VALIDATION REPORT

LUCÉLIA BAGASSE COGENERATION PROJECT (LBCP)

REPORT NO. 2004-0528

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DET NORSKE VERITAS

VALIDATION REPORT

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Client: Central de Álcool Lucélia Ltda. (Lucélia) and Econergy Brasil Ltda.	Client ref.: Marcelo S Diniz Junqueira

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Summary:
Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Lucélia Bagasse Cogeneration Project (LBCP)" 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 Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.
The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.
In summary, it is DNV's opinion that the "Lucélia Bagasse Cogeneration Project (LBCP)" as described in the revised PDD of August 2005, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0015. Hence, DNV will request the registration of the "Lucélia Bagasse Cogeneration Project (LBCP)" as a 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 the DNA of Brazil, including confirmation that the project assists in achieving sustainable development.

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Work carried out by: Luis Filipe Tavares, Cintia Dias, Vicente San Valeros, Kumaraswamy Chandrashekara	
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Appendix A Validation Protocol

Abbreviations

ANEEL	Agência Nacional de Energia Elétrica (Brazilian National Electricity Agency)
BM	Build margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CETESB	Environmental Sao Paulo State Agency
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
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
LBCP	Lucélia Bagasse Cogeneration Project
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating margin
ONS	National Electric System Operator
PDD	Project Design Document
PROINFA	Programme of Incentives to the Alternative Sources of Electric Energy
RSA	Simplified Environmental Report
SMA	Secretaria de Estado do Meio Ambiente, dos Recursos Hídricos e da Habitação
S-SE-CO	South-Southeast-Midwest (one of two regional grids in Brazil)
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

Central de Álcool Lucélia Ltda. (Lucélia) and Econergy Brasil Ltda (Econergy) have commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the "Lucélia Bagasse Cogeneration Project (LBCP)", in Lucélia Municipality, São Paulo State, Brazil.

This report summarises the findings of the validation of the project, performed on the basis of UNFCCC and host Party criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr. Luis Filipe Tavares	DNV Rio de Janeiro	Team leader
Ms. Cintia Dias	DNV Rio de Janeiro	CDM auditor
Mr. Vicente San Valero	DNV Rio de Janeiro	CDM auditor
Mr Kumaraswamy Chandrashekara	DNV Bangalore	CDM auditor
Mr. Michael Lehmann	DNV Oslo	Energy sector expert/Technical reviewer

1.1 Validation Objective

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

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol criteria for the CDM, the CDM rules and modalities as agreed in the Marrakech Accords and relevant decisions by the CDM Executive Board. The validation team has employed, based on the recommendations in the Validation and Verification Manual /6/ 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 corrective actions may provide input for improvement of the project design.

1.3 Lucélia Bagasse Cogeneration Project

The "Lucélia Bagasse Cogeneration Project (LBCP)" involves the increase of the cogeneration capacity of Lucélia's sugarcane mill located in Lucélia, São Paulo State, Brazil. The project allows Lucélia to supply excess electricity to the grid. The project has already been implemented and started operation on 12 July 2002. Emission reductions are claimed from displacing grid electricity with electricity generated by the mill and supplied to the grid. The estimated amount of GHG emission reductions from the project is 93 512 tCO_2e during the first crediting period (7 years), resulting in an estimated average annual emission reductions of 13 359 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.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /6/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

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

The completed validation protocol for the "Lucélia Bagasse Cogeneration Project (LBCP)" is enclosed in Appendix A to this report.

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

i) mistakes have been made with a direct influence on project results;

ii) validation protocol requirements have not been met; or

iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

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

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***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			
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

2.1 Review of Documents

The initial PDD /1/ submitted by Lucélia and Econergy in July 2003 was reviewed by DNV. However, this documentation was formatted according to version 01 of the CDM-PDD and was based on the proposed baseline and monitoring NM0001. In January 2005 a new version of the PDD /2/ was submitted to DNV correctly applying the approved methodology AM0015 and formatted according to version 02 of the CDM-PDD. A further revised version of the PDD /3/ was submitted in August 2005 to address DNV's initial validation findings and was reviewed by DNV. In addition, spreadsheets containing detailed calculations for the combined margin emission coefficient /4/, which is applied by the project, were reviewed.

Other documents, such as the Environmental Licences and licence requirements as well as the letters sent to local stakeholders, were reviewed during the follow up interviews in order to ensure the accuracy of the provided information.

