Industrie Service

Validation Report

USINA VALE DO ROSÁRIO
FAZENDA INVERNADA MORRO AGUDO

VALIDATION OF THE
VALE DO ROSÁRIO
BAGASSE COGENERATION PROJECT
(VRBCP)

REPORT NO. 324115098

21/12/2005

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Carbon Management Service
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Industrie Service

Report No.	Date of first issue	Revision No.	Date of this revision	Certificate No.
324115098	11 May 2002	3 b	21 December 2005	-

Subject:	Validation of a CDM Project
Executing Operational Unit:	TÜV Industrie Service GmbH TÜV SÜD Group Carbon Management Service Westendstr. 199 - 80686 Munich Federal Republic of Germany
Client:	Companhia Açucareira Vale do Rosário Usina Vale do Rosário Fazenda Inverda Morro Agudo – SP, Brazil
Contract approved by:	Bernhard Grimm
Report Title:	Validation of the Vale do Rosário Bagasse Cogeneration Project (VRBCP)
Number of pages	16 (including cover page and without annexes)

Summary:

The Certification Body ”Climate and Energy” has been ordered by Usina Vale do Rosario to perform a validation of the above mentioned project.

Using a risk based approach; the validation of this project has been performed by document reviews and on-site inspection, audits at the locations of the project and interviews at the offices of the project developer and the project owner.

In summary, it is TÜV SÜD´s opinion that the “Cerrandinho Bagasse Cogeneration Project (CBCP)”, as described in the revised project design document of September 2005, meets all relevant UNFCCC requirements for the CDM, set by the Kyoto Protocol, the Marrakech Accords and relevant guidance by the CDM Executive Board and that the project furthermore meets all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0015

Hence, TÜV SÜD will recommend the VRBCP for registration as CDM project activity by the CDM Executive Board.

Prior to the submission of this validation report to the CDM Executive Board, TÜV SÜD will have to receive the written approval of the DNA of involved parties, including confirmation by the DNA of Brazil that the project assists in achieving sustainable development.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 176.937 tonnes CO_{2e} over a crediting period of seven years, resulting in a calculated annual average of 25.277 tonnes CO_{2e}, represent a reasonable estimation using the assumptions given by the project documents.

Work carried out by:	Werner Betzenbichler (project manager) Wilson Tomao (ghg auditor) Markus Knödlseder (ghg auditor)	Internal Quality Control by: Michael Rumberg

Abbreviations

AE	Applicant Operational Entity
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CR	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission reduction
GHG	Greenhouse gas(es)
KP	Kyoto Protocol
MP	Monitoring Plan
NGO	Non Governmental Organisation
PDD	Project Design Document
PPA	Power purchase agreement
TÜV SÜD	TÜV Industrie Service GmbH TÜV SÜD Group
UNFCCC	United Nations Framework Convention on Climate Change
VR	Companhia Açucareira Vale do Rosário
VRBCP	Vale do Rosário Bagasse Cogeneration Project
VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

Usina Vale do Rosario has commissioned TÜV Industrie Service GmbH TÜV SÜD Group (TÜV SÜD) to validate the Vale do Rosário Bagasse Cogeneration Project (VRBCP). The validation serves as design verification and is a requirement of all CDM projects. The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and 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).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

The audit team has been provided with an early draft PDD in 2001. Based on this documentation a document review and a fact finding mission in form of an on-site audit has taken place. Afterwards the client decided to revise the PDD several times according to established regulations an approved methodology the CARs and CRs indicated in the first audit process also has been taking into account new developments on the regulatory side (as for example the new PDD format); the changes ar3e documented in the reference list, see bullet point 18), 19), and 21). The final PDD version was submitted for publishing in the global stakeholder process in December 2004. It serves as the basis for the assessment presented herewith. In July 2005 a revised final PDD has been submitted in which all open issues and clarification requests have been solved by the project developer by submitting additional or corrected information. That changes are not considered to be significant with respect to the qualification of the project as a CDM project based on the two main objectives of the CDM to achieve a reduction of anthropogenic GHG emissions by sources and to contribute to sustainable development. Hence no repetition of the public stakeholder process has taken place.

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the validation team has to cover at least the following aspects:

- Knowledge of Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Skills in environmental auditing (ISO 14000, EMAS)
- Quality assurance

- Technical aspects of cogeneration and the use of biomass
- Monitoring concepts
- Political, economical and technical random conditions in host country

According to these requirements TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV certification body “climate and energy”:

The validation team was consisting of the following three experts:

Mr. Werner Betzenbichler	(project manager, GhG auditor)	TÜV SÜD
Mr. Markus Knödlseder	(GHG auditor)	TÜV SÜD
Mr. Wilson Tomao	(local expert, ISO1400 auditor)	TÜV Bayern Brazil

Mr. Werner Betzenbichler is head of the “Certification Body for Climate and Energy” and expert for conventional energy generation, renewable energy, energy expansion planning and familiar with the recent version of CDM and JI criteria as necessary for the implementation of Art. 6 and Art. 12 of the KP. Since 2000 he has been working in the international climate change and emission trading business as a verifier. He was strong involved in the development of the Validation and Verification Manuals (VVM).

Markus Knödlseder: After his professional training as chemical assistance Mr. Knödlseder studied environmental engineer at the University of Applied Science in Bingen, Germany. Beside his main focus in studies of environmental technologies, he dealt with environmental management and environmental controlling issues. He has been a staff at the department “Carbon Management Service” located in the head office of TÜV Industrie Service GmbH, TÜV SÜD Group in Munich since Oct. 2001. He has been involved in the topic of environmental auditing, baselining, monitoring and verification due to the requirements of the Kyoto Protocol with special focus on renewable energies. Mr. Knödlseder is also an auditor for environmental management systems (ISO 14.000).

