sector with the regulation rules set by the Electricity Law and the Sectoral Regulation System Law. This National Development Plan would not have an impact on the baseline.

Hence the baseline for the project remains to be the electricity supplied by the project activity to the grid in MWh multiplied by an emission coefficient (measured in t CO_2e/MWh) calculated in accordance with Tool to calculate the emission factor for an electricity system

/5/ as a combined margin. The operating margin (OM) and build margin (BM) emission coefficient for the project will be determined ex-post.

Step 1.2: Assess the impact of circumstances

DNV's assessment could not identify any circumstances existing at the time of requesting renewal of the crediting period which would impact the current baseline emissions in additions to the circumstances discussed in step 1.1 and 1.4.

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

This step is not applicable as the baseline is not the continuation of the current practice in the sense of the *Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period* contained in the "Procedures for renewal of the crediting period of a registered CDM project activity" (version 05) /6/.

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

The project applies the approved consolidated baseline methodology ACM0002 (version 8) – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" /4/ in combination with Tool to calculate the emission factor for an electricity system /5/. The application of this methodology is justified to the "Rio Taquesi Hydroelectric Power Project" as the project is a grid-connected renewable power generation project activity for supplying electricity to the Bolivian grid (SIN). Its applicability has been justified by DNV due to that i) the project is a run-of-river reservoir type hydropower project with the power density of 3 774 W/m^2 (greater than 4 W/m^2) ii) is connected to an electricity grid (Bolivian grid – SIN), and; iii) the project does not involve switching from fossil fuels to renewable energy sources at the site of the project activity.

The baseline scenario is that an equivalent of electricity would, in the absence of the project activity, have been generated by the operation of grid-connected thermal power plants.

According to the latest version of ACM0002, there are no GHG emissions from the renewable energy project and the leakage of the project is zero.

Baseline emissions due to displacement of grid electricity generated by thermal power plants are calculated by multiplying the electricity exported by the project activity to the SIN grid with a determined baseline grid emissions coefficient.

The combined margin emission coefficient for the grid is determined *ex-post* in accordance with ACM0002 (version 8) /4/ which calls the "Tool to calculate the emission factor for an electricity system" /5/.

In accordance with ACM0002, the project boundary includes the project plant and the SIN grid to which the two plants are connected to.

During the first crediting period, starting 01 July 2002, the baseline combined margin emission factor was determined as the weighted average of the "operating margin" and the "build margin" for the SIN grid of Bolivia at 0.581 t CO_2e/MWh (for the first four years) and 0.553 t CO_2e/MWh (for the last three years). This was based on data sourced from the CNDC (Load Dispatch National Committee) and appropriate IPCC default values.

The combined margin emission factor for the estimation of the emission reduction for the second renewable crediting period from 01 July 2009 to 30 June 2016 has been established as

the weighted average of the "operating margin" and the "build margin" for the SIN grid at 0.610 tCO_2/MWh, calculated in accordance with "Tool to calculate the emission factor for an electricity system". The calculations are based on electricity generation data provided by the Load Dispatch National Committee (CNDC) for the electricity generated in the grid in the period November 2007-October 2008. This is the most recent available electricity generation data by the time the PDD version PDD – RTHPP – 2.01 of 15 December 2008 was received.

The dispatch data analysis OM method was considered for the determination of the operating margin (OM). The build margin emission factor (BM) was calculated ex-ante considering the most recent 20% power plants capacity additions (in MWh) in the electricity system. The values calculated for the build margin (BM) and operating margin (OM) is 0.600 t CO_2e/MWh and 0.640 t CO_2e/MWh, respectively. The combined margin emission factor has been calculated using weights of 25% for the OM and 75% for the BM at 0.610 t CO_2e/MWh for the second crediting period. The selection of the weight is in line with the "Tool to calculate the emission factor for an electricity system".

The grid emission factor will be calculated ex-post during the second crediting period as the operating margin (OM) is determined ex-post. The methodologies for calculating emission reductions are transparently documented and the accuracy of the calculations has been verified.

As stated in the section 5.2 above, the baseline for the project activity continues to be the power generation in the grid connected power plants in the absence of the project activity.

The estimated amount of GHG emission reductions from the project is 1 320 427 tCO_2e during the second crediting period (7 years) from 01 July 2009 to 30 June 2016, resulting in estimated average annual emission reductions of 188 632 tCO_2e.

A spreadsheet for the calculation of the emission reductions was provided and checked to confirm the estimated emission reductions /11/.

5.3 Monitoring plan

The project applies the approved consolidated monitoring methodology ACM0002 (version 8) – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" /4/ in combination with Tool to calculate the emission factor for an electricity system /5/ for the grid emission factor.

