VALIDATION REPORT

INPA Fuel Switch Project in Brazil

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VALIDATION REPORT

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CERTIFICATION AS

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Approved by: Michael Lehmann	Organisational unit: Climate Change Services
Client: EcoSecurities Group Plc	Client ref.: Pedro Moura Costa

Project Name: INPA Fuel Switch Project
Country: Brazil
Methodology: AMS-I.C
Version:12
GHG reducing Measure/Technology: Fuel switch from furnace oil to biomass briquettes
ER estimate: 422 788 tCO_2 over 7-years, (60 398 tCO_2/year).
Size
☐ Large Scale
☒ Small Scale
Validation Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is DNV's opinion that the INPA Fuel Switch Project in Brazil, as described in the revised PDD of 01 September 2008, 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 12). Hence, DNV will request the registration of the INPA Fuel Switch Project as a CDM project activity. Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and the DNA of United Kingdom of Great Britain and Northern Ireland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

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VALIDATION REPORT

Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
INPA	Indústria de Embalagens Santana S/A
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

VALIDATION REPORT

TABLE OF CONTENTS

VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

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

The Project participants are INPA - Indústria de Embalagens Santana S/A of Brazil and EcoSecurities Group Plc of United Kingdom of Great Britain and Northern Ireland. The host Party Brazil and the Annex I Party United Kingdom of Great Britain and Northern Ireland meet all relevant participation requirements.

The INPA Fuel Switch Project involves the substitution of fuel oil (BPF 3A) used for steam generation in pulp and paper manufacturing process by biomass residues (briquettes from pinus and eucalyptus barks, from wood other than pinus and eucalyptus, woodchips, wood and charcoal), so as to reduce CO_2 emissions and allow for the use of renewable energy sources in the 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" (AMS I.C). 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 use of a renewable energy source, the project results in reductions of CO_2 emissions that give long-term benefits to the mitigation of climate change. Emission reductions are directly monitored and calculated ex-post by using the approach stipulated in AMS-I.C.

Local stakeholders, such as the City Hall and Chamber of Deputy of Pirapetinga, District Attorney, the state and local agencies, the Brazilian forum of NGOs and local communities associations, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. No comments were received.

In summary, it is DNV's opinion that the INPA Fuel Switch Project, as described in the revised and resubmitted project design document of 01 September 2008 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 12). Hence, DNV will request the registration of the INPA Fuel Switch Project as a CDM project activity.

Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and the DNA of United Kingdom of Great Britain and Northern Ireland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

2 INTRODUCTION

EcoSecurities Group Plc has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the INPA Fuel Switch Project located in the municipality of Pirapetinga, Minas Gerais State, Brazil. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.C (Version 12). The validation team has, based on the recommendations in the Validation and Verification Manual employed 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.

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

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

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

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

/1/ Project Design Document for the INPA Fuel Switch Project. Version 01 of 27 August 2007.

/2/ Project Design Document for the INPA Fuel Switch Project. Version 02 of 01 November 2007.

/3/ Project Design Document for the INPA Fuel Switch Project. Version 03 of 01 September 2008.

/4/ Spreadsheet used for the calculation of the emission reductions and investment analysis (INPA Workbook v8 (TV-PF).xls).

/5/ INPA – Operation Licence # 246 issued on 13 June 2006.

/6/ INPA - Copy of letters sent to local stakeholders.

/7/ Equipment lifetime: letter from Protermo Engenharia Ltda on January 2007.

/8/ Boilers efficiency – report with the result of the measurement performed by the manufacturer of the boilers.

/9/ Evidences of biomass suppliers in the region (Declaração de Capacidade Produtiva - Bricabrás.pdf, Declaração de Capacidade Produtiva - Eucabráz.pdf and Declaração de Capacidade Produtiva - Madembar.pdf).

/10/ First agreement to sign a contract (09 May 2007).

/11/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/12/ CDM Executive Board: AMS-I.C – "Thermal energy for the user with or without electricity" for Type I – Renewable Energy Project. Version 12.

/13/ CDM Executive Board: Attachment A to the CDM Executive Board:. Version 06 of 30 September 2005.

/14/ CDM Executive Board: Attachment C to the CDM Executive Board:. Version 02.

3.2 Follow-up Interviews with Project Stakeholders

	Date	Name	Organization	Topic
/15/	30-10-2007	Thiago Viana	EcoSecurities	• Biomass consumed in the project • Evidence to demonstrate additionality of the project • Monitoring plan • Efficiency of the baseline boiler • Leakage emission • Environmental Licenses and legal compliance • Stakeholders consultation process
/16/	30-10-2007	João Plicas	EcoSecurities	
/17/	30-10-2007	Luis Filipe Kopp	EcoSecurities	
/18/	30-10-2007	Ivan Antônio da Silva	INPA	
/19/	30-10-2007	Takashi Nagahama	INPA	
/20/	30-10-2007	Elias Francisco Pereira	INPA	
/21/	30-10-2007	Jean Antônio Pereira Rosa	INPA	

3.3 Resolution of Outstanding Issues

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

- It 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 the figure below. The completed validation protocol for the INPA Fuel Switch Project is enclosed in Appendix A to this report.

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

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

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

VALIDATION REPORT

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

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

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

Figure 1 Validation protocol tables

3.4 Internal Quality Control

The 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.

3.5 Validation Team

Role/Qualification	Last Name	First Name	Country
Team leader/CDM validator	Leiroz	Andrea	Brazil
Sector expert	Lehmann	Michael	Norway
Technical reviewer	Kakaraparthi	Venkata Raman	Bangalore
Technical reviewer (applicant)	Flagstad	Ole Andreas	Norway

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

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.
The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation of 01 September 2008.

4.1 Participation Requirements

The Project participants are INPA - Indústria de Embalagens Santana S/A of Brazil and EcoSecurities Group Plc of United Kingdom of Great Britain and Northern Ireland. The host Party Brazil and the Annex I Party United Kingdom of Great Britain and Northern Ireland meet all relevant participation requirements.

Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and the DNA of United Kingdom of Great Britain and Northern Ireland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

4.2 Project Design

The INPA Fuel Switch Project involves the substitution of the fuel oil (BPF 3A) used for steam generation in the pulp and paper manufacturing process by biomass residues (briquettes from pinus and eucalyptus barks, from wood other than pinus and eucalyptus, woodchips, wood and charcoal) to reduce CO_2 emissions and allow for the use of renewable energy sources in the company operations. The ashes resulting from burning of biomass are expected to be used as fertilizer.

With the replacement of four fuel oil fired boilers (ATA MP815 and AWN15, Aalborg Mission M3P-15 and Steammaster Four-6000) by two new biomass boilers, the system will be able to generate 44 tons of steam per hour to supply all of its demand for steam.

The four 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 existing boilers model ATA MP815, ATA AWN15, Aalborg Mission M3P-15 and Steammaster Four-6000 started operation on 1991 (retrofitted in 2001), 1997, 2002 and 2005, a minimum lifetime of 24, 20, 25 and 28 years can be assumed, respectively. The lifetime of the existing boilers was confirmed through a letter from Protermo Engenharia Ltda. Due to maintenance practices, the lifetime of these equipments could be extended to more than 30 years /7/. In addition to this, INPA undertook a boiler revision (ATA MP815) on November 2001 and the necessary retrofits were made to extend its operational lifetime.

