VALIDATION REPORT

NOBRECEL FUEL SWITCH IN BLACK LIQUOR BOILER PROJECT IN BRAZIL

REPORT NO. 2006-0875

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DET NORSKE VERITAS

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VALIDATION REPORT

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Approved by: Michael Lehmann Technical Director	Organisational unit: DNV Certification, International Climate Change Services
Client: EcoSecurities Brazil	Client ref.: Mr. Moura Costa

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Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Nobrecel fuel switch in black liquor boiler Project" in Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

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

In summary, it is DNV's opinion that the "Nobrecel fuel switch in black liquor boiler Project", as described in the revised and resubmitted project design documentation of 29 August 2006, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies AMS-I.C. Hence, DNV will requests the registration of the "Nobrecel fuel switch in black liquor boiler Project" as a CDM project activity. However, prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil and the DNA of the United Kingdom, including the confirmation by the DNA of Brazil that the project assists in achieving sustainable development.

Report No.: 2006-0875	Subject Group: Environment	
Report title: Nobrecel fuel switch in black liquor boiler Project in Brazil		
Work carried out by: K.V.Raman, Vicente San Valero		
Work verified by: Susanne Haefeli-Hestvik		
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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CRQ	Black Liquor recovering boiler. CRQ – from Portuguese – “Caldeira de Recuperação Química”
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NCV	Net Calorific Value
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
PDD	Project Design Document
SELIC	Sistema Especial de Liquidação e Custodia (Special System of Clearance and Custody, central depository of securities issued by the National Treasury and the Central Bank)
S-SE-CO	South-Southeast-Midwest
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

EcoSecurities PLC has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the “Nobrecel fuel switch in black liquor boiler Project” in Brazil, hereafter called “the project”.

The validation team consisted of the following personnel:

Mrs Susanne Haefeli-Hestvik	DNV Certification Norway	Team Leader, Technical Reviewer
Mr K.V.Raman	DNV Certification India	GHG auditor
Mr Vicente San Valero	DNV Certification Brazil	GHG auditor
Mr Michael Lehmann	DNV Certification Norway	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, 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, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.C. The validation team has, based on the recommendations in the Validation and Verification Manual /5/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

1.3 Description of Proposed CDM Project

The project activity consists of the installation of new equipment that enables an increase in the black-liquor solid mass concentration at the cellulose and paper mill of Nobrecel in Brazil. This installation – together with the necessary retrofits of the black liquor boiler – elevate the calorific value of the black liquor. As a result, black liquor can be burned without the need to co-fire fuel oil in the black liquor boiler, which was the practice prior to project implementation.

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 /5/. The protocol shows in 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 “Nobrecel fuel switch in black liquor boiler Project” 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			
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

2.1 Review of Documents

The PDD version 1 dated 25 April 2006 and version 3 dated 29 August 2006 /1/ submitted by the client and additional background documents related to the project design, baseline and leakage /2/ - /4/ were reviewed.

The following changes have been made between version 1 and 3:

- Removal of the methane avoidance component and thus change of the project title,
- Inclusion of more information regarding the exact technology and processes used
- Elaboration of the economic assessment in the barrier analysis,
- Correction of the starting date of the project activity,
- Adjustment of the crediting period,
- Adjustment of the monitoring requirements and emission reduction calculations.

2.2 Follow-up Interviews

On 12 June 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified during the document review. Representatives of Nobrecel were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Nobrecel	➢ Project design
EcoSecurities	➢ Baseline scenario ➢ Debundling ➢ Additionality ➢ Emission calculations

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve and any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design.

The project participants' response to DNV's draft validation report findings, including the submission of the revised PDD of 29 August 2006, addressed the requests for corrective actions (CAR) and requests for clarification (CL) raised by DNV to DNV's satisfaction. To guarantee the transparency of the validation process, the concerns raised and the response provided by the project participants 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 final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation of 29 August 2006.