2.2 Follow-up Interviews

On 18 August 2003, DNV performed interviews with Econergy and Lucélia to confirm and to resolve issues identified in the document review and performed a site visit at the Lucélia sugarcane mill.

The main topics of the interviews were:

- Environment impacts & their control
- Environment licenses conditioning compliance;
- Cogeneration systems;
- Calibration requirements
- Quality procedures.
- Invitation of comments by local stakeholders and how due account was taken of comments received;
- The possibility of leakage due to a historical practice of selling the bagasse.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues, which needed to be clarified for DNV's positive conclusion on the project design. The *Corrective Action Requests* and requests for *Clarification* raised by DNV were resolved during communications between the project participants and DNV.

To guarantee the transparency of the validation process, the concerns raised and the response provided are documented in Table 3 of the validation protocol in Appendix A.

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 August 2005 /3/.

3.1 Participation Requirements

The project participants are Central de Álcool Lucélia Ltda. and Econergy Brasil Ltda. of Brazil. The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.

3.2 Project Design

The "Lucélia Bagasse Cogeneration Project (LBCP)" is a grid-connected renewable energy project activity, displacing grid electricity with electricity generated from renewable sources (bagasse) and thus resulting in the reduction of emissions of greenhouse gases in the energy sector. The project aims to increase the efficiency and capacity of the prevailing bagasse based energy generation, by refurbishing low pressure boilers into high pressure boilers and by installing an additional 33 MW generation capacity. These measures allow Lucélia to supply excess electricity to the regional grid.

The cogeneration capacity expands from 3.7 MW to 35.7 MW, through two phases. The first phase (2002) included the refurbishment of a 23 bar boiler to a 44 bar and the installation of one 12 MW back pressure turbo-generator. The second phase (2006) will include the installation of a 65 bar boiler and a 20 MW (G3) condensing turbo-generator and the 23 bar boiler will be put on stand-by.

The project design engineering reflects good practice through the use of steam Rankine technology for steam rising and power generation.

A renewable seven years crediting period is selected, starting on 12 July 2002, which is the starting date of the project activity. The expected operational lifetime of the project is 25 years.

The project is expected to bring social (employment), environmental (fauna and flora preservation) and economic benefits, thus contributing to the sustainable development objectives of the Brazilian Government.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.

3.3 Project Baseline and Additionality

The project applies the approved baseline methodology AM0015 - "*Bagasse-based cogeneration connected to an electricity grid*" /7/. The project fulfils the conditions under which AM0015 is applicable. The baseline scenario is that the current practice continues, i.e. bagasse is not utilized to generate excess electricity to be supplied to the grid and an equivalent of electricity would in the absence of the project activity have been generated by the operation of grid-connected power

plants and by the addition of new generation sources. In accordance with AM0015, an electricity baseline emission factor is calculated as a combined margin, consisting of the combination of operating margin (OM) and build margin (BM) factors (see section 3.5).

In accordance with AM0015, the additionality of the "Lucélia Bagasse Cogeneration Project (LBCP)" is demonstrated through the "Tool for the demonstration and assessment of additionality" /9/, which includes the following steps:

Step 0 -Preliminary screening based on the starting date of the project activity: The starting date of the CDM project activity, i.e. 12 July 2002, falls between 1 January 2000 and the date of the registration of the first CDM project activity (November 2004). Evidence for the project's starting date of 12 July 2002 was provided in the form of the ANEEL authorization 225/2002. Sufficient evidence, i.e. communications with Econergy concerning the development of the project as CDM project activity, was also presented to demonstrate that Lucélia seriously considered the CDM in the decision to proceed with the project.

Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations: The possible baseline scenarios are: a) Business as usual which means producing energy and steam for self consumption with low efficiency and b) investing in modifications of boilers and installing a new electricity generator. Both scenarios are in compliance with all applicable legal and regulatory requirements.

