VALIDATION REPORT

INÁCIO MARTINS BIOMASS PROJECT IN BRAZIL

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DET NORSKE VERITAS

VALIDATION REPORT

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Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Inácio Martins Biomass Project" (hereafter called "the project") in Brazil, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to the Kyoto Protocol criteria and the simplified modalities and procedures for small-scale CDM project activities. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the "Inácio Martins Biomass Project", as described in the revised and resubmitted project design document of May 2005, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baseline and monitoring methodologies for category I.D and III.E small-scale CDM project activities. Hence, DNV requests the registration of the "Inácio Martins Biomass Project" as CDM project activity. Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of the participating Parties, including confirmation by the DNA of Brazil that the project assists in achieving sustainable development.

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Work verified by: Michael Lehmann		
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Abbreviations

ANEEL	Brazilian Electricity Agency (Agência Nacional de Energia Elétrica)
BM	Build margin
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
DOC	Degradable organic carbon
DOC_f	Fraction DOC dissimilated to landfill gas
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MCF	Methane correction factor
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N-NE	North-Northeast
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating margin
ONS	National Electricity System Operator (Operador Nacional do Sistema)
PDD	Project Design Document
S-SE-CO	South-Southeast-Midwest
tCO_2e	Tonne carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

EcoSecurities has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the "Inácio Martins Biomass Project" in Brazil (hereafter called "the project"). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consisted of the following personnel:

Cintia Dias	DNV Oslo	Team Leader, GHG auditor
Luis Filipe Tavares	DNV Brazil	GHG auditor
Michael Lehmann	DNV Oslo	Internal verifier, Energy sector expert

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan and the project's compliance with relevant UNFCCC and host country 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).

UNFCCC criteria refer to the Kyoto Protocol criteria for the CDM, the CDM rules and modalities as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and relevant decisions by the CDM Executive Board.

1.2 Validation Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. The validation team has, based on the recommendations in the Validation and Verification Manual /7/ 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 provide input for improvement of the project design.

1.3 The Inácio Martins Biomass Project

The objective of this proposed small-scale CDM project activity is the construction of a new biomass electricity generation unit with 12.33 MW of installed capacity using climate change neutral biomass residues as fuel and exporting all the electricity produced to the grid.

The project is expected to displace carbon intensive electricity (renewable energy component) and to avoid that biomass is left to decay (methane avoidance component) and is instead used as an energy source in the project. The biomass used is wood residues derived from third parties.

The project's expected annual emission reductions from the grid-electricity displacement component is 50 550 tCO_2e. The annual emission reductions for the methane avoidance component of the proposed project activity is estimated as 247 501 tCO_2e.

2 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents;
II follow-up interviews with project stakeholders;
III the resolution of outstanding issues and the issuance of the final validation report and opinion.

Findings established during the validation can either be seen as a non-fulfilment of validation 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 or host Party requirements have not been met; or
iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term *Clarification* may be used where additional information is needed to fully clarify an issue.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /7/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a validation project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the "Inácio Martins Biomass Project" is enclosed in Appendix A to this report.

2.1 Review of Documents

The initial PDD of August 2004 /1/ and the final PDD of May 2005 /2/ were reviewed. In addition, spreadsheets documenting the calculation of the combined margin /3/ and a spreadsheet documenting the cash flow calculations /4/ were reviewed.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below).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 Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	***Ref. to Table 2***	***Summary of project participants' response***	***Final conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

2.2 Follow-up Interviews

On 11 January 2005 DNV performed interviews with Winimport /9/, Transer /10/ and EcoSecurities /11// in Inácio Martins, Paraná State, to confirm and to resolve issues identified in the document review.

The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Winimport Transer EcoSecurities	➢ Project's environmental additionality as mandated in Article 12 of the Kyoto Protocol (Investment barriers, technological barriers and barriers due to prevailing practice) ➢ Project technology: energy output, experience with biomass boiler technology and provisions for technology and capacity transfer, including training of local employees ➢ Biomass availability ➢ Environmental impacts and planned measures to mitigate environmental impacts ➢ Consultation with local stakeholders ➢ Emergency procedures/corrective actions, i.e. provisions to mitigate emergencies, i.e. fire, procedures for corrective actions and project performance reviews

2.3 Resolution of Clarification and Corrective Action Requests

The validation identified four *Corrective Action Requests* and six requests for *Clarification.* These were presented to the project participants on 3 March 2005 in the form of a draft validation report (rev 01). Subsequently, Inácio Martins and EcoSecurities provided clarifications and additional information through a revised PDD /2/ and spreadsheets for the calculation of the combined margin /3/ and the calculation of the cash flow /4/. This response provided by the project participants and the revised PDDs sufficiently addressed DNV's *Corrective Action Requests* and requests for *Clarifications*.

To guarantee the transparency of the validation process, the concerns raised by DNV and the response provided by the project participants are documented in Table 3 of the Validation Protocol in Appendix A to this report.

3 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 validation findings relate to the project design as documented and described in the PDD of May 2005.

3.1 Participation Requirements

The project participants are Usina Termoelétrica Abílio Bórnia, S.A. of Brazil and EcoSecurities Ltd of the United Kingdom. All Parties involved, i.e. Brazil and the United Kingdom, meet the requirements to participate in the CDM.

3.2 Project Design

The project is a renewable energy project activity with an output capacity of less than 15 MW, i.e. 12 33 MW. The project also avoids methane emissions with project emissions being less than 15 kilotonnes of carbon dioxide equivalent annually. The project is thus eligible as a *Renewable electricity generation for the grid* (Category I.D) and *Methane avoidance* (Category III.E) small-scale CDM project activity as outlined in Appendix B of the simplified modalities and procedures for a small-scale CDM project activities /8/.