Mr. Wilson Tomao is lead auditor and former manager of TÜV Bayern Brazil. He is familiar with local laws and regulations and the assessment of technical installations. He assisted Mr. Betzenbichler during the on-site inspections and by evaluating documents submitting in Portuguese language. Meanwhile he can refer to the participation in the validation process of more than 15 CDM-projects in Brazil.

The audit team covers the above mentioned requirements as follows:

- Knowledge of Kyoto Protocol and the Marrakech Accords (Betzenbichler/Knödlseder)
- Environmental and Social Impact Assessment (Betzenbichler/ Tomao)
- Skills in environmental auditing (Betzenbichler/ Tomao)
- Quality assurance (Betzenbichler/ Tomao)
- Technical aspects (Betzenbichler/Knödlseder)
- Monitoring concepts (Betzenbichler/Knödlseder)
- Political, economical and technical random conditions in host country (Tomao)

In order to have an internal quality control of the project, a team of the following persons has been composed by the certification body “climate and energy”:

- Michael Rumberg (deputy head of certification body “climate and energy”)

1.3 GHG Project Description

This project activity consists of increasing efficiency in the bagasse (a renewable fuel source, residue from sugarcane processing) cogeneration facility at **Companhia Açucareira Vale do Rosário** (VR), a Brazilian sugar mill. With the implementation of this project, the mill has been able to sell electricity to the national grid, avoiding that fossil-fuelled thermal plants dispatch the same amount of energy to that grid. By that, the initiative avoids CO_2 emissions, also contributing to the regional and national sustainable development.

By investing to increase steam efficiency in the sugar and alcohol production and also increasing the efficiency in the steam production with more efficient boilers, VR generates surplus steam for using it exclusively on electricity production in its power-house, which also required buying turbo-generators.

The municipality where the project is located is Morro Agudo; it is in the northeast of the State of São Paulo, about 340 kilometers (km) far from the state capital, São Paulo, in the agricultural region of Orlândia. The region holds an ample availability of manpower, and communication and transport infrastructures, and can be accessed through a direct highway from São Paulo, "Rodovia Anhangüera" (SP-330).

The technology in in that project for generating megawatt (MW) levels of electricity from biomass is the steam-Rankine cycle, which consists of direct combustion of biomass in a boiler to raise steam, which is then expanded through a turbine. Such combined heat and power (CHP), or cogeneration, systems provide greater levels of energy services per unit of biomass consumed than systems that generate power only.

Using steam-rankine cycle as the basic technology of its cogeneration system, for achieving an increasing amount of surplus electricity to be generated, VR began its energy improvements in four phases, which are:

- **Phase 1 (1990-1994)**: involved installation of higher-efficiency steam turbines and a ten-year contract with then state-owned utility, *Companhia Paulista de Força e Luz* (CPFL), to sell 4 MW to the utility's grid.

- **Phase 2 (1995- 1997)**: involved acquisition of two new boilers and a 12 MW turbo-generator. Another ten-year contract with CPFL was signed then, in order to sell 15 MW of installed capacity to the utility's grid.

- **Phase 3 (2001)**: involves acquisition of a 15 MW turbo-generator and another stand-by one 4 MW turbo-generator in order to increase the surplus electricity available for sale to the grid by 15 MW;

- **Phase 4 (2003)**: as an expansion of the Phase 3 and operational in June 2003, it is based on increasing the pressure in the boiler, which increases the total surplus electric power generation capacity, allowing VR to sell an additional 35 MW energy to CPFL. This phase includes acquisition of one 65-bar boiler and two 25 MW turbo-generators, standing-by two 4 MW turbo-generators, and the enhancement of the energy hub from 138 kV to 42 MVA.

The technology related assets involved in both phases of the VR's project activity system are indicated in following table 1. In spite of being unilaterally funded, technology transfer was applied in VRBC project activity, as the steam turbines are Swedish, manufactured by ABB. The boiler technology is domestic (Brazilian), as is much of the small equipment installed to work with the turbine. Further technical assistance has been incorporated into this CDM project by the Swedish Energy Agency.

Table 1: Detailed description of VRBC project activity

Component of the cogeneration system	Equipments		
	Before VRBC project activity implementation	VRBC project activity	
		Phase 3 (2001)	Phase 4 (2003)
	Total capacity = 36MW	Total capacity = 51MW	Total capacity = 101MW
OPERATION	6 turbo-generators: 3 of 4MW; 2 of 6MW 1 of 12MW	6 turbo-generators: 2 of 4MW 2 of 6MW 1 of 12MW 1 of 15MW (cond.-type)	6 turbo-generators: 2 of 6MW 1 of 12MW 1 of 15MW (cond.-type) 2 of 25MW (cond.-type)
STAND BY	-	1 generator of 4MW	3 generators of 4MW

It is worthy to note that the investments to increase efficiency in phases 3 and 4 are not intended to enhance the sugar production process. It is an entirely new project focused on better exploiting the biomass resource to increase renewable energy production through a closed cycle condensing type steam turbine.

Sectorial Scope of the project is 1 - Energy industries (renewable - / non-renewable sources).

2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (for further information see www.vvmanual.info), an initiative of all Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, 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 Figure 1.

The completed validation protocol is enclosed in Annex 1 to this report.

Validation Protocol Table 1: Mandatory Requirements			
Requirement	***Reference***	***Conclusion***	***Cross reference***
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**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*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 **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification** 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 Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the Client or other 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

2.1 Review of Documents

The project design document submitted by the Client and additional background documents related to the project design and baseline were reviewed. A complete list of all documents reviewed is attached as annex 2 to this report.