3.1 Participation Requirements

The project participants are Nobrecel S/A Celulose e Papel and EcoSecurities Ltd.. The host Party Brazil and Annex I Party the United Kingdom meet all relevant participation requirements.

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

The project does not involve public funding by an Annex I Party, and the validation did not reveal any information that indicates that official development assistance (ODA) funding towards Brazil has been diverted to this project.

3.2 Project Design

The project activity consists of the installation of new equipment that enables an increase in the black-liquor's solid mass concentration, resulting in an increase of its calorific value, thus reducing the need to co-fire fuel oil. More specifically, the pipeline design of the evaporation reservoirs, which are composed by black liquor and steam pipelines, is improved and new pipes are installed so as to allow for a more efficient use of the steam to dry the black liquor. Additionally, a heat exchanger is installed to further improve the use of steam. Finally, retrofits in the black liquor boiler including modifications to the air, black liquor and water feeding systems are made.

The operation and maintenance of the project activity are the responsibility of Nobrecel. No significant training is needed to operate the project activity. The site has a valid operating license.

The methane avoidance component originally included in this project was using the same technology as the large-scale CDM project "NOBRECEL Biomass energy project". However, this component has been eliminated from this proposed small-scale project. As for the thermal energy component, although both AMS-I.C and ACM0006 (used in the other PDD) belong to sectoral scope 1, the improvements of the black liquor are made to the black liquor boiler, i.e. to a different technology/measure than the biomass boilers included in the large-scale project, in which fuel oil boilers are replaced by a biomass boiler. Hence, the measures to improve the the black liquor boiler is not considered to be a debundled component of the proposed large project activity.

The improvements and installations part of this project started in late 2001 and phase three, i.e. the retrofit of the boiler, has been finished only recently. The starting date of the project activity has been chosen as 30 June 2004 i.e. when the amount of fuel oil co-fired in the black liquor

boiler started to decrease due to the first set of improvements part of the project activity. The operational lifetime of the project is 30 years. The black liquor boiler has been installed in 1999 and is forecast to run for at least as long as the crediting period lasts. A renewable crediting period of seven years has been selected with the starting date as 1 January 2007.

3.3 Baseline Determination

The project correctly applies AMS-I.C (Version 8). The baseline fuel consumption is 41.9 kg fuel oil/MWh of steam produced, based on data on the years 1999 – 2001, i.e. the three years before the improvements started. The CO_2 coefficient for fuel oil is 3.08 tCO_2/ton of fuel oil, based on the net calorific value as published by the Brazilian energy balance and the IPCC default CO_2 content value of fuel oil. All calculations and underlying data have been verified on-site and the baseline coefficient is deemed accurate.

3.4 Additionality

The additionality of the project has been demonstrated using the barrier analysis and three barriers have been identified:

1- Investment barrier: DNV has reviewed the presented debt level through the accounts of Nobrecel and was able to confirm the difficulty to receive long-term debt funding from any financial institution. The general situation in Brazil at the time the investment decision was taken i.e. in 2003, was characterised by political uncertainty so that long-term funding was only available at high interest rates and mainly to big private and public investors.

2- Financial barrier: DNV has reviewed the net present value (NPV) analysis of Nobrecel at the time of investment decision and confirmed the following:

- The high investment costs are due to the fact that many construction workers were needed to perform the changes to the retrofit of the boiler in a minimum amount of time, because the pulp and paper production needed to come to a halt while the black liquor boiler is in-operational.
- The fact that the plant had to stop for more than two weeks in order to do the retrofits also constitutes opportunity costs from not generating income from the production of pulp and paper.
- Finally, the discount rate taken i.e. 23%, is the average SELIC rate for 2003 and published by the Brazilian Central Bank. This rate is used for the execution of the Central Bank's monetary policy, i.e. the SELIC rate is the rate at which the Central Bank borrows money for one year. This rate is deemed conservative as the project has a higher risk level and longer forecast payback time, compared to the one-year government lending rate.

A sensitivity analysis has been performed, decreasing the investment level, increasing the fuel oil price and decreasing the discount rate. The NPV of the project remains negative.