The biomass boiler operators will be trained according to Brazilian regulation NR13. The initial training will be checked during the first verification.

A 7-year renewable crediting period is selected (with the potential of being renewed twice), starting on 01 October 2008 or on the date of registration of the CDM project activity, whichever is later. The starting date of the project activity is 09 May 2007 with an expected

operational lifetime of 21 years. The starting date of the project activity corresponds to the first real action of the project activity begins i.e., the first agreement to sign a contract. Evidence that INPA seriously considered the CDM in the decision to proceed with the project was presented as the first agreement that EcoSecurities sent to INPA on 9 May 2007 /10/.

The project is expected to contribute to regional integration and cooperation, to bring social (employment) and environmental (use of cleaner technologies and reduction of the GHG emissions) 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.

4.3 Baseline Determination

The project applies the simplified baseline methodology for selected small-scale CDM project activity AMS-I.C (Version 12) – "Thermal energy for the user with or without electricity" for Type I – Renewable Energy Project.

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

The new biomass-fuelled thermal application boilers will display, according to the manufacturer, a maximum installed capacity of 16.6 MW_{th} each comprising a total of 33.2 MW_{th}, which is thus below the established limit of 45MW_{th} for applying AMS-I.C.

The alternatives considered for the selection of the baseline scenario are:

- Implementation of the proposed project activity without CDM revenues.
- Continuation of the present practice of generating steam/heat using fuel oil.
- Installation of a new boiler burning natural gas.

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

The proposed project activity without CDM faces investment barrier and the installation of a new boiler burning natural gas is not possible because of constraints of the natural gas distribution lines. The only feasible baseline is a continuation of the status quo, which meets current regulations, and requires neither additional investments nor additional running costs.

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. IPCC value has been applied for the CO_2 emission factor of fuel oil.

The baseline boiler efficiency was determined by adopting the highest measured efficiency of the boilers. A copy of the result of the measurement performed by the manufacturer of the boilers (ATA MP815, ATA AWN15 and Aalborg Mission M3P-15) was provided. For the boiler Steammaster Four-6000 the efficiency value was provided by the manufacturer /8/, this value was not used in the calculations as the highest of the measured values was chosen for all four boilers for conservativeness.

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 warehouses that shelter the old boilers, the new boilers and the respective fuel to each (fuel oil and biomass).

4.4 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 of the project is being established on the barriers analysis:

- *Investment barrier*: The project involves an investment above 8 millions Reais in one phase. An investment barrier is being established by a NPV analysis of the project. The NPV values calculated with a discount rate of 12.5% indicate a negative NPV value. The chosen discount rate is conservative compared to the average SELIC rate set by the Central Bank of Brazil (http://www.bcb.gov.br) for the relevant period (16.5%). While the 12.5% discount rate represent the SELIC rate by the time the PDD was developed, the 16.5% discount rate represents the historical average for SELIC rate for the last three years prior to the investment analysis and the decision to go on with the project.

  A sensitivity analysis has been performed by decreasing the investment, increasing the total cost of fuel oil and decreasing the total cost of biomass to see when the NPV would turn positive for these parameters.
  For the investment a decrease of 72% is needed to reach the benchmark, this is unrealistic.
  For the fuel oil price the NPV will turn positive with a 4 % increase of the costs. The price variation analysis in local currency (increase of 3%) was based on historical price variation for the period 2004-2006 available in the Brazilian Energetic Balance (www.ben.epe.gov.br/). Given the historic variation of the fuel price, variations in the fuel price are expected to be lower than 4%.
  The price of biomass needs to decrease by 4% to have the NPV turn positive. Given the increased demand in Brazil for biomass, such a decrease is unlikely to occur.
  Other conservative elements of the investment analysis is that operations and maintenance costs are not included and that the chosen benchmark of 12.5% is conservative compared to the average SELIC value for the last 3 year period.
  DNV has been able to verify that the variations in the critical parameters in the context of the sensitivity analysis are reasonable and it is DNV's opinion that it is unlikely that the critical parameters will change in order to reach a positive NPV. Hence, it can be concluded that the project is not financially attractive and thus is additional.

The investment analysis spreadsheet which has to be enclosed for the CDM registration was provided.

- *Technological barrier*: It has been stated that the use of biomass briquettes to produce energy in Brazil is not well known since there are not many companies using this kind of fuel. Although the lower risks and costs of transportation when compared to biomass residues, the implementation of this technology requires the creation of a new process in order to process the biomass before the burning in the boiler. Moreover, there is a risk of briquettes supply since the suppliers are not well established in Brazil.

No other barrier are presented. Given the above barriers, it is sufficiently demonstrated that the project is not a likely baseline scenario for the 7-year renewable credit period and that emission reductions thus are additional to what would otherwise have occurred.

4.5 Monitoring

The project applies the approved monitoring methodology AMS-I.C (Version 12) – "Thermal energy for the user with or without electricity" for Type I – Renewable Energy Project.

According to AMS-I.C, the monitoring consists of 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 amount of biomass and fuel oil and the specific fuel consumption.

The INPA project calculates baseline emissions through monitoring the amount of steam produced by the biomass boiler. INPA has a system that can control the weight of biomass that arrives in trucks, the consumption of biomass and the steam production.

No sources of leakage emission were identified according to AMS-I.C. The supply of biomass residues in the region will be monitored annually according to Attachment C to the Appendix B of the simplified modalities and procedures for CDM small-scale project activities in order to confirm that there is a surplus in biomass availability.

4.5.1 Parameters monitored ex-post

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

4.5.2 Parameters monitored ex-ante

According to AMS-I.C, the specific consumption for each type of fuel (fuel oil and specific biomass) per unit of thermal energy shall be specified ex-ante.

The biomass specific consumption (0.224 tonnes of biomass/MWh steam) is calculated as a ratio between the value reached from the fuel oil energy consumption from the baseline using the calorific value from briquettes and the steam produced.

The fuel oil specific consumption (0.100 tonnes of fuel oil/MWh steam) is calculated as a ratio between the value reached from the monitoring of fuel oil consumption from the baseline and the steam production.

4.5.3 Management system and quality assurance

Responsibilities and authorities for project management, monitoring and reporting activities as well as for organizing and training of the staff in the appropriate monitoring, measurement and reporting techniques and QA/QC procedures are not clearly defined, and will be put in place by the time of operation of the project activity.

The procedures for maintenance of monitoring equipment and installations are not identified in the PDD. However it is stated that the equipments will be calibrated according to manufacturer's recommendation. The company has ISO 9001 systems in place.

4.6 Estimate of GHG Emissions

Emission reduction calculations are correct and transparently documented as established by AMS-I.C.

The baseline emissions are calculated as the energy baseline times the CO_2 emission factor for the fuel displaced (default IPCC value for fuel oil = 77.37 TJ / t CO_2) divided by the efficiency of the boilers using fossil fuel (90 %).