2.2 Follow-up Interviews

In the period of November 27th – 29th, 2001, TÜV SÜD performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the first document review. Representatives of

- Head quarters of CPFL in Campinas, State of Sao Paulo, Brazil, on November 27th, 2001;
- CPFL's Carioba power plant in Americana, State of Sao Paulo, Brazil, on November 27th, 2001;
- Vale do Rosário Sugar Mill in Morro Agudo, State of Sao Paulo, Brazil, on November 28th, 2001 and
- Econergy International Corporation in Sao Paulo, State of Sao Paulo, Brazil, on November 29th 2001
- Operacão Nacional do Sistema (ONS), the national dispatcher of Brazilian grid in Brasilia, State of Brasilia, Brazil, on 30th May 2005

were interviewed. The main topics of the interviews are summarised in Table 2.

Table 2 Interview topics

Interviewed organisation	Interview topics
Vale do Rosário Sugar Mill in Morro Agudo	▪ Project design ▪ Technical equipment ▪ Sustainable development issues ▪ Additionality ▪ Crediting period ▪ Monitoring plan ▪ Management system ▪ Environmental impacts ▪ Stakeholder process ▪ Approval by the host country
Econergy International Corporation	▪ Project design ▪ Technical equipment ▪ Sustainable development issues ▪ Baseline determination ▪ Additionality

	▪ Crediting period ▪ Monitoring plan ▪ Environmental impacts ▪ Stakeholder process
CPFL's Carioba power plant in Americana	▪ Metering system, calibration, power supply
Head quarters of CPFL	▪ Metering system, contracts, bills, responsibilities, sectoral policy
Operacão Nacional do Sistema (ONS)	▪ Operation of Brazilian grid ▪ Objectives and responsibility of ONS ▪ Availability of data and their reliability

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which needed to be clarified for TÜV SÜD`s positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that have been given are summarised in chapter 3 below and documented in more detail in the validation protocol in annex 1.

3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

1) The findings from the desk review of the final project design document and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in annex 1.

2) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in annex 1. The validation of the project resulted in three Corrective Action Request.

3) Where Clarification or Corrective Action Requests have been issued, the exchanges between the Client and TÜV SÜD to resolve these Clarification or Corrective Action Requests are summarised.

4) The final conclusions for validation subject are presented.

The validation findings relate to the project design as documented and described in the final project design documentation 08/01/2005.

3.1 Project Design

3.1.1 Discussion

As mentioned above the purpose of the project is to avoid CO2 emissions from fossil power plants by increasing the efficiency of the existing renewable energy generation. The surplus of electricity being generated by an installed CHP plant is fed into the grid. The whole energy generation is based on renewable biomass, here bagasse from the sugar cane process. Hence, the project contributes to the sustainable development in Brazil, reducing GHG emissions, substituting electricity generated by gas-fired plants through electricity generated from biomass (renewable energy).

The project also contributes to the sustainable development by saving jobs and generating new jobs.

The design engineering does reflect current good practices. The design has been professionally developed. Subsequently the project got approval by the relevant authorities. The project itself does apply state of the art equipment. Regarding the employed technology, there is no requirement to change the existing technology as a result of running out of life-time of the existing technical equipment. There are no significant indications that the technology used to implement the project could be substituted during the envisaged operational lifetime of the project activity (25 years) and in particular in the first crediting period until 2007.

The first crediting period is 2001 – 2007, with the intention for renewal. The operational lifetime of the project is 25 years.

The project is in line with relevant legislation of the Brazil. According to the public available document renewable energy projects belong to the favoured options under the CDM. Hence, the project can currently be seen as being in line with the host country specific requirements for CDM.

The funding for the project does not lead to a diversion of official development assistance as according to the information obtained by the audit team ODA does not contribute to the financing of the project.

The starting date as well as the operational lifetime are clearly defined and also handled in a reasonable manner. The first crediting period is with 7 years clearly defined.

Moreover its is assured that as the start of the crediting period is before the registration of the project that the project activities starting date falls in the period between 1 January 2000 and the registration of the first clean development mechanism project. The start of project activities has been before the registration date of the first clean development mechanism project.

3.1.2 Findings

Outstanding issue:

The project has not obtained a Letter of Approval/ Letter of Authorization from the Brazilian government so far. No documentation has been submitted to the validation team. The issuance of these documents will also demonstrate whether the project is in line with sustainable development policies of the host country

Response:

The response will be given by the issuance of the Letter of Approval. This has not happened so far as the approval of the project depends on the review of the validation report which has to be submitted in advance.

3.1.3 Conclusion

Prior to the submission of this validation report to the CDM Executive Board, TÜV SÜD will have to receive the written approval of the DNA of involved parties, including confirmation by the DNA of Brazil that the project assists in achieving sustainable development.

3.2 Baseline and Additionality

3.2.1 Discussion

By dispatching renewable electricity to a grid, electricity that would otherwise be produced using fossil fuel is displaced. This electricity displacement will occur in the system's margin, i.e. this CDM project will displace electricity that is produced by marginal sources - fossil fueled thermal plants - , which have higher electricity dispatching costs and are solicited only over the hours that base load sources (low-cost or must-run sources) cannot supply the grid.

According to the applied and approved methodology AM0015 the project activity follows the steps provided by the methodology taking into account the (b) Simple Adjusted OM calculation for the STEP 1, since there would be no available data for applying to the preferred option – *(c) Dispatch Data Analysis OM.* For STEP 2, the option 1 was chosen.

The physical boundary is the Brazilian grid south-southeast-midwest, controlled by ONS.

The application of the Additionality Tool the project can be confirmed as additional. The economic unattractiveness of enhancing the already existing cogeneration process is indicating the additionality of this project; because the improved operation of the energy processes is not considered as necessary for the operation of Vale do Rosario Sugar Mill. The project baseline is clearly, retraceable and plausibly displayed in the project BLS. Possible project alternatives are discussed,

3.2.2 Findings

Corrective Action Request No 1:

The application of the methodology and the discussion and determination of the chosen baseline is transparent, but not correct. Used data for calculating the emission factors from the OECD study are

not are not eligible, as they are too old. Updated data should be applied. If data from ONS will be used for calculation of new emission factor, the special circumstances and weakness of that approach shall be pointed out.