5.3.1 Parameters determined ex-ante

The build margin CO_2 emission factor (EF_{BM}) is determined *ex ante* based on the most recent information available.

5.3.2 Parameters monitored ex-post

Details of data to be collected, the frequency of data recording and its format are described in the monitoring plan and deemed to be adequate.

The electricity generated by the hydropower plants and supplied to the grid will be measured hourly and recorded on a monthly basis using electricity meters. The electricity meters at the plant's site will comply with the CNDC standards and will be periodically calibrated.

According to the "Tool to calculate the emission factor for an electricity system", the dispatch data analysis OM method was considered for the determination of the operating margin (OM).

Thus, combined margin CO_2 emission factor ($EF_{grid,CM,y}$) and the Operating Margin CO_2 emission factor (EF_{OM}) will be monitored ex-post.

The calculations are based on electricity generation data provided by the Load Dispatch National Committee (CNDC) for the electricity generated in the grid in the period November 2007-October 2008. This is the most recent available electricity generation data by the time the PDD version PDD – RTHPP – 2.01 of 15 December 2008 was received. DNV can confirm the data source is reliable, and the calculation and result are correct /11/.

Data will be archived for a period of two years after the end of the last crediting period.

5.3.3 Management system and quality assurance

For the monitoring plan:

- Procedures to deal with erroneous measurements have been established.
- Procedures for the registration, monitoring, measurement and reporting of the parameters in the monitoring plan have been identified.
- Procedures for maintenance of the monitoring equipments and installations and the calibration frequency have been established.
- Procedures for day-to-day record handling, collection and archiving have been identified.
- The measurements accuracy has been addressed for the various parameters.
- Procedures for identification of training for the monitoring personnel have been addressed.
- No such emergencies were identified in the monitoring plan since emergencies are not likely to occur.
- Procedures for review of reported results/data and for corrective actions in order to provide more accurate future monitoring and reporting have been established.

APPENDIX A

RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION REQUESTS

Table 1

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
CAR 1 Project participants are requested to apply the correct formulas in order to calculate the combined margin CO_2 emission factor for grid connected power generation. In addition, as stated in section B.6.1 of the PDD page 24, option A of the Tool to calculate the emission factor for an electricity system was selected to calculate the operating margin (OM). According to the tool, this option refers to the simple OM method. Moreover, as stated in page 27 of the PDD, the combined margin CO_2 emission factor is the weighted average of the build and operating margin (w_{OM} = 0.5 and w_{BM} = 0.5). According to the Tool to calculate the emission factor for an electricity system to calculate the emission factor for an electricity system, the following default values 0.25 and 0.75 should be used for w_{OM} and w_{BM}, respectively for the second crediting period.	Correct formulas have been applied for the calculation of the emission factor in accordance to the Tool to calculate the emission factor for an electricity system. The wrong reference to Option A for estimating the Operating Margin has been fixed and a new reference to Option C is included in the PDD v1. Weighing values for the calculation of the combined emission factor were corrected and now equal to 0.25 and 075 for w_{OM} and w_{BM} respectively.	The correct formulas to calculate the combined margin CO_2 emission factor were applied in the revised PDD assessed by DNV. The CAR is closed.
CAR 2 According to the tool, for the second crediting period, the build margin emissions factor shall be calculated *ex-ante*,	There was a typographical error in the PDD, page 29, now corrected. The text now fixed is: "In the second crediting period, the ex-ante approach will be used…" The calculations, which suffered no modifications at all, are in the "BM Data" and "Annex3 v2" spreadsheets. Please refer to the file	A revised PDD and spreadsheet was verified and DNV checked that build margin emission factor is correctly calculated. The CAR is closed.

<table>
<tr><th>Draft report clarifications and corrective action requests by validation team</th><th>Summary of project owner response</th><th>Validation team conclusion</th></tr>
<tr><td></td><td>“Annex3 PDDv2.02.xls”.

The Build Margin emission factor is calculated ex ante based on the most recent information available on units already built for a sample group m at the time of the CDM- PDD submission to the DOE for validation. The next table shows the detail of the additions for the period from June 2000 to August 2008:

<table>
<tr><th>Unit</th><th>Starting Date</th><th>Generation GWh (November 2007 to October 2008)</th></tr>
<tr><td>ARJ13</td><td>Aug/2008</td><td>2.01</td></tr>
<tr><td>ARJ14</td><td>Aug/2008</td><td>2.56</td></tr>
<tr><td>ARJ15</td><td>Aug/2008</td><td>1.75</td></tr>
<tr><td>ANG3</td><td>Aug/2008</td><td>1.83</td></tr>
<tr><td>GBE1</td><td>Oct/2007</td><td>39.40</td></tr>
<tr><td>QHE2</td><td>Oct/2007</td><td>1.64</td></tr>
<tr><td>QHE1</td><td>Oct/2007</td><td>1.64</td></tr>
<tr><td>GCH11</td><td>Apr/2007</td><td>370.41</td></tr>
<tr><td>ARJ9</td><td>Aug/2006</td><td>10.30</td></tr>
<tr><td>ARJ10</td><td>Aug/2006</td><td>10.40</td></tr>
<tr><td>ARJ11</td><td>Aug/2006</td><td>10.28</td></tr>
<tr><td>ARJ12</td><td>Aug/2006</td><td>7.67</td></tr>
<tr><td>SRO2</td><td>Jul/2006</td><td>30.78</td></tr>
<tr><td>SRO1</td><td>Jul/2006</td><td>34.69</td></tr>
<tr><td>SIS5</td><td>May/2004</td><td>116.62</td></tr>
<tr><td>LAN3</td><td>May/2001</td><td>10.18</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Draft report clarifications and corrective action requests by validation team</th><th>Summary of project owner response</th><th>Validation team conclusion</th></tr>
<tr><td></td><td>
<table>
<tr><td>KIL3</td><td>May/2001</td><td>18.00</td></tr>
<tr><td>BUL1</td><td>Jun/2000</td><td>312.34</td></tr>
<tr><td>BUL2</td><td>Jun/2000</td><td>300.75</td></tr>
<tr><td colspan="2">Total Unit - Build Margin (BM)</td><td>1,283.3</td></tr>
<tr><td colspan="2">Total Generation - National Interconnected System (SIN)</td><td>5,191.1</td></tr>
<tr><td colspan="2">Rate>=20%</td><td>24.7%</td></tr>
</table>
Table1.

Taking advantage of the review requested by means of the CAR, another typo has been corrected, changing the starting date for LAN3 and KIL 3 units (Landara 3 and killpani 3) from Mar/2001 to May/2001.</td><td></td></tr>
<tr><td>CL 1
Project participants are requested to provide the e-mail sent to the “CDM Registration and Issuance Team” from UNFCCC stating the intention to request a renewal of a crediting period of project activity 1031 “Rio Taquesi Hydroelectric Power Project” and informing of their selection of a DOE.</td><td>The required e-mail, in Portable Document Format, is provided in the file:
“20081229IntentionToRenewCPI.pdf”.</td><td>Ok. A copy of the e-mail sent to the “CDM Registration and Issuance Team” was provided.
The CL is closed.</td></tr>
<tr><td>CL 2
The baseline as per the original registered PDD of version PDD - RTHPP dated 15 September was electricity delivered to the</td><td>Historical information on capacity additions in the Bolivian interconnected grid show the dominance of fuel-fired power plants. 74% of all capacity</td><td>DNV was able to verify the evidences provided by PP and checked that in the absence of the project activity electricity would still have been</td></tr>
</table>

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
grid by the project would have otherwise been generated by the operation of grid-connected power plants and by addition of new generation sources As stated in the revised PDD submitted for renewal of crediting period, the power generation in the National Interconnected grid (SIN) was still dominated by fossil fuel power. Hence in the absence of the project activity electricity would still have been generated in the existing fossil fuel power plants or by the addition of new fossil fuel power plants. DNV requests documented evidences to confirm this information.	additions from 1996 to 2008 come from natural gas power plants and 56% of capacity additions projected for commissioning in 2009 and 2010 come from natural gas power plants. The file "HistoricalCapAdditions.xls" summarizes the available data. Different documents, listed in the same spreadsheet and almost all coming from the National Load Dispatch Committee, evidence the data provided.	generated in the existing fossil fuel power plants or by the addition of new fossil fuel power plants. The CL is closed.
CL 3 The project participants are requested to clarify the impact of new national/sectoral policies/legislation/circumstances that could affect the baseline scenario during the renewal of the crediting period.	The Electricity Law and its Regulations were not changed in that of relevance for this section. However, a change in the approach of the State to the market has occurred with the approval of the National Development Plan, which encourages and allows the Bolivian State to participate in the services chain (generation, transmission and distribution) and to recover a major role in the sectors, leaving behind its position as a regulator or policy maker only. As per the Capitalization Law effective in 1994, the Bolivian State handed over its former responsibilities as a power services provider, as did in other sectors as well, allowing private	DNV was able to verify the revised PDD and confirmed that there are no new national/sectoral policies/legislation/circumstances that could affect the baseline scenario during the renewal of the crediting period. The CL is closed.

