VALIDATION REPORT

"São Domingos II Hydroelectric Project" in Brazil

REPORT NO. 2008-0706

REVISION NO. 02

DET NORSKE VERITAS

VALIDATION REPORT

DET NORSKE VERITAS
CERTIFICATION AS

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Approved by: Michael Lehmann	Organisational unit: Climate Change Services
Client: Santa Cruz Power Corporation Usinas Hidroelétricas S/A	Client ref.: Hélcio Garcia Camarinha

Project Name: "São Domingos II Hydroelectric Project"
Country: Brazil
Methodology: ACM0002
Version: 8
GHG reducing Measure/Technology: Power generation with hydro resources
ER estimate: 363 675 tCO_2e over 10-years
Size
☒ Large Scale
☐ Small Scale
Validation Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

This validation report summarizes the findings of the validation. The only changes made to this version of the validation report compared to the validation report rev. 01 dated 7 July 2009 referred to in the letter of approval of the DNA of Brazil are linked to the status of issuance of the letter of approval by the DNA of Brazil and the corrections in this validation report due to the incorporation of the information submitted in response to the request for review regarding the suitability of input values to the investment analysis, prevailing practice barrier and common practice analysis.

In summary, it is DNV's opinion that the "São Domingos II Hydroelectric Project" in Brazil, as described in the PDD (Version 04 of 30 March 2010), meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002 (version 8). DNV thus requests the registration of the project as a CDM project activity.

Report No.:	Date of this revision:	Rev. No.
2008-0706	2010-04-01	02

Report title:
"São Domingos II Hydroelectric Project" in Brazil

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Key words:
Climate Change
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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
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
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

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VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the "São Domingos II Hydroelectric Project" in Brazil. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The Project participant is Santa Cruz Power Corporation Usinas Hidroelétricas S/A of Brazil. The host Party Brazil meets all relevant participation requirements.

The project is a grid-connected renewable energy project activity, displacing fossil fuel based grid electricity with electricity generated from a hydroelectric power plant and thus resulting in the reduction of emissions of greenhouse gases in the energy sector.

The project correctly applies ACM0002 (version 8) – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

By generating renewable energy which will displace fossil fuel based grid electricity, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be 363 675 tCO_2e over the selected 10-years crediting period. The emission reduction forecast has been checked and it is deemed likely that the state amount is achieved given that the underlying assumptions do not change.

The monitoring methodology has been correctly applied. The monitoring plan sufficiently specifies the monitoring requirements. Adequate training and monitoring procedures have been implemented.

Local stakeholders, such as the Municipal Government and City Councils, State Attorney, State and Municipal Environmental Agencies, the Brazilian forum of NGOs and communities associations, were invited to comment on the project, in accordance with the requirements of the Brazilian DNA. The comments received were properly addressed.

In summary, it is DNV's opinion that the "São Domingos II Hydroelectric Project", as described in the revised project design document, Version 04 of 30 March 2010 meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002 (version 8). Hence, DNV will request the registration of the "São Domingos II Hydroelectric Project" as a CDM project activity.

2 INTRODUCTION

Santa Cruz Power Corporation Usinas Hidroelétricas S/A has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the "São Domingos II Hydroelectric Project", located in the municipality of São Domingos, Goiás State, Brazil (hereafter called "the project"). This validation report summarizes the findings of the validation of the project, performed 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 modalities and procedures and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects 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).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 (version 8) /39/.

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

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

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

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

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

/1/ Project Design Document for the "São Domingos II Hydroelectric Project". Version 01 of 14 March 2008.

/2/ Project Design Document for the "São Domingos II Hydroelectric Project". Version 04 of 30 March 2010.

/3/ Feasibility Study, issued on 11 July 2005, by Rischbieter Engenharia Indústria e Comércio Ltda (Document Number: 101.01.02.003.000).

/4/ ANEEL (Electric Energy National Agency): Authorization as Independent Power Producer (IPP) for Santa Cruz power corporation. Resolution nº 510, issued on 26 November 2001.

/5/ ANEEL (Electric Energy National Agency): Change in the type of the company from Ltda to S.A and the quantity of turbines in the Energy National Agent (ANEEL). Dispatch n° 1892, issued on 18 August 2006.

/6/ Stakeholder process: List of the entities invited for the local stakeholders' consultation process, invitation letters and receipt notes confirming that the consulted entities received the invitation letter for comments.

/7/ DNV: CDM Validation commercial proposal sent by DNV to CountourGlobal, on 01 October 2007.

/8/ Contract signature between DNV and CountourGlobal for validation services, signed on 12 February 2008.

/9/ E-mail from CountourGlobal to DNV, on 07 May 2008, where the PDD was sent to validation. Period for comments: 16 May 08 - 14 Jun 08.

/10/ Power Purchase Agreement (PPA), contract N° 3637/2006 – 21440SE, signed between Santa Cruz Power – SCP and AES – Sul Distribuidora Gaúcha de Energia S.A. – AES – SUL, on 17 January 2007.

/11/ ANEEL (Electric Energy National Agency): Registration of the plant in the National Electricity Agency: Dispatch N° 785, issued on 19 April 2006.

/12/ ANEEL (Electric Energy National Agency): Database containing public available information regarding the "Brazilian Capacity Generation".
Available at: http://www.aneel.gov.br/area.cfm?idArea=15

/13/ Eletrobrás: "Diretrizes para projetos de PCH" (Guidelines for small hydroelectric project in Brazil).
Available at: http://www.eletrica.ufu.br/siteatual/laboratorios/nerfae/pch/cap4.PDF

/14/ Civil work contract, signed on 30 March 2007 between Santa Cruz Corporation Usinas Hidroelétricas S.A. and CONSTRUCAP.

/15/ Investment Analysis Spreadsheet: “CL 6 Investment Analysis june 09.xls”

/16/ Supporting documents, contracts and proposals related to the main equipments listed in the Investment Analysis Spreadsheet:

- Commercial proposal issued on 07 July 2005 by ALSTON: equipment supplier of turbines, generators and complementary equipments;
- Commercial proposal issued on 16 May 2006 by GEVISA: equipment supplier of generators and complementary equipments;
- Commercial proposal issued on 19 June 2006 by AREVA: equipment supplier of substation, control panel and complementary equipments;
- Commercial proposal issued on 03 July 2006 by TERRAM: civil and engineering works;
- Commercial proposal issued on 10 October 2006 by MOLLER: equipment supplier of pipes, floodgate and rails.

/17/ Major investment evidences after the civil work contract with CONSTRUCAP:

- Contract signed on 25 May 2007, between Santa Cruz Power Corporation Usinas Hidroelétricas S/A and WEG Equipamentos Elétricos S.A., in order to provide: electrical generators, auxiliary equipments, construction supervision, start-up and transport of equipments;
- Contract signed on 04 July 2007, between Santa Cruz Power Corporation Usinas Hidroelétricas S/A and HISA – Hidráulica Industrial S.A. Indústria e Comércio, in order to provide: hydro turbines, auxiliary equipments, installation and engineering services;
- Commercial proposal, issued on 14 November 2007, by Petrofisa do Brasil Ltda, in order to provide: pipes and accessories;
- Commercial proposal, issued on 22 January 2008, by RIBASA Indústria de Base, in order to provide: engineering, transport, construction, project management and web system;
- Contract signed on 31 January 2008, between Santa Cruz Power Corporation Usinas Hidroelétricas S/A and WEG Equipamentos Elétricos S.A. - Transformadores, in order to provide: electrical transformers;
- Contract signed on 05 May 2008, between Santa Cruz Power Corporation Usinas Hidroelétricas S/A and GRAMEYER Equipamentos Eletrônicos Ltda., in order to provide: electrical equipments;
- Contract signed on 07 May 2008, between Santa Cruz Power Corporation Usinas Hidroelétricas S/A and Bremer and Marcovil Metalomecânica Ltda, in order to provide: heavy mechanical equipments;
- Contract signed on 14 July 2008, between Santa Cruz Power Corporation Usinas Hidroelétricas S/A and FEBA Indústria Mecânica Ltda, in order to provide: electrical equipments and services;
- Contract signed on 11 August 2008, between Santa Cruz Power Corporation Usinas Hidroelétricas S/A and A.S.T.J. Montagem e Manutenção Industrial Ltda., in order to provide: pipelines and construction services.

/18/ Common practice analysis. Electronic spreadsheet: “CL 8 Common practice analysis.xls”.

/19/ Brazilian DNA - Interministerial Commission on Global Climate Change / Comissão Interministerial de Mudança Global do Clima (CIMGC).
Website: http://www.mct.gov.br/index.php/content/view/13986.html

/20/ Resolutions of the Interministerial Commission as Designated National Authority under the Clean Development Mechanism, published by the Brazilian DNA:

- Resolution no. 1, of September 11, 2003: Establishes the procedures for approval of project activities under the Clean Development Mechanism of the Kyoto Protocol and makes other provisions. Approved by Administrative Ruling no. 863, of November 27, 2003 and published in the Federal Official Gazette of December 2, 2003;
- Resolution no. 7, of March 5, 2008: Amends resolutions no. 1, no. 2, no. 3 and no. 4 of this same Commission concerning the invitations for comments sent by project proponents to the stakeholders involved, interested and/or affected by project activities under the Clean Development Mechanism and provides other measures.

/21/ Emission factor of the Brazilian electricity grid for the year 2007, published by the Brazilian DNA.
Available at: http://www.mct.gov.br/index.php/content/view/74691.html

/22/ RIMA – Relatório de Impacto ao Meio Ambiente (Environmental Impact Report), issued in October 2001.

/23/ EIA – Estudo de Impacto Ambiental (Environmental Impact Study), issued on 01 October 2001.

/24/ Installation and Environmental License, issued by the Environmental Agency of Goias State, on 04 December 2006 and valid until 25 June 2007. Process N° 5601.38981/2001-1. License N° 400/2005.

/25/ Installation and Environmental License, issued by the Environmental Agency of Goias State, on 29 June 2007 and valid until 25 June 2009. Process N° 5601.38981/2001-1. License N° 214/2007.

/26/ Evidence of CDM consideration: CountourGlobal performed a due diligence (Santa Cruz Investment Proposal), on 06 February 2006, considering the possibility of the CDM revenues from a renewable energy project.

/27/ Investment contract, signed on 21 March 2005, among ARS Energia Ltda, SMA Administração de imóveis e Patrimônio S.A., Tânia Helou, Tatiana Helou and Santa Cruz Power Corporation Usinas Hidroelétricas Ltda., transferring 90% of the shares to ARS.

/28/ Shareholder agreement signed on 31 October 2006, by Contour Global L.P., ARS Energia Ltda and Santa Cruz Power Corporation Usinas Hidroelétricas S.A.

/29/ CountourGlobal: E-mails with the summary of the meeting with Ecoinvest and other CDM developers (MGM, ICF), January 2007.

/30/ E-mails switched from 02 March 2007 to 05 April 2007, between MGM and CountourGlobal regarding the submission and acceptance of the Commercial Proposal sent by MGM and accepted by CountourGlobal.

/31/ Contract signature between CountourGlobal and MGM for consulting services regarding CDM, issued on 28 May 2007.

/32/ Emissions reductions calculation spreadsheet. “Emissions Reductions São Domingos15May09.xls”

/33/ ANEEL (Electric Energy National Agency): Guidelines for the energy auction (Ref. no 002/2006-ANEEL), issued on 07 June 2006.

/34/ CCEE – Camara Comercializadora de Energia Elétrica / Electric Energy Commercial Chamber: Historical spot price or PLD: from 2002 to October 2006, taken form CCEE website. Available at:
http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=a893f5b4ccd98110VgnV

CM1000005e01010aRCRD

/35/ CCEE – Camara Comercializadora de Energia Elétrica / Electric Energy Commercial Chamber: Historic price for the energy auction in 2005: "Resultado Completo" (Complete Result), taken from CCEE website. Available at: http://www.ccee.org.br/cceeinterdsm/v/index.jsp?contentType=RESULTADO_LEILAO&vgnextoid=5e106db97ad5b010VgnVCM1000005e01010aRCRD&qryRESULTADO-LEILAO-CD-RESULTADO-LEILAO=e2f83afb5f884110VgnVCM1000005e01010a____&x=9&y=7

/36/ CCEE – Camara Comercializadora de Energia Elétrica / Electric Energy Commercial Chamber: Historical spot price or PLD: from October 2006 to March 2007, taken form CCEE website. Available at: http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=a893f5b4ccd98110VgnVCM1000005e01010aRCRD

/37/ Central Bank of Brazil (http://www.bcb.gov.br): Historical SELIC rate, available at: http://www.bcb.gov.br/?COPOMJUROS

/38/ CDM EB: *Validation and Verification Manual*, version 1.

/39/ CDM EB: Approved Consolidated Baseline and Monitoring Methodology ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 8

/40/ CDM EB: *Tool for the demonstration and assessment of additionality*. Version 05.2.

/41/ Comissão Interministerial de Mudança Global do Clima (DNA of Brazil): *Letter of Approval*, issued on 17 September 2009.

/42/ Preliminary Energetic Study, document reference number: 101.01.05.008.001) issued on 11 January 2005 by a third party Rischbieter Engenharia Industria e Comercio Ltda

/43/ CDM EB: Tool to calculate the emission factor for an electricity system. Version 1.1.