Response:

Revised PDD and revised baseline calculations were submitted.

Corrective Action Request No. 2:

The baseline boundaries are not clearly defined and do not sufficiently cover sources and sinks for baseline emissions as old data from the OECD does not reflect the imports and exports. Imports and export of electricity has to be considered.

Response:

Revised PDD and revised baseline calculations were submitted.

3.2.3 Conclusion

The revised baseline calculation is based on latest available data and in line with calculation method of applied and approved Methodology AM0015. Delivered information can be confirmed. However the baseline calculations have according to available data some weaknesses:

i. The ONS grid includes only 76% of installed capacity and 20% of installed power plants,
ii. ONS dispatch only power plant bigger than 30 MWel,
iii. ONS has no control over sub grids below 138 kV.

In spite of those weaknesses the validation team confirms that the chosen baseline determination is transparent and according to approved methodology against the background of available data. Those special circumstances of the project boundary are also described in the final PDD version, which is the base for that conclusion.

The projects baseline and additionality is in line with appropriate requirements.

3.3 Monitoring Plan

3.3.1 Discussion

The monitoring plan is appropriate, traceable and transparent. The generated electricity that is fed into the grid in order to estimate emissions within the project boundary can be measured simply and with an appropriate accuracy. According to the interview with ONS needed data for calculating the combined margin will be made available to the project developer.

As the project is already in operation it can be confirmed that monthly and annual reporting of the collected data at the several monitoring points is working, the responsibilities for registration, monitoring, measurement and reporting are established.

Uncertainty and possibility of monitoring errors are addressed and discussed plausible in the project documents.

3.3.2 Findings

None

3.3.3 Conclusion

The projects monitoring plan is line with approved methodology AM0015.

3.4 Calculation of GHG Emissions

3.4.1 Discussion

The calculation follows the approach of the approved methodology AM0015, using the simple adjusted operational margin in order to calculate the combined margin as a fifty-fifty mix of operational and build margin.

The amount of prospective generated electricity is multiplied with this combined margin in order to calculate the emission reduction in the grid.

The data sources are reliable and the approach of calculating the operational and the build margin is traceable and correct against the background of available data and chosen project boundary.

3.4.2 Findings

Clarification Request No. 1:

The last PDD version (VALE PDD 08.01.05 HG.pdf) mentioned a change in the PPA since time of on-site visits. It is necessary to provide the most recent version of the PPA in order to assess the emission reduction estimation.

Response:

Updated PPA was submitted.

3.4.3 Conclusion

The project will result in a reduction of GHGs. The calculated estimation of prospective emission reductions, stated with 176.937 tonnes CO_{2e} over a crediting period of seven years, resulting in a calculated annual average of 25.277 tonnes CO_{2e} seems to be realistic.

3.5 Environmental Impacts

3.5.1 Discussion

An Environmental Impact assessment has to be submitted to the responsible national authorities.

A RAP (“Preliminary Environmental Report”) was submitted to the relevant authority (SMA - State Secretary of Environment and CETESB). The RAP was approved by CETESB and an Installation License has been awarded to Vale do Rosario (VR) sugar mill in 2001.

3.5.2 Findings

None

3.5.3 Conclusion

The project is in line with national and regional law. No negative environmental effects are to be expected, environmental impacts are sufficiently documented. The project fulfils the requirements of the UNFCCC.

3.6 Comments by Local Stakeholders

3.6.1 Discussion

A local stakeholder process was performed in order to inform about project activity. According to the requirements of the Brazilian DNA the stakeholder were invited to comment the project.

3.6.2 Findings

None

3.6.3 Conclusion

VR did not receive any comments on the project. Since no comments were received, VRBCP fulfils relevant requirements.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on UNFCCC website and on its own website from **27th of December 2004** for 30 days and invited comments by Parties, stakeholders and non-governmental organisations. No comments were received.

5 VALIDATION OPINION

TÜV SÜD has performed a validation of the Validation of the Vale do Rosário Bagasse Cogeneration Project, Brazil. The validation was performed on the basis of UNFCCC criteria and host country criteria, 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 subsequent decisions by the CDM Executive Board.

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM under the condition that a written Letter of Approval will be issued by involved parties. By the time we will receive the LoA TÜV SÜD will recommend the project for registration by the CDM Executive Board.

Hence, TÜV SÜD will recommend the CBCP for registration as CDM project activity by the CDM Executive Board.

By displacing fossil fuel-based electricity in principal with electricity generated from a renewable source, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment and technological barriers demonstrates that the proposed project activity 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. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 176.937 tonnes CO_{2e} over a crediting period of seven years, resulting in a calculated annual average of 25.277 tonnes CO_{2e}, represent a reasonable estimation using the assumptions given by the project documents.

The validation is based on the information made available to us and the engagement conditions detailed in this report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

Munich, 2005-12-21

Michael Rumberg

Deputy of certification body
"climate and energy"

Munich, 2005-12-21

Werner Betzenbichler

Project Manager

Annex A: Validation Protocol

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

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
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	Outstanding issue	A final written approval is not yet available, but Sweden Government has indicated to accept Bagasse cogeneration projects to be eligible under CDM.
2. 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, Marrakesh Accords, CDM Modalities §40a	☑	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	☑	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	Outstanding issue	A final written approval is not yet available, but Brazilian Government has indicated to accept Bagasse cogeneration projects to be eligible under CDM.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	☑	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic	Kyoto Protocol Art. 12.5c, Marrakesh Accords,	☑	Table 2, Section B.2