Step 2 - Investment analysis: Not applicable (Only Step 3 is selected)

Step 3 - Barrier analysis: Technological barriers, institutional and political barriers, economic and investment barriers and cultural barriers are presented in the PDD.

a) *Technological barriers*. The Rankine cycle technology is well known in Brazil and can not be considered a technological barrier, although sugar cane units mainly operate with low-efficiency. However, there is a technological barrier because the project needs to supply energy at a certain quality to the grid which requires better cogeneration technology than generally applied by sugarcane mills.

b) *Institutional and political barriers*. DNV could confirm that the regulatory environment for the electricity sector changes a lot and often in Brazil, resulting in uncertainty for renewable energy generation. The project does not qualify for PROINFA, the Brazilian Programme of Incentives for Alternative Sources of Electric Energy, because it started operation before 2006.

c) *Economic and investment barriers*. DNV confirmed as an economic and investment barriers the fact that the revenues of the selling of energy represent only 1.87% of the core business revenues, i.e. production of sugar and alcohol, thus constituting a very minor part of the project developer's total income. Moreover, it is demonstrated that the project is not financially attractive in absence of CER revenues.

d) *Cultural barriers*. DNV was able to confirm that the sugarcane production is different from the energy production and that, when energy is produced, it is usually produced only for internal use and inefficiently. Hence, there are cultural barriers for sugarcane mills to invest in increased cogeneration capacity in order to supply excess electricity to the grid.

Step 4 - Common practice analysis. DNV was able to confirm that the efficient production of energy and heat by sugarcane mills is not common practice in Brazil. Usually the sugarcane mills produce energy inefficiently.

Step 5 - Impact of CDM registration: The project participants were able to demonstrate that the sale of CERs will provide the necessary incentives for the project to overcome the above presented barriers.

Given the above and in particular the technological, institutional, economic and investment and cultural barriers which the project faces, it is sufficiently demonstrated that the project is not a likely baseline scenario.

3.4 Monitoring Plan

The project correctly applies the approved monitoring methodology AM0015 - "*Bagasse-based cogeneration connected to an electricity grid*" /8/.

The methodology considers monitoring emissions reductions generated from cogeneration projects using sugarcane bagasse. The monitoring plan for emissions reductions occurring within the project boundary is based on the energy sold to ENERTRADE (the electricity company) and reliability is assured through two-party verification. The electricity baseline emission factor is determined *ex-ante* and will only be updated at renewal of the crediting period.

Details of the data to be collected, the frequency of data recording, its certainty, and format and storage location are described. The recording frequency of the data seems appropriate for the project.

Lucélia is responsible for the project management, monitoring and reporting project activities as well as for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques.

The monitoring plan is straightforward and no specific procedures beyond the established on the QA/QC checked will be necessary, concluding that the established measures reflect good monitoring and reporting practices.

3.5 Calculation of GHG Emissions

Baseline emissions due to displacement of electricity are calculated by multiplying the electricity exported by the project activity to the S-SW-CO grid with a baseline emissions factor.

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

The combined margin emission coefficient for the S-SE-CO grid is determined *ex-ante* in accordance with AM0015. The calculations were based on electricity generation data provided by the Brazilian Electricity Agency (ANEEL) and the National Electricity System Operator (ONS) for the electricity generated in the South-Southeast-Midwest grid in the years 2001-2003. Average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid /10/ and IPCC carbon emission factors for specific fuels were applied to calculate plant specific emission coefficients. The simple-adjusted operating margin (OM) emission coefficient is calculated to be 0.4043 tCO_2e/MWh (applying an average λ of 0.519) and build margin (BM) emission coefficient of 0.0937 tCO_2e/MWh, resulting in a combined margin emission coefficient of 0.249 tCO_2e/MWh (weighted average of the build and operating margin). The emission coefficient calculations were transparently presented in spreadsheets /4/ submitted to and verified by DNV.

Even though the S-SE-CO grid is connected with the North-Northeast grid, the energy flow between these grids is heavily limited by the transmission lines capacity. It is hence appropriate to consider the S-SE-CO grid for the purpose of determining the BM and OM emission coefficient and consider imports from the North-Northeast grid at 0 tCO_2/MWh in accordance with AM0015.

Generation data for the years 2001-2003 are the most recent statistics available and 2004 data was not publicly available at the time of submitting the PDD for validation. It is recognised that in the absence of actual fuel consumption data, the calculated plant specific emission coefficients are sensitive to the assumed plant efficiency for each plant. Nonetheless, the applied average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid /10/ is deemed to represent the best data that is currently available.

The ONS dataset does not include power plants that are locally dispatched. However, it is justified to only include plants dispatched by ONS although they only represent about 80% of the total installed capacity. Data for the remaining plants is not publicly available. Also, these plants 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. Hence, these plants are not likely to be affected by a CDM project and the power plants dispatched by ONS are thus representative for the operating margin.