Main changes between the version of the PDD published for the 30 days stakeholder commenting period and the final version submitted for registration are:

1) Installed capacity updated, from 24 MW to 24.3 MW;
2) Additional information included in section A.4.3 regarding the mini-central and transmission lines;
3) Update of the estimated amount of emission reductions over the chosen crediting period;
4) Section C of the PDD was updated: crediting period has shifted from 7-years (renewable) to 10-years (fixed) crediting period, the starting date of the project activity was re-defined as 30 March 2007, the starting date of the crediting period was re-defined as 01 January 2010;
5) Update of the version of ACM0002, from version 7 to version 8;
6) Updated information regarding the emission factor of the Brazilian grid system;
7) Additional information was included in section B.5 of the PDD regarding the serious consideration of the CDM, inclusion of one new alternative scenario, complementary information regarding the financial analysis and sensitivity analysis;
8) Monitoring plan was revised;
9) Section E of the PDD was updated with additional information regarding the local stakeholders consultation process;
10) Contact information on participants was updated;
11) "Annex 5 – Project Timeline" was included in the PDD;
12) Changes related to the CARs and CLs identified in the DNV's validation report;

13) Corrections due to the incorporation of the information submitted in response to the request for review regarding the suitability of input values to the investment analysis, prevailing practice barrier and common practice analysis.

After reviewing the PDD (Version 04 of 30 March 2010), DNV issued this final validation report and opinion.

3.2 Follow-up Interviews with Project Stakeholders

On 9 October 2008, a site visit was made in Contour Global's office in São Paulo / SP; on 10 October 2008, a site visit was made to the project activity facilities in São Domingos / GO. Representatives of the project owner, Contour Global and the project consultant MGM International were interviewed to resolve the issues identified during the desk review of the PDD.

Table below provides the information regarding the issues discussed during the site visits:

	Date	Name	Organization	Topic
/44/	09-10 Oct 2008	Flávio José Costa Vaz	Contour Global	• Project starting date • Additionality • Monitoring plan • Emission reductions estimation • Environmental Licenses and legal compliance • Stakeholders consultation process
/45/	09-10 Oct 2008	Luiz Romeo Pereira D'Andrea	Contour Global	
/46/	09-10 Oct 2008	Victor Pulz Filho	MGM International	
/47/	09-10 Oct 2008	Rocio Rodriguez	MGM International	
/48/	09-10 Oct 2008	Leandra Reis	MGM International	

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customized for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It 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 validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "São Domingos II Hydroelectric Project" project is enclosed in Appendix A to this report.

Findings established during the validation 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.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a c**orrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

3.4 Internal Quality Control

The validation report 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.

3.5 Validation Team

The validation team consisted of the following personnel:

Role/Qualification	***Last Name***	***First Name***	***Country***	***Type of involvement***					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
CDM validator / technical team leader	Leiroz	Andrea	Brazil	x			x		
CDM validator	Costa	David	Brazil	x	x	x			
Technical reviewer (draft, applicant)	Deng	Cuiping	China					x	
Technical reviewer (draft)	Viddal	Mari	Norway					x	
Technical reviewer (final, applicant)	Flagstad	Ole A	Norway					x	
Technical reviewer (final)	Yang	Weidong	USA					x	

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

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.
The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation (Version 04 of 30 March 2010) /2/.

4.1 Participation Requirements

The project participant is Santa Cruz Power Corporation Usinas Hidroelétricas S/A of Brazil. The host Party Brazil meets all relevant participation requirements. Brazil has ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 28 February 1994, and the Kyoto Protocol on 23 August 2002. No participating Annex I Party is yet identified.

No public funding is involved, and the validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.

4.2 Project Design

The "São Domingos II Hydroelectric Project" involves the construction of hydroelectric power plant located in the municipality of São Domingos, Goiás State, Brazil. Total installed capacity of the Project will be 24.3 MW, with a predicted power supply to the grid of 197 435 MWh per year. The project is a new reservoir type hydropower plant with power density of 16 W/m^2 /11/. The expected load factor is 92.75%. The plant is connected to the Brazilian interconnected grid.

The project design engineering reflects good practice. São Domingos II utilizes three Francis turbines with an installed capacity of 8.291 MW each and three generators with an installed capacity of 9 000 kVA each. Copies of the Feasibility Study /3/ and the Power Purchase Agreement (PPA) /10/, as well as the registration of the plant in the National Electricity Agency (ANEEL) /11/ were provided by the project participant during the site visit on 9 - 10 October 2008. It was confirmed, through the assessment of the referred documents, the estimated installed capacity of the power generators is 24.3 MW.

The surface area at the full reservoir level is equivalent to 1.5 km^2. Therefore, the power density is around 16 W/m^2. As the project is a hydro power station with power density greater than 10 W/m^2, no project emissions have to be considered according to ACM0002 (version 8).

A 10-years fixed crediting period is selected, starting on 01 January 2010 or on the date of registration of the CDM project activity, whichever is later. The starting date of the project activity is 30 March 2007, which corresponds to the date of civil work contract signature /14/. The expected operational lifetime is 40 years, which was based on the experience of the project participant. DNV was able to verify, through documental evidence issued by Eletrobrás /13/, that the average lifetime for small hydro power plants in Brazil is estimated to be 50 years. Therefore, the information provided by the project participants about the expected operational lifetime of 40 years is acceptable.

The project is expected decrease the dependence on fossil fuels, contribute to better work conditions and revenue distribution, increase job opportunities and contribute to regional integration and connection with other sectors, thus contributing to sustainable development objectives of the Brazilian Government.

4.3 Baseline Determination

The project applies the approved consolidated baseline methodology ACM0002 (version 8) - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" /39/.

The applied baseline methodology is justified as it has been demonstrated that the proposed project activity fulfils the following criteria:

- DNV was able to confirm, by reviewing documental evidences – /3/ /10/ /11/ /14/ – and the site visit, that the project is a grid connected hydropower plant with a newly built reservoir, and the power density of the project is 16 W/m^2, which is greater than 4 W/m^2. The total installed capacity of the project is 24.3 MW.
- The project is connected to the Brazilian Integrated Grid System (SIN), whose geographical and system boundaries are clearly identified and information on the characteristics of the grid is available /21/.

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 large hydro and thermal power plants.

The grid emission factor is determined as a combined margin consisting of the combination of operating margin and build margin factors and will be calculated *ex-post* for the fixed 10-years crediting period (see section 4.6).

The selected sources and gases are justified for the project activity:

	GHGs involved	*Description*
Baseline emissions	CO_2	*Brazilian Integrated Grid System (SIN)*
Project emissions	*N/A*	*Project emission is regarded as zero as the project is a renewable energy (hydro power) project with power density of approximately 16 W/m^2 and thus greater than 10 W/m^2*
Leakage	*N/A*	*There is no leakage that need to be considered in applying this methodology*

The application of the baseline methodology is transparent and conservative.

4.4 Additionality

In accordance with ACM0002 (version 8), the additionality of the project is demonstrated through the "*Tool for the demonstration and assessment of additionality*" /40/.

4.4.1 CDM consideration and continued action to secure CDM status

The starting date of the proposed project activity is 30 March 2007, which is the date of civil work contract signature /14/. It is DNV's opinion that this date correctly represents the earliest date of financial commitment of the project activity, as the purchase contracts of the main equipment and services suppliers (turbines, generators, electrical equipments, mechanical equipments, pipelines, engineering services, among other issues) /17/ were signed after this date, from 25 May 2007 onwards.

The serious consideration of CDM prior to project start was demonstrated through the first due diligence /26/ performed by Contour Global, a company seeking for renewable energy generation projects eligible for Kyoto Protocol under the CDM Mechanism, in 06 February 2006. After some months of negotiation among Contour Global and the two major shareholders of Santa Cruz (SMA, a local commercial real estate company, and ARS, an energy trading and development company), Contour Global bought a participation of Santa Cruz, through the shareholder agreement /28/ signed on 31 October 2006, considering the possibility of the CDM revenues from a renewable energy project.

As a consequence, in order to proceed with the CDM, Contour Global hired personnel to be in charge of the project and to contact several CDM consulting firms /29/. In March 2007 Contour Global decided to accept the commercial proposal of MGM International – /30/ /31/

– to start with the PDD development and to provide support for the other activities corresponding to the CDM cycle.

The following timeline of project implementation demonstrates that the CDM incentives were considered essential in the decision to invest in the project activity, as well as that real and continuous actions to secure CDM registration were undertaken in parallel with the implementation of the project:

- On 26 November 2001: Authorization as Independent Power Producer (IPP) for Santa Cruz power corporation. Resolution nº 510, issued on 26 November 2001, by ANEEL (Electric Energy National Agency) /4/;
- On 21 March 2005: Investment contract signed among ARS Energia Ltda, SMA Administração de imóveis e Patrimônio S.A., Tânia Helou, Tatiana Helou and Santa Cruz Power Corporation Usinas Hidroelétricas Ltda., transferring 90% of the shares to ARS /27/;
- On 06 February 2006: CountourGlobal performed a due diligence (Santa Cruz Investment Proposal), considering the possibility of the CDM revenues from a renewable energy project /26/;
- On 19 April 2006: Registration of the plant in ANEEL (Electric Energy National Agency) through the “Dispatch N° 785” /11/;
- On 18 August 2006: Change in the type of the company from Ltda to S.A and the quantity of turbines in ANEEL (Electric Energy National Agency) through the “Dispatch n° 1892” /5/;
- On 31 October 2006: Shareholder agreement signed by Contour Global L.P., ARS Energia Ltda and Santa Cruz Power Corporation Usinas Hidroelétricas S.A., where ContourGlobal bought a participation in the company (Santa Cruz) /28/;
- In January 2007: Meeting with CDM consulting companies /29/;
- On 17 January 2007: Power Purchase Agreement (PPA), contract N° 3637/2006 – 21440SE, signed between Santa Cruz Power – SCP and AES – Sul Distribuidora Gaúcha de Energia S.A. – AES – SUL /10/;
- From 02 March 2007 to 05 April 2007: E-mails switched between MGM and CountourGlobal regarding the submission and acceptance of the Commercial Proposal sent by MGM and accepted by CountourGlobal /30/;
- On 30 March 2007: Civil work contract, signed between Santa Cruz Corporation Usinas Hidroelétricas S.A. and CONSTRUCAP /14/;
- On 28 May 2007: Contract signature between CountourGlobal and MGM for consulting services regarding CDM /31/;
- On 29 June 2007: Installation and Environmental License, issued by the Environmental Agency of Goias State, valid until 25 June 2009. Process N° 5601.38981/2001-1. License N° 214/2007 /25/;
- On 01 October 2007: CDM Validation commercial proposal sent by DNV to CountourGlobal /7/;
- On 30 October 2007: Beginning of the local stakeholders’ consultation process /6/;
- On 12 February 2008: Contract signature between DNV and CountourGlobal for validation services /8/;
- On 07 May 2008: E-mail from CountourGlobal to DNV, where the PDD was sent to validation. Period for comments by global stakeholders: 16 May 08 - 14 Jun 08 /9/;
- On 09 -10 October 2008: Site visit performed by DNV.

By verifying all evidences mentioned above, DNV has confirmed that these evidences are reliable and demonstrate that incentives of the CDM were a decisive factor in the project

participant's decision to proceed with the project activity and that continuing and real actions were taken to secure CDM status for the project activity in parallel with its implementation.

4.4.2 Identification of alternatives to the project activity:

Three possible baseline scenarios have been identified and discussed.

a) the continuation of the current situation with the supply of electricity from the Brazilian interconnected grid;

b) the proposed project activity without consideration of CDM: construction of a new hydroelectricity generation plant with installed capacity of 24.3 MW connected to the grid, but not undertaken as a CDM project activity; and

c) the installation of new thermal power plants in the Brazilian electricity system in order to supply the country's electricity demand.

These scenarios are in compliance with all applicable legal and regulatory requirements. DNV considers the list of realistic and credible alternatives to be complete.

4.4.3 Investment analysis: Choice of approach

As the proposed project generates financial and economic benefits other than CDM related income through the sales of electricity and the alternative for the baseline scenario of the proposed project is not a similar investment project, a benchmark analysis (option III) is justified for conducting the investment analysis.

4.4.4 Investment analysis: Benchmark selection

The benchmark analysis is made by comparing the project IRR (after taxes) with the more conservative opportunity cost in the Brazilian economy, known as "SELIC" ("Sistema Especial de Liquidação e Custódia" / Special System of Clearance and Custody), which is the Basic Interest Rate set by the "Banco Central do Brasil" (Central Bank of Brazil, available at: http://www.portalbrasil.net/indices_selic.htm), which represents the expected return of a low-risk investment fund. SELIC rate is the weighted average of the rates traded in overnight repurchase agreements backed by government bonds.

The basis for the discount rate is the SELIC rate set by the Central Bank of Brazil (http://www.bcb.gov.br). The project involves an investment above 5 millions Reais (BRL$) in one phase.

The source of the information regarding the value for the SELIC rate of 14.54% (average SELIC for the period from July 2006 to October 2006) was assessed and confirmed by DNV.

The chosen period from July 2006 to October 2006 was the period used during the financial closure. The financial closure is the Shareholder Agreement, signed on 31 October 2006, between Contour Global L.P., ARS Energia Ltda and Santa Cruz Power Corporation Usinas Hidroelétricas S.A., where ContourGlobal bought a participation in the company (Santa Cruz), considering the possibility of the CDM revenues.