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	CDM Modalities §43		
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords	☑	According to the information obtained by the audit team ODA does not contribute to the financing of the project.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	☑	Both Parties involved have designated national authorities for the CDM
9. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	☑	Brazil has approved the Kyoto Protocol
10. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	☑	Table 2, Section G
11. 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.	Marrakech Accords, CDM Modalities §37c	☑	Table 2, Section F
12. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	☑	Table 2, Section B.1.1 and D.1.1
13. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the	Marrakech Accords,	☑	Table 2, Section D

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities §37f		
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	Marrakech Accords, CDM Modalities, §40	☑	TÜV SÜD published the project documents on UNFCCC website and on its own website from **27th of December 2004** for 30 days and invited comments by Parties, stakeholders and non-governmental organisations
15. 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	Marrakech Accords, CDM Modalities, §45c,d	☑	Table 2, Section B.2
16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	☑	Table 2, Section B.2
17. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	☑	The final PDD is in conformance with the CDM Project Design Document (version 02) which is in effect as of July 1, 2004.

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.1.1. Are the project's spatial (geographical) boundaries clearly defined?	1, 3, 4, 5, 18, 20, 24, 24, 25	DR, I	The baseline study considers the energy generation in the independent south-southeast and mid-west subsystem of the Brazilian electricity grid. So the project boundaries are defined as the sphere of influence of the south-south-eastern and mid-west grid (including the project site and all electrification equipment).	☑	☑
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	1, 3, 4, 5, 18, 20, 24	DR, I	Yes, see above.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A.2. 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.2.1. Does the project design engineering reflect current good practices?	3, 4, 5, 6, 18, 19, 20, 24	DR, I	Yes, the project design engineering does reflect current good practices. Vale do Rosario Sugar Mill and the affiliated companies responsible for the supply and the installation of the technical equipment have wide experiences in this field of technology, management and maintenance. The project is professionally managed and the applied technology represents state of the art technique.	☑	☑
A.2.2. 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, 5, 6, 20, 24	DR, I	Yes, see above.	☑	☑
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1, 5, 6, 20, 24	DR, I	There are no significant indications that the technology used to implement the project could be substituted during the envisaged first crediting period. The technology used is state-of-the-art in the branch in Brazil. It seems less probable especially under the aspect of financing that another, even more	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			efficient one, could substitute the envisaged technology in the project period.		
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	5, 6	I	No. The measures do not provide technologies that require a specific training and maintenance additional to the usual procedures. The measures will be integrated in the generic training and maintenance plan of Vale do Rosario Sugar Mill.	☑	☑
A.2.5. Does the project make provisions for meeting training and maintenance needs?	5, 6,	I	No, see also above.	☑	☑
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	1, 5, 6, 20, 24	DR, I	Yes. The new government under President Lula (president since 2003) intends to create a stricter environmental legislation in the forthcoming years. But it is not to expect that this change in the political direction will have an influence on the project.	☑	☑
A.3.2. Is the project in line with host-country specific CDM requirements?	1, 5, 6,	DR, I	Yes.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	20, 24				
A.3.3. Is the project in line with sustainable development policies of the host country?	1, 5, 6, 20, 24	DR, I	Yes. The project contributes to the sustainable development of Brazil by using biomass as a renewable energy source (substituting a share of fossil fuels).	☑	☑
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	1, 5, 6, 20, 24	DR, I	Yes, other positive environmental effects are the reduction of emissions (methane emissions of deployed bagasse) and the possibility to create new jobs.	☑	☑
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. Is the baseline methodology previously approved by the CDM Methodology Panel?	5, 6, 24	I, DR	Yes, the (revised) Baseline Methodology of Vale do Rosario bagasse cogeneration project was approved as a New Methodology by the CDM Methodology Panel in November 2003 (NM0001-rev) and has been published in September 2004 as	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			AM0015.		
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	1, 5, 6, 18, 20, 24	I, DR	The baseline methodology of Vale do Rosario bagasse cogeneration project uses the combined margin approach to quantify the bagasse cogeneration project displacement of emissions from the grid. This is the most appropriate methodology for this kind of projects.	☑	☑
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	18, 20, 24	DR	Yes, application of the methodology and the discussion and determination of the chosen baseline is transparent, but not performed in a conform manner. Corrective Action Request No 1: Used data for calculating the emission factors from the OECD study are not eligible, as they are too old. Updated data should be applied.	CAR 1	☑
B.2.2. Has the baseline been determined using conservative assumptions where possible?	18, 20, 24	DR	No, see. B.2.1	See CAR 1	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B.2.3. Has the baseline been established on a project-specific basis?	1, 18, 20, 24	DR	The baseline was determined due to the project-specific situation (region, relevant grid etc.).	☑	☑
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	5, 6, 18, 20, 24	I, DR	Yes, see also A.3.1	☑	☑
B.2.5. Is the baseline determination compatible with the available data?	6, 18, 20, 24	I, DR	No as long as OECD data are in use. Interviews with the national dispatch centre (ONS) by the validation team demonstrate that necessary data are available.	See CAR 1	☑
