VALIDATION REPORT

Industrial de Oleaginosas Americanas S.A

Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A (INOLASA)

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Abbreviations

AM	Approved Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
DNA	Designated National Authority
EF	Emission Factor
EFB	Empty Fruit Bunches
IRR	Internal Rate of Return
MP	Monitoring Plan
NIR	New Information Request
NPV	Net Present Value
PDD	Project design Document
SGS	Société Générale de Surveillance
UNFCCC	United Nations Framework Convention on Climate Change

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Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A	SGS Climate Change Programme
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Summary

SGS United Kingdom Ltd. has made a validation of the CDM project activity "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A, 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 rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The scope of validation is the independent and objective review of the project design document, baseline study and monitoring plan and other relevant document of the project. The information in this document is reviewed against the criteria defined in the Marrakech Accords (Decision 17) and the Kyoto Protocol (Article 12) and subsequent guidance from the CDM Executive Board.

The validation is not meant to provide any consulting towards the Client. However, stated requests for clarifications plan and/or corrective actions may provide input for improvement of the project design document (PDD).

The overall validation process, from Contract Review to Validation Report & Opinion, was conducted using internal procedures (UK.PP.12 issue 3 dated 19/01/2007).

The first output of the validation process is a list of Corrective Actions Requests and New Information Requests (CAR and NIR), presented in Annex 2 of this document. Taking into account this output, the project proponent revised its project design document.

In summary, it is SGS's opinion that the proposed CDM project activity correctly applies the baseline and monitoring methodology as mentioned in approved methodology adopted for the proposed project activity and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Subject.:			
CDM validation			**Indexing terms**
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1. Introduction

1.1 Objective

The Industrial de Oleaginosas Americanas S.A. INOLASA has commissioned SGS to perform the validation of the project 'Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A.' with regard to the relevant requirements for CDM project activities. 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 (MP) and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Certified Emission Reduction (CER). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board.

1.2 Scope

The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. SGS has employed a risk-based approach in the validation, 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 Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 GHG Project Description

This report summarizes the validation of the project switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A (INOLASA), performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents from Industrial de Oleaginosas Americanas S.A and a site visited located in Puntarenas, Costa Rica.

INOLASA is a company located in Costa Rica since 1986, supplying the region with soybean products. Before the implementation of the project, INOLASA produced steam for internal production process using two coal fired boilers each having a capacity to produce 20 tonnes of steam/hour with a pressure of 12 bars. Two coal fired boilers would have replaced the bunker fuelled boilers in the baseline scenario (capacity 40kBtu/h, 10.4barg), but the project activity involves installation of a new biomass boiler having a capacity to produce 35 tonnes of steam per hour with a design pressure of 35 bars. The boiler will combust biomass in a mixture of 85% palm kernel shells and 15% empty fuel bunches.

There is no leakage associated with the INOLASA project activity. The project emissions comprise of the emissions associated with the use of electricity and transport of the biomass to the site.

The emission reduction of Greenhouse gases due to the implementation of the project activity is estimated as 267487tCO2e during the first crediting period of seven years.

1.4 The names and roles of the validation team members

Name	***Role***
Marco van der Linden	*Team Leader*
Siddharth Yadav	*Lead Assessor*
Emilio Doens	*Local assessor*

Statement of Competence of team members are attached at Annex IV.

2. Methodology

2.1 Review of CDM-PDD and additional documentation

The validation is performed primarily as a document review of the publicly available project documents. The assessment is performed by trained assessors using a validation protocol.

A site visit is usually required to verify assumptions in the baseline. Additional information can be required to complete the validation, which may be obtained from public sources or through telephone and face-to-face interviews with key stakeholders (including the project developers and Government and NGO representatives in the host country). These may be undertaken by the local SGS affiliate. The results of this local assessment are summarized in Annex 1 to this report.

2.2 Use of the validation protocol

The validation protocol used for the assessment is partly based on the templates of the IETA / World Bank Validation and Verification Manual and partly on the experience of SGS with the validation of CDM projects. It serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements are linked to checklist questions the project should meet.	*Explains how conformance with the checklist question is investigated. Example of means of verificatio 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 (**Y**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **New Information Request (NIR)** is used when the validation team has identified a need for further clarification.*

The completed validation protocol for this project is attached as Annex 2 to this report

2.3 Findings

As an outcome of the validation process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the Assessor shall raise a **New Information Request (NIR)** specifying what additional information is required.

Where a non-conformance arises the Assessor shall raise a **Corrective Action Request (CAR).** A CAR is 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 verified.

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

Observations may be raised which are for the benefit of future projects and future verification or validation actors. These have no impact upon the completion of the validation or verification activity.

Corrective Action Requests and New Information Requests are raised in the draft validation protocol and detailed in a separate form (Annex 3). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

2.4 Internal quality control

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

3. Determination Findings

3.1 Participation requirements

The project is located in Costa Rica. Costa Rica ratified Kyoto protocol on 2nd August 2002 and is allowed to participate. This was checked from the UNFCCC website (available at http://maindb.unfccc.int/public/country.pl?country=CR. The letter of approval of the Costa Rican DNA was not available, hence CAR 1 was raised. The project participant is Industrial de Oleaginosas Americanas S.A. INOLASA; a private entity and there are no other Annex-I Parties involved at this stage. The letter of approval no. DM-904-2007, dated 3rd August 2007 was provided and thus CAR 1 was closed.