DNV was able to assess historical values of SELIC rate through the official website of the Central Bank of Brazil /37/. It was verified that average SELIC rate for the period from July 2006 to October 2006 was the lowest value registered since 1996 up to October 2006. In other words, the larger the period considered before this date, the higher would be the average SELIC rate and consequently the benchmark. Therefore, even considering a small period of time, from July 2006 to October 2006, for the determination of the average SELIC rate, the average value of 14.54% is considered conservative and appropriate by DNV.

Hence, the use of SELIC rate as a benchmark is considered reasonable by DNV, considering the fact that it comes from a credible national source of information, as Central Bank of Brazil, and it was already used in other registered CDM projects as a financial indicator.

4.4.5 Investment analysis: Input parameters

DNV compared all input parameters for the financial analysis included in the spreadsheet /15/ with the parameters stated in the internal documents of CountourGlobal's financial department, contracts and proposals related to the main equipments presented in the investment analysis spreadsheet.

The total investment is 124.478 million BRL /15/ based on information available at the time of the investment decision taken by the project participant and considers the investment made in equipment (turbines, generators, pipes, floodgate and rail, control panel, substation and electronic components), services (project management, engineering and civil works) and other issues such as environmental permits, contingences, etc. These input parameters were based on commercial proposals received /16/, which were issued from July 2005 to October 2006, and were verified by DNV. Although the estimated values are based on commercial proposals received since July 2005, the project participants considered that the values presented in the commercial proposals was still valid for the time the investment decision was made (through the shareholder agreement signed on 31 October 2006 /28/) as the prices were not expected to vary significantly. DNV considers that the explanation provided by the project participants is reasonable and acceptable.

The operation and maintenance cost corresponds to 5% of the gross revenues. The inputs for all the items considered for the operational and maintenance assumptions were taken from comparable projects and local knowledge of Contour Global internal engineering department. The source for the maintenance parameter was estimated based on information provided by PSR – a local energy consultant. The operation costs figures included man power and the maintenance costs included spare parts and preventive/corrective maintenance.

At the time the project was first evaluated, in 2006, the energy price of BRL 117/MWh was assumed for the base case. The tariff assumed for selling the energy was based on previous energy auctions and market survey. According to CCEE (Camara Comercializadora de Energia Elétrica / Electric Energy Commercial Chamber), historic price for the energy auction in 2005 was R$ 116/MWh /35/. Therefore, the price was chosen observing the market conditions and the previous auction, because at the moment of analysis there was not a PPA available. The PPA /10/ was only signed on 17 January 2007 and the price of the electricity was established as R$ 124/MWh.

The electricity tariff assumed was based on previous energy auctions and market survey. According to CCEE (Camara Comercializadora de Energia Elétrica / Electric Energy Commercial Chamber), the historical price for the energy auction in 2005 was 116 BRL/MWh /35/ and this information is publicly available and it was confirmed by DNV. At the time the project was first evaluated, in 2006, the energy price of 117 BRL/MWh was assumed for the base case. Therefore, the price was chosen observing the market conditions and the previous auction, because there was no PPA available at the moment the analysis was made. The PPA /10/ was signed on 17 January 2007 and the price of the electricity was established as 124 BRL/MWh. In the CDM project activity, 117 BRL/MWh was used, but also for a tariff of 124 BRL /MWh, the IRR is 13.31% and below the benchmark.

Regarding the "Guidelines for the reporting and validation of plant load factors" DNV would like to state that the PLF of 92.75% used in the financial analysis is sourced from the *Preliminary Energetic Study* /42/, issued on 11 January 2005 by a third party for the feasibility study phase. DNV has verified the third party assessment report and the estimated PLF was the basis for the evaluation of the proposed project activity. Thus the PLF of the project activity is in line with the guidance on PLF of Annex 11, EB 48.

Hence it is DNV's opinion that the selection of the PLF of the project activity of 92.75%, which a) has been estimated by third party consultants, b) has been the basis for the evaluation of the technical characteristics of the project and c) the financial analysis, is reasonable.

Tax calculation including tax benefits from interest payments have been described in the financial analysis spreadsheet and checked by DNV. Regarding the tax benefits from interest payments, the company is under "presumed tax" ("lucro presumido", from Portuguese) regime given the fact that the revenues are below the threshold of BRL 48 MM. The presumed tax regime changes the income tax calculation from 34% of Earning Before Taxes (EBT) to 3% of Gross Revenues. Because the company is in the presumed tax regime, there is no tax benefit from the interest payment on the loan given that the base for tax calculation is the revenues and no the EBT.

DNV was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

4.4.6 Investment analysis: Calculation and conclusion

Although the current total installed capacity of the project activity is 24.3 MW, the investment was based on 24 MW, which was the installed capacity considered in the financial analysis at the time of the investment decision. DNV considers that the impact of such difference in the investment analysis is significant and the project would still be considered not economically attractive. In addition, as discussed in the sensitivity analysis, in order to achieve the benchmark of 14.54%, the installed capacity should be significantly higher than 26 MW operating at a full capacity.

The project-IRR calculations were provided in a spreadsheet and verified by DNV /15/. The assumptions used in the calculations were deemed to be correct by DNV. The project-IRR over 32 years, as the period of 30 years of a power purchase agreement /10/ and 2 years for the project construction has been considered in the investment analysis. The IRR without CDM revenues is 12.75 %, which confirms that the project in the absence of CDM benefits is not financially attractive, compared to the benchmark. With CER revenues the project-IRR increases to 15.78 %, which is above the benchmark of 14.54%.

The investment analysis lifetime considered is 32 years. This is considering 30 years of a power purchase agreement and 2 year for project construction.

It is DNV's opinion that the input values used in the investment analysis are considered valid and applicable as they were based on the relevant information available at the time of the investment decision taken by the project participant. The timing of the investment decision and the consistency and appropriateness of the input values with this timing are reasonable. All the input values have been checked by DNV and these were consistently applied in all calculations.

Hence, the input parameters were verified to be valid at the time of decision making and hence in line with the VVM requirements, including requirement of paragraph 109, and section 6 of the Guideline on Investment Analysis, EB 41 Annexure 45, which states the *"Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant"*.

4.4.7 Investment analysis: Sensitivity analysis

The sensitivity analysis was developed through the variation of the values, including the situations when the benchmark is reached, for the parameters related to: electricity sale price, electricity output, capital expenditure and operations & maintenance costs (O&M).

- Electricity sales price variation: The price at which the IRR reaches the benchmark of 14.54% is at BRL 139/MWh, but the most likely price is BRL 117/MWh, which results in an IRR of 12.75%. The electricity sale price of 139 BRL/MWh is not a possible value to be achieved and this was justified through the following documental evidences:
    - The first one is the guidelines for the energy auction (Edital de Leilão n° 002/2006-ANEEL) /33/. In page 11 of this document, the starting price for the auction for hydro projects is established as BRL 125/MWh and BRL

140/MWh for thermal electric projects. Energy auction is a reverse style auction; this means that every time the investor bids a price, it has to be lower than the previous price. Therefore the probability that the price would reach BRL 139/MWh is zero in this case.

- The second evidence is the historical spot price (or PLD), from 2002 until October 2006 (taken form CCEE website) /34/, which was around the time of the analysis for the auction. The maximum spot price for the analyzed period was BRL 135/MWh. This maximum value was reached only during 2 weeks, in January 2002. The probability of reaching BLR 139/MWh was very low.

Regarding the prevision of future prices possibilities, these are usually based on historical data. As already mentioned, according to the historical spot price from 2002 until October 2006, the price of electricity was always below of BLR 139/MWh. In addition, DNV assessed the database of CCEE /36/ considering the period since the financial closure, on 31 October 2006, up to the starting date of the project activity, on 30 March 2007, in order to analyze the behavior of the prices during the referred period, which could be considered as future prices possibilities, taking into account the time when the decision to implement the CDM project was taken. DNV was able to verify that, for the referred period, there is a clear trend showing that the prices have decreased over time, which demonstrates that the price of BLR 139/MWh was not likely to be achieved at that time. Moreover, the variation of electricity generation was not possible since the price of 124 BRL /MWh, which is lower than BRL 139/MWh, and the generation was already established in the PPA, signed on 17 January 2007. From the financial point of view, the revenues are considered fixed and the only possible variation is with a revision of the assured energy granted.

- Capital expenditure (CAPEX): To achieve the benchmark of 14.54%, the capital expenditure would have to be reduced from 5.120 million BRL/MWh to 4.035 million BRL/MWh, representing a reduction of 21% of the capital expenditure. This is unrealistic and unlikely to occur, as the capital expenditure of 5.120 million BRL/MWh was based on the preliminary quotations obtained from the equipment manufacturer and civil works contractor and that no contingency or over costs were included in the budget.
- Operations & Maintenance costs (O&M): As the operation and maintenance costs were set by the project participants as corresponding to 5% of the total revenues, the sensitivity analysis for O&M shows that the impact on the IRR is very low. Even if the O&M costs are eliminated, meaning that the O&M costs are reduced from 5% to 0%, the IRR reaches 13.28%, which is still lower than the benchmark of 14.54%.
- Electricity Output: Considering a total installed capacity of the project as 24.3 MW, with a predicted power supply to the grid of 197 435 MWh/year and an expected load factor is 92.75%, the IRR of the project is 12.75%. In order to achieve the benchmark of 14.54%, the electricity output should be increased to 225.5 GWh per year. This is not to be achieved since it corresponds to a capacity of approximately 26 MW working at 100% of capacity factor for 8.760 hours/year.

Considering the different scenarios created in the sensitivity analysis, through the variation of the parameter's values previously mentioned and without the CERs, the IRR value fluctuates between 12.09% and 14.43%, which is lower than the average SELIC rate of 14.54%. Therefore, the sensitivity analysis shows that even with substantial variation of the key indicators, the project-IRR of the proposed project is lower than the benchmark.

DNV has been able to verify that the variations in the critical parameters in the context of the sensitivity analysis are reasonable and it is DNV's opinion that it is unlikely that the critical parameters will change in order that the IRR reaches the benchmark. Hence, it can be concluded that the project is not financially attractive and thus is additional.

4.4.8 Barrier analysis: Barriers due to prevailing business practice

The regulatory environment for the electricity sector undergoes frequent changes in Brazil, which causes uncertainties for investors and developers of similar hydropower projects.
In addition, DNV was able to assess the public available information, published by ANEEL (Agência Nacional de Energia Elétrica / Electric Energy National Agency), regarding the "Brazilian Capacity Generation" /12/. It was possible to verify that small hydro power plants, with potency between 1 MW and 30 MW, as defined by ANEEL, represents only 2.65% of the total installed capacity in operation in Brazil, while large hydroelectric power plants, with potency higher than 30 MW, as defined by ANEEL, and thermal power plants represents 71.81% and 23.16%, respectively. In addition, considering the power plants under construction in Brazil, the share of small hydro power plants, in terms of installed capacity, represents just 5.61% against 60.10% and 34.41% of large hydro power plants and thermal power plants, respectively. Additionally, considering the power plants with preliminary license that could not start the constructions yet, the small hydro power plants represents 8.34% of the total installed capacity expected to be constructed, which is significantly lower than the 33.65% and 48.90% of the large hydro power plants and thermal power plants that expected to be constructed, respectively.

Through the assessment of this data made publicly available by ANEEL, it is possible to confirm that the prevailing business practice in Brazil has been to construct large-scale hydroelectric plants and natural gas based thermal plants. This common practice has become a barrier to invest in small renewable energy projects similar to São Domingos II Hydroelectric Project.

The essential aspect for the prevailing business practice analysis was focused on the minor participation of small hydro power plants (SHP) in Brazil. DNV assessed an analysis based on data available on September 2006 /12/, which confirms that:

- There were 214 small hydropower plant projects approved in Brazil between 1998 and 2005, which have not started construction yet;

- Small hydropower plants in operation correspond to less than 1.46% of the total electric power generated in the country;

- About 74.65% and 21.54% of the total power generated in Brazil is being generated by large hydro and thermal plants, respectively.

The governmental initiative for the creation of several programs like PROINFA (Programa de Incentivo às Fontes Alternativas de Energia Elétrica / Incentive Program for Power Generation from Renewable Sources) is another evidence that renewable energy projects are not feasible in the Brazilian context and need additional incentives. Although some programs and incentives were launched by the government along the last years, the difficulty to make these initiatives successfully implemented demonstrates the difficulties and barriers faced by the private sector to implement small hydro projects in the country. The main barriers are due to the types of guarantees required and the clauses in the contracts for the project sponsors.

It is possible to conclude that: i) common practice in Brazil has been the construction of large-scale hydroelectric plants and, more recently, natural gas based thermal power plants, and ii) the construction of thermal power plants has been more attractive than the construction of small hydropower plants.

DNV also concludes that the prevailing practice, existing regulatory and policy requirements would have led to the implementation of a technology with higher emissions. These barriers clearly demonstrates the high risk perception of the small hydro power energy market and discourages possible investors from the private sector because the incentives are not enough to guarantee the project profit.

Therefore, DNV was able to verify that the prevailing business practice in Brazil is the construction of large hydro power plants and thermal power plants, but not small hydro power plants with installed capacity similar to the "São Domingos II Hydroelectric Project".