3- Prevailing practice analysis: Prevailing practice in Brazil is to use the black liquor only for heat generation. Out of 44 pulp and paper producers in Brazil, only 12 use black liquor to produce electricity, Nobrecel being by far the smallest entity of these.

In conclusion, it has been sufficiently demonstrated that the project is not a likely baseline scenario and results in emission reductions that would not have occurred in its absence.

3.5 Monitoring Plan

The project will monitor the steam volume and steam enthalpy as well as the black liquor boiler's fuel oil and electricity consumption. The electricity used by two pumps is produced on-site and the fossil fuel used to produce it is accounted for under this project. The electricity CO_2 coefficient is thus 0 tCO_2/MWh.The responsibilities and authorities for project management, procedures for monitoring and reporting, and QA/QC procedures have been sufficiently described and evidenced.

3.6 Calculation of GHG Emissions

An Excel file documenting all equations, the parameters and default values as well as the sources of these has been provided. Forecast project emissions consist of the remaining amount of fuel oil co-fired with the black liquor, times the fuel oil CO_2 coefficient of 3.08 tCO_2/ton of fuel oil. Baseline emissions consist of the forecast amount of steam times the 41.9 kg fuel oil/MWh steam coefficient and the fuel oil CO_2 coefficient of 3.08 tCO_2/ton of fuel oil. Appropriate and conservative assumptions, regarding expected amounts of steam produced and fuel oil consumption have been used based on the available data for the years 2005 and 2006. The annual forecasted emission reductions are 38 540 tCO_2.

3.7 Environmental Impacts

The site has a valid operating licence. No adverse environmental impacts are foreseen.

3.8 Comments by Local Stakeholders

Local stakeholders have been involved appropriately and in accordance with Brazilian requirements. No comments have been received.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 25th April 2006 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 06/05/2006 to 04/06/2006. One comment was submitted and is inserted hereafter, in its unedited form:

Comment by:	g. hamaliuk, phascon technologies
Inserted On:	2006-05-30
Subject:	Nobrecel Methane Avoidance SSM
Comment:	Where do we start?? First, the second project proposed as small scale breaks all the rules for small-scale projects:

- the two boiler systems are over 104 t/h steam, which is more than 45 MWth no matter which Thermodynamic Tables you use

- the rules for small scale not being a debundled part of a large scale are violated. How can anyone insult the intelligence of a reader by saying that there is no debundling when the boiler that is used to reduce the methane emissions by burning the biomass belongs to another project, and is NOT DEBUNDLED?

- Also, the economic justification used has the same numbers in the 2 PDDs, but the projects are NOT DEBUNDLED??

There are obviously a number of other issues with the 2 Nobrecel projects, but they should be clear once the small-scale project issues are addressed.

I really cannot believe what I am reading. Does EcoSecurities have any ethical standards?

How DNV has taken the comment into account

- The project – in its revised form – only comprises of the black liquor improvement component, the capacity of which is less than 45 MW_{th} (Refer to CAR 1 in table 3 of the validation protocol).

- The methane avoidance component was indeed a debundle component from the large scale project "NOBRECEL Biomass energy project" and has thus been eliminated from this proposed small-scale CDM project activity (Refer to CAR 1 in table 3 of the validation protocol).

- The economic justification has been adjusted in the PDD of 29 September 2006 (Refer to CAR 2 in table 3 of the validation protocol).

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Nobrecel fuel switch in black liquor boiler Project" in Brazil. The validation was performed on the basis of UNFCCC criteria for small-scale CDM project activities, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project improves the quality of black liquor so that the co-firing of fuel oil decreases. The project participants are Nobrecel S/A Celulose e Papel and EcoSecurities Ltd. Brazil and the United Kingdom meet the requirements to participate in the CDM.