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	18, 20, 24	DR	Can not assessed, see B.2.1	See CAR 1	☑
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not	18, 20, 24	DR	Yes, through (c) by demonstrating investment barriers and (d) showing that the project activity is not “business-as-usual”. Annotation: The use of cogeneration is part of the energy extension plan of the Brazil government. But there is only a small amount of facilities in Brazil having the capacity to sell energy from its cogeneration activities. There is no sustainable financial incentive to extend this type of energy	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
required by a Party's legislation/regulations)?			production besides possible revenue stream from the sales of CERs. VdR has already used cogeneration without governmental incentives. The additional improvement of the system including an extension of the generation capacity is even more in the upfront of the sugar mill business. In particular it should be recognized that any further addition beyond the existing system requires a higher investment per additional capacity than it was required for the first installation.		
B.2.8. Have the major risks to the baseline been identified?	6, 18, 20,24	I, DR	Can not be validated, see B.2.1	See CAR 1	☑
B.2.9. Is all literature and sources clearly referenced?	18, 20, 24	DR	Yes.	☑	☑
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1, 5, 6, 18, 20,	I, DR	Yes.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	24, 24				
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	1, 18, 20, 24, 24	DR	Yes, the crediting period is 7 years (2001 – 2007) with the intention for renewal.	☑	☑
C.1.3. Is it assured that in case the start of the crediting period is before the registration of the project that the project activities starting date falls in the period between 1 January 2000 and the registration of the first clean development mechanism project?	1, 5, 6, 18, 20, 24, 24	I, DR	Yes, the first onsite was performed at the end of 2001. That first step of validation can be seen as evidence.	☑	☑
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Methodology Panel?	2,19, 20, 24, 24, 28	DR	The (revised) Monitoring Methodology of Vale do Rosario bagasse cogeneration project was approved as an New Methodology by the CDM Methodology Panel in November 2003 (NM0001-rev) and has been published in September 2004	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			as AM0015.		
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	2, 19, 20, 24	DR	Yes.	☑	☑
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	2, 19, 20, 24	DR	Yes.	☑	☑
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	19, 20	DR	Yes.	☑	☑
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. 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?	5, 6, 19, 20, 24	DR, I	Yes, as there are no such emissions. The use of fossil fuels is excluded for the existing equipment.	☑	☑
D.2.2. Are the choices of project GHG indicators reasonable?	5, 6, 19, 20, 24	DR, I	Not applicable.	☑	☑
D.2.3. Will it be possible to monitor / measure the	5, 6,	DR,	See comment above.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
specified project GHG indicators?	19, 20, 24	I			
D.2.4. Will the indicators give opportunity for real measurements of achieved emission reductions?	5, 6, 19, 20, 24	DR, I	See comment above.	☑	☑
D.2.5. Will the indicators enable comparison of project data and performance over time?	5, 6, 19, 20, 24	DR, I	See comment above.	☑	☑
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	5, 6, 19, 20, 24	DR, I	Yes, but is shown that no such activities are necessary.	☑	☑
D.3.2. Have relevant indicators for GHG leakage been included?	5, 6, 19, 20, 24	DR, I	Not applicable. See also comment above.	☑	☑
D.3.3. Does the monitoring plan provide for the	5, 6,	Dr, I	See comment above.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
collection and archiving of all relevant data necessary for determining leakage?	19, 20, 24				
D.3.4. Will it be possible to monitor the specified GHG leakage indicators?	5, 6, 19, 20, 24	Dr, I	See comment above.	☑	☑
D.4. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	5, 6, 18, 19, 20, 24	DR, I	The project itself generates no GHG emissions. The use of fossil fuel is excluded for the existing equipment. Due to the inspection the combustion furnace of the boiler could be used for bagasse and wood only. To calculate the emissions reductions it is necessary to measure the generated electricity fed in the grid: Then the emission reductions can be calculated on base of existing data for specific emissions of the grid or electricity generated by a gas-fired plant.	☑	☑
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	5, 6, 18,	DR, I	Yes, see above.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	19, 20, 24				
D.4.3. Will it be possible to monitor the specified baseline indicators?	5, 6, 18, 19, 20, 24	DR, I	Yes, see above.	☑	☑
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	5, 6, 20, 24	DR, I	Yes. Environmental Impacts: It is indicated in the PDD that negative environmental impacts are to be expected. In fact the project contributes to an improvement of the environmental situation by reducing GHG emissions. Social and Economic Impacts: The project does create employment opportunities during the realisation phase of the project (installation of the new equipment) and in addition during the	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			maintenance and operating phase of the project. So the project generates income for the local population.		
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	5, 6, 20, 24	I, DR	Yes, see above.	☑	☑
D.5.3. Will it be possible to monitor the specified sustainable development indicators?	5, 6, 20, 24	I, DR	The positive effects have been discussed with the project owner and the project developer and are demonstrated plausibly in the project documents. It is not necessary to install a project-specific monitoring system to collect data to demonstrate these positive effects.	☑	☑
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country?	5, 6, 20, 24	I, DR	See above.	☑	☑
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	5, 6, 20, 24	I, DR	Yes.	☑	☑
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and	5, 6, 20,	DR, I	Yes, the management of VdR is responsible for the reporting. The data necessary to	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
reporting clearly described?	24		calculate the emissions reductions are measured and registered electronically, quality control and assurance is addressed and plausibly guaranteed.		