4.4.9 Common practice analysis

A total installed capacity between 1 MW and 30 MW is the range defined as "small hydro power plants" by ANEEL in Brazil. Therefore, the markets' rules applied for São Domingos II small hydro power plant (SHPP) are the same applied for the other SHPP with a range between 1 MW and 30 MW and statistics are separately available for this group of project /12/ as mentioned in the table below, which shows the installed capacity for small hydro power compared to the total installed capacity.

Power Plants in Operation in Brazil

Power Plants in Operation				
Type	**Quantity**	**Installed Capacity in Operation (kW)**	**Potency Assured (kW)**	**%**
CGH	316	182 551	180 950	0.17
EOL	38	712 880	709 284	0.66
PCH	***357***	***3 017 339***	***2 973 182***	***2.77***
SOL	1	20	20	0
UHE	165	75 471 427	75 646 599	70.54
UTE	1 324	28 421 637	25 723 687	23.99
UTN	2	2 007 000	2 007 000	1.87
Total	**2 203**	**109 812 854**	**107 240 722**	100

LEGEND:
PCH: "Pequenas Centrais Hidrelétricas" = Small Hydro Power Plants (with an installed capacity between 1 MW and 30 MW);
UHE: "Usinas Hidroelétricas" = Large Hydro Power Plants (with an installed capacity higher than 30 MW);
UTE: "Unidades Termoelétricas" = Thermal Power Plants.

More importantly, considering the generation in Goias state, which is the region in which the project activity is located, it was verified that there are 15 small hydro power plants (with installed capacity below to 30 MW according to ANEEL definition) in operation in 2010. Taking into consideration the particular characteristics of São Domingos II Hydroelectric Project:

i) it is a small hydro power plant, as defined by ANEEL, with an installed power of 24 MW;
ii) the project itself is defined as IPP - Independent Power Producer;
iii) it is owned by a private entity, and;
iv) the hydro power plant did not apply to PROINFA.

DNV verified that there is no small hydro power plant with similar characteristics to São Domingos II Hydroelectric Project in Goias state as it is shown in the table below:

Small Hydroelectric Power Plant in operation in Goias State

Number	Plant Name	Installed Capacity (MW)	Category*	Comments
1	Alto Araguaia	0.8	SP	SP
2	Irara	30	IPP	PROINFA

3	Lago Azul	3.992	COM	It is been operating since 1990, that is, before the regulation of 1995 that has modified all the Energy Generation Scenario.
4	Rochedo	4	SP	SP
5	Cachoeira do Lavrinha (São Patrício)	3.01	SP	SP
6	Piranhas	18	IPP	PROINFA
7	Santa Edwiges III	11.6	IPP	CDM
8	Santa Edwiges II	13	IPP	CDM
9	Riachão (Ex-Santa Edwiges I)	10.1	PIE	CDM
10	São Domingos II	24.3	IPP	The proposed CDM project activity
11	Mosquitão	30	IPP	PROINFA
12	Planalto	17	IPP	CDM
13	Retiro Velho	18	IPP	PROINFA
14	Mambaí II	12	IPP	PROINFA
15	Jataí	30	IPP	PROINFA

(*) Category Legend:
IPP – Independent Power Producer
SP – Public Service

In conclusion, it can be noticed that São Domingos II could not be considered as common practice since there is no small hydroelectric power plants with similar conditions as the proposed project activity in Goias state, which is the region in which the project is located. The common practice in Brazil is the installation and the operation of large power plants, such as thermoelectric plants and large hydroelectric plants, and therefore Sao Domingos II does not fit in the business as usual type scenario.

4.5 Monitoring

The project applies the approved consolidated monitoring methodology ACM0002 (version 8) - “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” /39/ in combination with “Tool to calculate the emission factor for an electricity system” /43/ for the grid emission factor.

The selected monitoring methodology is applicable for the project activity as it involves grid-connected renewable power generation using hydro energy.

The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

Monitoring of sustainable development indicators is not required by ACM0002, or by the Brazilian DNA. The environmental impacts are considered minor and will be monitored by the hydropower plant and the local environmental authority during the project lifetime.

4.5.1 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 São Domingos II hydropower plant and supplied to the grid will be online measured and constantly monitored using calibrated electricity meters. Data will be recorded on a monthly basis and cross-checked through invoicing system according to standard procedures.

Four power meters will be installed in the project's facility: one meter for each of the 3 generator and other meter counting the total electricity generation in the hydro power plant. The power meters manufacturer is ABB and the model is IDM 144. These meters will be used for internal control and data cross check. For the internal control meters the calibration plan will be defined during the crediting period.

There are also two meters for invoicing purposes (main and back up), to be installed at the point where the energy will be delivered. The power meters manufacturer is Power Measurement and the model is ION 8600 (serial number PT-0804A405-01 and PT-0804A407-01).

All the power meters, to be used as the most credible and accurate source of information for invoicing, will be calibrated annually, in order to ensure their accuracy, which shall not exceed +/- 0.2% of error.

The surface area at full reservoir level will also be yearly measured since the beginning of the crediting period.

The emission factor (EF) for the electricity grid of Brazil, including the OM, BM and CM, will be determined annually ex-post, according to the results of the calculations to be published by the Brazilian DNA /19/, following the requirements of the "Tool to calculate the emission factor for an electricity system".

Moreover, the project participant will make use of the weighted average OM and BM (w_{OM} = 0.5 and w_{BM} = 0.5) for the fixed crediting period of 10 years.

The data will be archived in electronic form and be kept for two years after the end of the last crediting period.

4.5.2 Parameters determined ex-ante

The PDD (Version 04 of 30 March 2010) make use of the values related to emission factor of the Brazilian electricity grid for the year 2007, which is based on the most recent information published by the Brazilian DNA /21/. As verified on Brazilian DNA website /19/ the emission factor of integrated Brazilian grid was calculated according the "Tool to calculate the emission factor for an electricity system".

It is important to highlight that the emission factor of the Brazilian electricity grid for the year 2007, published by the Brazilian DNA, was used by the project participant in the PDD (Version 04 of 30 March 2010), but just in order to estimate the emissions reductions for the crediting period of the project activity.

Therefore, the Combined Margin (CM) value of the emission factor used in the PDD (Version 04 of 30 March 2010) of 0.1842 tCO_2e/MWh, based on data of 2007 as published by the Brazilian DNA, are not be used in the verification process, but need be updated and verified ex-post during the verification process.

4.5.3 Management system and quality assurance

The authority and responsibility for project management, monitoring, measurement, review and reporting has been established, as described in sections B.7.1, B.7.2 and Annex 4 of the PDD (Version 04 of 30 March 2010). The established procedures reflect good monitoring and reporting practices. Training sessions will be held with the equipments manufacturer and all the operating procedures will be explained and established based on the operator's manual.

The operating and maintenance team will coordinate a program of activities based on training and maintenance needs identified during the operation of the power plant. In addition, the operating and maintenance team will be responsible for identifying and developing procedures for project performance reviews and corrective actions on a regular basis.

4.6 Estimate of GHG Emissions

According to ACM0002 (version 8), there are no GHG emissions from the renewable energy project and the leakage of the project is zero.

Baseline emissions are calculated by multiplying the electricity exported by the project activity to the Brazilian grid with a determined grid emissions factor.

The emission reduction calculations have been presented, considering the energy to be delivered to the grid and the Combined Margin, consisting of the average of the operating margin (OM) and build margin (BM) for the Brazilian interconnected grid system.

The combined margin emission coefficient for the Brazilian grid is determined *ex-post* and it will be updated during the verification process in accordance with ACM0002 (version 8) - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" /39/ in combination with "Tool to calculate the emission factor for an electricity system" /43/.

The emission factor of the national grid system is calculated by the Brazilian DNA in accordance to the "Tool to calculate the emission factor for an electricity system (Version 01.1) using national data and/or information published by the official and recognized sources in Brazil, such as BEN (the National Energetic Balance), ANP – Petroleum National Agency, MCT – Ministry of Science and Technology, MME – Ministry of Mines and Energy and ONS – System National Operator.

The Dispatch Data was the option selected for the calculation of the Operating Margin. The average annual value used for the Operating Margin (OM) is 0.2909 tCO_2e/MWh and for the Build Margin (BM) is 0.0775 tCO_2e/MWh. As a result, the Combined Margin (CM) value used for estimating purposes of the emission reductions in the PDD (Version 04 of 30 March 2010) is 0.1842 tCO_2e/MWh, which is calculated using equation 13 of the "Tool to calculate the emission factor for an electricity system".

The Combined Margin (CM), considering the Operating Margin (OM) and for the Build Margin (BM) values, will be determined ex-post during the verification process for determining real emission reductions achieved by the project activity.

The PDD estimated amount of GHG emission reductions from the project is 363 675 tCO_2e during the fixed crediting period (10 years), resulting in estimated average annual emission reductions of 36 368 tCO_2e.

Project participant provided the emission reductions spreadsheet /32/ containing appropriate information regarding the expected amount of renewable electricity to be dispatched to the grid by the hydro power plant and about the emission factor of the Brazilian electricity grid system.

In summary, the GHG calculations are complete and transparent, and the data accuracy has been verified.

4.7 Environmental Impacts

São Domingos II Hydro Power Plant has been granted the Installation Environmental License #400/2005 issued by the Environmental State Agency (AGMA-Agência Goiana do Meio Ambiente) /24/. The permit was issued after an analysis of possible environmental impacts – /22/ and /23/.

Documental evidences were provided by the project participant during the site visit regarding environmental studies, Installation and Environmental Licenses - /22/, /23/, /24/ and /25/.

Therefore, it was confirmed by DNV through the assessment of the referred documents that "São Domingos II Hydroelectric Project" is in accordance to the national and governmental laws and requirements of the host country.

4.8 Comments by Local Stakeholders

The local stakeholder consultation process was performed two times by the project participants. This was necessary due to the changes made in the rules established by the Brazilian DNA to perform the local stakeholder consultation process. Such changes in the rules happened during the validation process of the project activity.

Therefore, the first Local Stakeholder Consultation process was made in October 2007 by the project developer /6/, following the rules established in the Resolution # 1 /20/ issued by CIMGC (Comissão Interministerial de Mudança Global do Clima), the Brazilian DNA.

In March 2008, Resolution # 7 /20/ was published, modifying some of the rules previously established in the Resolution # 1 regarding the local stakeholders' consultation process. Therefore, according to Resolution # 7, the full list of entities that should be consulted by the project sponsor for comments, should be: Municipality, Alderman Chamber, State Environmental Agencies, Municipal Environmental Agencies, Public Ministry, Federal Public Ministry, Brazilian Forum of NGOs and Community Associations.

Hence, the second local stakeholders' consultation process was performed in July 2008 /6/.

Thus, the invitation letters were sent by the project developer to the listed entities, informing that the full content of the Project Design Document, as well as the Annex 3 regarding the contribution of the Project Activity to sustainable development, would be made available in the following internet link:

http://www.mgminter.com/stakeholder/Sao_Domingos_II_Hydroelectric_Project/.

The contact information was also provided in the invitation letters in order to allow the invited entities to send comments, doubts and opinion about the project activity.

As a result, only one comment was received on 18 December 2007 by the "Community Associations and Brazilian NGO and Social Organizations Forum for Environment and Development (FBOMS)" suggesting the adoption of other sustainability criteria, such as the Gold Standard in the PDD. As the Gold Standard criteria is optional, no further action was necessary as the PDD template used is in accordance to the requirements of CDM. Thus, in this context, the project design document was not modified by the project developer.

Project participant provided copies of the invitation letters sent to local stakeholders /6/ and the comments received were included in the PDD (Version 04 of 30 March 2010) /2/.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 14 March 2008 was made publicly available on DNV's climate change website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 16 May 2008 to 14 June 2008 (available at: http://cdm.unfccc.int/Projects/Validation/DB/94OBX4LLICSAINIZFJ7UZBXCCSMG7A/view.html). No comments were received.

APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	No participating Annex I Party is yet identified.
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK Table 2, Section E.4.1
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	DNA of Brazil: Letter of Approval issued on 17 september 2009.
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK Table 2, Section A.3
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK The Brazilian designated national authority for the CDM is the "Comissão Interministerial de Mudança Global do Clima".
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK Brazil has ratified the Kyoto Protocol on 23 August 2002.

Requirement	Reference	Conclusion
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	No participating Annex I Party is yet identified.
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	No participating Annex I Party is yet identified.
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK - Table 2, Section B.3.1
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK - Table 2, Section B.4 to B.7
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK.- Table 2, Section D.
About stakeholder involvement		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK - Table 2, Section E.
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK - The PDD of 14 March 2008 was made publicly available on DNV's climate change website

Requirement	Reference	Conclusion
		and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 16 May 2008 to 14 June 2008. No comments were received.
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK – Table 2, Section B.1.1
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK.
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK.
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK - The project design document conforms to version 03.1 of the CDM-PDD.
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK.

