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# VALIDATION REPORT

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## BURNING OF SOLID BIOMASS FOR PROCESS STEAM GENERATION FOR BEER MANUFACTURE IN PLACE OF FUEL OILS AT AMBEV'S BRANCHES AGUDOS (SP) AND TERESINA (PI) IN BRAZIL

REPORT No. 2007-0765

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DET NORSKE VERITAS



## VALIDATION REPORT

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Summary:  
 Det Norske Veritas Certification AS (DNV) has performed a validation of the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)” project in Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board. The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. The only changes made to this version of the validation report compared to the validation report rev. 03 dated 05 November 2007 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. In summary, it is DNV’s opinion that the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)” as described in the revised PDD of 31 October 2007 meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS-IC (Version 09 of 23 December 2006). Hence, DNV will request the registration of the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)” as a CDM project activity. The only difference between this Validation Report version and Version 3a, date 27 December 2007, referred in the Brazilian LoA, dated on December 20th, 2007, is related to information included in the PDD (Version 4 date 31/10/2007\_A) regarding evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity.

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***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
FAG	AMBEV's Agudos Branch
FTE	AMBEV's Teresinas Branch
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
N <sub>2</sub> O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



## 1 INTRODUCTION

APSYS – Consultoria Empresarial S/C Ltda has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)” CDM project, located in the municipality of Agudos, São Paulo State and in the municipality of Teresina, Piauí State, Brazil. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting. The only changes made to this version of the validation report compared to the validation report rev. 03 dated 05 November 2007 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.

The validation team consists of the following personnel:

Mr. Luis Filipe Tavares	DNV Certification AS Brazil	Team leader, CDM validator;
Ms. Andrea Leiroz	DNV Certification AS Brazil	GHG auditor;
Mr. Michael Lehmann	DNV Certification AS Norway	Energy sector expert;
Mr Einar Telnes	DNV Certification AS Norway	Technical review

### 1.1 Validation Objective

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, 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).

### 1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against Kyoto Protocol criteria for the CDM, the CDM rules and modalities as agreed in the Marrakech Accords and relevant decisions by the CDM Executive Board. The validation team has employed, based on the recommendations in the Validation and Verification Manual a risk-based approach, 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 project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

### 1.3 Description of Proposed CDM Project

The “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI) Project” involves the replacing of the fossil fuel used for steam generation. Fuel Oil BPF 3 A (Agudos Branch) and BPF 1 A (Teresina Branch) will be replaced by a renewable solid biomass from sugar cane bagasse and wood chips



and babaçu coconut husks, respectively, in order to reduce CO<sub>2</sub> emissions and allow for the use of renewable energy sources in the company operations.

The estimated amount of GHG emission reductions from the project is 500 350 tonnes CO<sub>2</sub> equivalents (tCO<sub>2</sub>e) during the fixed 10-year crediting period, resulting in estimated average annual emission reductions of 50 035 tCO<sub>2</sub>e.

## 2 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.

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 initial validation protocol for the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)” project is enclosed in Appendix A to this report.

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

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol 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.

The term request for *clarification* (CL) is used where additional information is needed to fully clarify an issue.



<b>Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference</b>
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 ( <b>OK</b> ), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.	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.

  

<b>Validation Protocol Table 2: Requirement Checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
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 ( <b>OK</b> ), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). A request for <b>Clarification (CL)</b> is used when the validation team has identified a need for further clarification.

  

<b>Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification</b>			
<b>Draft report corrective action requests and requests for clarifications</b>	<b>Ref. to Table 2</b>	<b>Summary of project participants' response</b>	<b>Final conclusion</b>
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 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 (version1 of 26 April 2007) /1/ submitted by APSIS was assessed by DNV. The documentation was formatted according to version 3 (22 December 2006) of the CDM-SSC-PDD and was based on the proposed baseline and monitoring methodology AMS-I.C. Two revised versions of the PDD dated 18 June 2007 /2/ and 4 July 2007 /3/ were submitted by APSIS in order to properly address DNV's validation findings and assessed by DNV. Finally, a revised version of the PDD /4/ dated 31 October 2007 was submitted by APSIS and subsequently assessed by DNV.

Additional documents such as spreadsheets containing CERs calculations /5/ /6/, environmental licences /7/ /8/ and the letters sent to local stakeholders /9/ were assessed during the validation process.

In order to ensure the accuracy and of the relevant information, other project documents were sent by APSIS and assessed by DNV during the phases of desk review and the resolution of outstanding issues. Such documents include, among others, evidences of project starting date /10/ /11/, evidences that incentive from the CDM was considered in the decision to proceed with the project activity /13/ and evidences of equipment lifetime /14/. These documents, among others, are listed in the section "References" below.

## 2.2 Follow-up Interviews

On 28 May 2007, DNV performed interviews with AmBev - Agudos, Flamax and MaxAmbiental during the site visit to confirm selected information and to resolve issues identified in the document review. On 29-30 May 2007, DNV performed interviews with AmBev - Teresina, Alusid and MaxAmbiental during the site visit to confirm selected information and to resolve issues identified in the document review.

The main topics of the interviews are summarised in Table 1 and persons interviewed are listed in the "References" section of this report.

**Table 1 Interview topics**

Interviewed organisation	Interview topics
AmBev – Agudos	➤ Project participants
AmBev – Teresina	➤ Fuel oil consumption
Flamax	➤ Steam Production
Alusid	➤ Environmental Licenses and legal compliance
MaxAmbiental	➤ Baseline emissions calculations
	➤ Monitoring plan
	➤ Calibration requirements
	➤ Stakeholders consultant

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve any outstanding issues, which need to be clarified for DNV's positive conclusion on the project design.





The initial validation of the project identified three *corrective actions requests* and sixteen requests for *clarification*. The project participant's response to DNV's draft validation report findings and the final version of the PDD of 31 October 2007 addressed the *corrective actions requests* and the requests for *clarification* to DNV's satisfaction.

To guarantee the transparency of the validation process, the concerns raised are summarised in chapter 3 below and documented in more detail in the validation protocol in Appendix A.

## 2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

## 3 VALIDATION FINDINGS

The findings of the validation of the Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV's Branchs Agudos (SP) and Teresina (PI) project 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 validation findings relate to the project design as documented and described in the PDD of 31 October 2007 /4/.

### 3.1 Participation Requirements

The Project participants are AmBev – Agudos Branch, AmBev – Teresina Branch and APSIS Consultoria Empresarial S/C Ltda (Apsis Consulting). The host Party Brazil meets all relevant participation requirements and has provided written approval of voluntary participation in the project /15/. No participating Annex I Party is yet identified.

The "Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV's Branchs Agudos (SP) and Teresina (PI)" received the Letter of Approval from the DNA of Brazil (dated 20 December 2007) /15/.

### 3.2 Project Design

The project involves the substitution of the fuel oil (Oil BPF 3 A and BPF 1 A) used for steam generation in the beer manufacturing process by a renewable solid biomass from local surroundings. The burning of biomass in place of fuel oil in boilers decreases the GHG gas emissions. The ash resulting from burning of biomass is disposed in the municipal landfill in the case of Teresina and at Agudos the ash is sent to Biolândia city to be transformed into fertilizer.

AmBev will monthly buy the monitored value of steam supplied from the owner of the boiler for use in its beer and soft drinks manufacturing operations. The ownership of the emission reductions generated by this project activity is established in an agreement between AmBev and the partner /12/.