D.6.3. Are procedures identified for training of monitoring personnel?	5, 6, 20, 24	DR, I	This is not necessary. The monitoring of data is included in the routinely data monitoring.	☑	☑
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	5, 6, 20, 24	DR, I	Not applicant. Unintended emissions are not to be expected.	☑	☑
D.6.5. Are procedures identified for calibration of monitoring equipment?	3, 4, 5, 6, 20, 24	DR, I	Yes, the meter equipment of the regional electricity provider (CPFL) can be used as a safety procedure to “measure” the carbon emission reductions. This equipment and also the metering equipment at Vale do Rosario Sugar Mill was calibrated in 2001 and will be calibrated in the forthcoming years in accordance with the national calibration and technical regulations.	☑	☑
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	5, 6, 20, 24	DR, I	Yes, see also above.	☑	☑
D.6.7. Are procedures identified for monitoring, measurements and reporting?	3, 4, 5, 6, 20, 24	Dr, I	Yes. The monitoring is done via meters installed at the regional electricity provider (CPFL) and at the site of VdR sugar mill.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	3, 4, 5, 6, 20, 24	DR, I	Yes, but a (project-specific) day-to-day record handling is not necessary in this project, because the data are doubly assured (at CPFL and VdR sugar mill).	☑	☑
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	3, 4, 5, 6, 20, 24	DR, I	Yes, but no project-specific necessity to deal with monitoring data adjustments and uncertainties is given.	☑	☑
D.6.10. Are procedures identified for review of reported results/data?	3, 4, 5, 6, 20, 24	DR, I	Yes.	☑	☑
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	3, 4, 5, 6, 20, 24	DR, I	No, this is not necessary.	☑	☑
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	3, 4, 5, 6, 20, 24	Dr, I	Yes.	☑	☑
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	5, 6, 20, 24	Dr, I	This is not necessary in this project.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Predicted Project GHG Emissions *The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	5, 6, 18, 19, 20, 24	DR, I	Yes.	☑	☑
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	1, 2, 18, 19, 20, 24	DR	Yes.	☑	☑
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	18, 19, 20, 24	DR	Yes.	☑	☑
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the	1, 2, 5, 6,	DR, I	Yes.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
documentation?	18, 19, 20, 24				
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	1, 2, 5, 6, 18, 19, 20, 24	DR, I	Yes.	☑	☑
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.*					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	5, 6, 18, 19, 20, 24	Dr, I	Potential leakage effects are discussed, but it is show in the project documents that there are no such effects	☑	☑
E.2.2. Have these leakage effects been properly accounted for in calculations?	5, 6, 18, 19, 20, 24	DR, I	See above.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	5, 6, 18, 19, 20, 24	DR, I	See above.	☑	☑
E.2.4. Are the calculations documented in a complete and transparent manner?	5, 6, 18, 19, 20, 24	DR, I	See above.	☑	☑
E.2.5. Have conservative assumptions been used when calculating leakage?	5, 6, 18, 19, 20, 24	DR, I	See above.	☑	☑
E.2.6. Are uncertainties in the leakage estimates properly addressed?	5, 6, 18, 19, 20, 24	DR, I	See above.	☑	☑
E.3. Baseline Emissions *The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been	5, 6, 18,	DR, I	No, see CAR 2 above B.2.1.	CAR 2	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
chosen as reference for baseline emissions?	20, 24				
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	18, 20, 24	DR	No, as old data from the OECD does not reflect the imports and exports. <u>Corrective Action Request No. 3:</u> Imports and export of electricity has to be considered in the calculation.	CAR 3	☑
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	18, 19, 20, 24	DR	Can not be validated, additional information needed, see E.3.2 and B.2.1.	See CAR3	☑
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	18, 19, 20, 24	DR	Can not be validated, additional information needed, see E.3.2 and B.2.1.	See CAR3	☑
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	18, 19, 20, 24	Dr	No, see comment on E.3.2 and B.2.1.	See CAR3	☑
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	18, 19, 20, 24	Dr	Yes.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	5, 6, 18, 20, 24, 31	DR, I	The last PDD version mentioned a change in the PPA since time of on-site visits. Clarification Request No. 1: It is necessary to provide the most recent version of the PPA in order to assess the emission reduction estimation.	CR1	☑
F. 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.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	5, 6, 11, 18, 20, 24	DR, I	Yes.	☑	☑
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	5, 6, 11, 12, 18, 19, 20,	DR, I	Yes. An Environmental Impact assessment has to be submitted to the responsible national authorities. A RAP ("Preliminary Environmental Report") was submitted to the relevant authority (SMA – State Secretary of Environment and	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	24		CETESB). The RAP was approved by CETESB and an Installation License has been awarded to Vale do Rosario (VR) sugar mill in 2001.		
F.1.3. Will the project create any adverse environmental effects?	5, 6, 18, 20, 24	DR, I	No, it is not expected that the project will cause negative environmental effects.	☑	☑
F.1.4. Are transboundary environmental impacts considered in the analysis?	18, 20, 24	DR, I	The nature of the project allows to exclude transboundary impacts, possible negative impacts on local air quality should not be considered to have any detectable resultants on an transnational scale	☑	☑
F.1.5. Have identified environmental impacts been addressed in the project design?	18, 20, 24	DR	Yes.	☑	☑
F.1.6. Does the project comply with environmental legislation in the host country?	18, 19, 20, 24	DR	Yes.	☑	☑
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	5, 6, 8, 9,		There was a local stakeholder process. Local stakeholders have been invited via	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	10, 18, 20, 24		newspaper. The global stakeholder process still has to be started.		
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	8, 9, 10, 20, 24	DR	Yes.	☑	☑
G.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?	5, 6, 8, 9, 10, 20, 24	DR, I	Yes.	☑	☑
G.1.4. Is a summary of the stakeholder comments received provided?	18, 20, 24	DR	There have been no comments.	☑	☑
G.1.5. Has due account been taken of any stakeholder comments received?	18, 20, 24	DR	See above.	☑	☑