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A. Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR	Yes. The Project is located on the São Domingos River, in the municipality of São Domingos, Goiás State, Brazil. The exact location of the project is defined using GPS coordinates S 13^0 24' 39" latitude, W 46^0 22' 47" longitude.		OK
B. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	The project boundary is clearly defined as the site of the project activity and the system boundary is defined as the Brazilian interconnected grid system to which the project plant will be connected by transmission line.		OK
A.2. Participation Requirements *Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR	The project participant is Santa Cruz Power Corporation Usinas Hidroelétricas S/A of Brazil. The host Party Brazil meets all relevant participation requirements. No		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			participating Annex I Party is yet identified.		
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/	DR	The DNA of Brazil confirmed that the project assists in achieving sustainable development.		OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/	DR	Yes, Brazil fulfils all requirements.		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.		OK
A.3. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.3.1. Does the project design engineering reflect current good practices?	/1/	DR	The project design engineering reflects good practice. São Domingos II utilizes three Francis turbines with an installed capacity of 8.0 MW each and three generators with an installed capacity of 8.1 MW each. Relevant documents related to project design have not been provided to DNV. The following documents are therefore requested:	~~CL 1~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			- copy of the Feasibility Study, in particular the part that presents the estimation of plant capacity, plant generation per year, power density and power dispatched to the grid; - copy of the Power Purchase Agreement; - registration of the plant in the National Electricity Agency.		
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	There was no transfer of technology, as the technology used in the project activity is Brazilian.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	The project documentation does not report about provisions for meeting training and maintenance needs.	~~CL 14~~	OK
A.4. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/	DR	The DNA of Brazil confirmed that the project assists in achieving sustainable development.	--	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project is expected to decrease the dependence on fossil fuels, contribute to better work conditions and revenue distribution, increase job opportunities and contribute to regional integration and connection with other sectors, thus		OK

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			contributing to sustainable development objectives of the Brazilian Government.		
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/	DR	The project applies the approved consolidated baseline methodology ACM0002 (version 8) - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/	DR	Yes. The project i) is a new reservoir type hydropower project with the power density of 16 W/m^2(greater than 4 W/m^2); ii) is connected to an electricity grid, and: iii) the project activities does not involve switching from fossil fuels to renewable energy sources at the site of the project activity		OK
B.2. Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*					
B.2.1. What is the baseline scenario?	/1/	DR	The baseline scenario is that an equivalent of electricity would, in the absence of the		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			project activity, have been generated by the operation of grid-connected large hydro and thermal power plants.		
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR	No.		OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes.		OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Yes.		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Yes.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes. All literature and sources are clearly referenced.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	Yes.		OK
B.3. Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					
B.3.1. Is the project additionality assessed according to the methodology?	/1/	DR	In accordance with ACM0002, the additionality of the project is demonstrated		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			through the "*Tool for the demonstration and assessment of additionality*".		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	The "*Tool for the demonstration and assessment of additionality*" includes the following steps: *Step 1 – Identification of alternatives to the project activity consistent with the current laws and regulations:* The possible baseline scenarios considered are: a) the continuation of the current situation with the supply of electricity from the S-SE-CO Brazilian interconnected grid and b) the proposed project activity without consideration of CDM: construction of a new hydroelectricity generation plan with installed capacity of 24 MW connected to the grid, but not undertaken as a CDM project activity. Both scenarios are in compliance with all applicable legal and regulatory requirements. Only two alternatives were presented in "Step 1" of the PDD. Project proponents are requested to include additional(s) alternative(s) in "Step 1" of the PDD, instead of only two. (CL 3) *Step 2 - Investment analysis:* The investment barrier is being established by the IRR analysis of the project. The project IRR of 12.75 % is below the benchmark IRR selected i.e. the active interest rate in Brazil (SELIC rate of 14.54 %) at the time the	~~CL 3~~	OK

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			investment decision was made. The basis for the discount rate is the SELIC rate set by the Central Bank of Brazil (http://www.bcb.gov.br). The project involves an investment above 5 millions Reais in one phase. Project proponents are requested to include in the PDD the exactly source of the information related to the interest rate in Brazil (SELIC rate of 14.54 %) at the time the investment decision was made, including the period that the benchmark was sourced. (CL 4) A sensitivity analysis has been performed by decreasing and increasing in 5% and 10% the electricity sale price, the exchange rate and the capital expenditure. In the best case the IRR reaches 11.78%, below the benchmark. The sensitivity analysis should not be executed with fixed variations of 5 or 10%. It is the expected variations that are interesting. For parameters with historical values earlier variations should influence on the sensitivity range. (CAR 1) Clarification on the variation for each parameter until the IRR reaches the benchmark and the probability of the occurrence of this scenario is needed. The variation of electricity generation and O&M costs should be included in the sensitivity	~~CL 4~~ ~~CAR 1~~ ~~CL 7~~	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			analysis. (CL 5) The investment analysis spreadsheet which has to be enclosed for the CDM registration was not provided. (CL 8) *Step 3 – Barrier analysis: Sector regulation instability barriers, investment barriers, institutional barriers and barriers due to prevailing business practice are presented.* *a) Barriers due to prevailing business practice:* The regulatory environment for the electricity sector undergoes frequent changes in Brazil, which causes uncertainties for investors and developers of similar hydropower projects. However, the barrier described is of a generic nature. (CL 9) *Step 4 – Common practice analysis:* It was discussed that projects such as "São Domingos II Hydroelectric Project" are not widely observed and commonly carried out in Brazil. It was informed that only 1.5% of the Brazil's installed capacity comes from small-hydro projects. DNV requests document evidences that this is not common practice in the host country.(CL 8)	~~CL 8~~ ~~CL 7~~ ~~CL 8~~	
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	See B.3.2.	~~CAR 1~~ ~~CL 6~~ ~~CL 7~~ ~~CL 8~~	OK

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B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/	DR	The starting date of the project activity is 30 March 2007 with an expected operational lifetime of is 40 years. The starting date of a project activity is the earliest of implementation, construction and real action. Please clarify what event corresponds to the chosen date. Evidence of the project starting date needs to be **provided.** Only two alternatives were presented in "Step 1" of the PDD. Project proponents are requested to include additional(s) alternative(s) in "Step 1" of the PDD, instead of only two.	~~CL 2~~ ~~CL 3~~	OK
B.4. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Since the project has a power density greater than 10W/m^2, there are no emissions from the project itself.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	See B.4.1.		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	See B.4.1.		OK
B.5. Calculation of GHG Emission Reductions – Baseline					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Baseline emissions are calculated by multiplying the electricity exported by the project activity to the S-SE-CO grid with a determined baseline grid emissions factor. The emission reduction calculations have been presented, considering the energy to be delivered to the grid and the Combined Margin, consisting of the average of the operating margin (OM) and build margin (BM) for the S-SE-CO Brazilian grid. The combined margin emission coefficient for the S-SE-CO grid is determined *ex-ante* in accordance with ACM0002 (version 8) which calls the "Tool to calculate the emission factor for an electricity system". The calculations are based on electricity generation data provided by the National Electricity System Operator (ONS) for the electricity generated in the grid in the years 2004-2006. This is the most recent available electricity generation data at the time of PDD submission. As the Brazilian electric grid has more than 50% of low-cost-must-run, the simple		OK

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			adjusted OM method was considered for the determination of the operating margin (OM). The build margin emission coefficient (BM) was calculated considering the most recent 20% power plants capacity additions (in MWh) in the electricity system. The operating margin (OM) emission coefficient is calculated to be 0. 4749 tCO_2e/MWh and the build margin (BM) emission coefficient is 0.0903 tCO_2e/MWh, resulting in a combined margin emission coefficient of 0.2826tCO_2e/MWh (weighted average of the build and operating margin). The PDD estimated amount of GHG emission reductions from the project is 363 675 tCO_2e during the first crediting period (7 years), resulting in estimated average annual emission reductions of 36 368 tCO_2e. 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 reductions. The data used for calculation has to be provided along with the data sources.	~~CL 16~~	
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	See B.5.1.	~~CL 16~~	OK

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B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	See B.5.1.	~~CL 16~~	OK
B.6. Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	There are no leakages from the project.		OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	See B.6.1.		OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	See B.6.1.		OK
B.7. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	The project is expected to reduce CO_2 emissions to the extent of 363 675 tCO_2e (36 368 tCO_2e/year on average) during the first renewable 10-years crediting period.		OK
B.8. Monitoring Methodology *It is assessed whether the project applies an appropriate*					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
monitoring methodology.					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, the approved consolidated monitoring methodology *ACM0002* (version 8) - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" has been used in combination with "Tool to calculate the emission factor for an electricity system" for the grid emission factor.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	The data will be archived in electronic form and be kept for two years after the end of the crediting period.		OK
B.9. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	According to the requirement of EB, DNV was able to verify that the power density is greater than $10W/m^2$, hence no project emissions and leakage emissions need to be considered. However, the size of the reservoir will be monitored annually and this is therefore a project GHG indicator.		OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	See B.9.1		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed	/1/	DR	See B.9.1		OK

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appropriate?					
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR	See B.9.1		OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	See B.9.1		OK
B.9.6. Is the measurement *interval* identified and deemed appropriate?	/1/	DR	See B.9.1		OK
B.9.7. Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1/	DR	See B.9.1		OK
B.9.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	See B.9.1		OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	See B.9.1		OK
B.10. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions	/1/	DR	Details of data to be collected, the frequency of data recording and its format are described in the monitoring plan and deemed to be		OK

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during the crediting period?			adequate. The electricity generated by the hydropower plant and supplied to the grid will be measured hourly and recorded on a monthly basis using calibrated electricity meters. The generated energy by the power plant will be multiplied by the combined margin emission coefficient for the grid. As per ACM0002, electricity sales receipts should be provided for data quality control and cross check. The surface area at full reservoir level will also be measured yearly since the beginning of the crediting period. According to the "Tool to calculate the emission factor for an electricity system", the Operating margin CO2 emission factor (EFOM) and Build margin CO2 emission factor (EFBM) need to be specified ex-ante. However, section B.6.2 of the PDD does not mention all the parameters that need to be available at validation.	~~CL 10~~ ~~CL 11~~	
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	See B.10.1	~~CL 10~~ ~~CL 11~~	OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	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.		OK
B.10.4. Is the measurement *equipment* described and	/1/	DR	Yes. The electricity generated by the		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
deemed appropriate?			hydropower plant and supplied to the grid will be measured hourly and recorded on a monthly basis using calibrated electricity meters.		
B.10.5. Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	See B.10.1	~~CL 10~~ ~~CL 11~~ ~~CL 12~~	OK
B.10.6. Is the measurement *interval* for baseline data identified and deemed appropriate?	/1/	DR	See B.10.1	~~CL 10~~ ~~CL 11~~	OK
B.10.7. Is the registration, *monitoring, measurement* and *reporting* procedure defined?	/1/	DR	The authority and responsibility for project management, monitoring, measurement, review and reporting has been established.		OK
B.10.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	The project documentation does not report about provisions for meeting training and maintenance needs. There is no information regarding calibration intervals.	~~CL 14~~ ~~CL 9~~	OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Yes. The procedures for day-to-day records handling are identified in the project documentation.		OK
B.11. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data	/1/	DR	According to ACM0002 version 8, no leakage emissions need to be considered.		OK

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necessary for determining leakage?			According to the requirement of EB, DNV was able to verify that the power density is greater than 10W/m^2, hence no project emissions and leakage emissions need to be considered. However, the size of the reservoir will be monitored annually and this is therefore a project GHG indicator.		
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1/	DR	See B.6.2		OK
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1/	DR	See B.6.2		OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	Neither ACM0002 nor Resolution 1 of the Brazilian DNA requires the monitoring of social or environmental indicators.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	See B.12.1.		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host	/1/	DR	See B.12.1.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Country?					
B.13. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR	The authority and responsibility for project management, monitoring, measurement, review and reporting has been established. Responsibilities and authorities for organizing and training of the staff in the appropriate monitoring, measurement and reporting techniques are not clearly defined.	~~CL 13~~	OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	The project documentation does not report about provisions for meeting training and maintenance needs.	~~CL 14~~	OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	No unintended emissions are foreseen.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	There are no procedures identified for project performance reviews and corrective actions.	~~CL 15~~	OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	See B.13.3.	~~CL 15~~	OK
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are*					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR	The starting date of the project activity is 30 March 2007 with an expected operational lifetime of is 40 years. The starting date of a project activity is the earliest of implementation, construction and real action. Please clarify what event corresponds to the chosen date. Evidence of the project starting date needs to be **provided.**	~~CL 2~~	OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	A fixed 10-years crediting period was selected, starting on 01 January 2010 or on the registration date of the CDM project activity, whichever is later.		OK
D. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	São Domingos II Hydro Power Plant has been granted the Installation Environmental License #400/2005 issued by the Environmental State Agency (AGMA-Agência Goiana do Meio Ambiente). The permit was issued after an analysis of possible environmental impacts. DNV requests documented evidences of the issuance of the Installation Environmental License and environmental studies.	~~CL 17~~	OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if	/1/	DR	See D.1.1	~~CL 17~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
yes, is an EIA approved?					
D.1.3. Will the project create any adverse environmental effects?	/1/	DR	See D.1.1	~~CL 17~~	OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	See D.1.1	~~CL 17~~	OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	See D.1.1	~~CL 17~~	OK
D.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	See D.1.1	~~CL 17~~	OK
E. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*					
E.1.1. Have relevant stakeholders been consulted?	/1/	DR	Local stakeholders, such as the Municipal governments and City Councils, State Attorney, State and Municipal Environmental Agencies, the Brazilian forum of NGOs and communities associations, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. However, as per Resolution #7 (5 March 2008) the project participant is requested to invited federal attorney. CL 18	~~CL 18~~ ~~CL 19~~	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	See E.1.1	~~CL 18~~ ~~CL 19~~	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	See E.1.1	~~CL 18~~ ~~CL 19~~	OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Only one comment was received which suggested using other criteria of sustainability, such as using the Gold Standard PDD. No action is required as the PDD template used is as per the requirement of CDM. Thus, the project design did not require any modification. CL 19	~~CL 19~~	OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	See E.1.4		OK