The build margin emission coefficient calculated for only power plants dispatched by ONS is 0.0937 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).

The λ was calculated by interpolating daily dispatch data for thermal power plants and daily dispatch data for hydropower plants. The λ calculations were transparently presented in spreadsheets /4/ submitted to and verified by DNV. The selected approach for calculating λ is in accordance with AM0015.

3.6 Environmental Impacts

Lucélia has been granted environmental licenses (Operation) by the state environmental agency (CETESB-Companhia de Tecnologia e Saneamento Ambiental) after all possible impacts were analyzed by the State Secretary of Environment (SMA – Secretaria de Estado do Meio Ambiente) through a report called “Previous Environmental Report” (RAP – Relatório Ambiental Preliminar).

These environment licenses included stipulations that needed to be adhered-to by the company. Compliance with these stipulations was verified during the visit to the company.

3.7 Comments by Local Stakeholders

Local stakeholders were invited initially trough public discussion during the environmental license issuing process. No comments were received.

Complementary, local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, 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 were verified during the follow up interviews. No comments were received.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

DNV Certification published the PDD of January 2005 on the DNV Climate Change web site (http://www.dnv.com/certification/ClimateChange) and stakeholders were through the UNFCCC CDM web site invited to provide comments within a 30 days period from 13 February 2005 to 15 March 2005. One comment was received in this period. 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: 2005-02-24
Subject: Outdated baseline emission factors

Comment: The baseline emission factors are from an outdated (three-year old) IEA study and should be updated with more recent data

How DNV has considered the comment received in its validation:

In the PDD of January 2005, the combined margin emission coefficient was determined based on an International Energy Agency (IEA) study on the Brazilian electricity grid carried out in 2002 (using data from 2000) /10/. 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 AM0015 and DNV requested the project participants to recalculate the combined margin emission coefficient. The project participants were thus requested to submit a revised PDD with the operating margin and build margin emission coefficient calculated according to AM0015 and based on the most recent statistics available. In the revised PDD of August 2005, the combined margin was recalculated for the S-SE-CO grid and it was determined *ex-ante* in accordance with AM0015, 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 (see CAR 1 in Table 3 of the validation protocol and the section 3.5 “Calculations of GHG Emissions”).

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Lucélia Bagasse Cogeneration Project (LBCP)" at Lucélia Municipality, São Paulo State, Brazil (hereafter called "the project"). The validation was performed on the basis of UNFCCC criteria for CDM project activities and relevant Brazilian criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project participants are Central de Álcool Lucélia Ltda. and Econergy Brasil Ltda of Brazil. The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.

The project is a bagasse-based cogeneration power generation activity displacing grid electricity. By refurbishing low pressure boilers into high pressure boilers and by installing an additional 33 MW generation capacity, the project will allow Lucélia to generate excess electricity project which is dispatched to the regional grid.

By promoting renewable energy, the project is in line with the current sustainable development priorities of Brazil.

The project applies the approved baseline and monitoring methodology AM0015, i.e. "Bagasse-based cogeneration connected to an electricity grid". The baseline methodology has been applied correctly 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.

A combined margin emission coefficient of 0.249 tCO_2e/MWh is calculated in accordance with AM0015, 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 for the South-Southeast-Midwest grid.

The monitoring methodology has been applied correctly. The monitoring plan sufficiently specifies the monitoring requirements of the main project indicators.

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

Local stakeholder comments were invited according to the Brazilian DNA Resolution 1. No comments were received.

In summary, it is DNV's opinion that the "Lucélia Bagasse Cogeneration Project (LBCP)" as described in the revised project design document of August 2005, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0015.

Hence, DNV will request the registration of the "Lucélia Bagasse Cogeneration Project (LBCP)" 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 the DNA of Brazil, including confirmation that the project assists in achieving sustainable development.

REFERENCES

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

/1/ Econergy: *Project Design Document for the Lucélia Bagasse Cogeneration Project (LBCP)*. Version 1 (November 2003)

/2/ Econergy: *Project Design Document for the Lucélia Bagasse Cogeneration Project (LBCP)*. Version 2 (January 2005);

/3/ Econergy: *Project Design Document for the Lucélia Bagasse Cogeneration Project (LBCP)*. Version 3 (August 2005);

/4/ Econergy: *Spreadsheet for Calculation of Combined Margin* (ONS Emission Factor SSECO 2001-2003 v 2005-06-22.xls)

/5/ Lucélia MVP Workbook

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

/6/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/7/ Approved Baseline Methodology AM0015: "*Bagasse-based cogeneration connected to an electricity grid"*. Version 01 of 22 September 2004.