With the replacement of the fuel oil boilers by the new biomass boilers, the Agudos system will be able to generate 30 tons of steam per hour to meet the brewery and soft drink production requirement of 600 000 hl/month and the Teresina system will be able to generate 20 tons of steam per hour to meet a requirement of 150 000 hl/month. The amount of biomass consumption forecasted for the steam generation is 5 200 tons of bagasse and wood chips per month in Agudos and 1 200 tons of babaçu coconut husks per month in Teresina.

The project activity was implemented in FAG with the change of the two fuel oil boilers (Aalborg AR4D and ATA MP815) by two new biomass boilers (Biochamm models). The substituted fuel oil fired boilers will remain in place as standby equipment to serve for emergency steam supply (e.g., in case of any problem with the biomass boilers and to prevent any interruption of operations). Since the boilers model Aalborg AR4D and ATA MP815 were installed in 1992 and 1986, it can be assumed a minimum lifetime of 10 and 4 years, respectively. The two new biomass boilers were installed in 22/01/2005.

In FTE the project activity was implemented with the retrofit of a boiler model Aalborg FAM 20 in 2004 in order to continue its operations on-site using 100% biomass. The boiler was manufactured on 1993 and installed on 1997 and has a lifetime of 11 years. The two other fuel oil boilers were sent to AMBEV's Cuiabá branch for combustion of biomass. On 29/06/2005 and 29/03/2005 the two fuel oil boilers ATA MP815 and CBC CFI 1200 BHP respectively were transferred to the Teresina branch for stand-by purposes only (e.g., in case of any problem with the biomass boilers and to prevent any operational interruption). These last two boilers were installed in 1995 (Cuiabá branch) and 1991 (Natal branch) and have an estimated remaining lifetime of 13 and 9 years, respectively.

Due to maintenance practices, the lifetime of these equipments could be extended after the 25 years as per Brazilian NR13 regulation and as informed by the manufacturer. This has been confirmed through an e-mail that Marcelo José Salmazo from Aalborg Industries S/A sent to Fabio Sant'Anna Ruela from AmBev /14/. In addition to this, AMBEV undertakes a boiler revision when it reaches 25 years of operational lifetime and the necessary retrofits or corrections will be made to extend its operational lifetime, as per Brazilian NR13 regulation.

The biomass steam generation plants were designed to have:

Agudos Branch:

- minimum biomass stocking area for one month of operations;
- automated boiler biomass feed;
- two 15 tons of steam/hour boilers for solid biomass burning;
- Automated ash removal system.

Teresina Branch:

- minimum biomass stocking area for two month of operations;
- automated boiler biomass feed;
- one 20 tons of steam/hour boiler for solid biomass burning;
- Manual ash removal system.



The biomass boilers operators were trained according to Brazilian regulation NR13. In FTE and FAG the operators were trained by SENAI PI/Lençóis and JR Martorini Engenharia de segurança do Trabalho Ltda, respectively.

A fixed 10-year crediting period is selected, starting on 1 November 2007 or on the date of registration of the CDM project activity, whichever is later. The starting date of the project activity is 28 November 2004 with an expected operational lifetime of 30 years.

Evidence that AmBev seriously considered the CDM in the decision to proceed with the project was presented as evidenced in a minutes of meeting among the AmBev's managers to discuss the biomass project under the CDM eligibility on 10 April 2004 /13/.

The project is expected to bring social (employment) and environmental (use of cleaner technologies) benefits, thus contributing to sustainable development objectives of the Brazilian Government.

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.

### 3.3 Baseline Determination

The project applies the simplified baseline methodology for selected small-scale CDM project activity AMS-I.C (Version 09 of 23 December 2006) – “Thermal Energy for the User” for Type I – Renewable Energy Project as outlined in the Appendix B of the “Simplified modalities and procedures for small-scale CDM project activities”: Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities.

The AMS-I.C is applicable for projects with renewable energy technologies that supply individual households or users with thermal energy that displaces fossil fuels.

For Agudos, the new biomass-fuelled thermal application boilers display an installed capacity of 15 000 kg steam/hour at  $21\text{kgf/cm}^2$  or 10 000 000 kcal/h each, comprising a total of 20 000 000 Kcal/h =  $23.26\text{MW}_{\text{th}}$ . For Teresina, the new biomass-fuelled thermal application boiler display an installed capacity of 20 000 kg steam/hour at  $10.5\text{kgf/cm}^2$  or 12 900 000 kcal/h =  $15\text{MW}_{\text{th}}$ . The total capacity is  $38.26\text{MW}_{\text{th}}$ , thus below the established limit of  $45\text{MW}_{\text{th}}$ . Thus, this methodology is applicable to the project in accordance with the existing criteria.

The baseline scenario chosen was the fuel oil used by the conventional boilers without replacement by biomass boilers for thermal energy generation.

The baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced. A ratio between the amount of steam production and the oil consumed has been verified and it is calculated as an average of the ratios between steam production/oil consumption for the years 2002, 2003 and 2004. The net calorific value of fuel oil has been obtained from Brazilian official data: National Energy Balance and the IPCC value has been applied for the emission factor.

The project boundary is defined as the physical, geographical site of the renewable energy generation. So, in accordance with AMS-I.C, the project boundary includes the biomass boiler plant within the FTE and biomass plant and storage site at FAG.



### 3.4 Additionality

The additionality of the project is demonstrated by applying the Attachment A to the Appendix B of the simplified modalities and procedures for CDM small-scale project activities.

The additionality claims of the project are based on the following four barriers:

- Investment barrier: DNV was able to confirm that the investment in new boilers is not a part of AmBev's investment plans given that the operation and maintenance of boilers at both plants is outsourced. The retrofit and purchasing of the boilers were undertaken by Flamax and Alusid, the local service providers that operate the boilers. For this reason, there is no investment barrier associated with the boilers for project participants.
- Technological barrier: It has been demonstrated that the implementation of the biomass boilers within the beverage industry in Brazil is not yet considered a sufficiently reliable technology compared to the use of fossil fuel. The implementation of bioenergy technology at a typical beverage plant requires significant modifications in the exhaust system in order to control particulate emissions. The particulate emissions from a biomass boiler are higher than a fuel oil boiler, so a more complex operation, human and capital resources is required.
- Barrier on account of prevailing practice: DNV is able to confirm that the "Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV's Branchs Agudos (SP) and Teresina (PI)" project is an innovative project in Brazil whose switch a fossil fuel for biomass boilers in the beer manufacturing process.
- Other barriers: It has been demonstrated that the project faces barriers due to biomass supply. The AmBev branches have established a logistic operation for the biomass supply but in neither sites formal contracts are established between AmBev and biomass suppliers. Moreover, problems regarding supply continuity due to disrupting weather, low harvests or lack of suppliers in Teresina's specific case may occur. In this case, as a result, AmBev would have to reconsider its supplier base and look for different suppliers.

The additionality of the project is evidenced by a barrier due to prevailing practice, considering that this is a pioneer project in the Brazilian beverage industry. There are no similar projects that use biomass boilers in beer production activities in Brazil. Without the project the usual practice would prevail: Steam generation based on fossil fuels.

Given the above barriers, it is deemed sufficiently demonstrated that the project is not a likely baseline scenario for the fixed 10-year credit period and that emission reductions thus are additional to what would otherwise have occurred.