Table 2b: Additional requirements checklist for VVM version 1 (EB 44)

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.5. Letter of approval					
A.1.1 Is the LoA received directly from the DNA or through the project participant.	-	DR	DNA of Brazil: Letter of Approval issued on 17 september 2009. The Letter of Approval was received directly from the project participants and the approval of the project activity, which means that the project has received the Letter of Approval from the DNA of Brazil, was cofirmed through the official website of the DNA of Brazil.	-	OK
A.6. Project design					
A.2.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/2/	DR	Yes. The project activity is described in a transparent and accurate way. The project site, the generation capacity, the turbines and parameters were all confirmed during the site visit.		OK
A.2.2 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	/14/	DR/I	The project is newly built hydropower project constructed before the validation. The construction contract was signed on 30 March 2007.		OK
A.2.3 Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out?	/2/	DR/I	The project is a large scale project, the project activity has an installed capacity of 24.3 MW and the site visit was carried out by qualified DNV auditor on 09 and 10 October 2008.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2.4 Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/2/	DR/I	No. The project is a newly built hydropower project and therefore, there is no alteration of existing installation. This information was also confirmed during the site visit.		OK
A.7. Project emissions not addressed by the methodology					
A.3.1 Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).	/2/	DR	Yes.		OK
A.8. Documentation of baseline emissions					
A.4.1 Documentation of the baseline determination: a. All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. b. All documentation is relevant as well as correctly quoted and interpreted. c. Assumptions and data can be deemed reasonable d. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. e. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity	/2/ /3/ /10/ /11/ /21/ /22/ /23/ /24/ /25/ /32/	DR	a. All assumptions and data used by the project participant are listed in the PDD. b. Yes. c. Yes. d. Yes. e. Yes. The baseline is determined directly as per the methodology ACM0002 (version 8). The methodology has been correctly applied to identify three realistic and credible alternatives for the project: Scenario 1: The proposed project activity not undertaken as a CDM project activity; Scenario 2: Continuation of the current trends of the Brazilian interconnected		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			grid; and Scenario 3: Construction of a thermoelectric power plant with similar installed capacity. *Alternative 1* involves a 24.3 MW hydro power plant not undertaken as a CDM project. This alternative is not financially attractive and faces a prohibitive barrier that prevents its implementation. 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 large hydro and thermal power plants, which are represented by alternatives 2 and 3.		
A.9. Documentation of the calculations					
A.5.1 Algorithms and/or formulae used to determine emission reductions • All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the	/2/ /3/ /10/ /11/ /21/ /22/ /23/ /24/ /25/ /32/	DR	• Yes. The installed capacity is 24.3 MW and the estimated electricity generation in PDD is about 190 GWh per year for the fixed crediting period. This estimation is consistent with the Feasibility Study and the PPA. Other estimations like electricity tariff, construction cost, etc. are also consistent and were verified by DNV as proper.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
data provided in the PDD and supporting files to be submitted for registration.			• Yes. • Yes. The emission reduction calculation in the PDD is consistent with the Tool to calculate the emission factor for an electricity system. The emission reductions are calculated by multiplying the net quantity of electricity generated and dispatched to the grid by "São Domingos II Hydroelectric Project" with the emission factor of the Brazilian Interconnected Grid System, which will be determined ex post.		
A.10. Implementation of the monitoring plan					
A.6.1 How were the plans for implementation of the monitoring plan, data management, QA/QC procedures assessed? To what extent can the emission reductions achieved by the project by monitored ex-post and verified later by a DOE?	/2/ /32/	DR	Plans to implement the monitoring plan, data management, QA/QC procedures in the PDD were assessed during the site visit and are considered reasonable and sufficient. To estimate the emission reductions, only one parameter "the net power generation" needs to be monitored ex-post as per ACM0002. This parameter will be monitored ex-post as per the monitoring plan, and therefore the emission reduction of this project can be verified later by a DOE with reasonable confidence.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.11. CDM consideration prior to starting date					
A.7.1 The prior consideration of CDM for the project activity complies with EB41 annex 46	/14/	DR	The starting date of the proposed project activity is 30 March 2007, which is the date of civil work contract signature /14/. It is DNV's opinion that this date correctly represents the earliest date of the of financial commitment of the project activity, as the purchase contracts of the main equipment suppliers (turbines and generators) were signed after this date. The serious consideration of CDM prior to project start was demonstrated through the first due diligence /26/ performed by Contour Global, a company seeking for renewable energy generation projects eligible for Kyoto Protocol under the CDM Mechanism, in 06 February 2006. After some months of negotiation among Contour Global and the two major shareholders of Santa Cruz (SMA, a local commercial real estate company, and ARS, an energy trading and development company), Contour Global bought a participation of the Santa Cruz, through the shareholder agreement /28/ signed on 31 October 2006, considering the possibility of the CDM revenues from a renewable energy project.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			As a consequence, in order to proceed with the CDM issues, Contour Global hired personnel to be in charge of the issue and to contact several CDM consulting firms /29/. In March 2007 Contour Global decided to accept the commercial proposal of MGM International – /30/ /31/ – to start with the PDD development and to provide support for the other activities corresponding to the CDM cycle. By verifying all evidences mentioned above, DNV has confirmed that these evidences are reliable and thus consider that incentives of the CDM were a decisive factor in the project participant's decision to proceed with the project activity and that continuing and real actions were taken to secure CDM status for the project activity in parallel with its implementation.		

* MoV = Means of Verification, DR= Document Review, I= Interview

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 A sensitivity analysis has been performed by decreasing and increasing in 5% and 10% the electricity sale price, the exchange rate and the capital expenditure. In the best case the IRR reaches 11.78%, below the benchmark. The sensitivity analysis should not be executed with fixed variations of 5 or 10%. It is the expected variations that are interesting. For parameters with historical values earlier variations should influence on the sensitivity range.	B.3.2 B.3.3	Additional information was included in the PDD to shown that the conclusion regarding the financial attractiveness is robust to reasonable variation in the critical assumptions.	Additional information was included in the PDD (Version 04 of 30 March 2010) regarding the sensitivity analysis and the financial spreadsheet /15/ was also provided by the project participant. The sensitivity analysis was developed through the variation of the values for the parameters related to: electricity sale price, exchange rate, capital expenditure and operations & maintenance costs (O&M). These parameters were selected as being the most likely to fluctuate over time. Financial analyses were performed altering each of these parameters and assessing what the impact on the project IRR would be. According to the sensitivity analysis the project is unlikely to be financially attractive due to its IRR remaining lower than the benchmark. The average SELIC for the period July 2006 – October 2006 (financial project analysis) was 14.54%. Considering the different scenarios created in the sensitivity analysis, through the variation of the parameter's

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			values previously mentioned and without the CERs, the IRR value fluctuates between 12.09% and 14.43%, which is lower than the average SELIC rate of 14.54%. In the financial analysis spreadsheet, it is possible to see that the project activity's IRR results in 12.75 % without the CERs, and with the income generated by the CERs results in 15.78%. Therefore, CAR 1 is considered closed.
CAR 2 The project proponent is requested to prove the serious consideration of CDM before project starting date and to prove the continued action for CDM in parallel with the project implementation. This also needs to be elaborated in the PDD, section B.5.	B.3.4	Additional information was included in the PDD to prove the serious consideration of the CDM before project starting date and to prove the continued action in parallel with the project implementation. The timeline was attached in the Annex 5 of the PDD. The supporting documentation was provided to the DOE.	The starting date of the proposed project activity is 30th March 2007, which is considered as a date when a real action of the project activity has begun, and corresponds to the date of civil work contract signature /14/. Contour Global (CG), performed a due diligence, considering the possibility of the CDM revenues from a renewable energy project, in February 2006 /26/. In 31 October 2006, through the shareholder agreement signature /28/, CG bought a participation of the company, considering the possibility of the CDM revenues from a renewable energy project. As a consequence, in

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			order to precede with the CDM issues, Contour Global hired personnel to be in charge of the issue and to contact several CDM consulting firms /29/. In March 2007 Contour Global decided to accept the commercial proposal of MGM International /30/ to start with the PDD development and to provide support for the other activities corresponding to the CDM cycle. Detailed information was included in section B.5 of the PDD (Version 04 of 30 March 2010) to prove the serious consideration of CDM before project starting date. In addition, a timeline was attached in the Annex 5 of the PDD in order to prove the continued action for CDM in parallel with the project implementation. The supporting documental evidences for the timeline were also provided by the project participant. Therefore, CAR 2 is considered closed.
CL 1 Relevant documents related to project design have not been provided to DNV. The following documents are therefore requested: - copy of the Feasibility Study, in	A.3.1	These documents were provided during the validation visit.	Copies of the Feasibility Study /3/ and the Power Purchase Agreement (PPA) /10/, as well as the registration of the plant in the National Electricity Agency (ANEEL) /11/ were provided by the

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
particular the part that presents the estimation of plant capacity, plant generation per year, power density and power dispatched to the grid; - copy of the Power Purchase Agreement; - registration of the plant in the National Electricity Agency.			project participant during the site visit on 09-10 October 2008. Although the PDD states that the installed capacity is 24 MW, it was confirmed, through the assessment of the referred documents, the estimated installed capacity of 24.3 MW and the surface area at the full reservoir level is equivalent to 1.5 km^2. Therefore, the power density is around 16 W/m^2. As the project is a hydro power station with power density greater than 10 W/m^2 no project emissions have to be considered according to ACM0002. The expected amount of electricity to be generated and dispatched to the grid is approximately 190 000 MWh/year. Therefore, CL 1 is considered closed.
CL 2 The starting date of the project activity is 30 March 2007 with an expected operational lifetime of is 40 **years**. The starting date of a project activity is the earliest of implementation, construction and real action. Please clarify what event corresponds to the chosen date. Evidence of the project starting date needs to be provided.	B.3.4 C.1.1	The starting date is on March 2007 and corresponds to the civil work contract signature. Contract provided to the DOE with the timeline.	Project participant provided documental evidences in order to demonstrate the starting date of the project activity, defined as 30 March 2007, which corresponds to the date of civil work contract signature /14/. Therefore, CL 2 is considered closed.
CL 3	B.3.2	Additional alternative was included in	One additional alternative, described as

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Only two alternatives were presented in "Step 1" of the PDD. Project proponents are requested to include additional(s) alternative(s) in "Step 1" of the PDD, instead of only two.		the Step 1 of the PDD.	"Construction of a thermoelectric power plant", was included and discussed in section B.5 of the PDD (Version 04 of 30 March 2010) /2/. Therefore, CL 3 is considered closed.
CL 4 Project proponents are requested to include in the PDD the exactly source of the information related to the interest rate in Brazil (SELIC rate of 14.54 %) at the time the investment decision was made, including the period that the benchmark was sourced.	B.3.2	The source of the information related to the interest rate in Brazil was included in a footnote in the PDD. Information regarding the year and the value for the SELIC rate of 14.54% (average SELIC for the period July 2006 – October 2006) was included in the PDD.	The source of the information regarding the value for the SELIC rate of 14.54% (average SELIC for the period from July 2006 to October 2006) was included in section B.5 of the PDD (Version 04 of 30 March 2010) /2/. Therefore, CL 4 is closed.
CL 5 Clarification on the variation for each parameter until the IRR reaches the benchmark and the probability of the occurrence of this scenario is needed. The variation of electricity generation and O&M costs should be included in the sensitivity analysis.	B.3.2 B.3.3	Information and clarification regarding the variation of each parameter was included in the PDD together with the variation of O&M costs. The variation of electricity generation was not included in the sensitivity analysis since the price and the generation was already established with low probability of variation according to the following explanation. PPA Energy contracts are essentially price times volume contracts or fixed BRL$ /MWh (inflation- adjusted)	The PDD (Version 04 of 30 March 2010) was updated with additional information and clarification regarding the variation of each parameter related to IRR, including the situations when the benchmark is achieved. The variation of electricity generation was not included in the sensitivity analysis since the price and the generation were already established and the variation probability is very low. Therefore, CL 5 is considered closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		times the energy contracted on a take-or-pay basis. In hydroelectric power plants generation, it is necessary to consider the significant mitigation provided by the Assured Energy concept and the Energy Reallocation Mechanism. The assured energy is the amount of energy that a generating plant is entitled to commercialize through bilateral contracts. Assured energy is a number determined by government planners that reflects expected hydrological conditions. That is to say, the Assured Energy value reflects the sustainable production capacity for hydroelectric facilities and it is calculated by running 2000 stochastic simulations (based on observed hydrological data and assuming a 95% confidence interval). Considering this, hydroelectric power plants will generate an amount equal or major to the assured energy 95% of the time. In Sao Domingos II case, ANEEL (The National Energy Agency) granted the project with 22.4 MW of assured energy. This value is the amount of	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		energy established in the power purchase agreement and entitled to commercialize. From the financial point of view, the revenues are considered fixed and the only possible variation is with a revision of the Assured Energy granted; which may be revised every five years up to 5% and capped at 10% for the power plant lifetime. On the other hand, the Energy Reallocation principle consider that, despite the generation of individual hydroelectric power plant is variable, due hydrological conditions, the aggregate generation of all the hydroelectric power plants in the system is more stable. In other words, the Energy Reallocation Mechanism (ERM) tries to minimize the hydrological risk. This mechanism was created to conciliate the need of the centralized dispatch and the exposure minimization of the hydroelectric generator to a spot price. This mechanism must grantee that, under normal operation conditions of the electric sector, the generators will receive the revenue associated with their assured energy through the transfer	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		from generation presenting superavit to the generators presenting deficit. That is to say, individual hydroelectric power plants will meet its contractual obligations. In the unlikely event (5% probability) that the actual aggregate generation is lower than the aggregate Assured Energy, individual hydroelectric power plants will have to settle its pro-rata generation shortfall at prevailing spot energy prices. According to the above exposed there is no sensitivity on energy generation since the price and the generation were already established and the variation probability is very low.	
CL 6 The investment analysis spreadsheet which has to be enclosed for the CDM registration was not provided.	B.3.2 B.3.3	Investment Analysis Spreadsheet was attached.	The investment analysis spreadsheet /15/ was provided by the project participant. The sources of the information and the formulae used were assessed by DNV and considered appropriate. Therefore, CL 6 is considered closed.
CL 7 The regulatory environment for the electricity sector undergoes frequent changes in Brazil, which causes uncertainties for investors and developers of similar hydropower projects.	B.3.2 B.3.3	Additional information was included in the PDD to explain the barrier.	Project participant included additional information in the "Sub-step 3a", section B.5 of the PDD (Version 04 of 30 March 2010) /2/, in order to provide further information regarding frequent