/8/ Approved Monitoring Methodology AM0015: "*Bagasse-based cogeneration connected to an electricity grid"*. Version 01 of 22 September 2004.

/9/ CDM EB: *Tool for the demonstration and assessment of additionality*, EB 16 Report, Annex 1.

/10/ Bosi, M., A. Laurence, P. Maldonado, R. Schaeffer, A. F. Simões, H. Winkler and J.-M. Lukamba: *Road testing baselines for greenhouse gas mitigation projects in the electric power sector*. OECD and IEA information paper, October 2002.

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

/11/ Helvécio Guimarães– Econergy Brasil

/12/ Nivaldo Tomazella – Gerente Lucélia

/13/ Serafim Antonio Neto – Presidente Lucélia

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APPENDIX A

CDM VALIDATION PROTOCOL

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

REQUIREMENT	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	Not applicable	Table 2, Section E.4 No Annex I party has yet been identified.
2. The projec shall assist non-Annex I Parties in achieving sustainable development and the project shall have obtained confirmation by the host country that the project assists in achieving sustainable development	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	-	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
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a	-	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 Party.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic 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, Marrakesh Accords, CDM Modalities §43	OK	Table 2, Section B.2

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	Marrakech Accords	OK	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
8. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	OK	The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima
9. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	OK	Brazil has ratified the Kyoto Protocol on 23 August 2002
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	Not applicable	No participating Annex I Party
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	Not applicable	No participating Annex I Party
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, CDM Modalities §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	OK	Table 2, Section B.1.1 and D.1.1
15. 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	Marrakech Accords, CDM Modalities §37f	OK	Table 2, Section D

REQUIREMENT	Reference	Conclusion	Cross Reference / Comment
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	OK	The PDD was published for public comments in the period of 13 February 2005 to 15 March 2005 on www.dnv.com/certification/ClimateChange and comments were invited via the UNFCCC CDM website. One comment was received and addressed in the validation report.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, CDM Modalities, §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	OK	PDD is in accordance with CDM-PDD (version 02 of 1 July 2004).