The simplified modalities and procedures give no further guidance on which project emissions to include for determining whether a project meets the small-scale eligibility threshold for category III.E, i.e. the project emissions shall be less than 15 000 tCO_2e per year. However, the selected definition of the project emissions being the CH_4 and N_2O emissions due to incomplete combustion of biomass with an exclusion of biogenic CO_2 emissions from the combustion of biomass is in line with other approved CDM baseline and monitoring methodologies.

The project design engineering reflects good practice, and the technology as well as know-how being promoted by this project is environmentally safe and sound. The thermoelectric plant will be fuelled by biomass residues with high granularity and different calorific values supplied by third parties. Due to its characteristic, a new and complex process to treat the residues before its use must be installed. The new equipment shreds triturates and homogenizes the wood that is currently not utilised and dumped on landfills, and will produce a mix of fuel suitable for combustion in a boiler.

Social and other environmental effects than the reduction of GHG emissions are described. By promoting renewable energy and by using biomass residues from sawmills, the project is likely to contribute to sustainable development in Brazil.

The project will not receive any public funding from Parties included in Annex I. The validation did not reveal any information that indicates that the project's financing can be seen as a diversion of ODA funding towards Brazil.

3.3 Project Baseline

The project has two baseline components. The first baseline is established according to the simplified baseline methodologies for category I.D small-scale CDM project activities (Renewable Energy Projects / Renewable electricity generation for a grid).

The baseline emission coefficient is determined as the average of the approximate operating margin (OM) and the build margin (BM), i.e. the combined margin, in accordance with the simplified baseline methodology for category I.D small-scale CDM project activities /8/. The initial determination of the combined margin emission coefficient was based on an International Energy Agency (IEA) study on the Brazilian electricity grid carried out in 2002 (using data from 2000) /5/. The IEA study was based on installed capacity of plants built up to 2004 and assumptions regarding the plant efficiency and load factor. However, the IEA study did not calculate the combined margin as required by the simplified baseline methodology for category I.D small-scale CDM project activities and DNV requested the project participants to recalculate the combined margin emission coefficient.

Recently, the project participants managed to obtain more accurate data on the Brazilian electricity grid from the National Electricity System Operator (ONS) and recalculated the combined margin emission coefficient based on actual electricity generation data provided by ONS for the South-Southeast-Midwest (S-SE-CO) grid. Average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid and IPCC carbon emission factors for specific fuels were applied to calculate plant specific emission coefficients.

Although the ONS data only covers 76.4% of the installed capacity in the S-SE-CO grid, the recalculation of the operating and build margin emission coefficient based on actual dispatch data for the years 2001-2003 represents an improvement of the data quality compared to the original data from the IEA study. Data for the years 2001-2003 are the most recent statistics available and the data was verified against the data published on the ONS website. 2004 data was not publicly available at the time of writing this report.

The recalculated combined margin emission coefficient of 0.521 tCO_2e/MWh is calculated in accordance with the simplified baseline methodology for category I.D small-scale CDM project and is appropriate due to the following:

- *Operating margin*: The operating margin calculated based on generation data from power plant dispatched by ONS is 0.949 tCO_2e/MWh. No electricity generation data is publicly available for the remaining 23.6% of power plants which electricity is not dispatched through ONS. However, these plants are not likely to be affected by a CDM project. These operate either based on power purchase agreements which are not under control of the dispatch authority, or they are located in non-interconnected systems to which ONS has no access.
- *Build margin*: The build margin emission coefficient calculated for only power plants dispatched by ONS is 0.094 tCO_2e/MWh and thus more conservative than the emission coefficient calculated based on IEA data (0.421 tCO_2e/MWh) or the combination of IEA and ONS data (0.205 tCO_2e/MWh).
- *Project electricity system*: Even though the S-SE-CO grid is connected with the North-Northeast (N-NE) grid, the energy flow between N-NE and S-SE-CO grids are heavily

limited by the transmission line capacity. Given the relative small capacity of the project, it is hence deemed appropriate to consider data on the S-SE-CO grid only.

The second baseline component is established according to the simplified baseline methodologies for category III.E small-scale CDM project activities (Other Projects Activities / Methane Avoidance). The amount of methane produced from decay of biomass landfilled in absence of the project is determined using adequate IPCC default emission factors.

3.4 Additionality

A simplified baseline methodology may be used for small-scale CDM project activities if the project participants are able to demonstrate that the project activity would otherwise not be implemented due to the existence of barriers. DNV Certification has consequently investigated investment barriers, technological barriers and the barrier due to prevailing practice.

The additionality of the project is demonstrated by considering two scenarios: the scenario without the project (baseline) and the implementation of the project. The test considers financial/economic barriers, technical barriers and prevailing business practice. An investment analysis considering all savings and expenses associated to the project was presented /4/. The analysis shows that the carbon revenues increase the IRR from 9.24% to 13.79%%. Moreover, it is demonstrated that the use of wood residues like sawdust and wood chips require the installation of a complex process to treat the biomass residues before it can be used as fuel. Moreover, a complex logistic process must be implemented to secure a continuous supply of wood residues.

It is sufficiently demonstrated that the project faces investment barriers due to the IRR of the project without CER revenues being lower than the levels regarded as acceptable for other investments in Brazil. Moreover, it was confirmed that using wood waste that can not be readily utilised for generation of electricity is no prevailing business practice in Brazil and that the project thus faces technological barriers. Hence, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional.

3.5 Monitoring Plan

The project applies the monitoring methodologies established according to the simplified baseline methodology for category I.D and category III.E small-scale CDM project activities. The main parameters are electricity generated and biomass burned in the cogeneration unit. These parameters are consistent with the simplified monitoring methodology. Upon DNV's request, the PDD was revised to clarify how the net electricity produced by the new cogeneration plant and the quantity of waste wood purchased will be monitored.

Detailed responsibilities and authorities for project management, monitoring procedures and QA/QC procedures have not been presented during the interviews with Inácio Martins. However, they are foreseen to be established during the second quarter of 2005 and their implementation should be checked during the first periodic verification of emission reductions.