3.2 Baseline selection and additionality

The project has used the methodology AMS IC "thermal energy for the user with or without electricity" version 10. Currently, Inolasa uses bunker to generate heat. The simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity. It has been discussed that during past few years, the use of bunker fuel for heat generation purposes became more cost intensive due to increasing prices of bunker fuel in world market. Continuing with the usage of bunker fuel oil was economically very unattractive, therefore the company assessed the feasibility of using alternative fuels in the year 2004. The use of coal proved to be more cost-efficient than bunker fuel.

NIR 4 and NIR5 were raised to check on the evidence for financial assumptions used for table containing comparative financial indicators (table B.1. PDD) especially the IRR calculation involving :

- coal cost specification (including transport)
- price of biomass including transport.

The project developer provided financial details along with documentary evidence for the figures and the costs involved in the installation and use of coal fired boilers. The prices were also checked through the original documents by the local assessor during the site visit and also from the websites http://www.bunkerworld.com/markets/prices/region/cam . Continuation of the pre-project situation i.e. usage of bunker was a loss to the company (negative NPV) as compared to other options involving a fuel switch to coal or usage of biomass (Palm Kernel Shells and Empty Fuel Bunches).

Two alternatives to the usage of bunker fuel were further analysed, i.e. coal and biomass fuel. The financial analysis revealed that the NPV using coal fired boilers for heat generation was slightly higher than the project activity using empty fuel bunches (without CER revenues), but the installation of the coal fired boilers also involved a higher cost. The difference in the internal rate of return for the two scenarios namely coal fired boilers and the project activity (empty fuel bunches and palm kernel shells) was marginal (1%).

Further evidence to check whether both the above scenarios were considered was checked. This included quotations invited by the project developer for both systems i.e. quotation for a coal boiler (No.17541, dated June26, 2005, supplied by Calderas JCT S.A.) and quotation for a biomass boiler (GA Expertise Inc. dated October 25, 2005). It was found that the reference for the coal price is from INCSA,which is the only company in Costa Rica that has experience with the large scale use of coal. Coal prices and transportation costs are derived from their experiences as stated in the report "coal

transport cost from INCSA.pdf". The investment figures and investment details were checked from the documents and also by the local assessor during the site visit. NIR4 and NIR5 were closed.

INOLASA (project developer) initially decided not to proceed with the installation of boilers using biomass (EFB and palm kernel shells) because of the following reasons:

- it seemed to be a complicated alternative, having to deal with risks concerning security of biomass supply,
- a new and yet unknown and unproven technology in the sector, and other logistical and organisational risks.
- uncertainty regarding timely supply of quantities that fulfil the needs, due to dependency on different sources
- risk of interrupting the production process at Inolasa. This in contrary to the supply of Columbian coal in the baseline scenario, an option that would not have involved supply risks.
- risk that technological capacity building is insufficient for employers at Inolasa to execute the more complicated processes when operating the new biomass boiler

NIR (10) was raised because the project's lifetime is 25 years in the financial analysis but 10 years were considered. The project developer informed that the typical payback period for investment in this sector is 10 years. NIR10 was closed as 10 years payback period has been accepted by the lending institutions and is also used for similar projects registered under CDM.

NIR (11) was raised to gather further information regarding the sensitivity analysis, to know the behaviour of other parameters with variation in assumed values. It was noted that the internal rate of return did not vary much with the fluctuating fuel prices (+/-5%). NIR11 was closed.

NIR 3 was raised to gather evidence on further evidence on the decision not to proceed with biomass In response to NIR3, the project developer provided a copy of the e-mail communication dated 25 September 2005, which mentioned that the biomass was only considered as an option because that would yield to additional revenues through the sale of carbon credits and thus making the project activity much profitable. Hence NIR3 was closed.

The project is the first of its kind in the country as no other industries use biomass waste streams from another industrial sector. The supply of biomass (empty fuel bunches/palm kernel shell) to the project activity is dependent on the waste streams of three other industries, which is a risk, regarding timely supplies and also security of supply as against coal/bunker fuel being readily available in the market. It was also checked that the necessary adaptations at the Palo Seco and Naranjo palm oil mills are not directly related to / part of the CDM project.

Barriers due to prevailing practices and other barriers were found most credible to demonstrate additionality.

3.3 Application of Baseline methodology and calculation of emission factors

The approved small scale methodology AMS IC is applicable to renewable energy technologies that supply individual users with thermal energy, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times a coefficient for the fossil fuel displaced.

NIR 6 was raised to seek further clarification about the calculation of the power produced by the project and parameters involved, because the PDD mentioned that the steam flow will be monitored and the energy calculated. It was discussed that the general steam consumption to satisfy the soy production activity demand at the facility is 525 Kg of saturated steam at 10 bars of pressure per each ton of soy produced. It was further clarified that the boiler has to operate always at the same pressure because the steam consuming equipment operates at a design pressure. The demand from the plant affects the flow (measurement of this variable is included in the monitoring plan) but not the pressure since a variation in pressure will cause a breakdown of the plant. Evidence on this is provided through extracts of the plant equipments manufacturer specifications (Technical specifications, Projecto INOLSA, FAX dated 24/04/07). These documents clearly state that the required pressure at the plant site will be 10 bar. Since the boiler is located on a distance from the plant the operating pressure needs to be 12 bar in order to always guarantee the supply of steam at 10 bar at the plant site. As a secondary check, one measurement of the conditions of the steam at the outlet of the boiler shall be undertaken after due start of operations of the biomass boiler. This measurement will be supervised by an independent local official (third party). The state of the steam at this one time measurement, in combination with the continuously measured steam flow, shall be used for the calculation of the generated energy for monitoring. NIR 6 was closed.