To calculate the baseline emissions, INPA measured the fuel oil consumed in the conventional boilers. The amount of fuel oil consumed in the conventional boilers used to estimate baseline emissions was calculated based on the average of 2005 (June-December), 2006 and 2007 (January-August). The amount of steam produced by the fuel oil boiler will be derived from the amount of fuel oil consumed by the boiler divided the amount of steam that each kg of fuel oil can produce.

Baseline emissions are estimated to be on an average of 60 398 tCO_2/year.

The baseline emissions will be calculated ex-post and the energy baseline, during the crediting period, will be calculated as the quantity of steam supplied by the project activity.

The project is not expected to result in project GHG emissions due to the use of a renewable energy source for steam generation.

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. .Also, as it has been documented by the briquette supplier that there is surplus supply of biomass residue in the region, leakage calculations on account of competing use of biomass is not applicable for this project. Biomass survey will be carried out every year.

The PDD estimated amount of GHG emission reductions from the project is 422 788 tCO_2e during the first crediting period (7 years), resulting in estimated average annual emission reductions of 60 398 tCO_2e.

A spreadsheet used for the calculation of the emission reductions was assessed by DNV to confirm the emission reduction estimates. /4/

4.7 Environmental Impacts

INPA has granted Environment Operation Licence #246 which is valid until 13 June 2010 /5/. This license was issued by Environmental Foundation of the State of Minas Gerais (FEAM) which was reported of the implementation of the project activity.

A copy of the environmental license was sent and assessed.

4.8 Comments by Local Stakeholders

Local stakeholders, such as the City Hall and Chamber of Deputy of Pirapetinga, District Attorney, the state and local agencies, the Brazilian forum of NGOs and local communities associations, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. No comments were received.

The letters sent to the local stakeholders were assessed. /6/

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 01 November 2007 was made publicly available and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 22 December 2007 to 20 January 2008. No comments were received.

Prior to this, version1 of the PDD (27 August 2007) applying AMS-I.C version 11 was made publicly available and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 08 September 2007 to 07 October 2007. No comments were received.

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	2. Kyoto Protocol Art.12.2	Table 2, Section E.4.1 The project activity will assist Annex-1 country United Kingdom of Great Britain and Northern Ireland in achieving compliance.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	4. Kyoto Protocol Art.12.2.	Table 2, Section E.4.1. OK
5. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	6. Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and the DNA of United Kingdom of Great Britain and Northern Ireland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.
7. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	Table 2, Section A.3 Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of

Requirement	Reference	Conclusion
		voluntary participation from the DNA of Brazil and the DNA of United Kingdom of Great Britain and Northern Ireland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.
8. 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	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
9. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima. The United Kingdom DNA is the Department for Environment, Food and Rural Affairs.
10. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	Brazil has ratified the Kyoto Protocol on 23 August 2002. United Kingdom has ratified the Kyoto Protocol on 31 May 2002.
11. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	United Kingdom calculated and recorded its assigned amount units.
12. The participating Annex I Party shall have in place a national system for	CDM Modalities and	United Kingdom has in place a

Requirement	Reference	Conclusion
estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	Procedures §31b	national registry and reported in October 2001 their 3rd communication.
About additionality		
13. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	Table 2, Section B.3.1 OK
About forecast emission reductions and environmental impacts		
14. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	Table 2, Section B.4 to B.7 OK
For large-scale projects only		
15. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	Table 2, Section D. OK
About small-scale project activities (if applicable)		
16. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech 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	Table 2, Section A.5. OK
17. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified	Simplified Modalities and Procedures for Small	Table 2, Section A.5.

Requirement	Reference	Conclusion
baseline and monitoring methodology for that project category.	Scale CDM Project Activities §22e	OK
18. 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	Table 2, Section D. OK
About stakeholder involvement		
19. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	Table 2, Section E. OK
20. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	The PDD of 01 November 2007 was made publicly available and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 22 December 2007 to 20 January 2008. No comments were received. Prior to this, version1 of the PDD (27 August 2007) applying AMS-I.C version 11 was made publicly available and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 08 September 2007 to 07 October 2007. No comments were

Requirement	Reference	Conclusion
		received.
Other		
21. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	Table 2, Section B.1.1 and D.1.1 OK
22. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	Table 2, Section B.2 OK
23. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	Table 2, Section B.2 OK
24. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	The project design document conforms to version 03 of the CDM-SSC-PDD.
25. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	Table 2, Section D OK

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Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1//3/	DR	The project is located in the municipality of Pirapetinga, Minas Gerais State, Brazil.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1//3/	DR	The project system boundaries are defined and will consist of two new biomass fired boilers with steam generation capacity of 25 TPH each, and will replace the existing 4 furnace oil fired boilers. The project systems will also consist of the biomass briquettes handling systems. While the project of switch from fossil fuel to biomass briquettes reflects good practice, the project participant has not finalized on the suppliers of the new boilers which will replace the existing four boilers. The technical specifications sheet of the new boilers is to be provided to firmly conclude on the thermal capacity of the project and its applicability to ACM-I.C which has a limit of 45 MWth.	~~CL 3~~	OK
A.2. Participation Requirements					

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Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.					
A.2.1. Which Parties and project participants are participating in the project?	/1//3/	DR	The Project participant is INPA - Indústria de Embalagens Santana S/A of Brazil and EcoSecurities Group Plc of United Kingdom of Great Britain and Northern Ireland. The host Party Brazil and the Annex I Party United Kingdom of Great Britain and Northern Ireland meets all relevant participation requirements.		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1//3/	DR	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and the DNA of United Kingdom of Great Britain and Northern Ireland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.	–	--
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1//3/	DR	Yes, Brazil fulfils all requirements. United Kingdom has ratified the Kyoto Protocol on 31 May 2002. The United Kingdom DNA is the Department for Environment, Food and Rural Affairs. Brazil has ratified the Kyoto Protocol on 23		OK

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			August 2002. The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima		
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1//3/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.		OK
A.3. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.3.1. Does the project design engineering reflect current good practices?	/1//3/	DR	While the project of switch from fossil fuel to biomass briquettes reflects good practice, the project participant has not finalized on the suppliers of the new boilers which will replace the existing four boilers. The technical specifications sheet of the new boilers is to be provided to firmly conclude on the thermal capacity of the project and its applicability to ACM-I.C which has a limit of 45 MWth. DNV requests further explanations regarding the type of biomass briquettes that will be consumed in the project.	~~CL 3~~ ~~CL 1~~	OK
A.3.2. Does the project use state of the art technology or	/1//3/	DR	There was no transfer of technology involved		OK

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would the technology result in a significantly better performance than any commonly used technologies in the host country?			in the project. The project will result in environmentally better performance, that the use of fossil fuel fired boilers.		
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1//3/	DR	The project documentation does not report about provisions for meeting training and maintenance needs.	~~CL 8~~	OK
A.4. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1//3/	DR	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and the DNA of United Kingdom of Great Britain and Northern Ireland, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.	--	--
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1//3/	DR	The project will create employment opportunities during the implementation of the project activity and provide a boost to the biomass briquette industry.		OK
A.5. Small scale project activity *Tit is assessed whether the project qualifies as small-scale CDM project activity*					
A.5.1. Does the project qualify as a small scale CDM			The project applies the simplified baseline		OK