Being a fuel switch project activity with an output capacity of less than 45 MW_{th}, the project meets the criteria to apply the simplified baseline and monitoring methodology AMS-I.C., as defined in Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

Baseline emissions are determined based on the historic fuel oil consumption per MWh steam output. The additionality of the project is demonstrated through a barrier test. The presented barriers demonstrate that the project is not a likely baseline scenario.

The monitoring plan sufficiently specifies the monitoring requirements. Data monitoring procedures are sufficiently implemented to guarantee the verifiability of the emission reductions. By displacing fuel oil based energy, the project thus 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 already operating as designed, the project is likely to achieve the estimated amount of emission reductions.

In summary, it is DNV's opinion that the project as described in the revised and resubmitted project design document of 29 August 2006 meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS-I.D (version 08). Hence, DNV will request the registration of the "Nobrecel fuel switch in black liquor boiler Project" 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 voluntary participation from the DNA of Brazil and the DNA of the United Kingdom, including the 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, *Nobrecel fuel switch in black liquor boiler Project*, CDM PDD, Versions 1 25 April 2006 and Version 3 29th August 2006.

/2/ EcoSecurities, "Nobrecel, ERs calculation", Excel file, April and June 2006.

/3/ EcoSecurities, "Financial analysis", Excel file, May 2006.

/4/ EcoSecurities, "Enthalpy", Excel file, May 2006.

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

/5/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/6/ 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, Type I.C,* Version 08: 3 March 2006.

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

/7/ Nobrecel: Francisco Paulo dos Santos (EcoEficiencia Coordinator), Gilberto Mendonça (Environmental Supervisor), Bruna Rossi (Operation Annalist), Ivo de Conto (Forestry Coordinator), Israel (Account Coordinator).

/8/ EcoSecurities: Pablo Fernandez and Luis Filipe Kopp (CDM Project Manager and Monitoring Manager, respectively).

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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.
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	--	Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the 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	
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 approvals of voluntary participation from the DNA of Brazil and the DNA of the United Kingdom.
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
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
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not	Decision 17/CP.7, CDM Modalities and Procedures Appendix B,	OK.	The validation did not reveal any information that indicates that the project can be seen as a diversion of

Requirement	Reference	Conclusion	Cross Reference/Comment
result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	§ 2		ODA funding towards Brazil.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima. The UK DNA is 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	The host country Brazil ratified the Kyoto protocol on 23rd August 2002 and the Annex 1 country UK ratified the Kyoto Protocol on 31st 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	UK has in place a national registry and reported in October 2001 their 3rd communication.
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	~~**CAR 1**~~ OK	The methane avoidance component originally included in this project was using the same technology as the large-scale CDM project "NOBRECEL Biomass energy project". However, this component has been eliminated from this proposed small-scale project. As for the thermal energy component, although both AMS-I.C and ACM0006 (used in the other PDD) belong to sectoral scope 1, the improvements of the black liquor are made to the black

Requirement	Reference	Conclusion	Cross Reference/Comment
			liquor boiler, i.e. to a different technology/measure than the biomass boilers included in the large-scale project, in which fuel oil boilers are replaced by a biomass boiler. Hence, the measures to improve the efficiency of the black liquor boiler is not considered to be a debundled component of the proposed large project activity.
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	Project design document conforms to the UNFCCC format.
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	The project activity conforms to the small scale methodology AMS–I.C.
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	Comments have been invited from the local stakeholders. No comments have been received.
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	Brazilian environmental laws do not require an Environmental Assessment for this type of project.
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 has been published on DNV Certification's Climate Change website. Parties, stakeholders and NGOs were through the UNFCCC CDM website invited to provide comments on the validation requirement during a period

Requirement	Reference	Conclusion	Cross Reference/Comment
			of 30 days from 06 May 2006 to 04 June, 2006. One comment has been received and taken into account by DNV.