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
However, the barrier described is of a generic nature.			changes, complexity and requirements of the regulatory market for the Brazilian electricity sector. Therefore, CL 7 is considered closed.
CL 8 It was discussed that projects such as "São Domingos II Hydroelectric Project" are not widely observed and commonly carried out in Brazil. It was informed that only 1.5% of the Brazil's installed capacity comes from small-hydro projects. DNV requests document evidences that this is not common practice in the host country.	B.3.2 B.3.3	Additional information was included in the PDD (a figure illustrating the information and the source of data in a footnote). Additional documentation was provided to the DOE.	Project participant provided an electronic spreadsheet /18/ in order to demonstrate the common practice analysis. Additional information and references were also included in the PDD (Version 04 of 30 March 2010) /2/, in order to demonstrate that small hydro power plants do not represent a common practice in Brazil. The total installed capacity from small hydro power plants is indeed not significant (approximately 2.5%) when compared with the total installed capacity of the country. This information was assessed by DNV through the website of ANEEL which is the National Electricity Agency of Brazil. The value of 1.5% stated in the PDD is regarding the fraction of small hydro power plants in operation with an installed capacity range between 20 MW and 28 MW, which is similar to the installed capacity of the project activity. The additional explanation and documental evidences

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			provided by the project participant was considered appropriate and reasonable by DNV. Therefore, CL 8 is considered closed.
CL 9 There is no information regarding calibration intervals.	B.10.8	The electricity generated by the PCH São Domingos II, will be measured and monitored through a Measurement and Invoicing System called SMF; this System consists of Measurement Panel and a telecommunication link (via satellite) that will send data to CCEE[1]. Before its effective operation, SMF system will be calibrated at CELG[2] and Embratel [3] calibration laboratories following the procedures and meeting the standards for domestic and imported equipment. Calibration results will be submitted to CCEE, ONS[4] and ANEEL[5] for approval. CELG will calibrate the meters, and the certifications will be kept by the owner and will be available to the verifier whenever the verifier requires. The equipment will be	Additional information regarding calibration procedures, responsibilities, frequency and accuracy were included in section B.7.2 of the PDD (Version 04 of 30 March 2010) /2/. The energy generated by São Domingos II will be constantly measured and monitored with online measurement and invoicing system according to standard procedures. All the meters will be calibrated annually, in order to ensure their accuracy which shall not less than (+/- 0.2%). Therefore, CL 9 is considered closed.

[1] CCEE: Camara de Comercializaçao de Energia (Chamber of Energy Commerce)
[2] CELG: Centrais Elétricas de Goiás - Concessionaria de Energia Local (Local Energy Franchise)
[3] Embratel: Empresa Brasileira de Telecomunicações (Brazilian Telecommunications Company)
[4] ONS: Operador Nacional do Sistema Eletrico (National Operator of the Electric System)
[5] ANEEL: Agencia Nacional de Energia Elétrica (National Agency of Electrical Energy).

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		calibrated each year, and the calibration certifications will be attached to follow-up reports. If during the year significant reading discrepancies occur, both meters will be calibrated again. Santa Cruz Power Corporation will sign an agreement with CELG, where the latter will monitor, operate and maintain the SMF measurement system. All the meters will be annually calibrated, in order to ensure their accuracy which shall not exceed (+/- 0.2%). If errors larger than those permitted by the regulation are found, meters will be taken out of the panel and will suffer the necessary repairs and calibrations.	
CL 10 As per ACM0002, electricity sales receipts should be provided for data quality control and cross check.	B.10.1 B.10.2 B.10.5 B.10.6	Information regarding quality control and cross check was included in the PDD.	Additional information regarding data quality control and cross check were included in section B.7.2 of the PDD (Version 04 of 30 March 2010) /2/. The energy generated by São Domingos II will be constantly measured and monitored with online measurement and invoicing system according to standard procedures. Therefore, CL 10 is considered closed.
CL 11 According to the "Tool to calculate the	B.10.1	The PDD was updated with the	The PDD (Version 04 of 30 March 2010) make use of the values related to

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
emission factor for an electricity system", the Operating margin CO_2 emission factor (EFOM) and Build margin CO_2 emission factor (EFBM) need to be specified ex-ante. However, section B.6.2 of the PDD does not mention all the parameters that need to be available at validation.	B.10.2 B.10.5 B.10.6	parameter available at validation.	emission factor of the Brazilian electricity grid for the year 2007, which was published by the Brazilian DNA /21/. As verified on Brazilian DNA website /19/ the emission factor of integrated Brazilian grid was calculated according the "Tool to calculate the emission factor for an electricity system". The Dispatch Data was the option selected for the calculation of the Operating Margin. The average annual value used for the Operating Margin (OM) is 0.2909 tCO_2e/MWh and for the Build Margin (BM) is 0.0775 tCO_2e/MWh. As a result, the Combined Margin (CM) value used in the PDD (Version 04 of 30 March 2010) is 0.1842 tCO_2e/MWh, which is calculated using equation 13 of the "Tool to calculate the emission factor for an electricity system". It is important to highlight that the emission factor of the Brazilian electricity grid for the year 2007, published by the Brazilian DNA, was calculated ex-ante by the project participant in the PDD (Version 04 of 30 March 2010), but just in order to estimate the emissions reductions for the crediting period of the project activity. Therefore, the Combined Margin (CM) value used in the PDD (Version 04 of 30 March 2010) of 0.1842 tCO_2e/MWh,

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			based on data of 2007 as published by the Brazilian DNA, shall not be used in the verification process. Consequently, the emission factor (EF) for the electricity grid of Brazil, including the OM, BM and CM, shall be determined annually ex-post, after project's registration, during the verification process, following the requirements of the "Tool to calculate the emission factor for an electricity system". Moreover, the project participant shall make use of the weighted average OM and BM (w_{OM} = 0.5 and w_{BM} = 0.5) for the fixed crediting period of 10 years, unless otherwise specified in the approved methodology which refers to this tool. Therefore, CL 11 is considered closed.
CL 12 The measurement accuracy was not addressed in the PDD and the procedures in place on how to deal with erroneous measurements was not elaborated either.	B.10.5	More information regarding measurement accuracy was included in the PDD.	Additional information regarding the measurement accuracy, which shall not less than (+/- 0.2%), and the procedures to deal with erroneous measurements were included in section B.7.2 of the PDD (Version 04 of 30 March 2010) /2/. If errors larger than those permitted by the regulation are found, the meters will be taken out of the panel and will undergo the necessary repairs and calibrations. If during any of the previous months the reading on the

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
			main meter is not correct (error larger than expected) or the meter does not work properly, total energy generated will be determined first by the back-up meter reading, unless any of the parties proves that this reading is not correct. If back-up meter reading is not correct, the parties together will estimate the correct reading. If the parties do not agree in an estimate regarding the energy generated, the dispute will be solved by an arbiter following standard procedures described in the regulation. Therefore, CL 12 is considered closed.
CL 13 Responsibilities and authorities for organizing and training of the staff in the appropriate monitoring, measurement and reporting techniques are not clearly defined.	B.13.1	The operation and maintenance activities expected for the PCH SD II will include the establishment of development plans and training of the operational team. The pre-operating stage will start three months prior to the beginning of the plant operations. In this period the team will receive three days of training sessions. The operators will assist to the assembling and commissioning of the electro-mechanical equipment. Training sessions will be held with the	According to the explanation provided by project participant, training sessions will be held with the equipments manufacturer and all the operating procedures will be explained and established based on the operator's manual. Additional information regarding responsibilities and authorities for organizing in the appropriate monitoring, measurement and reporting techniques was included in the PDD. Therefore, CL 13 is considered closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		equipments manufacturer and all the operating procedures will be explained and established based on the operator's manual. Testing of the equipment will be carried out as well as simulation of different potential situations that the operator could face during the operational stage. Prior to the beginning of operations a 5 day training session will take place with the maintenance operators to set the standards for team work and develop a maintenance plan. The maintenance plan will include all the equipment and systems required for performing measurements, tests and maintenance verifications. Specialized engineers will be among the maintenance staff that will coordinate and execute all the procedures according to high quality standards. More information regarding responsibilities and authorities for organizing in the appropriate monitoring, measurement and reporting techniques was included in the PDD.	
CL 14 The project documentation does not report	A.3.3	Besides executing the operation and maintenance procedures, the operating	According to the explanation provided by project participant, the operating and

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
about provisions for meeting training and maintenance needs.	B.10.8 B.13.2	and maintenance team will coordinate the following activities: - Reporting for internal and external agents in order to evaluate equipment performance and recommend updates and improvements. - Performing recurring and corrective maintenance activities in case abnormalities are observed in the performance of the equipment. The maintenance program includes services required by the equipment and the civil works. The programmed maintenance activities are divided in 3 groups: 1. Preventive maintenance type 1: Includes cleaning, equipment inspections, filter cleaning and operational trials. All these actions are performed while the units are operating. 2. Preventive maintenance type 2: Includes cleaning and preventive maintenance for the auxiliary equipment and substation. As in	maintenance team will coordinate a program of activities based on training and maintenance needs identified during the operation of the power plant. Therefore, CL 14 is considered closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		type 1, these actions are performed while the units are operating. 3. General maintenance: This type of maintenance corresponds to a preventive maintenance that will require the unit to stop working and its respective penstock to be emptied. The recurrence of this type of maintenance is programmed depending on total hours of operation and occurs within regular intervals of time. Every so often, specialized engineers will coordinate training sessions in different areas such as civil works, electrical and mechanical to keep the staff up to date.	
CL 15 There are no procedures identified for project performance reviews and corrective actions.	B.13.4 B.13.5	The maintenance team will perform preventive and corrective actions on all the plant equipment. The team is responsible for the implementation and execution of the instructions and maintenance procedures according to the manufacturer specifications. In case there is a non recurrent situation there are two types of corrective actions that can be undertaken: - Emergency maintenance: To be	According to the explanation provided by project participant, the operating and maintenance team will be responsible for identifying and developing procedures for project performance reviews and corrective actions on a regular basis. Therefore, CL 15 is considered closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		performed after immediate observation of the event. - Urgent maintenance: To be performed up to 48 hours after observation of the event All of these actions are carried out by the local team. If any of the corrective action requires the intervention of a third party, the maintenance team will coordinate this activity with the local leader. The operational and maintenance activities will be audited by a third party engineer to verify that the procedures follow the standards set in the operator manual.	
CL 16 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 reductions. The data used for calculation has to be provided along with the data sources.	B.5.1 B.5.2 B.5.3	The spreadsheet for the calculation of emission reduction was provided.	Project participant provided the emission reductions spreadsheet /32/ containing appropriate information regarding the expected amount of renewable electricity to be dispatched to the grid by the hydro power plant and about the emission factor of the Brazilian electricity grid system. Therefore, CL 16 is considered closed.
CL 17 DNV requests documented evidences of the	D.1.1 D.1.2 D.1.3 D.1.4	The information was provided during validation visit.	Additional information was provided by the project participant during the site