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project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?			methodology for selected small-scale CDM project activity categories, category "I.C – Thermal energy for the user". 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. The new biomass-fuelled thermal application boilers will display, according to the manufacturer, a maximum installed capacity of 20 MW_{th} each comprising a total of 40 MW_{th}, thus below the established limit of 45MWth. Thus, this methodology is applicable to the project in accordance with the existing criteria. While the project of switch from fossil fuel to biomass briquettes reflects good practice, the project participant has not finalized on the suppliers of the new boilers which will replace the existing four boilers. The technical specifications sheet of the new boilers is to be provided to firmly conclude on the thermal capacity of the project and its applicability to ACM-I.C which has a limit of 45 MWth.	~~CL 3~~	
A.5.2. Is the small scale project activity not a debundled component of a larger project activity?			The project activity is not a debundled component of a large scale project activity		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			because the project developer does not act as a participant in another CDM project.		
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1//3/	DR	The project applies the simplified baseline methodology for selected small-scale CDM project activity AMS-I.C (Version 12) – "Thermal energy for the user with or without electricity" for Type I – Renewable Energy Project. While the project of switch from fossil fuel to biomass briquettes reflects good practice, the project participant has not finalized on the suppliers of the new boilers which will replace the existing four boilers. The technical specifications sheet of the new boilers is to be provided to firmly conclude on the thermal capacity of the project and its applicability to ACM-I.C which has a limit of 45 MWth.	~~CL 3~~	OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1//3/	DR	The AMS-I.C is applicable for projects with renewable energy technologies that supply		OK

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			individual households or users with thermal energy that displaces fossil fuels. It is stated in the PDD that the new biomass-fuelled thermal application boilers will display, according to the manufacturer, a maximum installed capacity of 20 MWth each comprising a total of 40 MWth, thus below the established limit of 45MWth. Thus, this methodology is applicable to the project in accordance with the existing criteria. While the project of switch from fossil fuel to biomass briquettes reflects good practice, the project participant has not finalized on the suppliers of the new boilers which will replace the existing four boilers. The technical specifications sheet of the new boilers is to be provided to firmly conclude on the thermal capacity of the project and its applicability to ACM-I.C which has a limit of 45 MWth.	~~CL 3~~	
B.2. Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*					
B.2.1. What is the baseline scenario?	/1//3/	DR	The baseline scenario is that in the absence of		OK

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			the project activity, the existing fossil fuel fired boilers would have continued to be used for the steam/heat requirement.		
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1//3/	DR	The other alternatives considered for the selection of the baseline scenario are. • Implementation of the proposed project activity without CDM revenues. • Continuation of the present practice of generating steam/heat using fuel oil. • Installation of a new boiler burning natural gas. The proposed project activity without CDM faces investment barrier and the installation of a new boiler burning natural gas is not possible because of constraints of the natural gas distribution lines. The only feasible baseline is a continuation of the status quo, which meets current regulations, and requires neither additional investments nor additional running costs. The alternative 3 of using natural gas as fuel has been eliminated on the grounds that gas distribution lines are not available in the town. Evidence is to be provided.	~~CL 4~~	OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1//3/	DR	Yes.		OK

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B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1//3/	DR	Yes.		OK
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1//3/	DR	Yes.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1//3/	DR	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. IPCC value has been applied for the CO_2 emission factor. It is to be clarified if the efficiency of the boilers provided in the PDD and the excel worksheet are the measured values or the manufacturers figures. Evidence is to be provided for the same. The baseline boiler efficiency was determined by adopting an average value that is a result of the monitoring of the four fuel oil boilers. However, according to the methodology, the highest measured efficiency of a unit with similar specifications shall be used. Also, DNV requests documented evidences of this monitoring. It is also seen in the emission reduction calculation sheet that the baseline specific fuel consumption is arrived at 90.81	~~CL 5~~	OK

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			kg/MWh. It is to be clarified as to how the steam generation in MWh is being measured / calculated. All base documents used to arrive at the specific fuel consumption in the baseline case need to be provided. The existing boilers started operation on 1991, 1997, 2002 and 2005, respectively and the oldest boiler is more than 16 years old. While the PDD states that the residual life of such boilers is more than 40 years, evidence is to be provided for the fact.		
B.2.7. Have the major risks to the baseline been identified?	/1//3/	DR	Yes.		OK
B.3. Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					
B.3.1. Is the project additionality assessed according to the methodology?	/1//3/	DR	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 of the project is being established on the barrier analysis. • Investment barrier: The investment barrier is being established	~~CL 6~~	OK

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			by the NPV analysis of the project. The NPV values calculated for a discount rate of 12.5% indicate a negative NPV value. The basis for the discount rate is the SELIC rate set by the Central Bank of Brazil (http://www.bcb.gov.br). The project involves an investment above 8 millions Reais in one phase. Evidence is to be provided for the investment of 8 million Reais. In addition, explanation for the adopted discount rate should be provided. The NPV analysis is seen to have been conducted for a period of 10 years only and not the lifetime of the project (21 years), as should be the case. Values of the operational NPV (as in Cells E63 and E32 do not tally) and need justification. The IRR of the project is seen to be 4.5% which seems to improve to 11% on considering a lifetime of 21 years of the project. It needs to be clarified on what is the benchmark of such projects in Brazil. The values presented in the tables Sensitivity analysis of project activity without CDM (Alternative 1) and Comparison of NPV in section B.5 and Financial Analysis in Annex 3 of the PDD do not tally and needs correction.		

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			Technological barrier: It has been stated that the use of biomass briquettes to produce energy in Brazil is not well known since there are not many companies using this kind of fuel. Although the lower risks and costs of transportation when compared to biomass residues, the implementation of this technology requires the creation of a new process in order to process the biomass before the burning in the boiler. Moreover, there is a risk of briquettes supply since the suppliers are not well established in Brazil. Clarification is to be provided on the number of briquette based boiler, briquettes suppliers in operation. It is also to be clarified if the project proponent has firmed up the suppliers for the project. It also needs to be clarified on the emergency system for steam/heat requirement in the event of non-availability of briquettes, since all the old boilers are being taken out of service and kept in stores.		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1//3/	DR	Yes		OK
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1//3/	DR	Evidences as stated in the section B.3.1 are to be provided.	~~CL 6~~	OK
B.3.4. If the starting date of the project activity is before	/1//3/	DR	The starting date of the project activity is 09	~~CL 2~~	OK