NIR 12 section A4 of the PDD mention two boilers as part of the project and during local consultation it was mentioned three boilers. It is necessary to clarify if this third unit will be part of the project and how it impacts on emission reduction calculations and application of baseline. NIR 12 was raised.
The project proponent informed that the third boiler can be used as a backup but none of the three boilers will be used when the biomass boilers are operating. If any of these are used during maintenance operations, emission reductions would not be claimed. NIR 12 was closed

It was noted that a grid emission factor of 488.35 tCO_2/GWh was used for the Costa Rican grid. It was mentioned that this factor has been taken from the registered small-scale CDM project “Cote small-scale hydro power project” (0251). The validators noticed that in the project 0251, the baseline has been established as of 2004 (start of crediting period). NIR 2 was raised to confirm if there were any changes in the grid composition since then and corresponding grid emission factors during the period 2004-06.

The project developer revised the grid emission factor to reflect recent changes in the grid make up. A updated grid emission factor of 628.6tCO2/GWh has been used. The emission factor is calculated in accordance with ACM0002 using data from reliable sources. NIR 2 was closed

3.4 Application of Monitoring methodology and Monitoring Plan

NIR 7 was raised to clarify how the load truck differences are considered in calculation and how this information can be verified later. The characteristics of the double axis truck were provided, but only one way distances were considered for the calculations. It was informed that the trucks will drive back empty, but this will have to be accounted as emissions occurring from the project activity, hence calculations have been adjusted and the spreadsheets were revised accordingly.

NIR 8 was raised to seek further information about QA/QC procedures, to ensure the quality of data. The project developer clarified this issue saying that the enterprise is responsible for the operation, maintenance and boiler control system, INOLASA personnel will be trained by PETRA, the technology provider.

The commissioning of the boiler is done by the technology provider PETRA. INOLASA will be responsible for the installed technology. INOLASAs personnel will be trained by PETRA that afterwards will support INOLASA's technical team. A training plan is carried out by PETRA during the first weeks of operation.

INOLASA will be in charge of monitoring the performance of the project activity related to carbon emissions. Since no leakage is expected from the project activity, the emission reductions will be monitored by installing the adequate and calibrated meters according to the standards of Costa Rica. The procedures for data collection and monitoring management were also included. Hence NIR8 was closed.

Monitoring parameters like total volume of biomass combusted, calorific value of the biomass, moisture content, ash content were found missing in the PDD, it was clarified that the energy output is measured and through the known efficiency of the biomass boiler and coal baseline boiler, the baseline emissions are calculated. Under the version of the methodology used in the PDD, metering the biomass input for quality assurance purpose is not necessary.

3.5 Project design

NIR 13 was raised because the start of crediting period can only be following registration. Earlier PDD mentioned 01/03/2007 as the start date of the crediting period. This was modified and the PDD now mentions that the date of registration of the project activity will be start date of the crediting period. NIR 13 was closed.

NIR9 was raised on the use of the CDM PDD template (version 3), it was noted that section D2 was not complete. Also, source and assumptions for the VF_{cons} were not clear. The project developer informed that after determining the project's feasibility, it was concluded that an Environmental Impact Study (EIA) was not required because there were no significant environmental impacts. The revised PDD version 02 dated 31st January 2007 includes information on VF_{cons}. Hence NIR9 was closed.

3.6 Environmental Impacts

As discussed in section 3.5 above, there is no adverse effects expected from the project activity. The extra emissions through transport of biomass are taken into account in the project activity.

There were no issues raised related to environmental impacts.

3.7 Local stakeholder comments

A meeting inviting local stakeholder's comments was held on September 30th 2006 at the Instituto National de Aprendizaje en Puntarenas, stakeholder were invited to that place to have the opportunity to make comments. The summary of the stakeholder's comments revealed that there are no adverse/pending comments related to the project activity.

4. Comments by Parties, Stakeholders and NGOs

In accordance with sub-paragraphs 40 (b) and (c) of the CDM modalities and procedures, the project design document of a proposed CDM project activity shall be made publicly available and the DOE shall invite comments on the validation requirements from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available. This chapter describes this process for this project.

4.1 Description of how and when the PDD was made publicly available

The PDD and the monitoring plan for this project were made available on the SGS website http://cdm.unfccc.int/ProjectOYB0P39YHLCHFS6O7BLRH83I98KO/view.html and were open for comments from 23-11-06 until 22-12-06. Comments were invited through the UNFCCC CDM homepage and SGS Climate change website at http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/project.php?id=285 during 08/06/2007 until 07/072007 as the revised version of the PDD was available (version 3).No comments were received on the project activity.

Comment number	*Date received*	*Submitter*	*Comment*
0			

4.2 Explanation of how comments have been taken into account

No comments were received

5. Validation opinion

SGS has performed a validation of the project: “Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)”. The Validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

Using a risk based approach, the review of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by SGS for registration with the UNFCCC.

SGS has received confirmation by the host Party that the project activity assists it in achieving sustainable development (Letter of approval no. DM-904-2007, dated 3rd August 2007).

By installing a biomass fuelled boiler to supply steam for internal production processes, the project will displace a greenhouse gas emissions which are equivalent to using a coal-fired boiler, thus the proposed CDM project activity results in reductions of greenhouse gas emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Although the project activity used bunker oil (Diesel) before the implementation of the project activity, coal would have been used in absence of the project activity. A review of the barrier analysis involving prevailing practice and other barriers associated with project activity demonstrate that the proposed project activity (biomass based boilers) was not a likely baseline scenario. Emission reductions attributable to the project are

hence additional to any that would occur in the absence of the project activity. The project is likely to achieve the estimated amount of emission reductions.