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 1 and 2	Summary of project owner response	Validation team conclusion
Yes, application of the methodology and the discussion and determination of the chosen baseline is transparent, but not correct. Corrective Action Request No 1: Used data for calculating the emission factors from the OECD study are not are not eligible, as they are too old. Updated data should be applied. Note: If data from ONS will be used for calculation of new emission factor, the special circumstances and weakness of that approach shall be pointed out.	Table 2, B.2.1	Revised PDD and revised baseline calculations were submitted on 01/08/2005 (VALE PDD 08.01.05 HG).	The revised baseline calculation is based on latest available data and in line with calculation method of applied and approved Methodology AM0015. All calculations have been conducted correctly. ☑
The baseline boundaries are not clearly defined and do not sufficiently cover sources and sinks for baseline emissions as old data from the OECD does not reflect the imports and exports. Corrective Action Request No. 2: Imports and export of electricity has to be considered.	Table 2, E.3.2	Revised PDD and revised baseline calculations were submitted on 01/08/2005 (VALE PDD 08.01.05 HG).	The revised baseline calculation is based on latest available data and in line with calculation method of applied and approved Methodology AM0015. ☑

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
The last PDD version (VALE PDD 08.01.05 HG.pdf) mentioned a change in the PPA since time of on-site visits. <u>Clarification Request No. 1:</u> It is necessary to provide the most recent version of the PPA in order to assess the emission reduction estimation.	Table 2, E.4.1	A new valid PPA was submitted to the validation team.	☑

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Annex B: Information Reference List

Reference No.	Document or Type of Information
1.	"Carbon Credits for Vale do Rosário Bagasse Cogeneration Project" – Final Report, Econergy International Corporation, Washington D.C., USA, Revised May 11th, 2001
2.	"Monitoring and Verification Procedures for GHG Emissions Reductions from Biomass Cogeneration Project", Econergy International Corporation, Washington D.C., USA, October 2001
3.	On-site interviews at head quarter of CPFL in Campinas, State of Sao Paulo, Brazil, by auditing team of TÜV Süddeutschland performed on November 27, 2001 Interviewed persons: Mr. Barsanulfo Jacinto X. Filho Mr. Marcos Roberto Escobar Mr. Jose Guiherme de Freitas
4.	On-site interviews and inspection at CPFL's Carioba power plant in Americana, State of Sao Paulo, Brazil, by auditing team of TÜV Süddeutschland performed on November 27, 2001 Interviewed persons: Mr. Carlos Alberto Nogueira Mr. Marcelo Alves Oliveira
5.	On-site interviews and inspection at Vale do Rosário Sugar Mill in Morro Agudo, State of Sao Paulo, Brazil, by auditing team of TÜV Süddeutschland performed on November 28, 2001 Interviewed persons: Mr. Ricardo Roxo Mr. Eduardo Peireira Mr. Joaquim Heck
6.	On-site interview at office of Econergy International Corporation in Sao Paulo, State of Sao Paulo, Brazil, by auditing team of TÜV Süddeutschland performed on November 29, 2001 Interviewed person: Mr. Marcelo Schunn Diniz Junqueira
7.	www.unfccc.int - web-page of UNFCCC
8.	Diário Oficial, Estado do Sao Paulo, Volume 111, Numero 125, July 5, 2001, Invitation to local stakeholder comments
9.	A Tribuna de Morro Agudo, July 6, 2001, Invitation to local stakeholder comments

Reference No.	Document or Type of Information
10.	O Diário de Ribeirao Preto, July 5, 2001, Invitation to local stakeholder comments
11.	Relatório Ambiental Prelimar (RAP), Cia Acucareira Vale do Rosario, Morro Agudo, June 26, 2001
12.	Request for Revison of RAP, Governo do Estado de Sao Paulo, Sao Paulo, September 18, 2001
13.	Acompanhamento de datos de operacao- usina termoelétrica Carioba em 1999 è 2000, submitted by CPFL, November 2001
14.	Power Purchase Agreement, CPFL – Geracao de Energia, UTE CARIOBA, USINAS HIDRAULICAS, Dates for 1987 to 2001, submitted by CPFL, November 2001
15.	Annual report with benchmarks of sugar industry , 2001
16.	Annual report of CPFL for activities in year 2000, Campinas, 2001
17.	Screenshot from control device of generators at VdR, November 2001
18.	"Baseline Analysis and Quantification of Net Emissions Reductions from the Vale do Rosário Biomass Cogeneration Project", Econergy International Corporation, Washington D.C., USA, Revised January, 2002
19.	"Monitoring and Verification Protocol for Greenhouse Gas Emissions Reductions from the Vale do Rosário Biomass Cogeneration Project" ", Econergy International Corporation, Washington D.C., USA, Revised April, 2002
20.	"CARBON CREDITS FOR VALE DO ROSÁRIO BAGASSE COGENERATION PROJECT BRAZIL" - DESCRIPTION OF THE PROJECT, Econergy International Corporation, Washington D.C., USA, Revised January, 2002
21.	"Vale do Rosario Bagasse Cogeneration – A GHG Emission Reductions Project Activity in Brazil"; CDM Project Design Document; (revised) version; 14th July 2003
22.	"Baselines – Estimating the Unknown", International Energy Agency, Paris, 2000
23.	"Vale do Rosário Bagasse Cogeneration (VRBC)"; CDM Project Design Document; published in the GSP; 20th Dec. 2004. name of file: Vale_New_PDD_12.20.04.pdf
24.	"Vale do Rosário Bagasse Cogeneration (VRBC)"; final CDM Project Design Document; 1st August. 2005, name of file: VALE PDD 08.01.05 HG.pdf

Reference No.	Document or Type of Information
25.	Interview with National Dispatch Center on May 30, 2005. Following people were interviewed: Delfim Maduro Zaroni — Head for department Opercão em Tempo Real (Operador Nacional do Systema Elétrico - ONS) Wilkens Geraldes Filho — Engineer at the depertment Opercão em Tempo Real (Operador Nacional do Systema Elétrico - ONS)
26.	OECD (2001). OECD Economic Surveys: Brazil. Organization for Economic Co-Operation and Development, Paris, France.
27.	Schaeffer, R., J. Logan, A. S. Szklo, W. Chandler and J. C. de Souza (2000). *Electric Power Options in Brazil.* Pew Center on Global Climate Change
28.	Methodology AM0015: Bagasse-based cogeneration connected to an electricity grid
29.	Revised calculation and data: ONS-Emission factors SSECO 2001-2003-v.2005.06.22
30.	Pre-Validation Report for VdR Bagasse Cogeneration Project, 22. Apr. 2002, TÜV SÜD
31.	Power Purchase Agreement between CPFL and Usina Vale do Rosario from 02/09/2002, submitted by Econergy
32.	Vale do Rosário Bagasse Cogeneration (VRBC); final CDM Project Design Document; 21st December. 2005