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
issuance of the Installation Environmental License and environmental studies.	D.1.5 D.1.6		visit regarding environmental studies, Installation and Environmental Licenses - /22/, /23/, /24/ and /25/. Therefore, CL 17 is considered closed.
CL 18 Local stakeholders, such as the Municipal governments and City Councils, State Attorney, State and Municipal Environmental Agencies, the Brazilian forum of NGOs and communities associations, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. However, as per Resolution #7 (5 March 2008) the project participant is requested to invited federal attorney.	E.1.1 E.1.2 E.1.3	The local stakeholder consultation process was done twice. The reason for that was that during the Validation process, the rules established by the Brazilian DNA to perform the local stakeholder consultation process were modified and as a consequence, following an advice of the DNA itself, the process was redone, according to the new rules. The PDD was updated with the information regarding both local stakeholder process.	As a consequence of the changes in the requirements made by the Brazilian DNA regarding the local stakeholder consultation process, a new invitation process for comments from local stakeholders was developed by the project participant. Project participant provided copies of the invitation letters sent to local stakeholders and the comments received were included in the PDD (Version 04 of 30 March 2010) /2/. Therefore, CL 18 is considered closed.
CL 19 The letters sent to the local stakeholders and the comments received are to be provided for evidence.	E.1.1 E.1.2 E.1.3 E.1.4	The letters sent to the local stakeholders and the comments received were provided during the validation visit.	Project participant provided copies of the invitation letters sent to local stakeholders and the comments received were included in the PDD (Version 04 of 30 March 2010) /2/. Therefore, CL 19 is considered closed.
CL 20 Section C.1.2 of the PDD (Version 04 of 30 March 2010) states that the expected operational lifetime of the project activity is	C.1.1	The information regarding the lifetime of the project activity was based on the experience of the project participant and the commonly estimated in the sector	DNV was able to verify, through documental evidence issued by Eletrobrás /13/, that the average lifetime for small hydro power plants in Brazil is

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
40 years. Therefore, project participants are requested to provide documental evidence or reference of this information.		for this issue. Documental evidence for this statement can be found in the guidelines for small hydroelectric project in Brazil delivered by Electrobras.	estimated to be 50 years. Therefore, the information provided by the project participants about the expected operational lifetime of 40 years is acceptable and conservative. CL 20 is considered closed.
CL 21 The value for the SELIC rate of 14.54% was based on the average SELIC for the period from July 2006 to October 2006. Project participants are requested to clarify why this is the correct period to determine interest level (starting in July2006 and ending in October 2006).	B.3.2	The first due diligence performed by Contour Global was in February 2006 and followed by some months of negotiation that ended when it, through the shareholder agreement signature, bought a participation of the company, considering the possibility of the CDM revenues from a renewable energy project. The closure of the financial analysis, after some months of decision making process, was made in October 2006. By this time, the result of the analysis showed that the project IRR is lower than the Brazilian interest rate at this moment; therefore, the project without CDM incentives is financially unattractive. In order to be conservative and to reflect the time for the decision making process, the variation of the SELIC rate for the second half of the year 2006 was considered in the	The additional information provided by the project participants is considered reasonable and acceptable by DNV. Therefore, CL 21 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		investment analysis (from July 2006). Making a sensitivity analysis and extending the period to determine the interest level, it is possible to observe that the interest level will increase when the period is widen, making stronger the results of the analysis because the IRR project is lower than the benchmark. After considering the CDM financial incentives in the project's cash flow; the project IRR is improved.	
CL 22 Regarding the sensitivity analysis, it needs to be extended in order to consider the situations when benchmark is reached. Project participants should make an assessment of the impact in each chosen parameter when benchmark is reached for the scenario without considering the future income of the CERs. Then, the project participants are requested to justify why the parameters cannot change so much, preferably using documental evidences or other references whenever possible.	B.3.2	Sensitivity analysis was performed altering each of the main parameters and assessing what the impact on the project IRR would be when the benchmark is reached. ***Electricity sale price*** The benchmark is reached when the electricity sale price is increased from 117 BRL/MWh to 139 BRL/MWh. The electricity sale price of 139 BRL/MWh is not a possible value and this can be justified through the following documental evidences: 1. The first one is the guidelines for the energy auction (edital de leilão no 002/2006-ANEEL). In	The PDD (Version 04 of 30 March 2010) was updated with additional information and clarification regarding the variation of each parameter related to IRR, including the situation when the benchmark is achieved. The additional information provided by the project participants is considered reasonable and acceptable by DNV. Therefore, CL 22 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		this document in page 11, the starting price for the auction for hydro projects is BLR 125/MWh and BLR 140/MWh for thermal projects. Energy auction is a reverse style auction; this means that every time the investor bids a price, it has to be lower than the previous price. Therefore the probability that the price would reach BLR 139/MWh is zero in this case. 2. The second piece of evidence is the historical spot price (or PLD) from 2002 until October 2006 (taken form CCEE website), which was around the time of the analysis for the auction. Attached is a spreadsheet (PLD Prices) with the spot prices corresponding to the region where Sao Domingos II is located. The maximum spot price for the analyzed period was BLR 135/MWh. This maximum was reached only during 2 weeks, in January 2002. The probability of	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		reaching BLR 139/MWh was very low. ***Capital expenditure*** The benchmark is reached when the capital expenditure is reduced from 5.120 million BRL/MWh to 4.035 million BRL/MWh, that is to say, when the capital expenditure is reduced a 21%. The capex used in the financial analysis corresponds to BLR 5.120/MW. This value is equivalent to the initial budget presented based on the preliminary quotations obtained from the equipment manufacturer and civil works contractor and it can be seen that no contingency is included in the budget. The latter means that the budget is very optimistic because it assumes that there will be no over costs. Based on previous experience with other projects usually a 20% contingency has to be added to the total budget. In addition to this, the budget presented included only the power plant and a local transmission line for connecting to the grid. After a thorough analysis, it was decided that	

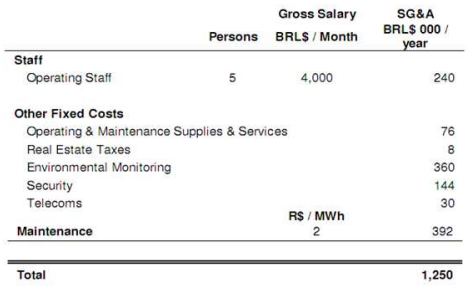
Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		additional capex was required (and not estimated in the preliminary budget presented) for constructing a substation and a longer transmission line that would get a more reliable connection than the initial one. This is why a value of BLR 4035/MW was a non probable value for the construction parameter. ***Operations & Maintenance costs (O&M)*** The sensitivity analysis for O&M shows that the impact on the IRR is very low because the amount of O&M for hydroelectric projects corresponds to a small portion of total revenues. If the O&M costs are eliminated, that is to say, when the O&M costs are reduced from 5% to 0% the IRR is 13.28%, and continue being lower than the benchmark. ***Electricity output*** The benchmark is reached when the electricity output is increased to 225.5 GWh per year. This is not a possible value since it corresponds to a capacity of 26.66 MW working at 100% of	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		capacity factor for 8.746 hours/year. As the capacity of the proposed project activity is 24.3 MW there is no way to generate an electricity output which would produce a project IRR that reaches the benchmark. On the other hand, as was explained before in the validation protocol, the variation of electricity generation was not possible since the price and the generation was already established in the PPA. From the financial point of view, the revenues are considered fixed and the only possible variation is with a revision of the Assured Energy granted. According to the sensitivity analysis the project is unlikely to be financially attractive due to its IRR remaining lower than the benchmark. The average SELIC for the period July 2006 – October 2006 (financial project analysis) was 14.54%. The results of the impact on the project IRR shows that the conclusion regarding the financial attractiveness is robust to the variation in the critical assumptions.	
CL 23	B.3.2	When a sensitivity analysis is	The additional information provided by

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Project participants are requested to include in the sensitivity analysis the parameter "electricity output" or to exchange the parameter "exchange rate" for the "electricity output".		performed for the parameter "electricity output", it is possible to conclude that the benchmark is reached when the electricity output is increased to 225.5 GWh per year. This is not a possible value since it corresponds to a capacity of 26.66 MW working at 100% of capacity factor for 8.746 hours/year. As the capacity of the proposed project activity is 24.3 MW there is no way to generate an electricity output which would produce a project IRR that reaches the benchmark. On the other hand, as was explained before in the validation protocol, the variation of electricity generation was not possible since the price and the generation was already established in the PPA. From the financial point of view, the revenues are considered fixed and the only possible variation is with a revision of the Assured Energy granted.	the project participants is considered reasonable and acceptable by DNV. Therefore, CL 23 is closed.
CL 24 Project participants are requested to provide and to include in the PDD additional information regarding the power meters, such as: - Number of power meters to be		Four meters will be installed. One meter for each generator (3) and other meter counting the total generation in the power plant. The brand is ABB and the model IDM 144. These meters will be used for internal control and data cross	The additional information provided by the project participants is considered reasonable and acceptable by DNV. Therefore, CL 24 is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
installed and for what purpose respectively (example: back up, internal control, data cross check, invoicing purposes); - Calibration frequency of each power meter and which meters will be calibrated; - Accuracy of the power meter; Manufacturer, model and additional specifications, if possible.		check. There are also two meters for invoicing purposes (principal and back up). The brand is Power Measurement, model ION 8600 (serie number PT-0804A405-01 e PT-0804A407-01), installed in the site of the energy delivery. These meters were calibrated by CELG (certified by Brazilian calibration grid (Rede Brasileira de Calibração (RBC)) which also have standardized meters which are traceable to INMETRO (Instituto Nacional de Metrologia, Normalização e Qualidade Industria). The calibration of SMF (the two meters in the site of the energy deliver) will be annual, according to the grid procedures of ONS. For the internal control meters the calibration plan will be defined during the crediting period. The accuracy of the meters is + or – 0.2%.	
CL 25 The sources for all the main input values for the IRR analysis needs to be provided, including the date of when this source was published and by whom, such as a break		At the time of investment evaluation the sources for the main inputs were the following: <u>Investment Costs</u> The construction cost for each item is	The additional information provided by the project participants is considered reasonable and acceptable by DNV. Therefore, CL 25 is closed.

<table>
<tr><th>Draft report clarifications and corrective action requests by validation team</th><th>Ref. to checklist question in table 2</th><th>Summary of project owner response</th><th>Validation team conclusion</th></tr>
<tr><td>down of investment costs, O&M costs, grid tariff, el generation data.</td><td></td><td>based on formal commercial proposals available at the time that CG was analyzing the feasibility of the project. The most representative commercial proposals corresponding to the suppliers below were provided to the DOE:
<table><tr><th>Item</th><th>Cost (BRL$ 000)</th></tr><tr><td>EPC / Civil Engineering</td><td>69,484</td></tr><tr><td>Turbines</td><td>12,900</td></tr><tr><td>Generators</td><td>6,500</td></tr><tr><td>Pipes</td><td>4,200</td></tr><tr><td>Floodgate & Rail</td><td>1,800</td></tr><tr><td>Control Panel / Electric / Substation</td><td>8,134</td></tr><tr><td>Executive Project</td><td>1,127</td></tr><tr><td>Project Management</td><td>5,000</td></tr><tr><td>Land</td><td>2,000</td></tr><tr><td>Environmental Permits</td><td>3,000</td></tr><tr><td>Contingencies</td><td>8,732</td></tr><tr><td>SubTotal</td><td>122,877</td></tr><tr><td>(+) EPC Inflation Adjustment</td><td>1,601</td></tr><tr><td>Total</td><td>124,478</td></tr></table>
<u>Operation & Maintenance (“O&M”)</u>
At the time of the analysis, the assumptions for O&M corresponded to a preliminary approach established by CG internal engineering department. This first approach corresponds to 5% of the gross revenue and it takes into account the following</td><td></td></tr>
</table>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		items:  <u>O&M breakdown</u> The inputs for all the items for the operational assumptions were taken from comparable projects and local knowledge of CG internal engineering department. The source for the maintenance parameter was estimated based on information provided by PSR – a local energy consultant. <u>Grid Tariff</u> The tariff assumed for selling the energy is based on previous energy auctions and market survey. According to CCEE, historic price for the energy auction in 2005 was R$ 116/MWh (see figure in the PDD) <u>Generation Data</u> The PPA contract establishes that SD II revenues are not based on actual	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		generation but on assured energy certified by ANEEL. SD II was granted 22.4 MW of assured energy and this is the amount that will be invoiced regardless the generation.	

APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Andrea Leiroz

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						
Renewables	*Hydro power*	Jan 2009	Jan 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, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Cuiping Deng

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						
Renewables	*Hydro power*	Jan 2009	Jan 2009		Jan 2009	Jan 2009
	Wind power	Jan 2009	Jan 2009			
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery		Mar 2009	Mar 2009			
Efficiency of thermal power plants						
Coal mine methane		Mar 2009				
Fuel switch						
Manure management						
Waste / wastewater treatment						
Energy efficiency						
N_2O			Jan 2009			
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 *recovery*						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 24 March 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

David Costa

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						
Renewables	*Hydro power*	Jan 2009	Jan 2009			
	Wind power					
	Other renewable					
Biomass				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						
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, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Mari Grooss Viddal

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes		
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 26 September 2007

Michael Lehmann
Technical Director, International Climate Change Services

CERTIFICATE OF COMPETENCE

Ole Andreas Flagstad

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						
Renewables	*Hydro power*					
	Wind power					
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery					Jan 2009	Jan 2009
Efficiency of thermal power plants						
Coal mine methane					Jan 2009	Jan 2009
Fuel switch						
Manure management						
Waste / wastewater treatment						
Energy efficiency				Jan 2009		
N_2O						
HFCs					Jan 2009	Jan 2009
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 9 January 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Weidong Yang

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						
Renewables	*Hydro power*				Jan 2009	Jan 2009
	Wind power					
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
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Høvik, 9 January 2009

Michael Lehmann

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