The validation is based on the information made available to SGS and the engagement conditions detailed in the report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence SGS can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

The DOE declares herewith that in undertaking the validation of this proposed CDM project activity it has no financial interest related to the proposed CDM project activity and that undertaking such a validation does not constitute a conflict of interest which is incompatible with the role of a DOE under the CDM.

6. List of persons interviewed

Name	***Position***	***Short description of subject discussed***
José Carlos Salas	Project Manager	Baseline, additionality, monitoring
Paulo Manso	Director, Costa Rica DNA	Eligibility requirements

7. Document references

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

/1/ PDD version 1, dated 12 December 2006

/2/ PDD version 2, dated 31st January 2007

/3/ Approved methodology AMS I.C. Thermal energy for the user with or without electricity version 10

/4/ Letter of Approval from Costa Rican DNA (Letter no. DM-904-2007, dated 3rd August 2007)

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

/5/ e-mail communication dated September 30, 2005 rgd. final decision for installing biomass boilers

/6/ Factura Performa Quotation #60048 Rev.7 dated 3rd May 2006

/7/ Truck Characteristics- Certificate from Transportes Internacionales dated 23rd April 2007

/8/ Price of biomass including transport, Price of coal- coal transport cost from INCSA.pdf

/9/ Factura Performa Quotation #60048 Rev.7 dated 3rd May 2006

/10/ Factura Proforma October 25, 2005

/11/ Biomass costs and purchase contract dated September 26, 2006

/12/ Technical specifications, Projecto INOLSA dated 24/04/07

/13/ Financial analysis for each alternative scenario

/14/ Quotation for a coal boiler

/15/ Quotation and investment details for a biomass boiler

/16/ Quotations for the necessary adaptations at the Palo Seco and Naranjo Palm Oil mills

/17/ Main characterisitics of double axis trucks

/18/ Description of the technological innovations of the biomass firing system in question

/19/ Stakeholder consultation advertisement dated 13th September 2006 (page 8)

Annex 1: Local assessment
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Annexure I: Local Assessment Checklist

Project Specific criteria to be confirmed by Local Assessor

Questions be defined by team leader, Answer and Objective Evidence / Source of information / Persons Interviewed to be completed by Local Assessor; Compliance to be reviewed by Team Leader.

What to check	How to check it (suggested approach)	Reference	Answer	Objective Evidence / Source of information / Persons interviewed
PDD is claiming that it was financially attractive to switch to coal from bunker. No details are provided in the PDD. Can you confirm that this switch was seriously considered and was financially attractive	Interview management and get documented evidence to back this up (board minutes, feasibility studies etc)	PDD, section A2	The company had been analyzing coal long time before biomass was considered and had already chosen the technology provider out of two quotations. Cash flow analysis provided for the coal boiler proved it to be financially more attractive than the biomass boiler. Internal email communication showed that biomass was considered as very risky but that the extra income through the sales of CERs triggered the final decision to take the risk.	Coal boiler quotation Coal price reference for Costa Rica e-mail communication dated September 30, 2005 rgd. final decision for installing biomass boilers
I am not an expert but it appears to me that the output of the 2 coal fired boilers (in TJ/h) would be different from the biomass boiler. Can you confirm if the 2 alternatives would have given the same output or if the biomass boiler provides them with more steam which would allow them to for example	Verify design parameters	PDD, section A4	Though the coal boiler has a design pressure of 35 bar it has been remodelled with a new dome in order to operate at a pressure of 12 bar which is required for the operations at INOLASAS facilities. This means that theoretically it could generate more energy, but in practice it can not because it may only operate at 12 bar.	Technical specifications, Projecto INOLSA dated 24/04/07

What to check	How to check it (suggested approach)	Reference	Answer	Objective Evidence / Source of information / Persons interviewed
expand the plant				
Can you verify if there are any contracts bewteen the palm oil mills and the project and if these contracts guarantee the quantity of biomass tha will be delivered per year (and if so how much)			There are biomass purchase agreements between Palma Tica and INOLASA. They don't guarantee firm delivery volumes. Only the surplus from the palm oil mills is sold to INOLASA. Therefore there is no leakage due to additional fossil fuel demand at the palm oil mills.	Biomass purchase agreements
Can you confirm that under the baseline the palm oil mills would have been allowed to leave the EFB and PKS in the open air to decay or if there would be restrictions forcing them to procerss this waste	Discuss with relevant local regulatory bodies	PDD section A4	There is no legislation in place in Costa Rica regulating the open decay of biomass at private sites.	Discussion with the DNA
Can you confirm that there is sufficient biomass vailble to supply both the project and the palm oil mills with biomass during the life time of the porject and that the porject will not lead to an increase of		PDD, section B3, technological barrier	See above. INOLASA will only get the SURPLUS of biomass from the palm oil mills. This surplus is made available through the adaptations and efficiency measures at their own boilers. If fossil fuel is consumed in order to satisfy the energy demand at INOLASA it will be in the new INOLASA boiler	Technology provider contracts for revamping the boilers at Palo Seco and Naranjo.