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the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?			May 2007. Evidence that INPA seriously considered the CDM in the decision to proceed with the project was presented as a communication that EcoSecurities sent to INPA. DNV requests a copy of the communication between EcoSecurities and INPA. It also needs to be clarified as to when the detailed project report / Feasibility study report of the project was prepared, and when the management approval for the project was obtained. If the date of the feasibility study is prior to March 2007, then that needs to be considered as the start date of the project. Evidence is also to be provided for the start date of 1st March 2007.		
B.4. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1//3/	DR	While it is stated that the project is not expected to result in project GHG emissions due to the use of a renewable energy source for steam generation, it needs to be clarified on the monitoring of the fossil fuel as stated in the section B.7.1.	~~CL 11~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			The emissions due to the transportation of the biomass from the plants have not been considered on the assumption that these are negligible and similar emissions would have taken place for the transportation of the fuel oil. This needs to be demonstrated. What is the quantity of the ash that will be generated and what are the emissions due to the transportation of the ash?		
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1//3/	DR	See B.4.1.	~~CL 11~~	OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1//3/	DR	See B.4.1.	~~CL 11~~	OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1//3/	DR	Emission reduction calculations are correct and transparently documented as established by AMS-I.C. The baseline emissions are calculated as the energy baseline times the CO_2 emission factor for the fuel displaced (default IPCC		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			value for fuel oil = 77.37 TJ / t CO_2) divided by the efficiency of the boilers using fossil fuel (88.6%). While the calculations are clear and transparent the following need clarification. How was the steam produced in MWh arrived at? How is the oil consumption arrived at? Evidence for the NCV of the fuel oil and briquette. How was the efficiency of the boilers arrived at and evidence. The baseline emissions will be calculated ex-post and the energy baseline, during the crediting period, will be calculated as the quantity of steam supplied by the project activity.	~~CL 10~~	
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1//3/	DR	See B.5.1.	~~CL 10~~	OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1//3/	DR	See B.5.1.	~~CL 10~~	OK
B.6. Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values*					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
– where applicable – is justified.					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1//3/	DR	No sources of leakage emission were identified according to AMS-I.C. However, according to Attachment C of SSC Appendix B, the project also needs to monitor whether there is abundant supply of biomass. This also needs to be demonstrated prior to the start of the project activity	~~CAR 1~~	OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?	/1//3/	DR	See B.6.1.	~~CAR 1~~	OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?	/1//3/	DR	See B.6.1.	~~CAR 1~~	OK
B.7. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1//3/	DR	The project is expected to reduce CO_2 emissions to the extent of 422 788 tCO2e (60 398 tCO2e/year on average) during the first renewable 7-year crediting period.		OK
B.8. Monitoring Methodology *It is assessed whether the project applies an appropriate monitoring methodology.*					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and	/1//3/	DR	Yes, the approved monitoring methodology		OK

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transparent manner?			AMS-I.C (Version 12) – "Thermal energy for the user with or without electricity" for Type I – Renewable Energy Project has been used.		
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1//3/	DR	Details of data to be collected and its certainty are described in the PDD. However, the frequency of data recording format and location are not described in the PDD. In addition, the monitoring plan does not report for how long the filed data will be kept. The equipments will be selected after the selection of the boiler and associated equipment and need to be addressed in the PDD.	~~CAR 2~~	OK
B.9. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1//3/	DR	While it is stated that the project is not expected to result in project GHG emissions due to the use of a renewable energy source for steam generation, it needs to be clarified on the monitoring of the fossil fuel as stated in the section B.7.1. The emissions due to the transportation of the biomass from the plants have not been considered on the assumption that these are negligible and similar emissions would have taken place for the transportation of the fuel	~~CL 11~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			oil. This needs to be demonstrated. What is the quantity of the ash that will be generated and what are the emissions due to the transportation of the ash?		
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1//3/	DR	Yes.		OK
B.9.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1//3/	DR	Details of data to be collected and its certainty are described in the PDD. However, the frequency of data recording format and location are not described in the PDD. In addition, the monitoring plan does not report for how long the filed data will be kept. The equipments will be selected after the selection of the boiler and associated equipment and need to be addressed in the PDD.	~~CAR 2~~	OK
B.9.4. Is the measurement equipment described and deemed appropriate?	/1//3/	DR	See B.9.3.	~~CAR 2~~	OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1//3/	DR	See B.9.3.	~~CAR 2~~	OK
B.9.6. Is the measurement *interval* identified and deemed appropriate?	/1//3/	DR	See B.9.3	~~CAR 2~~	OK

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B.9.7. Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1//3/	DR	Responsibilities and authorities for project management, monitoring and reporting activities as well as for organizing and training of the staff in the appropriate monitoring, measurement and reporting techniques and QA/QC procedures are not clearly defined, and will be put in place by the time of operation of the project activity.		OK
B.9.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1//3/	DR	The procedures for maintenance of monitoring equipment and installations are not identified in the PDD. However it is stated that the equipments will be calibrated according to manufacturer's recommendation. The company has ISO 9001 systems in place.		OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1//3/	DR	See B.9.3.	~~CAR 2~~	OK
B.10. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1//3/	DR	In line with the methodology, the monitoring plan provides for the monitoring of the net quantity of heat/steam generated using biomass briquettes. It is stated that the heat generated will be	~~CL 7~~	OK

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			monitored as Tera Joules. It is to be clarified as to if this parameter will be read directly from the meter or calculated. If it is calculated, what are the variable required to be monitored.		
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1//3/	DR	See B.10.1.	~~CL 7~~	OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1//3/	DR	See B.10.1.	~~CL 7~~	OK
B.10.4. Is the measurement *equipment* described and deemed appropriate?	/1//3/	DR	The equipments will be selected after the selection of the boiler and associated equipment.		OK
B.10.5. Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1//3/	DR	See B.10.1.	~~CL 7~~	OK
B.10.6. Is the measurement *interval* for baseline data identified and deemed appropriate?	/1//3/	DR	See B.10.1.	~~CL 7~~	OK
B.10.7. Is the registration, *monitoring, measurement* and *reporting* procedure defined?	/1//3/	DR	See B.10.1.	~~CL 7~~	OK
B.10.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1//3/	DR	The procedures for maintenance of monitoring equipment and installations are		OK