### 3.5 Monitoring Plan

The project applies the approved monitoring methodology AMS-I.C (Version 09 of 23 December 2006) – "Thermal Energy for the User" for Type I – Renewable Energy Project, according to the Appendix B of the "Simplified modalities and procedures for small-scale CDM project activities": Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities.

According to AMS-I.C, the monitoring consists in metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient.



The AmBev project calculates baseline emissions through monitoring the amount of steam produced by the biomass boiler in order to later convert it into fuel oil consumption. The prevented oil consumption figure will be calculated from this and by multiplying by the FO emission factor in order to determine the CO<sub>2e</sub> emissions/year which would have occurred in the baseline. AmBev has a system that can control the weight of biomass that arrives in trucks, the consumption of biomass and fuel oil and the steam production. The instruments are under a calibration regime and a plan for periodic calibration frequency was presented.

Concerning leakage, no sources of emission were identified according to AMS-I.C. In FAG, the fuel oil boilers previously used in the unit will remain as standby so as to serve for emergency steam supply through the oil-fired boilers, in case of any problem with the biomass boilers, to prevent any operational interruption. In FTE, the boilers were transferred to AmBev's Cuiabá branch. However, these boilers were retrofitted to comprise a new furnace and are burning biomass instead of fuel oil. The fuel oil boilers transferred to FTE will also remain in standby.

Details of the data to be collected, the frequency of data recording, its certainty, and format and location to be filed are described in the PDD. The format data archiving seems appropriate for the project. All data will be kept until two years after the end of the crediting period.

Responsibilities and authorities for project management, monitoring and reporting project activities as well as for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques and QA/QC procedures are clearly defined. The project will require additional training and project maintenance as described in the PDD.

The monitoring management system and training are clearly established in the PDD.

### 3.6 Calculation of GHG Emissions

The energy baseline is the fuel consumption of the technology in use or that would have been used in the absence of the project activity.

The amount of fuel oil consumption in conventional boiler used to estimate baseline emissions was calculated using the oil consumption in 2007 based on the average of 2002, 2003 and 2004.

The baseline emissions will be calculated ex-post. The amount of fuel oil which no longer combusted will be derived from the amount of steam produced in one year by the biomass boiler divided by the amount of steam that each kg of fuel oil can produce.

The ratio between the amount of steam production and the oil consumed were calculated for the years 2002, 2003 and 2004 and the average for these years will be used during the verification to calculate the emission reductions based on the measured effective steam production in the baseline.

The emissions baseline is the energy baseline calculated times the CO<sub>2</sub> emission coefficient for the fuel displaced (default value for fuel oil = 21.1 tC/TJ) and times the carbon fraction actually oxidized in combustion (0.99).

In case of fuel oil use, the project emission is based on the energy consumption calculated times the emission factor for the fuel displaced (default value for fuel oil = 21.1 tC/TJ) and times the carbon factor actually oxidized in combustion (0.99).

According to the methodology I.C., leakage would occur if the old equipment were transferred to another activity, which does not occur. In FAG, the fuel oil boilers previously used in the unit



will remain as standby so as to serve for emergency steam supply through the oil-fired boilers, in case of any problem with the biomass boilers, to prevent any operational interruption. In FTE, the boilers were transferred to AmBev's Cuiabá branch; however these boilers are burning biomass instead of fuel oil. The fuel oil boilers transferred to FTE will also remain in standby.

The forecast annual emission reductions thus amount to 50 035 tCO<sub>2</sub>.

Two spreadsheets used for the calculation of the emission reductions were assessed by DNV to confirm the above estimate.

### 3.7 Environmental Impacts

AmBev - Agudos branch has granted Environment Operation Licence #7001801 which is valid until 01/11/2008. This license was issued by the Environmental Agency of the State of São Paulo (CETESB) after an analysis of the NO<sub>x</sub> emissions reduction plan and a particulate emission monitoring presented by AmBev.

AmBev - Teresina branch has granted an Environment Operation Licence during the factory's renewal process D000327/07 – 002627/06 issued by State Environmental Protection Agency – SEMAR. This license is valid until 23/02/2009. A copy of the environmental licenses were sent and assessed.

No adverse environmental impacts are identified, which seems reasonable given the nature of the project design. The level of particulate emissions was in conformity with national regulations. Transboundary environmental impacts are not foreseen.

### 3.8 Comments by Local Stakeholders

Local stakeholders, such as the Brazilian NGOs Forum and Local Social Association, the City hall, the state environmental agency, Public prosecution service, Municipal Chamber, neighbouring communities, and the boiler's operational partner, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. However, as requested by the Brazilian DNA, new letters including an explanation of project's sustainable development contribution to Brazil were sent to local stakeholders.

The letters sent to the local stakeholders and the received comments were assessed.

Two comments were received, however due to content (commendation) the project design did not require any significant modification. However, as CETESB required attention to particulate emissions, a monitoring plan for the particulate emissions were implemented.

## 4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 26 April 2007 was made publicly available on DNV's climate change website ([www.dnv.com/certification/climatechange](http://www.dnv.com/certification/climatechange)) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 11 May to 09 June 2007. No comments were received.





## 5 VALIDATION OPINION

*Det Norske Veritas Certification AS (DNV) has performed a validation of the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)” in Brazil. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.*

*The project participants are AmBev – Agudos Branch, AmBev – Teresina Branch and APSIS Consultoria Empresarial S/C Ltda (Apsis Consulting). The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.*

*The “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI) Project” involves the replacement of the fuel used for steam generation. Fuel Oil BPF 3 A (Agudos Branch) and BPF 1 A (Teresina Branch) will be replaced by a renewable solid biomass from sugar cane bagasse and wood chips and babaçu coconut husks, respectively, so as to reduce CO<sub>2</sub> emissions and allow for the insertion of renewable energy sources in company operations.*

*The project applies the simplified baseline methodology for selected small-scale CDM project activity categories, category “I.C – Thermal energy for the user”. The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional to any that would occur in the absence of the project activity.*

*The monitoring methodology has been correctly applied. The monitoring plan sufficiently specifies the monitoring requirements.*

*By the using of a renewable energy source, the project results in reductions of CO<sub>2</sub> emissions that give long-term benefits to the mitigation of climate change. Emission reductions are directly monitored and calculated ex-post, through of fuel oil consumption, and using the approach indicated in AMS-I.C.*

*Local stakeholders, such as the Brazilian NGOs Forum and Local Social Association, the City hall, the state environmental agency, Public prosecution service, Municipal Chamber, neighbouring communities, and the boiler’s operational partner, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Two comments were received.*

*In summary, it is DNV’s opinion that the Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI), as described in the revised and resubmitted project design document of 31 October 2007 meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS-I.C (Version 09 of 23 December 2006). Hence, DNV will request the registration of the Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)project as a CDM project activity.*



## REFERENCES

*Documents provided by the project proponent that relate directly to the project:*