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 assessed 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	Yes the project activity qualifies as a AMS-I.C project as it provides thermal energy (steam) by displacing the partial use of fuel oil in the black liquor recovery boiler.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR, I	The methane avoidance component of this project is using the same technology as the large-scale CDM project called “NOBRECEL Biomass energy project”, proposed for registration. Thus, the methane avoidance component has to be eliminated from this PDD. As for the thermal energy component, although both AMS-I.C and ACM0006 (used in the other PDD) belong to sectoral scope 1, the improvements of the black liquor are made to the black liquor boiler, i.e. to a different technology/measure than the biomass boilers included in the large-scale project, in which fuel oil boilers are replaced by a biomass boiler. Hence, the measures to improve the efficiency of the black liquor boiler is not considered to be a debundled component of the proposed large project activity.	~~CAR 1~~	OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for	/1/	DR	Yes, the project activity conforms to the project category I.C defined for small scale CDM project		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
small scale CDM project activities?			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	Yes. The project activity will be implemented in the Nobrecel S/A Celulose e Papel plant located in the Pindamonhangaba city of Sao Paulo State in Brazil.		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR, I	See CAR ~~1~~.	~~CAR 1~~	OK
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR	The project uses equipment and technology that are prevalent in Brazil. Hence the project design reflects current good practices.		OK
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR	No, the project will not result in technology transfer to the host country Brazil.		OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Since the project technology and equipments are prevalent in Brazil and the project proponent has experience in the operation and maintenance of process plants, extensive initial training and maintenance efforts are not required for the project to work as presumed during the project period.		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	/1/	DR	The project activity has and still does create employment during the implementation of all design		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
reductions?			changes. The project further reduces the country's dependency on fossil fuel.		
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	No, the project will not create any adverse environmental or social effects.		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. Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the confirmation by the DNA of Brazil that the project assists in achieving sustainable development.	--	
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR, I	Yes.		OK
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	Yes. The project correctly applies AMS-I.C.		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	Yes. The baseline methodology is to determine the amount of fossil fuel used per unit of output in the baseline scenario.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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 prevailing practice or other barriers?	/1/	DR, I	The additionality assessment needs to be reformulated after the methane avoidance component has been taken out.	~~CAR 2~~	OK
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR, I	The baseline is the fuel oil consumption per MWh of steam produced by the CRQ boiler times the actually produced steam (in tons) in the project scenario. This fuel oil consumption ratio is based on the following data, directly taken from Nobrecel's records: - fuel oil consumption (in tons), and - steam generation (in tons), from the years 1999 – 2001. This data has been verified on-site. The ratio is 41.9 kg fuel oil per MWh of steam and is deemed correct. This ratio is fixed *ex-ante* for the entire crediting period.		OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR, I	Yes. No policies exist that apply to the improvement of the quality of the black liquor.		OK
B.2.4. Is the baseline selection compatible with	/1/	DR	Yes, the baseline is compatible with the available		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
the available data?			data.		
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR, I	Yes, the selected baseline represents the most likely scenario that would have happened in the absence of the project activity.		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, I	The project's starting date is 1st November 2001, and the operational lifetime is 30 years. The starting date of the project activity is to be confirmed and evidence for the starting date is to be submitted. The CRQ boiler was installed in 1999. The potential remaining lifetime of the CRQ boiler has been confirmed as being over 30 years.	~~CL 1~~	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, I	A renewable crediting period of seven years has been chosen. The starting date of the crediting period can not be before the registration of the project and thus needs to be changed.	~~CAR 3~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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 provided for the relevant project category?	/1/	DR, I	Yes. The following parameters will be monitored: - steam produced by the CRQ boiler, - fuel oil consumed by the CRQ boiler, and - steam enthalpy. The additional electricity consumption in the project activity has been included in the monitoring plan of the revised PDD but will only be monitored, in case it is imported from the grid. The steam produced will be monitored in terms of amount of steam and its enthalpy. The project developer is requested to clearly distinguish between the requirement to monitor the steam volume and the steam enthalpy in the monitoring plan.	~~**CAR 4**~~	OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes the monitoring methodology is applicable to the project.		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	Yes. The application of the monitoring methodology is transparent.		OK
D.1.4. Will the monitoring methodology give	/1/	DR	Yes, the monitoring methodology gives opportunity		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
opportunity for real measurements of achieved emission reductions?			for real measurement of emission reductions.		
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/		See D.1.1.	~~CAR 4,~~	OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Yes the choice of the GHG indicators is reasonable.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes, it will be possible to measure/monitor the project GHG indicators.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes.		OK
D.3. Monitoring of Leakage If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	As there is no transfer of energy generating equipment from another activity, leakage is not considered.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR, I	The baseline ratio of kg fuel oil per MWh steam produced is fixed ex-ante at 49.1.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes, the choice of the baseline indicator is reasonable.		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, I	This is not mentioned in the project design document and needs clarification.	~~**CL 2**~~	OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR, I	This is not mentioned in the project design document and needs clarification. Table D.4 needs to be completed for all parameters.	~~CL 2~~	OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR, I	This is not mentioned in the project design document and needs clarification.	~~CL 2~~	OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR, I	Increased fuel oil consumption will be monitored in case of decreased black liquor supply.		OK
D.5.5. Are procedures identified for calibration of	/1/	DR,	This is not mentioned in the project design	~~CL 2~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
monitoring equipment?		I	document and needs clarification.		
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR, I	Idem.	~~CL 2~~	OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR, I	Idem.	~~CL 2~~	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, I	Idem	~~CL 2~~	OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR, I	Idem	~~CL 2~~	OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR, I	Idem.	~~CL 2~~	OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR, I	Idem.	~~CL 2~~	OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR, I	Idem.	~~CL 2~~	OK