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			not identified in the PDD. However it is stated that the equipments will be calibrated according to manufacturer's recommendation. The company has ISO 9001 systems in place.		
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1//3/	DR	Details of data to be collected and its certainty are described in the PDD. However, the frequency of data recording format and location are not described in the PDD. In addition, the monitoring plan does not report for how long the filed data will be kept. The equipments will be selected after the selection of the boiler and associated equipment and need to be addressed in the PDD.	~~CAR 2~~	OK
B.11. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1//3/	DR	No sources of leakage emission were identified according to AMS-I.C. However, according to Attachment C of SSC Appendix B, the project also needs to monitor whether there is abundant supply of biomass. This also needs to be demonstrated prior to the start of the project activity	~~CAR 1~~	OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?	/1//3/	DR	See B.11.1.	~~CAR 1~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?	/1//3/	DR	See B.11.1.	~~CAR 1~~	OK
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1//3/	DR	Neither AMS-I.C nor Resolution 1 of the Brazilian DNA requires the monitoring of social or environmental indicators.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1//3/	DR	See B.12.1		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1//3/	DR	See B.12.1		OK
B.13. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1//3/	DR	Responsibilities and authorities for project management, monitoring and reporting activities as well as for organizing and training of the staff in the appropriate monitoring, measurement and reporting techniques and QA/QC procedures are not clearly defined, and will be put in place by the time of operation of the project activity.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1//3/	DR	The project documentation does not report about provisions for meeting training and maintenance needs.	~~CL 8~~	OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1//3/	DR	Procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been addressed and need clarification.	~~CL 9~~	OK
B.13.4. Are procedures identified for review of reported results/data?	/1//3/	DR	The project has not been implemented and procedures and manual will be prepared by the time of project implementation.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1//3/	DR	See B.13.4.		OK
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational	/1//3/	DR	The project starting date is stated as 09 May	~~CL 2~~	OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
lifetime clearly defined and evidenced?			2007 and needs clarification as in CL 2. The expected lifetime of the project is 21 years.		
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1//3/	DR	A renewable 7-year crediting period (with the potential of being renewed twice) was selected, starting on 01 October 2008.		OK
D. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
D.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1//3/	DR	As stated in the PDD, INPA is in compliance with all laws and regulations applicable. However, DNV requests documented evidences of issuance of the Operation Environmental Licenses. DNV requests documented evidences that INPA already reported the implementation of the project activity to FEAM.	~~CL 12~~	OK
D.1.2. Does the project comply with environmental legislation in the host country?	/1//3/	DR	See D.1.1.	~~CL 12~~	OK
D.1.3. Will the project create any adverse environmental effects?	/1//3/	DR	Being a project where the fossil fuel is being replaced with biomass briquettes, the project is not expected to create any adverse environmental impacts.		OK
D.1.4. Have environmental impacts been identified and addressed in the PDD?	/1//3/	DR	Since an EIA was not requested by the FEMA state environmental agency,		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			environmental impacts have not been identified and addressed in the PDD..		
E. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*					
E.1.1. Have relevant stakeholders been consulted?	/1//3/	DR	Local stakeholders were invited to comment on the project in accordance with the requirements of Resolution 1 of the Brazilian DNA. The letters sent to the local stakeholders are to be provided for evidence.	~~CL 13~~	OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1//3/	DR	Yes.		OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1//3/	DR	Yes		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1//3/	DR	It is stated that no comment were received.		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1//3/	DR	No comments were received.		OK

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

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 No sources of leakage emission were identified according to AMS-I.C. However, according to Attachment C of SSC Appendix B, the project also needs to monitor whether there is abundant supply of biomass. This also needs to be demonstrated prior to the start of the project activity.	B.6.1 B.6.2 B.6.3 B.11.1 B.11.2 B.11.3	The main concern of INPA is regarding the supply of biomass. The company is changing its entire production patterns in order to consume biomass and a shortage of this fuel would be drastic. Therefore, the company will consume biomass only from suppliers that can guarantee a continuous delivery of biomass, with no constraints that could jeopardize this supply chain. Documents from the forecasted suppliers of biomass stating that the consumption of INPA will not affect other biomass consumers were provided to the validator, evidencing the surplus of biomass in the region.	Evidences of three biomass suppliers were provided to the DOE. These documents state the production capcity, the demand and the excess of biomass. The supply of biomass was included in the monitoring plan. This CAR is closed.
CAR 2 Details of data to be collected and its certainty are described in the PDD. However, the frequency of data recording format and location are not described in the PDD. In addition, the monitoring plan does not report for how long the filed data will be kept. The equipments will be selected after the selection of the boiler and associated equipment and need to be addressed in the PDD.	B.8.2 B.9.3 B.9.4 B.9.5 B.9.6 B.9.9 B.10.9 B.8.2	Data will be registered daily in paper and digital formats, with backup in the company's network. The paper format will be kept until the next verification. The digital format will be kept for the entire crediting period plus two years. The monitoring section in the PDD was updated to reflect this information.	The last version of the PDD was assessed and the changes done in the monitoring plan (section B.7.2) are sufficient. This CAR is closed.
CL 1	A.3.1	The company forecasts to consume	Version 2 of the PDD was assessed and

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
DNV requests further explanations regarding the type of biomass briquettes that will be consumed in the project.		biomass briquettes in the new boilers. These briquettes will be made, initially, from Pinus and Eucaliptus barks. However, other kinds of biomass briquettes as well as other kinds of biomass can be used, depending on the availability of each type. As INPA is concerned with the sustainability of its activities, all suppliers will be investigated and they must be in compliance will all applicable laws and regulations. The PDD was updated with this information.	the different types of biomass briquettes that could be consumed in the project are now explained in section A.4.2. This CL is closed.
CL 2 Evidence that INPA seriously considered the CDM in the decision to proceed with the project was presented as a communication that EcoSecurities sent to INPA. DNV requests a copy of the communication between EcoSecurities and INPA. It also needs to be clarified as to when the detailed project report / Feasibility study report of the project was prepared, and when the management approval for the project was obtained. If the date of the feasibility study is prior to March 2007, then that needs to be considered as the start date of the project. Evidence is also to be provided for the start	B.3.4 C.1.1	The first registry of communication between EcoSecurities and INPA is dated 08 February 2007. This communication is an e-mail regarding the beginning of the contract discussion between the two companies. Before this, several phone conversations and meetings were conducted. This first e-mail was provided to the validator. The company asked for quotations around this time. However, the beginning of the conversations with EcoSecurities turned the tide in favor of the fuel switch. Therefore, the most appropriate starting date is February	The proposed start date of 8 Feb 2007 is the same day as is stated for substantiating the early consideration of the CDM. These two things can fall on the same day but then it would normally be a more formal decision that is taken and becomes "a point of no return" for the implementation of the project. This email sounds very informal and lacks this character. If 8 Feb is the starting date one could expect a decision or action that illustrates this "point of no return". If 8 Feb is the point of no return one could expect a more formal agreement between INPA and