- /1/ *Project Design Document for the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)”*. Version 1 of 26 April 2007.
- /2/ *Project Design Document for the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)”*. Version 2 of 18 June 2007.
- /3/ *Project Design Document for the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)”*. Version 3 of 4 July 2007.
- /4/ *Project Design Document for the “Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV’s Branchs Agudos (SP) and Teresina (PI)”*. Version 4 of 31 October 2007.
- /5/ Spreadsheets - Agudos\_calculosCERs\_v3\_100707.xls
- /6/ Spreadsheets - Teresina\_calculosCERs\_v3\_020207.xls
- /7/ AmBev Agudos branch – Operational Licence # 7001801 issued on 01 November 2005.
- /8/ AmBev Teresina branch – Operational Licence # D000327/07 – 00267/06 issued on 23February 2007.
- /9/ AmBev - Copy of letters sent to local stakeholders.
- /10/ AmBev – starting date evidence Agudos (Caldeira\_1\_AG\_1ª Pg.jpg, Caldeira\_1\_AG\_2ª Pg.jpg, Caldeira\_1\_AG\_3ª Pg.jpg, Caldeira\_2\_AG\_1ª Pg.jpg, Caldeira\_2\_AG\_2ª Pg.jpg and Caldeira\_2\_AG\_3ª Pg.jpg)
- /11/ AmBev – starting date evidence Teresina (evidencia partida caldeira teresina1.jpg and evidencia partida caldeira teresina2.jpg)
- /12/ Contractual agreement between AmBev and the partner
- /13/ Meeting minutes – 10 April 2004
- /14/ Equipment lifetime: FW Vida útil de caldeiras.htm
- /15/ Comissão Interministerial de Mudança Global do Clima (DNA of Brazil): *Letter of Approval*. 20 December 2007

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

- /16/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /17/ Appendix B of the “Simplified modalities and procedures for small-scale CDM project





activities”: Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities. AMS-I.C – “Thermal Energy for the User” for Type I – Renewable Energy Project. Version 09 of 23 December 2006.

- /18/ Attachment A to the Appendix B of the “Simplified modalities and procedures for small-scale CDM project activities”: Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities. Version 06 of September 2005.

*Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:*

- /19/ Fabio Sant’Anna Ruela – Ambev  
/20/ Beatriz Botelho de Oliveira – Ambev  
/21/ Carlos Alberto Pontes – Ambev Agudos  
/22/ Marco Antônio B. Ramos – Ambev Agudos  
/23/ André Bernardino de Andrade – Flamax  
/24/ Marconi Soares de Souza – Ambev Teresina  
/25/ José Edvaldo A. Franco – Alusid

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## **APPENDIX A**

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### **VALIDATION PROTOCOL FOR SMALL-SCALE CDM PROJECT ACTIVITIES**

**Table 1 Mandatory Requirements for Small Scale 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	<del>CL</del> 1	Table 2, Section E.4.1 No participating Annex I Party is yet identified. The table in the section A.3 of the PDD is not correctly answered. Only entities that take decisions on the allocation of CERs shall be listed. Consultants who only assisted in the development of the PDD and/or the baseline and monitoring plan should not be listed as project participant. Moreover, the host Party Brazil is an indirect participant through the entities authorised to participate in the project. DNV requests further clarifications about the list of the project participant and about the indication of the host Party as project participant.
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, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	--	Table 2, Section A.3 Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the project assists it in achieving sustainable development.
3. 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
4. The project shall have the written approval of voluntary	Kyoto Protocol Art.	--	DNA of Brazil: Letter of Approval. 20

Requirement	Reference	Conclusion	Cross Reference/ Comment
participation from the designated national authority of each party involved	12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a		December 2007
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must be additional to any that would occur in 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. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1
7. 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.
8. 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.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK	Brazil has ratified the Kyoto Protocol on 23 August 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	No participating Annex I Party is yet identified.
11. The participating Annex I Party shall have in place a	CDM Modalities and	OK	No participating Annex I Party is yet

Requirement	Reference	Conclusion	Cross Reference/ Comment
national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	Procedures §31b		identified.
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	The PDD is in line with the CDM-PDD for small-scale CDM project activities (22 December 2006).
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD "Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV's Branchs Agudos (SP) and Teresina (PI)", 26 April 2007, has been published on <a href="http://www.dnv.com/certification/Climat">http://www.dnv.com/certification/Climat</a> eChange. Parties, stakeholders and

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*Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV's Branchs Agudos (SP) and Teresina (PI)*

Requirement	Reference	Conclusion	Cross Reference/ Comment
			NGOs have been – through the UNFCCC CDM website – invited to provide comments on the validation requirement from 11 May to 09 June 2007. No comments were received.

**Table 2 Requirements Checklist**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>A. Project Description</b> The project design is assessed.					
<b>A.1. Small scale project activity</b> It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	<p>The project applies the simplified baseline methodology for selected small-scale CDM project activity categories, category "I.C – Thermal energy for the user".</p> <p>The category I.C is applicable for projects with renewable energy technologies that supply individual households or users with thermal energy that displaces fossil fuels. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass for water heating, space heating, or drying, and other technologies that provide thermal energy that displaces fossil fuel. Biomass-based cogeneration systems that produce heat and electricity for use on-site are included in this category. The renewable energy capacity may be new or replace old units for more efficient units. For co-generation systems and/or co-fired systems to qualify under this category, the energy output shall not exceed 45 MW<sub>thermal</sub>.</p> <p>For Agudos, the new biomass-fuelled thermal application boilers display an installed capacity of</p>		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			15 000 kg steam/hour at 21kgf/cm <sup>2</sup> or 10 000 010 Kcal/h each, comprising a total of 20 000 000 Kcal/h = 23.26MW <sub>th</sub> . For Teresina, the new biomass-fuelled thermal application boiler display an installed capacity of 20 000 kg steam/hour at 10.5kgf/cm <sup>2</sup> or 12 900 000 Kcal/h = 15MW <sub>th</sub> . The total capacity is 38.26 MW <sub>th</sub> , thus below the established limit of 45MW <sub>th</sub> . Thus, this methodology is applicable to the project in accordance with the existing criteria.		
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	The section "A.4.5 Confirmation that the small-scale project activity is not a debundled component of a large scale project activity" of the PDD is not correctly answered.	<del>CL-6</del>	OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/	DR	The project is a "Thermal energy for the user" (type I.C.) small-scale CDM projects activity as defined in the simplified modalities and procedures for small-scale CDM project activities.		OK



Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>A.2. Project Design</b> Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	Yes. The project involves the substitution of the fuel oil (Oil BPF 3 A and BPF 1 A) used for steam generation by a renewable solid biomass within the APSIS – Consultoria Empresarial S/C Ltda Plant located in the municipality of Agudos, São Paulo State and in the municipality of Teresina, Piauí State, Brazil.  AmBev will monthly buy the steam monitored value supplied from the owner of the boiler for its beer and soft drinks manufacturing operations. The CER's property generated by this project activity is established by contractual agreement between AMBEV and the partner. DNV requests evidence of the signed agreement.	CL-2	OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR	According to the Small Scale Methodologies (Version 09 of 23 December 2006), the total installed capacity of the projects shall not exceed the energy output shall not exceed 45 MW <sub>thermal</sub> for co-generation systems and co-fired systems. The new biomass-fuelled thermal application boilers display an installed total capacity of 38.26 MW <sub>th</sub> and comply with criteria.		OK
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR	Yes. The technology using solid biomass for steam generation reflects current good practices.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR	There was no transfer of technology, as the one used in project activities is Brazilian.		OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/	DR	It is not clear if the project will require initial training. The project participant should send information about that.	<del>CL-3</del>	OK
<b>A.3. Contribution to Sustainable Development</b> The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes. The project has been promoting supportable development for the host Country by providing: <ul style="list-style-type: none"> <li>• Adopting energy efficiency and cleaner technologies in industrial processes;</li> <li>• Increasing employment opportunities in the nearby region and in the city where biomass boilers are located;</li> <li>• Generation of local income.</li> </ul>		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	Adverse environmental or social effects are not foreseen.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	The DNA of Brazil confirmed that the project assists in achieving sustainable development.		OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	AmBev - Agudos branch has granted an Environment Operation Licences #7001801 issued by Environmental Agency of the State of São Paulo (CETESB) on 01 November 2005.  AmBev - Teresina branch has granted an Environment Operation Licences during the	<del>CL-14</del> <del>CL-15</del>	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p>factory's renewal process D000327/07 – 002627/06 issued by State Environmental Protection Agency – SEMAR. During the first verification, the renewal of the Operational Environmental Licence should be checked.</p> <p>DNV requests documented evidence of the Operation Environmental Licenses.</p> <p>If possible environmental impacts were analysed by CETESB and SEMAR, the section D.2 of the PDD should be answered. Moreover, DNV requests documented evidence of the environmental impact assessment.</p>		
<b>B. Project Baseline</b> 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>B.1. Baseline Methodology</b> It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/	DR	The project applies the simplified baseline methodology for selected small-scale CDM project activity categories, category I.C. – Thermal energy for the user. The project involves the substitution of the fuel oil (Oil BPF 3 A and BPF 1 A) used for steam generation in the beer manufacturing process by a renewable solid biomass. The burning of biomass in place of fuel oil in boilers decreases the GHG gas emissions.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	The category I.C methodology is applicable for the project.		OK
<b>B.2. Baseline Determination</b> It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	/1/	DR	<p>The additionality of the project is demonstrated by applying the Attachment A to the Appendix B of the simplified modalities and procedures for CDM small-scale project activities.</p> <p>The additionality claims of the project are based on the following four barriers:</p> <ul style="list-style-type: none"> <li>Investment barrier: DNV was able to confirm that the investment in new boilers is not a part of AmBev's investment plans given that the operation and maintenance of boilers at both plants is outsourced. The retrofit and purchasing of the boilers were undertaken by Flamax and Alusid, the local service providers that operate the boilers. For this reason, there is no investment barrier associated with the boilers for project participants.</li> <li>Technological barrier: It has been demonstrated that the implementation of the biomass boilers within the beverage industry in Brazil is not yet considered a sufficiently reliable technology compared to the use of fossil fuel. The implementation of bioenergy</li> </ul>		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p>technology at a typical beverage plant requires significant modifications in the exhaust system in order to control particulate emissions. The particulate emissions from a biomass boiler are higher than a fuel oil boiler, so a more complex operation, human and capital resources is required.</p> <ul style="list-style-type: none"> <li>Barrier on account of prevailing practice: DNV is able to confirm that the "Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV's Branchs Agudos (SP) and Teresina (PI)"project is an innovative project in Brazil whose switch a fossil fuel for biomass boilers in the beer manufacturing process.</li> <li>Other barriers: It has been demonstrated that the project faces barriers due to biomass supply. The AmBev branches have established a logistic operation for the biomass supply but in neither sites formal contracts are established between AmBev and biomass suppliers. Moreover, problems regarding supply continuity due to disrupting weather, low harvests or lack of suppliers in Teresina's specific case may occur. In this case, as a result, AmBev would have to reconsider its supplier base and look for different suppliers.</li> </ul> <p>The additionality of the project is evidenced by a barrier due to prevailing practice, considering that this is a pioneer project in the Brazilian beverage industry. There are no similar projects that use biomass boilers in beer production activities in</p>		

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			<p>Brazil. Without the project the usual practice would prevail: Steam generation based on fossil fuels.</p> <p>Given the above barriers, it is deemed sufficiently demonstrated that the project is not a likely baseline scenario for the fixed 10-year credit period and that emission reductions thus are additional to what would otherwise have occurred.</p>		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR	<p>Yes. However, If AmBev branches started the project activities in the beginning of 2005, the ratio between steam production and oil consumption has to be calculated as an average of the ratios for each past year (2002, 2003 and 2004). According to the PDD and the excel spreadsheet, this ratio is calculated based on the years 2003, 2004 and 2005. Also, DNV requests further explanations about the formula and the values of the parameters used to calculate this ratio. Moreover, the project participants need to calculate the ratio for the two fuel oils (BPF 1 A and 3 A).</p> <p>The table B.6.2 it is not mentioning the equipment used to measure the fuel oil consumption, the fuel oil emission factor unit and it is not clear if the net calorific value will be measure or will be used a value from the literature. It is not clear the source of data used for the emission factor and for the carbon fraction. Also, it is not necessary to include the conversion factor for kcal to TJ in this section but it is necessary to include the ratio between steam production and oil consumption.</p>	CAR-4 CL-7	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	Yes.		OK
B.2.4. Is the baseline selection compatible with the available data?	/1/	DR	See B.2.2.	<del>CAR-4</del> <del>CL-7</del>	OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR	Yes.		OK
<b>C. Duration of the Project / Crediting Period</b> 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?	/1/	DR	The starting date of the project activity is 28 November 2004 with an expected operational lifetime of 30 years.  The length of the crediting period and the expected operational lifetime of the project activity should be stated in years and months.	<del>CL-5</del>	OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A fixed 10-year crediting period is selected, starting on 1 November 2007.  The crediting period could not start before the registration of the project.  See C.1.1.	<del>CL-4</del> <del>CL-5</del>	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>D. Monitoring Plan</b> The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
<b>D.1. Monitoring Methodology</b> It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	/1/	DR	The project applies the approved monitoring methodology AMS-I.C (Version 09 of 23 December 2006) – “Thermal Energy for the User” for Type I – Renewable Energy Project, according to the Appendix B of the “Simplified modalities and procedures for small-scale CDM project activities”: Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities		OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes, it complies with the monitoring requirements for small scale CDM project category I.C.  However, The table B.7.1 is not mentioning all data to be monitored. According to the PDD, AmBev will buy the steam generated by boilers partners and this will be the only information necessary to be monitored. However, the project boundary comprises the biomass boiler plants and the storage area. Thus, parameters such as amount of biomass and the oil consumed in cases of boiler maintenance and firing up need to be monitored.  Details of the data to be collected, its certainty,	CAR-2 CAR-3	OK