What to check	How to check it (suggested approach)	Reference	Answer	Objective Evidence / Source of information / Persons interviewed
fossil fuel consumption atv the palm oil mills (also check biomass supply contracts if they address a situation where there wouldn't be aenough biomass)			itself. This is taken into account in the PDD in the monitoring section.	
can you confirm the starty date of the porject is 15/01/2007 as indicated in the PDD	Check contracts for project implementation, check on site of project is already in operation	PDD, section C.1.1	The starting date has been updated in the PDD. The commissioning of the boiler was in May 2007.	The dates of the documents available on site tallies with the start date
can you confirm if there is documented evidence that shows the effifiency of the boiler that would have been sued in the absence of the porject	Check design specification in tender documents etc if available		Yes, see tech specification in the coal boiler quotation.	Coal boiler quotation
Confirm if a EIA is required for the project activity	Discuss with relevant local regulatory bodies	PDD, section F1	No EIA is required.	National Environmental Technical Secretariat (SETENA)
Can you confimr if the project meets all other environmentral legislative requirements in Costa Rica	Discuss with relevant local regulatory bodies	PDD, section F1	Confirmed that the project meets all environmental regulations	Meeting with DNA
Can you check that the local stakeholder process has been performed as described in the	Check minutes and other documentation available for the process.	PDD , section G	Confirmed that the stakeholder consultation was held in a transparent manner and appropriate media was	Meeting minutes, press release Stakeholder consultation advertisement dated 13th September 2006 (page 8)

What to check	How to check it (suggested approach)	Reference	Answer	Objective Evidence / Source of information / Persons interviewed
PDD (section G.1), if the media were used as described and the meetings as announced in the papers were open to the public. Furthermore check if the summary of comments received (G.2) adequately reflects what was discussed. Furthermore do the local stakeholders feel their comments were taken into account properly?	Contact sample of stakeholders mentioned and confirm the text adequately reflects what has been discussed		used	
Section G1 describes that a number of persions and organizations were approached directly. Can you confirm what the criteria where for selecting these particular people. Confirm if possible if maybe some organizations have been excluded on purpose		PDD , section G1	These represented people from all organisations having interest/ stakes in the project activity or potentially affected by the project activity	Discussion with DNA

List of Person Interviewed

Name	Company	Job
José Carlos Salas	INOLASA	Project Manager
Paulo Manso	Costa Rican DNA	Director

ANNEXURE 2: VALIDATION PROTOCOL

Requirement	Description	
Participation requirements	The participation requirements as set out in Decision 17/CP7 need to be satisfied	Covered in table 1
Baseline and monitoring methodology	The baseline and monitoring methodology complies with the requirements pertaining to a methodology previously approved by the Executive Board	Baseline methodology is covered in table 2 Monitoring methodology is covered in table 4
Additionality	The project activity is expected to result in a reduction in anthropogenic emissions by sources of greenhouse gases that are additional to any that would occur in the absence of the proposed project activity	Covered in table 3
Monitoring plan	Provisions for monitoring, verification and reporting are in accordance with relevant decisions of the COP/MOP	Covered in table 5
Environmental impacts	Project participants have submitted to the designated operational entity documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts and, if those impacts are considered significant by the project participants or the host Party, have undertaken an environmental impact assessment in accordance with procedures as required by the host Party;	Covered in table 6
Comments by local stakeholders	Comments by local stakeholders have been invited, a summary of the comments received has been provided, and a report to the designated operational entity on how due account was taken of any comments has been received;	Covered in Table 7
Other requirements	The project activity conforms to all other requirements for CDM project activities in relevant decisions by the COP/MOP and the Executive Board.	Covered in Table 8

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

This protocol should be adapted as required. For example, if the project is not a small scale project or an AR project, some tables can be deleted.

TABLE 1 PARTICIPATION REQUIREMENTS FOR CLEAN DEVELOPMENT MECHANISM (CDM) PROJECT ACTIVITIES (REF PDD, LETTERS OF APPROVAL AND UNFCCC WEBSITE)

REQUIREMENT	MoV	Ref	Comment	Draft finding	Concl
1.1 The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3 and be entered into voluntarily.	DR	PDD	No Annex I party is involved a this stage, however the project would assist Annex I party/ies in achieving emission reduction commitment through the sale of CERs later	OK	OK
1.2 The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof, and be entered into voluntarily	DR	PDD	Letter of approval from the Host country government is not available Letter provided	CAR1	OK
1.3 All Parties (listed in Section A3 of the PDD) have ratified the Kyoto protocol and are allowed to participate in CDM projects	UNFCCC website	web	Costa Rica ratified Kyoto protocol on 2nd August 2002 and is allowed to participate http://maindb.unfccc.int/public/country.pl?country=CR	OK	OK
1.4 The project results in reductions of GHG emissions or increases in sequestration when compared to the baseline; and the project can be reasonably shown to be different from the baseline scenario	DR	PDD	Pending closure of CARs and NIRs	OK	OK
1.5 Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days (45 days for AR projects), and the project design document and comments have been made publicly available			The project was available for comments on the SGS group site and the UNFCCC website from 23/11/2006 until 22/12/2006 (http://maindb.unfccc.int/public/country.pl?country=CR , http://cdm.unfccc.int/Projects/Validation/DB/GYOYB0P39YHLCHFS6O7BLRH83I98KO/view.html) No comments were received	OK	OK

1.6 The project has correctly completed a Project Design Document, using the current version and exactly following the guidance	DR	PDD	PDD reviewed, no problems found with template PDD changed to version 3 of the template , section D2 left blank OK PDD modified	NIR 9	OK
1.7 The project shall not make use of Official Development Assistance (ODA), nor result in the diversion of such ODA	DR	PDD	No ODA used	OK	OK
1.8 For AR projects, the host country shall have issued a communication providing a single definition of minimum tree cover, minimum land area value and minimum tree height. Has such a letter been issued and are the definitions consistently applied throughout the PDD?				NA	
1.9 Does the project meet the additional requirements detailed in: Table 9 for SSC projects Table 10 for AR projects Table 11 for AR SSC projects	DR	PDD	Refer to table 9	OK	OK
1.10 Is the current version of the PDD complete and does it clearly reflect all the information presented during the validation assessment.	DR	PDD	Pending close out CARs and NIRs	OK	OK
1.11 Does the PDD use accurate and reliable information that can be verified in an objective manner?	DR	PDD	Pending close out CARs and NIRs	OK	OK