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1//2/	DR	The projected is located in the Lucélia Municipality in the São Paulo State in Brazil		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1//2/	DR	The project system's boundary is limited by the Lucélia cogeneration facilities for activities related to the cogeneration, and it is also limited to the subsystem Brazilian South-Southeast and Midwest grid which Lucellia is connected for activities related to the renewable energy displacement.		OK
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.2.1. Does the project design engineering reflect current good practices?	/1//2/	DR	The project design engineering reflects good practice through the use of steam Rankine technology for steam raising and power generation.		OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host	/1//2/	DR	The technology used is the standard steam Rankine technology adopted worldwide and the project also involves expanding the surplus electricity and steam generating		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
country?			capacities of the sugarcane mills cogeneration system.		
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1//2/	DR	The project is unlikely to be replaced by other more efficient technologies, at least within the first seven year crediting period.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1//2/	DR	The project will require minimal additional training for project maintenance since the retrofit is only a modification of the currently used system. Moreover, support from the manufacturer is also assured.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1//2/	I	The project documentation does not detail provisions for training and maintenance; however, for reasons indicated in A.2.4, this appears reasonable.		OK
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1//2/	DR	Yes, the project has been authorized by ANEEL and the Environment Licences have been issued.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1//2/		Brazil established the Resolution 1 in line with CDM requirements. The project invited stakeholder comments according to this resolution..		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1//2/	DR	The project is in line with current sustainable development priorities in Brazil.		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1//2/	I	The project is likely to improve employment, health and labour conditions,		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 baseline methodology previously approved by the CDM Methodology Panel?	/1//2/	DR	The projects applies the baseline methodology AM0015 - "Bagasse based cogeneration connected to an electric grid".		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1//2/	DR	Yes, the project fulfils the condition under which AM0015 is applicable. The projects uses a) only the bagasse from the same facility where the project activity is implemented, b) the project is not foreseen to be implemented by the public sector, c) the project will not increase the bagasse production and d) the bagasse to be used will not be stored for more than one year.		OK
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1//2/	DR	An ex-ante determined emission coefficient for calculating emission reductions from displacing grid electricity is selected. However, the data used to calculate the operation margin and build margin emission coefficient were based on an IEA report of	~~CAR 1~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Schaeffer et al. from October 2002, which is based on information of the Brazilian electricity grid in the 2000. Significant changes in the Brazilian electricity market have happened, mainly with regard to the availability of hydro energy. Moreover, the operation margin and build margin emission coefficient established in the IEA report was not determined according to the methodology AM0015 according to which the operating and build margin must be established based on a 3 year average based on most recent statistics available on the time of PDD submission. The project participants are requested to submit a revised PDD with the operating margin and build margin emission coefficient calculated according to AM0015 and based on the most recent statistics available and justification for the choice of S-SE-CO regional Brazilian grid and for the conservativeness of the approach used.		
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1//2/	DR/I	See B.2.1	~~CAR 1~~	OK
B.2.3. Has the baseline been established on a project-specific basis?	/1//2/	DR	See B.2.1	~~CAR 1~~	OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1//2/	DR	Yes. All the national and/or sectoral policies implemented during the initial phase were considered. PROINFA (Programme of Incentives to the Alternative Sources of Electric Energy) was only implemented in 2004 and the PPA was already signed with		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			a private buyer.		
B.2.5. Is the baseline determination compatible with the available data?	/1//2/	DR	The data available is based on OECD and IEA Information Paper. (Road-testing baselines for GHG Mitigation projects in the Electric Power Sector - Roberto Shaeffer et al). However, significant modifications on the electricity market happened after the issuance of this study. The project participants are requested to submit a revised PDD with the operating margin and build margin emission coefficient calculated according to AM0015 and based on the most recent statistics available and justification for the choice of S-SE-CO regional Brazilian grid and for the conservativeness of the approach used.	~~CAR 1~~	OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1//2/	DR	Yes		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's	/1//2/	DR	In accordance with AM0015, the additionality of the Lucélia Bagasse Cogeneration Project is demonstrated through the "Tool for the demonstration and assessment of additionality", which includes the following steps: Step 0 -Preliminary screening based on the starting date of the project activity: The starting date of the CDM project activity, i.e. 12 July 2002, falls between 1 January 2000 and the date of the registration of the first CDM project activity (November 2004). Evidence for the project's starting date of 12		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
legislation/regulations)?			July 2002 was provided in the form of the ANEEL authorization 225/2002. Sufficient evidence, i.e. communications with Econergy concerning the development of the project as CDM project activity, was also presented to demonstrate that Central de Álcool Lucélia Ltda. seriously considered the CDM in the decision to proceed with the project. Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations: The possible baseline scenarios are: a) Business as usual which means producing energy and steam for self consumption with low efficiency and b) investing in modifications of boilers and installing a new electricity generator. Both scenarios are in compliance with all applicable legal and regulatory requirements. Step 2 - Investment analysis: Not applicable (Only Step 3 is selected) Step 3 - Barrier analysis: Technological barriers, institutional and political barriers, economic and investment barriers and cultural barriers are presented in the PDD. a) Technological barriers. The Rankine cycle technology is well known in Brazil and can not be considered a technological barrier, although sugar cane units mainly operate with low-efficiency. However, there is a technological barrier because the		

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			project needs to supply energy at a certain quality to the grid which requires better cogeneration technology than generally applied by sugarcane mills. b) Institutional and political barriers. DNV could confirm that the regulatory environment for the electricity sector changes a lot and often in Brazil, resulting in uncertainty for renewable energy generation. The project does not qualify for PROINFA, the Brazilian Programme of Incentives for Alternative Sources of Electric Energy, because it started operation before 2006. c) Economic and investment barriers. DNV confirmed as an economic and investment barriers the fact that the revenues of the selling of energy represent only 1,87% of the core business revenues, i.e. production of sugar and alcohol, thus constituting a very minor part of the project developer's total income. Moreover, it is demonstrated that the project is not financially attractive in absence of CER revenues. d) Cultural barriers. DNV was able to confirm that the sugarcane production is different from the energy production and that, when energy is produced, it is usually produced only for internal use and inefficiently. Hence, there are cultural barriers for sugarcane mills to invest in increased cogeneration capacity in order to		