3.6 Calculation of GHG Emissions

The baseline calculations are according to two approaches. The first approach is according to the simplified baseline methodology for category I.D small-scale CDM project activities, i.e. the average of the approximate operating margin (OM) and the build margin (BM), which is calculated ex ante based on 2001-2003 data from ONS for the S-SE-CO grid.

The second approach is according to the simplified baseline methodology for category III.E small-scale CDM project activities:

$$BE_y = Q_{biomass} * CH_4\_IPCC_{decay} * GWP\_CH_4$$

Where:

BE_y = Baseline methane emissions from biomass decay (tonnes of CO_2 equivalent)
$Q_{biomass}$ = Quantity of biomass treated under the project activity (tonnes)
CH_4_GWP = GWP for CH_4 (tonnes of CO_2 equivalent/tonne of CH_4)

and

$$CH_4\_IPCCdecay = (MCF * DOC * F * 16/12)$$

Where:

CH_4_$IPCC_{decay}$ = CH_4C CH_4 emission factor for decaying biomass in the region of project activity (tonnes of CH_4/tonne of biomass or organic waste)
MCF = methane correction factor (fraction) (default is 0.4)
DOC = degradable organic carbon (fraction, see equation below or default is 0.3)
DOCF = fraction DOC dissimilated to landfill gas (default is 0.77)
F = fraction of CH_4 in landfill gas (default is 0.5)

The methane avoidance was determined using IPCC default MCF for unmanaged, shallow (< 5 m waste) landfills, a DOC of 0.3 for wood waste and a the IPCC default DOC_f of 0.77. The selection of these factors is reasonable.

For project activities using biomass, leakage must be considered. Potential leakage effects from concurrent uses of biomass as well as from biomass transport are considered.

Emissions resulting from the transportation of the biomass to the site are accounted for, and the formula and assumptions used to calculate these emissions seem reasonable and conservative. A transport emission factor (TEF) of 0.00270 tCO_2 /t of biomass transported from third parties has been calculated. For all biomass purchased by third parties this factor will be applied for determining emissions related to transports. It is demonstrated that the emissions originated from the transportation of sawmill residues to the site are significantly less than the amount that would be produced by the decay of biomass in normal conditions.

Possible leakage effects related to the use of biomass are not discussed according to paragraph 8 of the simplified baseline and monitoring methodologies for small-scale CDM project activities, which require that leakage shall be considered in the case of project activities using biomass. However, it was verified during site visit that over 10 times the amount of biomass to be used by the project is available and left to decay in the region. One of the main activities in the South region of Brazil where the project is located is the wood industry, with many sawmills. Sawmills generate huge amounts of biomass residues (sawdust), and the Brazilian legislation prohibits the uncontrolled burning of such biomass. As a result, sawmills have huge amounts of biomass that are left to decay. It was confirmed that the project represents a solution for the biomass residues

problem in the region. Therefore, the project is not likely to result in biomass scarcity which could cause other biomass users to switch to other fuels (leakage effects).

3.7 Environmental Impacts

According to the Brazilian regulations renewable energy projects are required to have a permit for construction. The renewable energy plant has received permit for construction from ANEEL, the Brazilian Electricity Regulatory Agency. The only impact to be considered was noise and due account was taken through an engineering project elaborated by Inácio Martins. The environmental permit for operation from the Environmental Agency of Paraná state (IAP – Instituto Ambiental do Paraná) has already been issued. Hence, environmental impacts of the project have been sufficiently assessed and taken into account.

3.8 Comments by Local Stakeholders

According to Resolution 1 of the Brazilian DNA, local stakeholders were invited to comment on the project. The main Brazilian stakeholders received letters and were asked to provide comments within a period of 30 days. These letters were verified during site visit. The selected stakeholders were: City Hall of Inácio Martins, Chamber of Inácio Martins, Environment agencies from the State and Local Authority, Brazilian Forum of NGOs, District Attorney (known in Portuguese as Ministério Público, i.e. the permanent institution essential for legal functions responsible for defending the legal order, democracy and social/individual interests) and local communities associations. No comments were received.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the validation of CDM projects, the validator shall make publicly available the project design document and receive, within 30 days, comments on the validation requirements from Parties, stakeholders and UNFCCC accredited Non-governmental Organisations (NGO) and make them publicly available.

The PDD was published on http://www.dnv.com/certification/ClimateChange and was open for comments from 6 December 2004 to 5 January 2005. Parties, stakeholders and NGOs were through the CDM website invited to provide comments on the validation requirement.

One comment was received on 29 December 2004. The comment (in unedited form) and how DNV has taken due account of the comment received is given below.

Comment by: Axel Michaelowa, Hamburg Institute of International Economics (HWWA)

Inserted on: 2004-12-29

Subject: Project is not small-scale project

Comments:

1. The project does not fulfil the requirements of the project category III.E as its methane emission reductions lie above the threshold of 15 kt CO2 eq. per annum. Thus it should use large-scale project methodologies.

How DNV has taken due account of the comment received:

The issue raised by the comment was considered in DNV's validation of the project. The comment seems to be a misunderstanding of the eligibility criteria for type III small-scale CDM project activities. Paragraph 4 of the simplified modalities and procedures for small-scale CDM project activities clearly state that "type (iii) projects shall not exceed total direct emissions of 15 kilotonnes (kt) of carbon dioxide (CO_2) equivalent annually, and must reduce greenhouse gas emissions". There is no requirement that the project's emission reductions are less than 15 kt CO_2 equivalents per year. With project emissions being 10 680 tCO_2e per year, the project qualifies as a category III.E small-scale CDM project activity.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Inácio Martins Biomass Project" in Brazil (hereafter called "the project"). The validation was performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to the Kyoto Protocol criteria for the CDM, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and relevant decisions by the CDM Executive Board.