TABLE 2 BASELINE METHODOLOGY(IES) (REF: PDD SECTION B AND E AND ANNEX 3 AND AM)

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
2.1 Does the project meet all the applicability criteria listed in the methodology	DR	PDD	The project activity falls in the category AMS IC, comprising renewable energy technologies that supply users with thermal energy that displaces fossil fuels. The energy output of the system is less than $45MW_{thermal}$	OK	OK
2.2 Is the project boundary consistent with the approved methodology	DR	PDD	Emissions from biomass, ash transportation; and use of	OK	OK

			grid electricity are considered in the project boundary		
2.3 Are the baseline emissions determined in accordance with the methodology described	DR	PDD	The baseline comprises emissions due to generation of heat through coal combustion. Currently bunker is being used but coal would have replaced it in the baseline scenario Number of boilers using bunker is unclear.	Pending NIR 12	OK
2.4 Are the project emissions determined in accordance with the methodology described	DR	PDD	The project emissions comprise of emissions due to use of electricity from the grid and emissions due to transport of biomass. The grid emission factor of 488.35 tCO_2/GWh is used for the Costa Rican grid. This factor has been taken from the registered small-scale CDM project "Cote small-scale hydro power project" (0251). In project 0251, the baseline has been established as of 2004 (start of crediting period). Please confirm if there were any changes in the grid composition since then and corresponding grid emission factors during 2004-06.	NIR 2	OK
2.5 Is the leakage of the project activity determined in accordance with the methodology described	DR	PDD	No leakage considered.	OK	OK
2.6 Are the emission reductions determined in accordance with the methodology described	DR	PDD	Pending, check spreadsheets and references/source of data	OK	OK

Table 3 Additionality (Ref: PDD Section B3 and AM)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Con

					cl
3.1 Does the PDD follow all the steps required in the methodology to determine the additionality	PDD	DR	Yes, technological barriers, barriers due to prevailing practice and other barriers have been used.	OK	OK
3.2 Is the discussion on the additionality clear and have all assumptions been supported by transparent and documented evidence	PDD	DR	- further evidence on the decision not to proceed with biomass - further evidence on financial assumptions - period of the NPV calculation to be clarified - sensitivity analysis outcome unclear general bunker price confirmed from http://www.bunkerworld.com/markets/prices/region/cam/	NIR 3 NIR 4 NIR 10 NIR 11	OK OK OK OK
Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios? Please check if there are any examples where bunker fuel indeed has been replaced by coal due to economic reasons to substantiate the selected baseline	PDD	DR	Provide documented evidence to back the statement that company would have used coal as a fuel has CDM not been considered (board minutes, feasibility studies etc).	NIR 5	OK
3.4 Is it demonstrated/justified that the project activity itself is not a likely baseline scenario	PDD	DR	Pending NIRs	pending	OK

Table 4 Monitoring methodology (PDD Section D and AM)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
4.1 Does the project meet all the applicability criteria listed in the monitoring methodology	DR	PDD	The project activity falls in the category AMS IC, comprising renewable energy technologies that supply users with thermal energy that displaces fossil fuels.	OK	OK

			The energy output of the system is less than $45MW_{thermal}$		
4.2 Does the PDD provide for the monitoring of the baseline emissions as required in the monitoring methodology	DR	PDD	In accordance with meth monitoring shall consists of metering the energy produced. Approach not totally clear.	NIR 6	OK
4.3 Does the PDD provide for the monitoring of the project emissions as required in the monitoring methodology	DR	PDD	Monitoring of emissions from biomass transport is not clear. Monitoring of emission due to electricity consumption pending NIR 2.	NIR 7	OK
4.4 Does the PDD provide for the monitoring of the leakage as required in the monitoring methodology	DR	PDD	No leakage taken into account.	OK	OK
4.5 Does the PDD provide for Quality Control (QC) and Quality Assurance (QA) Procedures as required in the monitoring methodology	DR	PDD	PDD does not give a lot of details on QA and QC.	NIR 8	OK

Table 5 Monitoring plan (PDD Annex 4)

CHECKLIST QUESTION	**Ref.**	**MoV***	**COMMENTS**	**Draft Concl**	**Final Concl**
5.1 Monitoring of Sustainable Development Indicators/ Environmental Impacts					
5.1.1 Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	DR	PDD	The PDD is claiming sustainable development benefits through the buying of biomass via the school and in terms of employment, however the monitoring plan does not foresee in monitoring these effects so they cannot be quantified Tbc during verification	Obs 1	OK
5.1.2 Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	DR	PDD	NA	NA	NA
5.1.3 Will it be possible to monitor the specified sustainable development indicators?	DR	PDD	NA	NA	NA