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			supply excess electricity to the grid. Step 4 - Common practice analysis DNV was able to confirm that the efficient production of energy and heat by sugarcane mills is not common practice in Brazil. Usually the sugarcane mills produce energy inefficiently. Step 5 - Impact of CDM registration: The project participants were able to demonstrate that the sale of CERs will provide the necessary incentives for the project to overcome the above presented barriers. Given the above and in particular the technological, institutional, economic and investment and cultural barriers which the project faces, it is sufficiently demonstrated that the project is not a likely baseline scenario.		
B.2.8. Have the major risks to the baseline been identified?	/1//2/	DR	Yes. The major risk is related to the PROINFA renewable power sources program, where the Brazilian government will set prices to be paid for renewable power. However, PROINFA was not available at the time that the decision to proceed with the project was taken.		OK
B.2.9. Is all literature and sources clearly referenced?	/1//2/	DR	Yes		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
C. *Duration of the Project/ Crediting Period* *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1//2/	DR	Yes, the project start date is 12/07/2002 with an expected lifetime 25 years.		OK
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	/1//2/	DR	A 7 year crediting period starting 12/07/2002 with the potential of being renewed twice 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 ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Methodology Panel?	/1//2/	DR	The project applies the monitoring methodology AM0015 - "Bagasse-based cogeneration connected to an electricity grid".		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1//2/	DR	The monitoring for electric power exported is adequate.		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1//2/	DR	Yes, the electric power measurements are assured by both parties involved; however, the period by which the data is kept is not	~~CL 1~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			established.		
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1//2/	DR	Yes. It is discussed according to AM0015 "Bagasse-based cogeneration connected to an electricity grid".		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. 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//2/	DR	The monitoring methodology of AM0015 is correctly applied and the measurement is based on electricity exported to the grid and verified by two parts. The project is not resulting in any project emissions.		OK
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1//2/	DR	According to the chosen methodology, the only potential source of leakage is from organizations that used to buy bagasse from the sugarcane mill prior to the cogeneration project's implementation. Without this bagasse supply, these organizations might burn a fossil fuel in its place. Lucélia did not sell bagasse prior to project implementation. Therefore, no monitoring of leakage is necessary.		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. Does the monitoring plan provide for the	/1//2/	DR	The baseline emission coefficient is fixed		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?			ex-ante and hence no data needs to be collected in this regard.		
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1//2/	DR/I	Neither AM0015 nor Resolution 1 of the Brazilian DNA require the monitoring of social or environmental indicators.		OK
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	/1//2/	DR	Yes, the conditions established on operational and management structure are sufficiently defined, including verification by two parts of the amount of electricity generated by the project .		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1//2/	DR	Yes, Lucélia sugarcane mill as well as the electricity company will be responsible.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1//2/	DR	No procedures for training of monitoring personnel are described, but the project only requires limited monitoring, which is part of normal operations.		OK
D.6.4. Are procedures identified for calibration of monitoring equipment?	/1//2/	DR/I	Yes, these procedures are addressed in the QA/QC procedures.		OK
D.6.5. Are procedures identified for maintenance of monitoring equipment and installations?	/1//2/	DR/I	Yes		OK