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

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 ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR, I	Forecast project emissions consist of the remaining amount of fuel oil co-fired with the black liquor, times the fuel oil CO_2 coefficient of 3.08 tCO_2/ton of fuel oil. The forecast fuel oil consumption has been based on the values from 2005 and the first part of 2006.		OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes.		OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	/1/	DR	Yes. The methodology to calculate fuel oil emissions is straight forward.		OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/	DR, I	Yes.		OK
E.1.5. Have conservative assumptions been used?	/1/	DR, I	Yes, national net calorific values have been used.		OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/	DR, I	No major uncertainties are foreseen.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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 and estimated ex-ante.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	As per the methodology leakage need not be considered because the project equipment is not transferred from another site.		OK
E.3. Baseline GHG Emissions The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	/1/	DR	Yes. The baseline emissions due to the fuel co-fired with the black liquor are taken into account: The forecast steam production in ton is multiplied by the fixed fuel oil coefficient i.e. 41.9 kg/MWh of steam and then multiplied by the CO_2 coefficient of fuel oil i.e. 3.08. The steam production is forecast based on the production of 2005 and the first half of the year 2006, which is reasonable.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	Yes, all aspects related to direct and indirect emissions have been captured.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes all relevant GHG sources have been evaluated.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	From the data and calculations in the excel file provided, it is unclear how one arrives at the forecast baseline emissions. The calculation steps including the actual values for each parameter need to be evidenced in part E. Also, reference to other parts i.e. E.2 in the PDD is not allowed.	~~CAR 5~~	OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	See E.3.4	~~CAR 5~~	OK
E.3.6. Have conservative assumptions been used?	/1/	DR	Yes conservative estimates have been used.		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	Yes.		OK
E.4. Emission Reductions Validation of ex-ante estimated emission reductions.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	Yes, the project is expected to result in 38 540t CO_2 emission reduction per year.		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	No environmental impact assessment is warranted by Brazilian law.		OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR, I	The plant is in operation and official permits are in place.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	No negative environmental impact is foreseen.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	Environmental impacts were assessed, but no significant environmental impacts identified.		OK
G. **Comments by Local Stakeholder** Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	Yes, the relevant stakeholders have been identified and consulted through letters.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR, I	As per the resolution of the DNA of Brazil, letters with the description of the project were sent to the relevant stakeholders identified requesting comments on the project within 30 days period. This is considered appropriate and has been confirmed during the site visit.		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, I	Yes.		OK
G.1.4. Is a summary of the comments received provided?	/1/	DR	No comments have been received to the letters sent.		OK
G.1.5. Has due account been taken of any comments received?	/1/	DR	No comments were received.		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 methane avoidance component of this project is using the same technology as the large-scale CDM project called "NOBRECEL Biomass energy project", proposed for registration. Thus, the methane avoidance component has to be eliminated from this PDD.	Table 1	The methane component is removed from the PDD. See new version of PDD.	OK The project in its revised form is limited to the improvement of the quality of the black liquor, so as to reduce and eventually eliminate the need to co-fire fuel oil. This CAR is therefore closed.
CAR 2 The additionality assessment needs to be reformulated after the methane avoidance component has been taken out.	B.2.1	See revised PDD.	OK The additionality of the project has been demonstrated using the barrier analysis and three barriers have been identified: 1- Investment barrier: DNV has reviewed the level of debt in the accounts of Nobrecel and was able to confirm the difficulty to receive long-term debt funding from any financial institution. The general situation in Brazil at the time the investment decision was taken was characterised by political uncertainty so that long-term funding was only available at high interest rates and mainly to big private and public investors. 2- Financial barrier: DNV has reviewed