5.1.4	Are the sustainable development indicators in line with stated national priorities in the Host Country?	DR	PDD	NA	NA	NA
5.2 Project Management Planning						
5.2.1	Is the authority and responsibility of project management clearly described?	DR	PDD	PDD does not give a lot of details on QA and QC.	NIR 8	OK
5.2.2	Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	DR	PDD	PDD does not give a lot of details on QA and QC.	NIR 8	OK
5.2.3	Are procedures identified for training of monitoring personnel?	DR	PDD	INOLASA personnel will be trained by boiler manufacturer.	OK	OK
5.2.4	Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	DR	PDD	Mentioned that there will be a procedure, no details available at this time but considered acceptable.	OK	OK
5.2.5	Are procedures identified for calibration of monitoring equipment?	DR	PDD	Mentioned that there will be a procedure, no details available at this time but considered acceptable.	OK	OK
5.2.6	Are procedures identified for maintenance of monitoring equipment and installations?	DR	PDD	Mentioned that there will be a procedure, no details available at this time but considered acceptable.	OK	OK
5.2.7	Are procedures identified for monitoring, measurements and reporting?	DR	PDD	Mentioned that there will be a procedure, no details available at this time but considered acceptable.	OK	OK
5.2.8	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	DR	PDD	Mentioned that there will be a procedure, no details available at this time but considered acceptable.	OK	OK
5.2.9	Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	DR	PDD	Mentioned that there will be a procedure, no details available at this time but considered acceptable.	OK	OK
5.2.10	Are procedures identified for review of reported results/data?	DR	PDD	Mentioned that there will be a procedure, no details available at this time but	OK	OK

				considered acceptable.		
5.2.11	Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	DR	PDD	Mentioned that there will be a procedure, no details available at this time but considered acceptable.	OK	OK
5.2.12	Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	DR	PDD	Mentioned that there will be a procedure, no details available at this time but considered acceptable.	OK	OK

Table 6 Environmental Impacts (Ref PDD Section F and relevant local legislation)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
6.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	DR	PDD	EIA has been performed in accordance with regulation and process is described.	OK	OK
6.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	DR	PDD	EIA has been performed in accordance with regulation. Documented evidence provided.	OK	OK
6.3 Will the project create any adverse environmental effects?	DR	PDD	No adverse effects expected.	OK	OK
6.4 Are transboundary environmental impacts considered in the analysis?	DR	PDD	Extra emissions through transport of biomass are taken into account in the project design.	OK	OK
6.5 Have identified environmental impacts been addressed in the project design?	DR	PDD	Extra emissions through transport of biomass are taken into account in the project design.	OK	OK
6.6 Does the project comply with environmental legislation in the host country?	DR	PDD	Evidence of permits have been provided.	OK	OK

Table 7 Comments by local stakeholders (Ref PDD Section G)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
7.1 Have relevant stakeholders been consulted?	DR	PDD	Stakeholders have been invited through pre-selection and open invitation.	OK	OK

			Participants represented a range of stakeholders. Feedback local assessor.		
7.2 Have appropriate media been used to invite comments by local stakeholders?	DR	PDD	Combination of invitations and newspaper announcement. Copy of newspaper articles provided.	OK	OK
7.3 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?	DR	PDD	Feedback local assessor.	OK	OK
7.4 Is a summary of the stakeholder comments received provided?	DR	PDD	Summary of discussions and comments from questionnaires is provided.	OK	OK
7.5 Has due account been taken of any stakeholder comments received?	DR	PDD	Feedback local assessor.	Ok	OK

TABLE 8 OTHER REQUIREMENTS

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
8.1 Project Design Document					
8.1.1 Editorial issues: does the project correctly apply the PDD template and has the document been completed without modifying/adding headings or logo, format or font.	DR	PDD	Refer to NIR 9.	pending	OK
8.1.2 Substantive issues: does the PDD address all the specific requirements under each header. If requirements are not applicable / not relevant, this must be stated and justified	DR	PDD	No substantive issues besides the ones already raised in CARs/NIRs.	OK	OK
8.2 Technology to be employed					
8.2.1 Does the project design engineering reflect current good practices?	DR	PDD	Description of the technology indicates good practices.	OK	OK
8.2.2 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 country?	DR	PDD	Use of biomass from palm oil mills is already practiced in Costa Rica, therefore not expected that this would lead to new technology being brought into the country.	OK	OK
8.3 Is the project technology likely to be substituted by other or more efficient	DR	PDD	Biomass based boiler for	OK	OK

technologies within the project period?			heat, not expected it would be replaced by other technology.		
8.2.4 Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	DR	PDD	Some training is likely to be necessary but is envisioned by the manufacturer. No reason to be believe at this time training could influence the project performance	OK	OK
8.3 Duration of the Project/ Crediting Period					
8.3.1 Are the project's starting date and operational lifetime clearly defined and reasonable?	DR	PDD	Starting date of the crediting period is 01/03/2007 which will not be possible.	NIR 13	Ok
8.3.2 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)?	DR	PDD	Renewable crediting period of max 3*7 which is reasonable based on 25 year lifetime.	OK	OK
8.3.3 Does the project's operational lifetime exceed the crediting period	DR	PDD	Max crediting period is less than lifetime.	OK	OK

TABLE 9 ADDITIONAL REQUIREMENTS FOR SSC PROJECTS

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
9.1 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?	PDD	DR	The project falls under Type I -Renewable energy projects; the project seeks to modify an existing facility for renewable energy generation (thermal).	OK	OK
9.2 The project conforms to one of the categories listed in Appendix B to Annex II to Decision 21/CP8	PDD	DR	Yes, The project activity falls in the category AMS I.C. Thermal energy for the user, comprising renewable energy technologies that supply users with thermal energy that displaces fossil fuels. The energy output of the system is less than $45MW_{thermal}$	OK	OK
9.3 The small scale project activity is not a debundled component of a larger project	PDD	DR / inter	The project is not a debundled component as per the clauses in Appendix	OK	OK