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
date of 1st March 2007.		2007, as INPA only closed the new boiler deal in the week before of the validation site visit (end of 2007). The first proposal agreed with INPA can be used to mark the point of no return instead. The Start Date of the project was changed to 09 May 2007. Please find attached the first page (as it is a confidential document) of the official proposal to corroborate this date. The PDD was changed accordingly.	Ecosecurities that includes the description of CDM, or a contract for construction or a decision based on documentation that can be substantiated. Evidence that INPA seriously considered the CDM in the decision to proceed with the project was presented and as a consequence the starting date of the project activity was changed to 9 May 2007. This CL is closed.
CL 3 While the project of switch from fossil fuel to biomass briquettes reflects good practice, the project participant has not finalized on the suppliers of the new boilers which will replace the existing four boilers. The technical specifications sheet of the new boilers is to be provided to firmly conclude on the thermal capacity of the project and its applicability to	A.1.2 A.3.1 A.5.1 B.1.1 B.1.2	The technical description of the boilers that will be installed was provided to the validator. The boilers have a capacity of about 16 MWth each, resulting in less than the 45 MWth limit for small scale projects.	According to the manufacturer the new biomass-fuelled thermal application boiler display an installed capacity of 14 271 400 kcal/h = 16.6 MW_{th} each, comprising a total of 28 542 800 kcal/h = 33.2 MW_{th}, thus below the established limit of 45MW_{th}. This CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
ACM-I.C which has a limit of 45 MWth.			
CL 4 The other alternatives considered for the selection of the baseline scenario are. • Implementation of the proposed project activity without CDM revenues. • Continuation of the present practice of generating steam/heat using fuel oil. • Installation of a new boiler burning natural gas. The proposed project activity without CDM faces investment barrier and the installation of a new boiler burning natural gas is not possible because of constraints of the natural gas distribution lines. The only feasible baseline is a continuation of the status quo, which meets current regulations, and requires neither additional investments nor additional running costs. The alternative 3 of using natural gas as fuel has been eliminated on the grounds that gas distribution lines are not available in the town. Evidence is to be provided.	B.2.2	According to the maps of distribution pipes of natural gas provided by the company responsible for distributing the Natural Gás in the state of Minas Gerais (GASMIG), the closest distribution pipes belongs to the sub-region of "Vale do Aço". In the map of the distribution pipeline inside this region (http://www.gasmig.com.br/redegasmig /tracadorede_vale.asp) it is shown that the closest municipality from Pirapetinga is Ouro Branco. The distance between these two cities is around 150-200 km. The installation of a new pipeline that can provide natural gas to Pirapetinga would involve, as stated in the PDD, many risks and investment. Therefore, this scenario is not a likely scenario, being excluded from further analysis.	This information was checked in the website of GASMIG. This CL is closed.
CL 5 It is to be clarified if the efficiency of the boilers provided in the PDD and the excel worksheet are the measured values or the manufacturers figures. Evidence is to be	B.2.6	The manufacturer of the boilers conducted inspections in October 2007 to verify the operation of the fuel oil boilers. In these inspections, the efficiency of the boilers was also	A copy of the result of the measurement performed by the manufacturer of the boilers (ATA MP815, ATA AWN15 and Aalborg Mission M3P-15) was provided. For the boiler Steammaster