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



Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			format and location to be filed are not described. Also, the monitoring plan not report for how long the filed data will be kept.		
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	See D.1.2	<del>CAR-2</del> <del>CAR-3</del>	OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	See D.1.2	<del>CAR-2</del> <del>CAR-3</del>	OK
<b>D.2. Monitoring of Project Emissions</b> 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?	/1/	DR	See D.1.2.	<del>CAR-2</del> <del>CAR-3</del>	OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	See D.2.1	<del>CAR-2</del> <del>CAR-3</del>	OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	See D.2.1	<del>CAR-2</del> <del>CAR-3</del>	OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	See D.2.1	<del>CAR-2</del> <del>CAR-3</del>	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>D.3. Monitoring of Leakage</b> If applicable, 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?	/1/	DR	According to the category I.C. Thermal Energy for the User, leakage would occur if the old equipment were transferred to another activity, which does not occur. In FAG, the fuel oil boilers previously used in the unit will remain as standby so as to serve for emergency steam supply through the oil-fired boilers, in case of any problem with the biomass boilers, to prevent any operational interruption. In FTE, the boilers were transferred to AmBev's Cuiabá branch. However, these boilers are burning biomass instead of fuel oil. The fuel oil boilers transferred to FTE will also remain in standby.		OK
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	See D.3.1.		OK
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	See D.3.1.		OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	See D.3.1.		OK
<b>D.4. Monitoring of Baseline Emissions</b> 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	/1/	DR	The monitoring methodology in which project activities fit is that of letter (a) of I.C Thermal	<del>CAR-2</del> <del>CAR-3</del>	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
necessary for determining baseline emissions during the crediting period?			Energy for the User: the energy produced by a system sample should be measured where the baseline refers to the energy which would be produced, multiplied by an emission factor. See D.1.2.		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	See D.1.2.	<del>CAR-2</del> <del>CAR-3</del>	OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	See D.1.2.	<del>CAR-2</del> <del>CAR-3</del>	OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	See D.1.2.	<del>CAR-2</del> <del>CAR-3</del>	OK
<b>D.5. Project Management Planning</b> It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/	DR	The responsible for monitoring and reporting project activities as well as for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques are clearly defined. However, the responsible for the project management is only described for Agudos site.	<del>CL-8</del>	OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR	See D.5.1.	<del>CL-8</del>	OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR	See D.5.1.	<del>CL-8</del>	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	The fuel oil boilers previously used in the unit shall remain as standby so as to serve for emergency steam supply, through the oil-fired boilers, in case of any problem with the biomass boilers, to prevent any interruption.		OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	The calibrations instruments make part of a computer management system, whose all measuring and safety equipments are predicted al Calibration Instruments Plan.		OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Yes. Maintenance of the equipments will be carried out by Flamax and Alusid.		OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Procedures for monitoring, measurements and reporting are clearly described.		OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	Details of the data to be collected, its certainty, format and location to be filed are not described. Also, the monitoring plan not report for how long the filed data will be kept.	<del>CAR-3</del>	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	See D.5.2.	<del>CL-8</del>	OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR	There are no procedures identified for internal audits of GHG project, project performance reviews and corrective actions.	<del>CL-9</del>	OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR	See D.5.10.	<del>CL-9</del>	OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR	See D.5.10.	<del>CL-9</del>	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>E. Calculation of GHG emission</b> 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.					
<b>E.1. Project GHG Emissions</b> The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	Yes.		OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes.		OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	/1/	DR	The calculation of the emission reductions is in accordance with AMS-I.C and takes into account all relevant factors of the project technology.		OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	<p>The baseline and project emissions calculations are correct but not transparently documented. The PDD only presented the emissions calculation for one of the sites.</p> <p>If Agudos Branch old boilers fired fuel oil BPF 3 A, it is not clear why for emergency cases the boilers will fired the oil BPF 1 A. DNV requests further explanations about this replacement of fuel.</p> <p>Two spreadsheets used for the calculation of the emission reductions were assessed by DNV to</p>	<del>GL-11</del> <del>GL-12</del> <del>GL-13</del>	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			confirm this estimative. However, the oil consumption for the year 2002 was not reported in the spreadsheets. Also, the formulas used in the spreadsheet are not completely transparent.		
E.1.5. Have conservative assumptions been used?	/1/	DR	<p>The energy baseline is the fuel consumption of the technology in use or that would have been used in the absence of the project activity.</p> <p>The amount of fuel oil which shall cease to be consumed shall be equivalent to the amount of steam produced in one year by the biomass boiler divided by the amount of steam that each kg of fuel oil can produce.</p> <p>The project emission is the energy consumption calculated times the emission factor for the fuel displaced (default value for fuel oil = 21.1 t C / TJ) and times the carbon factor actually oxidized in combustion (0.99).</p> <p>See E.1.4.</p>	<del>CL-11</del> <del>CL-12</del> <del>CL-13</del>	OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/	DR	See E.1.5	<del>CL-11</del> <del>CL-12</del> <del>CL-13</del>	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
<b>E.2. Leakage</b> 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 and estimated ex-ante.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	According to the category I.C. Thermal Energy for the User, leakage would occur if the old equipment were transferred to another activity, which does not occur. In FAG, the fuel oil boilers previously used in the unit will remain as standby so as to serve for emergency steam supply through the oil-fired boilers, in case of any problem with the biomass boilers, to prevent any operational interruption. In FTE, the boilers were transferred to AmBev's Cuiabá branch. However, these boilers are burning biomass instead of fuel oil. The fuel oil boilers transferred to FTE will also remain in standby.		OK
E.2.2. Are potential leakage effects properly accounted for in the calculations (if applicable)?	/1/	DR	Yes.		OK
E.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?	/1/	DR	Yes.		OK
E.2.4. Are the calculations documented in a complete and transparent manner and (if applicable)?	/1/	DR	Yes.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.2.5. Have conservative assumptions been used (if applicable)?	/1/	DR	Yes.		OK
E.2.6. Are uncertainties in the leakage estimates properly addressed (if applicable)?	/1/	DR	Yes.		OK
<b>E.3. Baseline GHG Emissions</b> The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	/1/	DR	<p>The energy baseline is the fuel consumption of the technology in use or that would have been used in the absence of the project activity.</p> <p>The amount of fuel oil which shall cease to be consumed shall be equivalent to the amount of steam produced in one year by the biomass boiler divided by the amount of steam that each kg of fuel oil can produce.</p> <p>According to the excel spreadsheet, the amount of fuel oil consumption in conventional boilers used to estimate baseline emissions in both sites was calculated based on the average of 2002, 2003 and 2004. However, in the section "B.6.3 Ex-ante calculation of emission reductions" of the PDD, the baseline emissions are calculated only for the year 2002 instead of the average of the past years.</p> <p>The emissions baseline is the energy baseline calculated times the CO<sub>2</sub> emission coefficient for the fuel displaced (default value for fuel oil = 21.1 t C / TJ) and times the carbon fraction actually oxidized in combustion (0.99).</p>	CL-10 CL-14	OK



Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			The baseline and project emissions calculations are correct but not transparently documented. The PDD only presented the emissions calculation for one of the sites.		
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	Yes.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes.		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	The calculation of the emission reductions is in accordance with AMS-I.C and takes into account all relevant factors of the project technology.		OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	Yes. Two spreadsheets used for the calculation of the emission reductions were assessed by DNV to confirm this estimative. However, the oil consumption for the year 2002 was not reported in the spreadsheets. Also, the formulas used in the spreadsheet are not completely transparent. See E.3.1.	CL-10 CL-11 CL-13	OK
E.3.6. Have conservative assumptions been used?	/1/	DR	See E.3.1.	CL-10 CL-11	OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	See E.3.6	CL-10 CL-11	OK
<b>E.4. Emission Reductions</b> Validation of ex-ante estimated emission reductions.					
E.4.1. Will the project result in fewer GHG	/1/	DR	The project is expected to reduce CO <sub>2</sub> emissions to		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
emissions than the baseline case?			the extent of 500 350 during the fixed 10-year crediting period.		
<b>F. Environmental Impacts</b> It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/	DR	<p>AmBev - Agudos branch has granted an Environment Operation Licences #7001801 issued by Environmental Agency of the State of São Paulo (CETESB) on 01 November 2005.</p> <p>AmBev - Teresina branch has granted an Environment Operation Licences during the factory's renewal process D000327/07 – 002627/06 issued by State Environmental Protection Agency – SEMAR. During the first verification, the renewal of the Operational Environmental Licence should be checked.</p> <p>DNV requests documented evidence of the Operation Environmental Licenses.</p> <p>If possible environmental impacts were analysed by CETESB and SEMAR, the section D.2 of the PDD should be answered. Moreover, DNV requests documented evidence of the environmental impact assessment..</p>	<del>CL-14</del> <del>CL-15</del>	OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR	See F.1.1	<del>CL-14</del> <del>CL-15</del>	OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	See F.1.1	<del>CL-14</del> <del>CL-15</del>	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	See F.1.1	<del>CL-14</del> <del>CL-15</del>	OK
<b>G. Comments by Local Stakeholder</b> Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	Local stakeholders, such as the Brazilian NGOs Forum and Local Social Association, the City hall, the state environmental agency, Public prosecution service, Municipal Chamber, neighbouring communities, and the boiler's operational partner, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA.  Two comments were received, however due contend (commendation) the project design did not require any significant modification. However, as CETESB required attention to particulate emissions, a monitoring plan for the particulate emissions were implemented.  DNV requests a copy of the letters sent to the stakeholders, the comments received and the answers provided by the project proponent.	<del>CL-16</del>	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	See G.1.1	<del>CL-16</del>	OK
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?	/1/	DR	See G.1.1	<del>CL-16</del>	OK