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
			the net present value (NPV) analysis of Nobrecel at the time of investment decision and confirmed the following: - the high investment costs are due to the fact that many construction workers were needed to perform the changes to the retrofit of the boiler in a minimum amount of time, because the pulp and paper production needed to come to a halt while the black liquor boiler is in-operational. - The fact that the plant had to stop for more than two weeks in order to do the retrofits also constitutes opportunity costs from not generating income from the production of pulp and paper. - Finally, the discount rate of 23% has been verified based on data published by the Brazilian Central Bank and is deemed conservative. A sensitivity analysis has been performed, decreasing the investment level, increasing the fuel oil price and decreasing the discount rate. The NPV of the project remains negative.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
			3- Prevailing practice analysis: Prevailing practice in Brazil is to use the black liquor only for heat generation. Out of 44 pulp and paper producers in Brazil, only 12 use black liquor to produce electricity, Nobrecel being by far the smallest entity. In conclusion, it has been sufficiently demonstrated that the project is not a likely baseline scenario and results in emission reductions that would not have occurred in its absence. This CAR is therefore closed.
CAR 3 The starting date of the crediting period can not be before the registration of the project and thus needs to be changed.	C.1.2	The new starting date of the crediting period is forecast to be 1 January 2007.	OK This CAR is therefore closed.
CAR 4 The project developer is requested to clearly distinguish between the requirement to monitor the steam volume and the steam enthalpy in the monitoring plan.	D.1.1	Table D.3. was updated. See new version of PDD.	OK The revised PDD clearly distinguishes between the requirement to monitor steam volume and enthalpy. This CAR is therefore closed.
CAR 5 From the data and calculations in the excel file provided, it is unclear how one arrives at the forecast baseline emissions. The calculation steps including the actual values for each parameter need to be evidenced in	E.3.4	See revised PDD.	OK The revised PDD clearly details the forecast emission reductions In part E. This CAR is therefore closed.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
part E. Also, reference to other parts i.e. E.2 in the PDD is not allowed.			
CL 1 The starting date of the project activity is to be confirmed and evidence for the starting date is to be furnished.	C.1.1	The actual start of the improvements made to the steam piping system as well as the air, fuel and water feeder is late 2001. The starting date of the project activity has been chosen as June 2004.	OK The starting date of the project activity as well as the crediting period have been adjusted accordingly. This CL is therefore closed.
CL 2 It is unclear whether the project implementation is properly prepared for and that critical arrangements are addressed. Also, table D.4 needs to be completed for all parameters.	D.5.1 – D.5.12	All QA/QC were filled in. Table D.4 were updated. See new version of PDD.	OK The PDD has been updated accordingly and the project developer's capacity to manage the monitoring requirements has been assessed during the site visits. This CL is therefore closed.

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