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
provided for the same. The baseline boiler efficiency was determined by adopting an average value that is a result of the monitoring of the four fuel oil boilers. However, according to the methodology, the highest measured efficiency of a unit with similar specifications shall be used. Also, DNV requests documented evidences of this monitoring. It is also seen in the emission reduction calculation sheet that the baseline specific fuel consumption is arrived at 90.81 kg/MWh. It is to be clarified as to how the steam generation in MWh is being measured / calculated. All base documents used to arrive at the specific fuel consumption in the baseline case need to be provided. The existing boilers started operation on 1991, 1997, 2002 and 2005, respectively and the oldest boiler is more than 16 years old. While the PDD states that the residual life of such boilers is more than 40 years, evidence is to be provided for the fact.		measured. Documentation that resulted from this inspection was provided to the validator and this new real efficiency is being used to calculate the emission reductions. The PDD was updated to reflect this change. The specific fuel consumption of 90.81 kg/MWh was reached based on data sent by the project developer. However, when the calculations were made according to the actual monitoring, the correct value became 100.11 kg/MWh. The steam was being measured as tones of steam per hour, and calculated based on conversion factors provided by the manufacturer of the boilers. All calculations and conversion factors were provided to the validator. The oldest boiler (installed in 1991) went through a major retrofit in 2001. Therefore, the oldest boiler is, in reality, from 1997. Documentation was provided to the validator from an engineering company of Brazil accustomed to deal with boilers stating that fuel oil boilers generally last for 30 years. The PDD was updated to reflect it.	Four-6000 the efficiency value was provided by the manufacturer. Moreover, version 2 of the PDD was assessed and the highest measured efficiency was adopted. The lifetime has been confirmed through a letter from Protermo Engenharia Ltda. Moreover, a copy of a report proves the retrofit of the boiler was provided. This CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL 6 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 of the project is being established on the barrier analysis. • Investment barrier: The investment barrier is being established by the NPV analysis of the project. The NPV values calculated for a discount rate of 12.5% indicate a negative NPV value. The basis for the discount rate is the SELIC rate set by the Central Bank of Brazil (http://www.bcb.gov.br). The project involves an investment above 8 millions Reais in one phase. Evidence is to be provided for the investment of 8 million Reais. In addition, explanation for the adopted discount rate should be provided. The NPV analysis is seen to have been conducted for a period of 10 years only and not the lifetime of the project (21 years), as should be the case. Values of the operational NPV (as in Cells E63 and E32 do not tally)	B.3.1 B.3.3	The use of Briquettes in Brazil, as stated in the PDD, is extremely recent. There is no official statistics of producers and consumers of briquettes. This fact shows how new and how uncertain is this kind of biomass use. No governmental official source could be found to represent the briquette market in Brazil. The project proponents did not decide which supplier will be used. They are analyzing several options and only the supplier that guarantees the continuous supply and that the supply to INPA will not lead to a shortage of biomass to other consumer. Documents evidencing the conversation with different suppliers of briquettes were provided to the validator during site visit. In case of a shortage of briquettes, other kind of biomass can be used. However, in the case of shortage of biomass in general, the company can not stop their productive process. Therefore, they will keep the fuel oil boilers as back-up, to be used in the case of a shortage. This use will be monitored. The PDD was updated to reflect this fact.	The last version of the PDD and excel spreadsheet were assessed and the investment analysis are now correct. The chosen 12.5% discount rate represent the average SELIC rate by the time the PDD was developed, the 16.5% discount rate represents the historical average for SELIC rate for the last three years prior to the investment analysis and decision taking phase of the project. Documented evidences of the fuel oil and biomass price, NVC and investment were provided to the DOE. The explanation about the briquette suppliers seems sufficient. This CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
and need justification. The IRR of the project is seen to be 4.5% which seems to improve to 11% on considering a lifetime of 21 years of the project. It needs to be clarified on what is the benchmark of such projects in Brazil. The values presented in the tables Sensitivity analysis of project activity without CDM (Alternative 1) and Comparison of NPV in section B.5 and Financial Analysis in Annex 3 of the PDD do not tally and needs correction. Technological barrier: It has been stated that the use of biomass briquettes to produce energy in Brazil is not well known since there are not many companies using this kind of fuel. Although the lower risks and costs of transportation when compared to biomass residues, the implementation of this technology requires the creation of a new process in order to process the biomass before the burning in the boiler. Moreover, there is a risk of briquettes supply since the suppliers are not well established in Brazil. Clarification is to be provided on the number of briquette based boiler, briquettes suppliers in operation. It is also to be clarified if the project proponent has firmed up the suppliers for the project. It also needs to be clarified on		The NPV analysis was conducted for a period of 10 years. However, in the latest update of the financial analysis, the perpetuity was added to this 10-year period. The financial analysis done for the project is not considering the lifetime, but as said in a conservative approach a perpetuity value was considered. The financial analysis of a project should be done considering the period of time that the project is able to have revenues, not necessarily the lifetime of the project. In order to correctly address the period of revenues, a conservative approach should be used and it was decided to use the concept of "perpetuity" for this project activity. The perpetuity is the net present value of all revenues that the Project can have during a infinite timeline (Samanez, 2007). For this project the interest rate is represented by the discount rate, that is the rate of return of the money spent in the Project. Therefore, the Project additionality is correctly addressed and the financial analysis was done according to the latest EB decision.	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
the emergency system for steam/heat requirement in the event of non-availability of briquettes, since all the old boilers are being taken out of service and kept in stores.		Samanez, C.P. (2007). Matemática financeira: aplicações à análise de investimentos. Ed. Pearson Prentice Hall, São Paulo. 273 p. The benchmark used represents the Brazilian Special Settlement and Custody System (SELIC) rate, which is expressed in annual terms and is the Central Bank of Brazil's lending rate. This is the most conservative discount rate in the host country, given that it represents the lowest risk return in Brazil (risk free tax). As seen in the Tool for the demonstration and assessment of additionality, benchmarks can be derived from government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert. References for the values were provided to the validator at the time of the site visit and the financial analysis for this project was updated to reflect a more realistic scenario, with perpetuity.	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL 7 In line with the methodology, the monitoring plan provides for the monitoring of the net quantity of heat/steam generated using biomass briquettes. It is stated that the heat generated will be monitored as Tera Joules. It is to be clarified as to if this parameter will be read directly from the meter or calculated. If it is calculated, what are the variable required to be monitored.	B.10.1 B.10.2 B.10.3 B.10.5 B.10.6 B.10.7	The monitoring equipment of INPA will monitor the production of steam as "tones per hour". The conversion to Tera Joules is posterior to monitoring. Temperature and pressure will be monitored according to guidelines supplied by the manufacturer in order to achieve the enthalpy variation data. With this data, is possible to transform the amount of steam into energy supplied by the project activity to the production process of the project developer.	The last version of the PDD was assessed and the steam amount, temperature and pressure were included in the monitoring plan. This CL is closed.
CL 8 The project documentation does not report about provisions for meeting training and maintenance needs.	A.3.3 B.13.2	The PDD was updated in order to incorporate provisions for training and maintenance.	The version 2 of the PDD was assessed and documented evidences about the initial training will be checked during the first verification. During the site visit the client provided documented evidences about training for the fuel oil boiler. This CL is closed.
CL 9 Procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been	B.13.3	In case of any problems with the new steam system that burns biomass, the old boilers (kept as backup) will be used to produce steam, therefore burning fuel	Version 2 of the PDD was assessed and the explanation regarding procedures for emergency is sufficient.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
addressed and need clarification.		oil. This emergency operation will be monitored by consumption of steam and stock control of fuel oil, cross-checked with receipts from fuel oil purchase. It is already part of the monitoring performed by the company. The emissions occurred in this period will be discounted from the emission reductions. The PDD was updated to reflect this change.	This CL is closed.
CL 10 While the calculations are clear and transparent the following need clarification. How was the steam produced in MWh arrived at? How is the oil consumption arrived at? Evidence for the NCV of the fuel oil and briquette. How was the efficiency of the boilers arrived at and evidence.	B.5.1 B.5.2 B.5.3	Steam production in MWh and Oil consumption – according to data and calculations provided by INPA. A new version of the calculations spreadsheet already considering this request and with a detailed calculations regarding MWh was provided to the validator. NCV of fuel oil – Source: Brazilian Energetic Balance, as stated in the calculations spreadsheet. NCV of Briquette – a supplier of biomass being considered by INPA as a possible supplier to the project, as stated in the calculations spreadsheet. The evidence of this NCV was given to the validator during site visit. Efficiency of the boilers – Inspections made in 2007 by the manufacturer	The spreadsheet was assessed and data used was checked. Documented evidences of the NCV of the briquettes (copies of two suppliers proposal) were provided to the DOE. A copy of the result of the measurement performed by the manufacturer of the boilers (ATA MP815, ATA AWN15 and Aalborg Mission M3P-15) was provided. For the boiler Steammaster Four-6000 the efficiency value was provided by the manufacturer This CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		(Aalborg Industries). Inspection reports given to the validator during site visit.	
CL 11 While it is stated that the project is not expected to result in project GHG emissions due to the use of a renewable energy source for steam generation, it needs to be clarified on the monitoring of the fossil fuel as stated in the section B.7.1. The emissions due to the transportation of the biomass from the plants have not been considered on the assumption that these are negligible and similar emissions would have taken place for the transportation of the fuel oil. This needs to be demonstrated. What is the quantity of the ash that will be generated and what are the emissions due to the transportation of the ash?	B.4.1 B.4.2 B.4.3 B.9.1	Conforming to the guidelines and rules for small-scale project activities, the emissions related to production, transport and distribution of the fuel used in the power plants in the baseline are not included in the project boundary, as these do not occur at the physical and geographical site of the project. Either the baseline scenario or the project activity scenario will involve transportation of fuel. The transportation of fuel oil is generally performed in trucks with the capacity ranging from 12 to 28,000 liters and the transportation of briquettes is generally done in trucks with the capacity of about 30 to 40 tonnes. Therefore, is expected an equivalency of number of trucks transporting the fuel in both baseline and project scenarios. The transportation of the fuel oil to INPA was from “Refinaria de Duque de Caxias” (REDUC), one of the most importants refinery of the Petrobrás	The explanation was considered sufficient. This CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		system. This refinery is about 400 km away from INPA. This distance is enough to cover a good area, again balancing the emissions from baseline and project scenarios. Based on these three assumptions the transportation project emissions were neglected. The proportion of ashes that are estimated to be generated is 2% of the biomass burned. The destination of the ashes will be probably as fertilizer, in Pirapetinga city itself and its surroundings, leading to no significant emissions regarding this matter. The validator was informed of this fact during site visit.	
CL 12 As stated in the PDD, INPA is in compliance with all laws and regulations applicable. However, DNV requests documented evidences of issuance of the Operation Environmental Licenses. DNV requests documented evidences that INPA already reported the implementation of the project activity to FEAM.	D.1.1 D.1.2	INPA already has a valid Operational License provided by the State Environmental Authority (FEAM). A copy of this license was provided to the validator. The project developer already communicated the changes that will be made inside its site to FEAM. A letter protocolled by FEAM was provided to the validator as a proof of this	A copy of the Environmental License and a copy of the letter sent to FEAM were provided. This CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		communication.	
CL 13 Local stakeholders were invited to comment on the project in accordance with the requirements of Resolution 1 of the Brazilian DNA. The letters sent to the local stakeholders are to be provided for evidence.	E.1.1	The proof of stakeholders consultation were sent to the validator.	A copy of all the letters were sent to DNV. This CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Michael Lehmann

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 Sectoral Scope(s):	Sectoral scope 1, 2, 3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0027*	Yes
ACM002, AMS-I.A-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

Raman Venkata Kakaraparthi

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 5		
Technical Reviewer for (group of) methodologies:			
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes		

Høvik, 22 December 2006

Einar Telnes
Director, International Climate Change Servicer

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Ole Andreas Flagstad

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

GHG Auditor:	Yes		
CDM Validator:	--	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Andrea Leiroz

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 Sectoral Scope(s):	--		

Høvik, 18 July 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director