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
	companies to participate in the electricity sector with the regulation rules set by the Electricity Law and the Sectoral Regulation System Law. This change will not affect the baseline scenarios, still dominated by the rationale behind the decisions on capacity additions, highly concentrated on the hydrocarbon resources and more or less unaffected by the nature (governmental or private) of the players in the power sector. (Text included in the PDD).	
CL 4 DNV requests latest documented evidences of the Licenses.	Generation License has been granted by the Superintendence of Electricity. The file "LICENCES-SSDE RESOLUTIONS.pdf" includes the original license and its modifications. Ernst & Young Independent Report on compliance of the regulation regarding the validity of the License is found in the file "LicenseCertificat.pdf"	A copy of the licenses was sent to DNV. The CL is closed.
CL 5 A spreadsheet for the calculation of the emission reductions was not provided to confirm this estimate. DNV requests the data used for the baseline determination, the calculation sheet for the grid emission factor, the calculations of the OM and BM emission coefficient used to estimate emission	The requested spreadsheet is presented in file "ANNEX3 v2.02.xls"	The spreadsheet was provided and calculation was checked. The CL is closed.

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
reductions. The data used for calculation has to be provided along with the data sources.		
CL 6 The electricity generated by the hydropower plants and supplied to the grid will be measured hourly and recorded on a monthly basis using electricity meters. The electricity meters at the plant's site will comply with the CNDC standards and will be periodically calibrated. However, project participants are requested to provide further information regarding the monitoring of the net electricity generation.	Information on the monitoring of the net electricity generation is provided in section B.7.1. The total energy produced per unit and the electricity consumption of each plant is monthly monitored by HB's own metering system. This information is presented in HB's Operation and Maintenance Department monthly reports ("Informe Mensual de Operaciones"). Part of the said report is shown, as an example, in worksheets "Energy Balance" and "ISE-110" of the MS-EXCEL file "Informe Op. Octubre de 2008". The file containing information on HB's gross generation and consumption is sent monthly to the regulator (the file "ISE-110 Oct08 HB.xls" serves as an example).	The revised PDD was updated and the modifications in section B.7.1 are sufficient. In addition, the evidences provided by PP were checked by DNV. The CL is closed.
CL 7 According to the "Tool to calculate the emission factor for an electricity system", the operating margin CO_2 emission factor (EF_{OM}) is determined ex-post. However, section B.7.1 of the PDD does not mention all the parameters that need to be monitored.	Section B.7.1 has been modified to conform the "Tool to calculate the emission factor for an electricity system"	The revised PDD was assessed by DNV and section B.7.1 was updated. The CL is closed.
CL 8	Accurate and reliable procedures are put	Ok. DNV was able to verify the revised

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
For the monitoring plan: - Procedures to deal with erroneous measurements will need to be established. - Procedures for the registration, monitoring, measurement and reporting of the parameters in the monitoring plan have been identified. - Procedures for maintenance of the monitoring equipments and installations and the calibration frequency have been established. - Procedures for day-to-day record handling, collection and archiving have been identified. - The measurements accuracy needs to be addressed for the various parameters. - Procedures for identification of training for the monitoring personnel have not been addressed. - No such emergencies were identified in the monitoring plan. It is not clear if such emergencies are likely to occur. - Procedures for review of reported results/data and for corrective actions in order to provide more accurate future monitoring and reporting need to be established.	in place. These are described in "P-CM-01-a.pdf" and "P-CM-01-b.pdf".	PDD and checked the information included in the monitoring plan. The CL is closed.
CL 9	The requested renewed Environmental	A copy of the Environmental licenses

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
DNV requests latest documented evidences of the Environmental License.	License (coded 021103-05-DIA-001-08) or Declaratoria de Impacto Ambiental is contained in the attached file “20080829DIARENEWED.pdf”	was sent to DNV. The CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Andrea Leiroz

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas						
Renewables	*Hydro power*	Jan 2009	Jan 2009		July 2009	July 2009
	Wind power					
	Other renewable					
Biomass		Jan 2009	Jan 2009			
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane						
Fuel switch						
Manure management		Jan 2009	Jan 2009			
Waste / wastewater treatment						
Energy efficiency						
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 1 July 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Raman Venkata Kakaraparthi

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas		Jan 2009				
Renewables	*Hydro power*	Jan 2009			Jan 2009	Jan 2009
	Wind power	Jan 2009	Jan 2009			
	Other renewable					
Biomass		Jan 2009				
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery		Jan 2009	Jan 2009	Jan 2009		
Efficiency of thermal power plants				Jan 2009		
Coal mine methane						
Fuel switch				Jan 2009		
Manure management						
Waste / wastewater treatment		Jan 2009				
Energy efficiency		Jan 2009	Jan 2009	Jan 2009		
N_2O						
HFCs		Jan 2009	Jan 2009			
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery				Jan 2009		
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services