The project design engineering reflects good practice. By promoting renewable energy and by using biomass residues from sawmill industries, the project is likely to contribute to sustainable development in Brazil.

Being a renewable energy project activity with an output capacity of less than 15 MW and having less than 15 000 tCO_2e project emissions, the project meets the criteria for Renewable electricity generation for the grid (Type I.D) and Methane avoidance (Type III.E) as defined in Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

Category I.D comprises projects "that supply electricity to an electricity distribution system". The electric energy generated by the project will be supplied to an independent energy consumer which currently purchases electricity from the national grid. Hence, as this project activity avoids marginal fossil fuel based electricity generation by the grid in the same way as projects supplying all their electricity to the grid, it is DNV's opinion that the project can apply the simplified baseline and monitoring methodology for category I.D small-scale CDM project activities.

The simplified modalities and procedures give no further guidance on which project emissions to include for determining whether a project meets the small-scale eligibility threshold for category III.E, i.e. the project emissions shall be less than 15 000 tCO_2e per year. The selected definition of the project emissions being the CH_4 and N_2O emissions due to incomplete combustion of biomass with an exclusion of biogenic CO_2 emissions from the combustion of biomass is in line with other approved CDM baseline and monitoring methodologies..

The project applies the appropriate simplified baseline methodologies proposed for these small-scale project activity categories. A combined margin emission coefficient of 0.521 tCO_2e/MWh is calculated in accordance with the simplified baseline methodology for category I.D small-scale CDM project activities, i.e. the average of the approximate operating margin and the build margin. The determination of this combined margin emission coefficient is based on actual electricity generation data provided by the National Electricity System Operator (ONS) for the years 2001- 2003 in the South-Southeast-Midwest (S-SE-CO) grid.

The second baseline component is established according to the simplified baseline methodology for category III.E small-scale CDM project activities. The amount of methane produced from decay of biomass landfilled in absence of the project is determined using adequate IPCC default emission factors.

An analysis of relevant barriers demonstrates that the proposed project is not a likely baseline scenario and emission reductions are hence additional to any that would occur in its absence of

this proposed CDM project activity. The additionality of the project is demonstrated through a barrier test. Upon request, an investment analysis considering all savings and expenses associated to the project was presented. It was sufficiently demonstrated that the project without CER revenues faces investment barriers and that there are technological barriers for the proposed project technology.

By displacing fossil fuel-based electricity with electricity generated from a renewable source and by avoiding landfilling of biomass, the project results in reductions of CO_2 emissions and the avoidance of CH_4 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

The project applies the simplified monitoring methodologies described for category I.D and III.E small-scale CDM project activities. Detailed responsibilities and authorities for project management, monitoring procedures and QA/QC procedures have not been presented during interviews with Inácio Martins. They are foreseen to be established during the second quarter of 2005 and their implementation should be checked during the first periodic verification of emission reductions.

A consultation process with relevant local stakeholders has been conducted and no comments were received during the consultation process.

Parties, stakeholders and NGOs were invited to provide comments and all issues raised by stakeholders were taken into account during the validation.

In summary, it is DNV's opinion that the "Inácio Martins Biomass Project", as described in the revised and resubmitted project design document of May 2005, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified baseline and monitoring methodologies for category I.D and III.E small-scale CDM project activities. Hence, DNV requests the registration of the "Inácio Martins Biomass Project" as CDM project activity.

Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of the participating Parties, including confirmation by the DNA of Brazil that the project assists in achieving sustainable development.

6 REFERENCES

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

/1/ EcoSecurities, *PDD of the Inácio Martins Biomass Project*, August 2005

/2/ EcoSecurities, *PDD of the Inácio Martins Biomass Project*, May 2005

/3/ Spreadsheet of Calculation of Combined Margin (ONS database SSC 2001-2003 v.05.xls), May 2005.

/4/ EcoSecurities, *Financial Analysis*, Excel sheets, May 2005

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

/5/ Martina Bosi: *Road-Testing Baselines for Greenhouse Gas Mitigation Projects in the Electric Power Sector* (OECD and IEA Information Paper COM/ENV/EPOC/IEA/SLT(2002)6). October 2002. Available at http://www.oecd.org.

/6/ IPCC: *Good Practise Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. 2000

/7/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/8/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories* (Version 05 of 25 February 2005).

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

/9/ Marcelo Augusto Bornia – Winimport - Administrative Manager

/10/ Marcos Aurèlio Reami – Transer Ltda - Administrative Manager

/11// Flavia Resende – EcoSecurities - Consultant

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APPENDIX A

VALIDATION PROTOCOL
FOR SMALL-SCALE CDM PROJECT ACTIVITIES

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

Requirement	Reference	Conclusion	Cross Reference/Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	-	Table 2, Section A.3 Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written confirmation by the DNA of Brazil that the project assists in achieving sustainable development.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	-	Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of the participating Parties
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1

Requirement	Reference	Conclusion	Cross Reference/Comment
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Decision 17/CP.7	OK	No public funding is used and the validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	The DNA of Brazil is the "Comissão Interministerial de Mudança Global do Clima". The DNA of the UK is the "The Department for Environment, Food and Rural Affairs".
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK	Brazil has ratified the Kyoto Protocol on 23 August 2002. UK has ratified the Kyoto Protocol on 31 May 2002
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	UK calculated and recorded its assigned amount units.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	The UK has in place a national registry and reported on 15 April 2004 its national GHG inventory for the years 1990-2002..
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	OK