DET NORSKE VERITAS

*Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV's Branchs Agudos (SP) and Teresina (PI)*

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
G.1.4. Is a summary of the comments received provided?	/1/	DR	See G.1.1	<del>CL 16</del>	OK
G.1.5. Has due account been taken of any comments received?	/1/	DR	See G.1.1	<del>CL 16</del>	OK

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

**Table 3 Resolution of Corrective Action and Clarification Requests**

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p><b>CAR 1</b></p> <p>If AmBev branches started the project activities in the beginning of 2005, the ratio between steam production and oil consumption has to be calculated as an average of the ratios for each past year (2002, 2003 and 2004). According to the PDD and the excel spreadsheet, this ratio is calculated based on the years 2003, 2004 and 2005. Also, DNV requests further explanations about the formula and the values of the parameters used to calculate this ratio. Moreover, the project participants need to calculate the ratio for the two fuel oils (BPF 1 A and 3 A).</p>	<p>B.2.2 B.2.4</p>	<p>The ration between steam production and oil consumption was recalculated as an average of 2002, 2003 and 2004 years. The excel Agudos_calculosCERs_v2 was corrected – see spreadsheet Agudos Oil consumption - and the necessary changes in PDD v3 were made.</p> <p>Boiler's efficiency formula was explained to validation team during on-site visit according to the combustion performance explanation. The ratio of the fuel oils was calculated for baseline and project emissions.</p>	<p>The last version of the PDD and the spreadsheet were assessed. The ratio between the amount of steam production and the oil consumed was correctly calculated. Also, the boiler's efficiency was explained during the site visit and the data was updated.</p> <p>This CAR is closed.</p>
<p><b>CAR 2</b></p> <p>The table B.7.1 is not mentioning all data to be monitored. According to the PDD, AmBev will buy the steam generated by boilers partners and this will be the only information necessary to be monitored. However, the project boundary comprises the biomass boiler plants and the storage area. Thus, parameters such as amount of biomass and the oil consumed in cases of boiler maintenance and firing up need to be monitored.</p>	<p>D.1.2 D.1.3 D.1.4 D.2.1 D.2.2 D.2.3 D.2.4 D.4.1 D.4.2 D.4.3 D.4.4</p>	<p>Tables at B71 were inserted to contain all monitoring data as Fuel oil consumption, steam production and quantity of biomass burnt at the boilers in PDD v3.</p>	<p>The version 02 of the PDD was assessed and the correct parameters were introduced in the table B.7.1</p> <p>This CAR is closed.</p>
<p><b>CAR 3</b></p> <p>Details of the data to be collected, its certainty, format and location to be filed are</p>	<p>D.1.2 D.1.3 D.1.4</p>	<p>Data monitoring details were described at B71 and B72. The length of keeping the monitoring plan was stated at B72</p>	<p>The version 02 of the PDD was assessed and the changes done are enough.</p>

<b>Draft report corrective action requests and requests for clarification</b>	<b>Ref. to Table 2</b>	<b>Summary of project participants' response</b>	<b>Final conclusion</b>
not described. Also, the monitoring plan not report for how long the filed data will be kept.	D.2.1 D.2.2 D.2.3 D.2.4 D.4.1 D.4.2 D.4.3 D.4.4 D.5.8	item in PDD v3.	This CAR is closed.
CL 1 The table in the section A.3 of the PDD is not correctly answered. Only entities that take decisions on the allocation of CERs shall be listed. Consultants who only assisted in the development of the PDD and/or the baseline and monitoring plan should not be listed as project participant. Moreover, the host Party Brazil is an indirect participant through the entities authorised to participate in the project. DNV requests further clarifications about the list of the project participant and about the indication of the host Party as project participant.	1	Table in A3 in PDD v3 was corrected with the right participants and indications of host Party.	The version 02 of the PDD was assessed and the correct project participants were indicated in section A.3.  This CL is closed.
CL 2 AmBev will monthly buy the steam monitored value supplied from the owner of the boiler for its beer and soft drinks manufacturing operations. The CER's property generated by this project activity is established by contractual agreement between AMBEV and the partner. DNV requests evidence of the signed agreement.	A.2.1	The steam contract for both sites doesn't establish CER property for boiler's operators. Being so, this is an evidence that AMBEV is the owner of CERs. Signed contracts were sent to the validation team.	A copy of the contractual agreement was sent and assessed by DNV.  This CL is closed.
CL 3 It is not clear if the project will require initial training. The project participant should send	A.2.5	It was clarified in PDD v3 that in both sites the boilers operators received proper training according to Brazilian	The version 02 of the PDD was assessed and information about initial training were included. The changes