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

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.6.6. Are procedures identified for monitoring, measurements and reporting?	/1//2/	DR/I	Yes, according monitoring methodology "two party monitoring plan"		OK
D.6.7. 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//2/	DR/I	Yes, as indicated in the monitoring plan.		OK
D.6.8. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1//2/	DR	Yes. See D.6.7.		OK
D.6.9. Are procedures identified for review of reported results/data?	/1//2/	DR	See D.6.1		OK
D.6.10. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1//2/	DR/I	Considering the simplicity of the monitoring plan, the compliance verification by the second party is considered sufficient.		OK
D.6.11. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1//2/	DR/I	See D.6.7		OK
D.6.12. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1//2/	DR/I	See D.6.1		OK
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Predicted Project GHG Emissions *The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect	/1//2/	DR	Project emissions are considered zero in		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
GHG emissions captured in the project design?			line with the AM0015 and IPCC guidelines which stipulate that biomass combustion is assumed to equal its re-growth.		
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.*					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1//2/	DR	The only potential source of leakage is from organizations that used to buy bagasse from the sugarcane mill prior to the cogeneration project's implementation. Lucélia did not not sell bagasse prior to project implementation. Therefore, no leakage is expected.		OK
E.3. Baseline Emissions *The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1//2/	DR	Emissions reductions are directly calculated by multiplying the amount of electricity supplied to the grid with a grid emission coefficient. However, the data used to calculate the operation margin and build margin emission coefficients were based on information on the Brazilian electricity grid in 2000. Significant changes in the Brazilian electricity market have happened, mainly with regard to the availability of hydro energy. Moreover, the operation margins and build margin emission coefficient established in the IEA report was not	~~CAR 1~~	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			determined according to the methodology AM0015, according to which the operating and build margin must be established based on a 3 year average based on most recent statistics available on the time of PDD submission. The project participants are requested to submit a revised PDD with the operating margin and build margin emission coefficient calculated according to AM0015 and based on the most recent statistics available.		
E.4.Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1//2/	DR	Yes. The project is expected to abate CO_2 emissions to the extent of 93 512tCO_2e over the 7 year crediting period.		OK
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1//2/	DR	Yes. The environment impacts have been analysed by the State Environment Secretary (SMA/CETESB) through the Preliminary Environment Report (RAP) and a working license has been already issued.		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1//2/	DR	Yes, see F.1.1		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
F.1.3. Will the project create any adverse environmental effects?	/1//2/	DR/I	No significant environmental impacts are expected to be created. Given the nature of the project design this is reasonable		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1//2/	DR/I	Not foreseen		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1//2/	DR	The project is unlikely to create any adverse environmental impacts		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1//2/	DR	Yes, see F.1.1		OK
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	/1//2/	DR	Lucélia published in two regional and one official newspaper the requirement for Environment Operation Licence and hasn't subsequently received any comments from stakeholders. Complementarily Lucélia invited the local stakeholders to provide comments, according to the Resolution 1 of the Brazilian DNA. No comments were received.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1//2/	DR	See G.1.1		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//2/	DR	See G.1.1		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
G.1.4. Is a summary of the stakeholder comments received provided?	/1//2/	DR	See G.1.1		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1//2/	DR	See G.1.1		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to table 2	Summary of project owner response	Validation team conclusion
CAR 1 An ex-ante determined emission coefficient for calculating emission reductions from displacing grid electricity is selected. However, the data used to calculate the operation margin and build margin emission coefficient were based on an IEA report of Schaeffer et al. from October 2002, which is based on information of the Brazilian electricity grid in the 2000. Significant changes in the Brazilian electricity market have happened, mainly with regard to the availability of hydro energy. Moreover, the operation margin and build margin emission coefficient established in the IEA report was not determined according to the methodology AM0015 according to which the operating and build margin must be established based on a 3 year average based on most recent statistics available on the time of PDD submission. The project participants are requested to submit a revised PDD with the operating margin and build margin emission coefficient calculated according to AM0015 and based on the most recent statistics available and justification for the choice of S-SE-CO regional Brazilian grid and for the conservativeness of the approach used.	B.2.1 to B.2.5 D.4.1 to D.4.3 E.3.1 E.3.3	Project developers have solved this problem using data that is real and available through the national dispatch centre ONS. This data is from the period 2001-2003, being the most recent available by the time of PDD submission. The PDD has been revised in its sections E.4 and Annex 3, where the pertinent explanations for this source use are given.	OK. The revised baseline emission calculations are according to the baseline methodology AM0015 CDM project activities for energy production for the grid. It is justified to only include plants dispatched by ONS although they only represent about 80% of the total installed capacity. Data for the remaining plants is not publicly available. Also, these plants 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. Hence, these plants are not likely to be affected by a CDM project and the power plants dispatched by ONS are thus representative for the operating margin. The build margin emission coefficient is correctly calculated considering the 20% capacity additions of the most recently installed plants dispatched by ONS. Even though the S-SE-CO grid is connected with the North-Northeast grid, the energy flow between these grids is heavily limited by the transmission lines capacity. It is hence appropriate to consider the S-SE-CO grid for the purpose of determining the

Draft report clarifications and corrective action requests by validation team	Ref. to table 2	Summary of project owner response	Validation team conclusion
			BM and OM emission coefficient and consider imports from the North-Northeast grid at 0 tCO_2/MWh in accordance with AM0015, It is recognised that in the absence of actual fuel consumption data, the calculated plant specific emission coefficients are sensitive to the assumed plant efficiency for each plant. Nonetheless, the applied average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid is deemed to represent the best data that is currently available. This CAR is therefore closed.
CL 1 The period by which the monitoring data is to be kept is not established	D.1.3	This has been updated in the PDD.	OK, information is included. This CL is therefore closed.

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