Requirement	Reference	Conclusion	Cross Reference/Comment
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G Comments by stakeholders were verified during the site visit.
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F The validator checked the "Environmental License" and also the ANEEL license and Operation License during the site visit.
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD was published on http://www.dnv.com/certification/ClimateChange. Parties, stakeholders and NGOs were through the CDM website invited to provide comments on the validation requirement from 6 December 2005 to 5 January 2005. One comment was received.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. **Project Description** The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	The project conforms to the small-scale project Type I.D since the nominal installed capacity of the Project is below the 15 MW threshold. Category I.D comprises projects "that supply electricity to an electricity distribution system". The electric energy generated by the project will be supplied to an independent energy consumer which currently purchases electricity from the national grid. Hence, as this project activity avoids marginal fossil fuel based electricity generation by the grid in the same way as projects supplying all their electricity to the grid. In addition, the methane avoidance component of the project is eligible under Type III.E because in the project scenario the emissions related to the combustion of the biomass will be lower than 15,000 tCO_2e annually.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	It remains to be justified that the Imbituva and Inácio Martins Biomass Projects are not a debundled large scale project.	~~CL 1~~	OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for	/1/	DR	The project is a "Renewable electricity generation for a grid project activity" (Type I.D) and "Methane		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
small scale CDM project activities?			avoidance" (Type III.E) small-scale CDM project activity as defined in the simplified baseline and monitoring methodologies for small-scale CDM project activities.		
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The project is located within the City of Inácio Martins in the Department of Irati-Pr, at the property called Boa Vista, premise of Beira Linha, parcel of land #8.		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR	The project comprises a new 12.33 MW biomass electricity generation plant, using biomass from wood waste; that on normal conditions is dumped on a landfill and left to decay. Its components are clear identified as well as its boundaries.		OK
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR	Yes, the plant to be installed will be composed by a boiler manufactured by Biochamm Ltda a Brazilian industry. The boiler is designed for using wood chips, powder and husk as fuel, generating steam with temperature of 420°C and pressure of 43 bar. The steam turbine is manufactured by Tuthil. The project represents a technology transfer, since this type of technology is a new development and it is still not available from any Brazilian company.		OK
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR	Yes.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/	DR	The project will require new safety measures as well as management capacity. The PDD is not clear about any training necessary for the employees or about maintenance efforts.	~~CAR 1~~	OK
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project is likely to mitigate the environmental impacts: it will diversify the sources of electricity generation; it will use clean and efficient technologies, and it will conserve natural resources; it will act as a clean technology demonstration project, encouraging development of modern and more efficient generation of electricity; it will optimise the use of natural resources; and it will avoid new uncontrolled waste disposal places, using a large amount of wood residues from region. For the social benefits: it will increase employment opportunities in the area where the project is located, specifically, it is expected that about 60 direct and indirect jobs will be created.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	It is not clear how much of the biomass needs to be transported from other sites thus creating transport emissions and noise.	~~CL 2~~	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	The project is in line with current sustainable development priorities in Brazil.	-	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	The "Environmental License" and also the ANEEL license and Operation License were checked.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B. **Project Baseline** The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/	DR	The project applies the simplified baseline methodologies proposed for category I.D. (Renewable electricity generations for the grid), i.e. the average of the approximate operating margin and the build margin, and category III.E (Methane avoidance), i.e. the methane emissions from biomass that would have otherwise been left to decay.		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	Yes, both baseline methodologies are applicable.		OK
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to	/1/ /4/	DR	Financial, technical and prevailing practice barriers are presented to demonstrate the additionality of the project. Technical: It is demonstrated that the use of wood		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
prevailing practice or other barriers?			residues like sawdust and wood chips require the installation of a complex process to treat the biomass residues before it can be used as fuel. Moreover, a complex logistic process must be implemented to secure a continuous supply of wood residues. Prevailing practice: The efficiency of Brazilian sawmills is very poor, and less than 50% of wood is transformed into products. The other 50% are left as wood residue. The construction of a new renewable energy plant represents a deviation from the company's core business. A new, expensive, and complex process must be installed.		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/ /3//4/	DR	The methodology for determining the combined margin emission factor differs from the methodology proposed for category I.D small-scale CDM project activities. The project proponents are thus requested to calculate the operating and build margin according to the methodology given in the simplified baseline and monitoring methodologies for category I.D small-scale CDM project activities. The selected baseline for the methane avoidance component is the CH4 emissions from disposing the wood waste on a landfill and leaving it to decay.	~~CAR 2~~	OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	The project could apply for the PROINFA programme. However, this programme by itself cannot be considered an incentive to the project as it pays less than the price obtained from selling electricity to an independent energy consumer. For methane avoidance no policy is established with respect to controlled biomass burning..		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.2.4. Is the baseline selection compatible with the available data?	/1/ /3/	DR	The amount of energy that will be used by the Inácio Martins Plant needs to be clarified.	~~CL 3~~	OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/ /3/	DR	See B.2.1		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 lifetime clearly defined?	/1/	DR	The project starting date was 10/26/2004 but it is not yet implemented. It needs to be clarified when the project is expected to be implemented.	~~CL 4~~	OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A crediting time of 7 years starting on 6 July 2005 with two possible renewals is selected.		OK
D. **Monitoring Plan** The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies	/1/	DR	Yes, both selected monitoring methodologies are according to the methodologies established for		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
provided for the relevant project category?			small scale CDM project categories I.D and III.E.		
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes, it complies with the monitoring requirements for small scale CDM project categories I.D and III.E.		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	Yes		OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	To determine the amount of electricity displaced by the project the net electricity produced by Inácio Martins generation plant is monitored. To determine CH_4 avoidance the total amount of biomass burned is monitored.		OK
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Are the choices of project emission indicators reasonable?	/1/	DR	Yes. There are only two gases to be measured: CH_4 and N_2O from incomplete combustion of biomass. CO_2 emissions associated with the combustion of biomass must not be accounted for since biomass is a climate neutral source of energy.		OK
D.2.2. Will it be possible to monitor / measure the specified project emission indicators?	/1/	DR	The biomass consumed by the project can be easily monitored.		OK
D.2.3. Do the measuring technique and frequency comply with good monitoring practices?	/1/	DR	The PDD is clear about the monitoring practices, but the implementation of these practises need to be checked during the verification phase as the project is yet not implemented.		OK
D.2.4. Are the provisions made for archiving	/1/	DR	Yes. For the crediting period plus two years.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
project emission data sufficient to enable later verification?					
D.3. Monitoring of Leakage It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. If applicable, are the choices of leakage indicators reasonable?	/1/	DR	Although it is written in the Appendix B that in the case of projects activities using biomass, leakage shall be considered, no assessment of leakage is provided in the PDD. It needs to be demonstrated that the project is not likely to affect the supply of biomass in the region and thus potentially affect other users of biomass. Moreover, the amount of biomass collected outside the project boundary, the trucks capacity and number of trips needs to be clarified in order to verify that there are no significant project emissions resulting from biomass transports.	~~CAR 3~~	OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	The determination of grid electricity displacement is based on the monitoring of electric energy generation. Methane avoidance is simply calculated based on amount biomass used as combustible.		OK
D.4.2. Will it be possible to monitor / measure the	/1/	DR	The net electricity generated by the biomass plant	~~CAR 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
specified baseline emission indicators?			is easily measured. It needs to be specified how the amount of biomass used will be monitored. Since there are some different kinds of wood biomass and qualities, it has to be demonstrated how it can be assured that the biomass would in absence of the project be left for decay on landfills. As there is biomass with high quality, it is likely that this biomass would be used and not be dumped. In this case, no methane avoidance can be claimed from this biomass.		
D.4.3. Do the measuring technique and frequency comply with good monitoring practices?	/1/	DR	Yes, the PDD establishes good monitoring practices but the proper implementation of this practises will have to be checked during the verification phase.		OK
D.4.4. Are the provisions made for archiving baseline emission data sufficient to enable later verification?	/1/	DR	Yes.		OK
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/	DR	No authorities and responsibilities are described.	~~CL 5~~	OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR	No authorities and responsibilities are described.	~~CL 5~~	OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Training is not mentioned.	~~CAR 1~~	OK
D.5.4. Are procedures identified for emergency	/1/	DR	No procedures are described.	~~CL 5~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
preparedness for cases where emergencies can cause unintended emissions?					
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	No procedures are described.	~~CL 5~~	OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	No procedures are described.	~~CL 5~~	OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	No procedures are described.	~~CL 5~~	OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	No procedures are described.	~~CL 5~~	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	No procedures are described.	~~CL 5~~	OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR	No procedures are described.	~~CL 5~~	OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR	No procedures are described.	~~CL 5~~	OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR	No procedures are described.	~~CL 5~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E. **Calculation of GHG emission** It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	Yes. There are only two emissions to be determined: CH_4 and N_2O emissions from incomplete combustion of biomass. CO_2 emissions associated with the combustion of biomass are not accounted since biomass generation is considered a climate neutral source of energy.		OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes, see E.1.1		OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	/1/	DR	Yes, according to the formulae established by the simplified baseline and monitoring methodologies for small scale CDM project categories I.D and III.E.		OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	The source of the energy content of biomass in E.2 of the PDD is unclear.	~~CL 6~~	OK
E.1.5. Have conservative assumptions been used?	/1/	DR	Yes. Default IPCC CH_4 and N_2O emission factors for the combustion of wood/wood waste in other sectors were selected to calculate project CH_4 and N_2O emissions from the combustion of biomass.	~~CL 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/	DR	Yes, according formulae established by the simplified baseline and monitoring methodologies for small scale project type I.D and III.E.		OK
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	See D.3.1	~~CAR 3~~	OK
E.3. Baseline GHG Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	/1/	DR	For the treatment of the biomass the boundaries are defined as the physical, geographical site where the project takes place. The system boundary for the electricity generation is the sub-national interconnected grid of the South-Southeast of Brazil.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	The methodology for determining the combined margin emission factor differs from the methodology proposed for category I.D small-scale CDM project activities. The project proponents are thus requested to calculate the operating and build margin according to the methodology given in the simplified baseline and monitoring methodologies		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			for category I.D small-scale CDM project activities. The emissions related to the methane avoidance are determined based on the formula established for small scale project type III.E. Indirect baseline emissions are insignificant according guidelines for small scale project type I.D and III.E.		
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Only CO_2 emissions from power plants being displaced by the project and CH_4 emissions from biomass being landfilled are considered.		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	B.2.2		OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	B.2.2		OK
E.3.6. Have conservative assumptions been used?	/1/	DR	There are many sawmills operating around Inácio Martins. It was during the site visit verified that dumping sawdust and tree bark is common practise. This biomass accounts for hundred tonnes and in some places it was observed in decay condition (hot vapours). However, during the verification phase of the project, it will be important to evidence that the biomass used is of low quality (low cost, around US$3,00/ton) and to assure that it is not wood chips (high cost, around US$15,00/ton) which is used for several other purposes (cellulose, agglomerate, chicken bed) and which is normally not dumped and left for decay.		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	No uncertainties are foreseen.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	Total emission reductions from displacing electricity and avoiding methane are estimated as 6 259 067 tCO_2e over 21 years, which means an average annual emission reduction of 298 051 tCO_2e.		OK
F. **Environmental Impacts** It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/	DR	The "Environmental License" and also the ANEEL license and Operation License were checked during the site visit.		OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR	Yes		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	No. if there were any, they would have to be mitigated accordingly to the national requirements to obtain an Environmental License.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	Yes		OK
G. **Comments by Local Stakeholder** Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	According to the Brazilian DNA Resolution 1, letters to main local stakeholders were issued.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	A letter with a description of the project and an invitation for comments by local stakeholders was sent to the following local stakeholders: City Hall of Inácio Martins, Chamber of Inácio Martins, Environment agencies from the State and Local Authority, Brazilian Forum of NGOs, District Attorney (known in Portuguese as Ministério Público, and local communities associations.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	See G.1.2.		OK
G.1.4. Is a summary of the comments received provided?	/1/	DR	No comments were received.		OK
G.1.5. Has due account been taken of any comments received?	/1/	DR	See G.1.4		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1 The project will require new safety measures as well as management capacity. The PDD is not clear about provisions for training of employees or about necessary maintenance efforts.	A.2.5	The project proponents will hire a company specialised in management capacity services to train its employees concerning the thermoelectric operational procedures. The company is called Corece.	OK. The implementation of the training should be checked during the first periodic verification of emission reductions.
CAR 2 The methodology for determining the combined margin emission factor differs from the methodology proposed for category I.D small-scale CDM project activities. The project proponents are thus requested to calculate the operating and build margin according to the methodology given in the simplified baseline and monitoring methodologies for category I.D small-scale CDM project activities. If the calculation is different, this must be discussed and justified and it must demonstrated that the combined margin calculated for the project is more conservative.	B.2.2 E.3.2	The Brazilian electricity system nowadays comprises of around 98,8 GW of installed capacity, in a total of 1.420 electricity generation enterprises. Approved methodologies AM0015 and ACM0002 ask project proponents to account for "all generating sources serving the system". In that way, when applying one of these methodologies, project proponents in Brazil should search for, and research, all power plants serving the Brazilian system. In fact, information on such generating sources is not publicly available in Brazil. The national dispatch centre, ONS – Operador Nacional do Sistema – argues that dispatching information is strategic to the power agents and therefore cannot be made available. On the other hand, ANEEL, the electricity agency, provides information on power capacity and other legal matters on the electricity sector, but no dispatch or generation information can be got through this entity.	OK. The operating margin (the weighted average emissions of all generating sources serving the system excluding hydro, geothermal, wind, low-cost biomass nuclear and solar generation) and build margin (most recent 20% capacity additions to the system) were calculated according to the methodology given in the simplified baseline and monitoring methodologies for category I.D small-scale CDM project activities. Although the ONS data only covers 76.4% of the installed capacity in the S-SE-CO grid, the recalculation of the operating and build margin emission coefficient based on actual dispatch data from ONS represents an improvement of the data quality compared to the data from the IEA study on the Brazilian electricity grid carried out in 2002 (using data from 2000). The IEA study was based on installed capacity of plants built up to 2004 and assumptions regarding the