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
information about that.		NR13 rule for biomass boiler operation.	are sufficient. This CL is closed.
CL 4 The crediting period could not start before the registration of the project.	C.1.2	The crediting period was changed to 1.11.2007 in the PDD v3.	The version 02 of the PDD was assessed and the crediting period was changed. This CL is closed.
CL 5 The length of the crediting period and the expected operational lifetime of the project activity should be stated in years and months.	C.1.1	The length of the crediting period and the expected operational lifetime of the project activity were corrected and stated in years and months in the PDD v3.	The version 02 of the PDD was assessed and the changes done are sufficient. This CL is closed.
CL 6 The section "A.4.5 Confirmation that the small-scale project activity is not a debundled component of a large scale project activity" of the PDD is not correctly answered.	A.1.2	The section A45 was corrected in the PDD v3 according to Annex C paragraph 2.	The version 02 of the PDD was assessed and as the project boundary is far from each other more than 1 Km, the project activity is not a debundled component of a large scale project. This CL is closed.
CL 7 The table B.6.2 it is not mentioning the equipment used to measure the fuel oil consumption, the fuel oil emission factor unit and it is not clear if the net calorific value will be measure or will be used a value from the literature. It is not clear the source of data used for the emission factor and for the carbon fraction. Also, it is not necessary to include the conversion factor for kcal to TJ in this section but it is necessary to include the ratio between steam production and oil consumption.	B.2.2 B.2.4	The table B62 was corrected in PDDv3: <ul style="list-style-type: none"> <li>▪ equipment used to measure the fuel oil consumption was inserted;</li> <li>▪ the fuel oil emission factor unit and source were corrected;</li> <li>▪ Fuel Oil Net Calorific Value (NCVi) was corrected to literature values;</li> <li>▪ the carbon fraction source was corrected;</li> </ul>	The version 02 of the PDD was assessed but there is a mistake in the parameters inserted. The equipment used to measure the oil consumption was inserted as a new parameter in this section. The last version of the PDD was assessed and the changes done are sufficient. This CL is closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<ul style="list-style-type: none"> <li>Conversion factor was deleted;</li> <li>The ratio between steam production and oil consumption was inserted in this section.</li> </ul>	
<p>CL 8</p> <p>The responsible for monitoring and reporting project activities as well as for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques are clearly defined. However, the responsible for the project management is only described for Agudos site.</p>	<p>D.5.1</p> <p>D.5.2</p> <p>D.5.3</p> <p>D.5.9</p>	<p>The responsible for project management and monitoring and training were corrected in B72 in PDD v3 for Agudos and Teresina, as AMBEV defined that the engineering manager is the responsible for the monitoring. The whole plan was revised and need a new validation team evaluation.</p>	<p>The version 02 of the PDD was assessed and the changes done in the monitoring plan are sufficient.</p> <p>This CL is closed.</p>
<p>CL 9</p> <p>There are no procedures identified for internal audits of GHG project, project performance reviews and corrective actions.</p>	<p>D.5.10</p> <p>D.5.11</p> <p>D.5.12</p>	<p>The engineering manager is responsible for all project monitoring data, its review and corrective actions. This was inserted in B72 in PDD v3.</p>	<p>The version 02 of the PDD was assessed and the changes done are sufficient.</p> <p>This CL is closed.</p>
<p>CL 10</p> <p>According to the excel spreadsheet, the amount of fuel oil consumption in conventional boilers used to estimate baseline emissions in both sites was calculated based on the average of 2002, 2003 and 2004. However, in the section "B.6.3 Ex-ante calculation of emission reductions" of the PDD, the baseline emissions are calculated only for the year 2002 instead of the average of the past years.</p>	<p>E.3.1</p> <p>E.3.5</p> <p>E.3.6</p> <p>E.3.7</p>	<p>The average of 2002, 2003 and 2004 of fuel oil consumption was corrected in B63 in PDD v3.</p>	<p>The version 02 of the PDD was assessed and the emission reductions are now calculated based on the average of 2002, 2003 and 2004.</p> <p>This CL is closed.</p>
<p>CL 11</p> <p>The baseline and project emissions</p>	<p>E.1.4 E.1.5</p> <p>E.1.6</p>	<p>The baseline and project emissions calculation were transparently</p>	<p>The version 02 of the PDD was assessed and the baseline and project</p>



<b>Draft report corrective action requests and requests for clarification</b>	<b>Ref. to Table 2</b>	<b>Summary of project participants' response</b>	<b>Final conclusion</b>
calculations are correct but not transparently documented. The PDD only presented the emissions calculation for one of the sites.	E.3.1 E.3.5 E.3.6 E.3.7	documented in B63 in PDD v3.	emission calculations are transparently documented.  This CL is closed.
CL 12 If Agudos Branch old boilers fired fuel oil BPF 3 A, it is not clear why for emergency cases the boilers will fired the oil BPF 1 A. DNV requests further explanations about this replacement of fuel.	E.1.4 E.1.5 E.1.6	The fuel oil BPF 03A is not used in Agudos anymore because of its viscosity. Being so, it was replaced by BPF 01A which might be used for emergency purposes in Agudos. This was explained to validation team during on-site visit.	The change in the fuel oil was explained during the site visit. As this oil is so viscous, it became hard if it is not used continuously. So, it is difficult to use in case of emergency.  This CL is closed.
CL 13 Two spreadsheets used for the calculation of the emission reductions were assessed by DNV to confirm this estimative. However, the oil consumption for the year 2002 was not reported in the spreadsheets. Also, the formulas used in the spreadsheet are not completely transparent.	E.1.4 E.1.5 E.1.6 E.3.5	The 2002 oil consumption was included in both sites CERs calculation spreadsheets. Check the new files sent to the validation team.	In the spreadsheets version 2, the calculation of the emission reductions is not according the starting date of the credit period.  The spreadsheets version 3 used for the calculation of the emission reduction were assessed. The emission reductions are now correctly calculated. This CL is closed.
CL 14 DNV requests documented evidence of the Operation Environmental Licenses.	A.3.4 F.1.1 F.1.2 F.1.3 F.1.4	The documented evidences will be sent to the validation team.	A copy of all the Environmental Licenses was sent to DNV. This CL is closed.
CL 15 If possible environmental impacts were analysed by CETESB and SEMAR, the section D.2 of the PDD should be answered. Moreover, DNV requests documented evidence of the environmental impact assessment.	A.3.4 F.1.1 F.1.2 F.1.3 F.1.4	No environmental impacts assessments were requested by any of the state environmental authorities. However, in Agudos CETESB required a NOx reduction plan to authorize the Operational License. This plan was presented and accepted by CETSB, who emitted the OL.	The version 02 of the PDD was assessed and the changes done are sufficient..  This CL is closed.

DET NORSKE VERITAS

*Burning of solid biomass for process steam generation for beer manufacture in place of fuel oils at AMBEV's Branchs Agudos (SP) and Teresina (PI)*

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 16 DNV requests a copy of the letters sent to the stakeholders, the comments received and the answers provided by the project proponent.	G.1.1 G.1.2 G.1.3 G.1.4 G.1.5	Copies of the letters to stakeholders was sent to the validation team.	A copy of all the letters were sent to DNV. This CL is closed.

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## **APPENDIX B**

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### **CERTIFICATES OF COMPETENCE**



# CERTIFICATE OF COMPETENCE

***Michael Lehmann***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	--
<b>CDM Verifier:</b>	Yes	<b>JI Verifier:</b>	--
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1, 2, 3 & 9		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

**Einar Telnes**  
Director, International Climate Change Services

**Michael Lehmann**  
Technical Director



# CERTIFICATE OF COMPETENCE

***Einar Ternes***

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

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	--
<b>CDM Verifier:</b>	Yes	<b>JI Verifier:</b>	--
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1, 2, 3 6 & 10		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0027	Yes
ACM002, AMS-IA-D, AM0019, AM0026, AM0029, AM0045	Yes	AM0028, AM0034	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0030	Yes
ACM0004	Yes	AM0031	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0032	Yes
ACM0007	Yes	AM0035	Yes
ACM0008	Yes	AM0038	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0041	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	AM0034	Yes
AM0009, AM0037	Yes	AM0043	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	AM0046	
AM0014	Yes	AM0047	
AM0017	Yes	AMS-II.A-F, AM0044	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

**Einar Ternes**  
Director, International Climate Change Services

**Michael Lehmann**  
Technical Director



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## CERTIFICATE OF COMPETENCE

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***Luis Filipe Tavares***

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:*** Yes

***JI Verifier:*** -

***Industry Sector Expert for*** pe 9 & 13  
***Sectoral***  
***Scope(s):***

Høvik, 6 November 2006

Einar Telnes  
*Director, International Climate Change Services*

Michael Lehmann  
*Technical Director*



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## CERTIFICATE OF COMPETENCE

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***Andrea Leiroz***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1

***GHG Auditor:*** Yes

***CDM Validator:*** Yes

***JI Validator:*** -

***CDM Verifier:*** Yes

***JI Verifier:*** -

***Industry Sector Expert for  
Sectoral  
Scope(s):***

Høvik, 18 July 2007

Einar Telnes  
Director, International Climate Change Services

Michael Lehmann  
Technical Director