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		In that regard, project proponents looked for a plausible solution in order to be able to calculate the emission factor in Brazil in the most accurate way. Since real dispatch data is necessary after all, the ONS was contacted, in order to let participants know until which degree of detail information could be provided. After several months of talks, plants' daily dispatch information was made available for years 2001, 2002 and 2003. According to ANEEL, in fact, ONS centralized dispatched plants accounted for 75.547 MW of installed capacity by 31/12/2004, out of the total 98.848,5 MW installed in Brazil by the same date (http://www.aneel.gov.br/arquivos/PDF/Resumo_Gráficos_mai_2005.pdf). Therefore, even though the emission factor calculation is carried out without considering all generating sources serving the system, about 76,4% of the installed capacity serving Brazil is taken into account, which is a fair amount if one looks at the difficulty in getting dispatch information in Brazil. Moreover, the remaining 23,6% are plants that do not have their dispatch coordinated by ONS, since: either they operate based on power purchase agreements which are not under control of the dispatch authority; or they are located in non-interconnected systems to which ONS has no access. In	plant efficiency and load factor. The revised combined margin emission coefficient of 0.521 tCO_2e/MWh is calculated in accordance with the simplified baseline methodology for category I.D small-scale CDM project activities based on electricity generation data provided by ONS for the S-SE-CO grid in the years 2001-2003 (Data for the years 2001-2003 are the most recent statistics available). Average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid and IPCC carbon emission factors for specific fuels were used to calculate plant specific emission coefficients. The recalculated combined margin emission coefficient of 0.521 tCO_2e/MWh is appropriate due to the following: - Operating margin: The operating margin calculated based on generation data from power plant dispatched by ONS is 0.949 tCO_2e/MWh. No electricity generation data is publicly available for the remaining 23.6% of power plants which electricity is not dispatched through ONS. However, these plants are not likely to be affected by CDM project. They operate either based on power purchase agreements

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		that way, this portion is not likely to be affected by the CDM projects, and this is another reason for not taking them into account when determining the emission factor. In the end, the approach of having ONS information only in the calculation of the combined margin emission factor for the Brazilian grid appeared to project proponents as the most transparent, conservative and reasonable. The combined margin factor was already revised and corrected. We have adopted the 0.521 tCO2/MWh agreed and also the ERs were corrected. The Brazilian electricity system has been historically divided into two subsystems: the North-Northeast (N-NE) and the South-Southeast-Midwest (S-SE-CO). This is due mainly to the historical evolution, which was naturally developed nearby the biggest consuming centres of the country and to the large distances between these consuming centres. The national dispatch centre, ONS – *Operador Nacional do Sistema* – and technical papers divides the Brazilian system in two (Bosi, 2000 and Bosi, 2002): Moreover, Bosi (2000) gives a strong argumentation in favour of dividing the grid of large countries: "*For large countries with different circumstances within their borders and different power grids based in these*	which are not under control of the dispatch authority, or they are located in non-interconnected systems to which ONS has no access. Hence, these power plants dispatched by ONS is representative for the operating margin. - Build margin: The build margin emission coefficient calculated for only power plants dispatched by ONS is 0.094 tCO_2e/MWh and thus more conservative than the emission coefficient calculated based on IEA data (0.421 tCO_2e/MWh) or the combination of IEA and ONS data (0.205 tCO_2e/MWh). - Project electricity system: Even though the S-SE-CO grid is connected with the North-Northeast (N-NE) grid, the energy flow between N-NE and S-SE-CO grids are heavily limited by the transmission line capacity. Given the relative small capacity of the project, it is hence deemed appropriate to consider data on the S-SE-CO grid only.

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		different regions, multi-project baselines in the electricity sector may need to be disaggregated below the country-level in order to provide a credible representation of 'what would have happened otherwise" Finally, one has to take into account that even though the systems today are connected, the energy flow between N-NE and S-SE-CO is heavily limited by the transmission lines capacity. Therefore, only a fraction of the total energy generated in both subsystems is sent one way or another. The regions S and SE-CO are heavily interconnected. There are 8 large transmissions lines (4 of 230 kV, 3 of 500 kV and 1 of 750 kV. Data from *Revista Brazil Energia*, n°276, November 2003. See annexed map) and many small ones, do not presenting significant emissions constrains. On the other hand, the systems N-NE and S-SE-CO presents only one transmission line of 500 kV, interconnecting Goias to Tocantins. Considering these facts, the project boundary will be limited to the system S-SE-CO, and not the entire interconnected system. **References:** Bosi, M. *An Initial View on Methodologies for Emission Baselines: Electricity Generation Case Study*. International Energy Agency. Paris, 2000.	

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		Bosi, M. *Road-testing baselines for greenhouse gás mitigation projects in the electric power sector.* International Energy Agency. Paris, 2002.	
CAR 3 Appendix B of the simplified modalities and procedures for small-scale CDM project activities requires that in the case of projects activities using biomass, leakage shall be considered. However, leakage considerations are not provided in the PDD.	D.3.1	The only leakage identified referred to the emission due to the transportation of the biomass to the site. This was included in E.1.2.2.	OK. The revised PDD properly considers leakage. An emission factor for accounting biomass transport related emissions has been established. During the site visit DNV assured that the quantity of available biomass is more than 10 times the quantity necessary to be burned in order to generate the energy to be delivered by the plant.
CAR 4 It needs to be specified how the amount of biomass used will be monitored. Since there are different kinds of wood biomass and qualities, it has to be demonstrated how it can be assured that the biomass would in absence of the project be left for decay on landfills. For biomass with high quality, it is likely that this biomass would be used and not be dumped. In this case, no methane avoidance can be claimed from this biomass.	D.4.2	The four biomass types indicated in the project correspond to the typical biomass mix found in a load of biomass residue and not to the purchase of different type of biomass. Therefore, only the total amount of biomass used will be monitored. According to previous conversation with the validator, the demonstration of assurance that the biomass would be left for decay in the absence of the project was already done by visiting the sites where huge amounts of biomass residues were being landfilled. Please refer to site visit done by DNV in Brazil to clarify this issue. Furthermore, in an answer (sent by e-mail to de validator on 03/02/2005) to validator questions (sent by e-mail to us on	OK. It is sufficiently justified that the project will only apply biomass of low quality that in absence of the project would likely be left for decay on landfills.

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		14/01/2005) about biomass prices we stated that: "Basically, the high value residue (which is called cavaco in portuguese) costs between 20-13 dollars/ton (60-40 reais); the bark costs between 10 and 3 dollars/ton (30-10 reais) and the biomass residue costs 3 dollars/ton (10 reais). Therefore we can clearly see that the biomass residue has an extremely low value in the market." As a result, we understand that the assurance comes from the financial non-viability of the project if high cost biomass is used. Also, please note that, in the same questionnaire sent by the validator on 03/02/2005, we clarified that, as a consequence of the fact that the project will use the cheap biomass residue: "... Propower will invest in a new special equipment (the choppers) to use the residues on the new boiler, as a new barrier to this project. "	
CL 1 It remains to be justified that Imbituva and Inácio Martins are not a debundled large scale project.	A.1.2	I was added on item A.4.5 that both are not part of a larger project since the distance between Imbituva and Inácio Martins are bigger than 100 km and therefore the project boundaries are totally different.	OK. The project is not a debundled part of another project because the Imbituva project is located in a 100 km of distance of the Inácio Martins project.
CL 2 It is not clear how much of the biomass needs to be transported from other sites	A.3.2	From the total of biomass used by the boiler, 200,000 tonnes of biomass/year is from third parties and therefore it will be	OK. The revised PDD considers leakage as well as the quantity to be transported from other sites to the

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thus creating transport emissions and noise.		transported from other sites. A transport emission factor (TEF) was created where each tonne of biomass releases 0,00270 tCO_2/year (see formula at the PDD section E.1.2.2). For all biomass purchased by third parties this factor will be applied as leakage calculation. The amount of biomass is already monitored by the monitoring plan. The methodology applied to the project does not require monitoring of transport emissions. Impacts regarding noise were considered and mitigated by the engineering project elaborated by projects proponents. Both clarifications were detailed on sections A.2, D.2 and E.1.2.2 of the PDD.	plant. It also indicates measures implemented to prevent noise.
CL 3 The amount of energy that will be used by the Inácio Martins Plant needs to be clarified.	B.2.4	It was added a line with energy consumed by own Propower to be monitored on the project.	OK. The use of energy by the plant is considered in the revised PDD and datasheet.
CL 4 The project starting date is indicated as 26 October 2004 but the project is not yet implemented. It needs to be clarified when the project is expected to be implemented.	C.1.1	According to the Glossary of Terms for CDM PDD, Starting Date is the date of "implementation or construction or real action of a project activity begins". The construction procedures have already started in 26 October 2004. However, the crediting period starts on 1st June 2006, date when the project will became operational.	OK.

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CL 5 It must be clarified whether procedures are developed to establish authority, responsibilities emergency, calibration and maintenance.	D.5.1-5.2 D.5.4-5.12	The procedures for QA/QC will be established and implemented before start up of project.	OK. It is acknowledged that these procedures are only developed shortly before project start. The development and implementation of these procedures will need to be checked during verification of emission reductions.
CL 6 The source of the energy content of biomass in E.2 of the PDD is unclear.	E.1.4	Energy content of biomass was based on Brand *et al* (2001) from UNIPLAC, Brazilian Institution. The revised PDD clearly presents this information in tables in E.2.	OK. The revised PDD clearly presents the sources for the calculations.

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