activity?		net	C (para 2) of the Simplified Modalities and Procedures for Small-Scale CDM project Activities. UNFCCC website does not show similar activity in Costa Rica.		
9.4 PDD has been prepared in accordance with appendix A of Annex II to Decision 21/CP8	PDD	DR	PDD version 2 is used. Version 3 is also available (EB 28) . Version 3 has been used in revised PDD.	Obs.	OK
9.5 The project uses a simplified baseline and monitoring methodology specified in Appendix B. If not, they may propose changes to the meths or a new SSC project category	PDD	DR	Pending NIRs, refer to table 2.	pending	OK
9.6 Is there any bundling of SSC activities into one PDD? If so, does the monitoring plan consider sampling of activities? Refer to para 19 of Annex II. Also, note bundling provisions in SSC Briefing Note and SSC meths I C / I D and III D and Para 22e of Appendix B	PDD	DR	There is no bundling involved in the project.	OK	OK
9.7 Is EIA required by host party? If not, none is required irrespective of SHC. If yes, has one been performed consistent with local requirements?	PDD	DR	Required approvals are available.	OK	OK
9.8 The project results in emission reductions that are additional in accordance with the following requirements: (para 26) The project is additional if emissions are reduced below those in the absence of the project (Para 27) Simplified baseline can be used; if not, baseline proposed shall cover all gases, sectors and sources listed in Annex A to the KP Para 28) One or more barriers as detailed in attachment A to Appendix B to Annex II will be used to demonstrate that the project would not proceed without the CDM	PDD	DR	Pending NIRs, refer to table 3.	pending	OK
9.9 Leakage is calculated according to the provisions of the SSC methodologies in Appendix B (http://cdm.unfccc.int/Projects/pac/ssclistmeth.pdf)	PDD	DR	No leakage required, new boiler.	OK	Ok
9.10 The project boundary shall be constructed in accordance with the requirements of the SSC meths in	PDD	DR	Emissions from biomass transportation; and use of grid electricity are	OK	OK

Appendix B			considered in the project boundary.		
9.11 The Monitoring plan shall be consistent with the requirements of the SSC methodology in Appendix B and shall provide for the collection and archiving of data needed to determine project emissions, baseline emissions and leakage.	PDD	DR	Pending NIRs / CARs, refer to table 4.	pending	Ok
9.12 The monitoring plan shall present good monitoring practice appropriate to the circumstances of the project activity (para 33)	PDD	DR	Pending NIRs / CARs, refer to table 5.	pending	Ok
9.13 If project activities are bundled, separate monitoring plan shall be prepared for each of the activities or an overall plan reflecting good monitoring practice will be prepared, consistent with the above requirements	PDD	DR	No bundling, non applicable.	OK	OK

Annexure 3 : FINDINGS OVERVIEW

Findings from validation of "Switching of fuel from coal to palm oil mill biomass waste residues at Industrial de Oleaginosas Americanas S.A. (INOLASA)." [CDM.VAL0592]

Each Table below represents a finding from the validation assessment. The findings are numbered consecutively, approximately in the order that they have been identified.

Description of table:

Type	Findings are either New Information Requests (NIR) or Corrective Action Requests (CAR). CARs are items that must be addressed before a project can receive a recommendation for registration. NIRs may lead to the raising of CARs. Observations are included at the end and may or may not be addressed. They are primarily to act as signposts for the verifying DOE.
Issue	Details the content of the finding
Ref	refers to the item number in the Validation Protocol
Response	Please insert response to finding, starting with the date of entry.

Rows for comments and further response will be appended to the table until the Findings has been addressed to the satisfaction of the Lead Assessor.

Please note that this is an open list and more findings may be added as validation progresses.

Date: 13-01-2007 Raised by: Marco van der Linden / Siddharth Yadav

No.	Type	Issue	Ref
1	CAR	No Letter of Approval from the host Party has been provided to the validator.	1.2
[Reply from project] Date: 20-03-2007 It has been agreed with the validator that this component will be submitted before the project requests its registration			
[Acceptance and close out by validator] Date: 08-08-2007; Siddharth Yadav Letter of approval dated 03 August 2007, provided, CAR1 Closed			

Date: 13-01-2007 Raised by: Marco van der Linden / Siddharth Yadav

No.	Type	Issue	Ref
2	NIR	The grid emission factor of 488.35 tCO_2/GWh is used for the Costa Rican grid. This factor has been taken from the registered small-scale CDM project "Cote small-scale hydro power project" (0251)	2.4

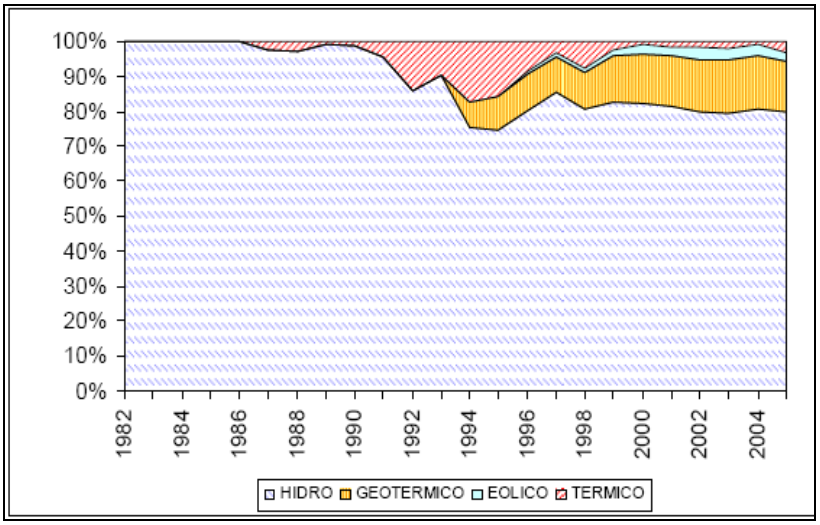
		In project 0251, the baseline has been established as of 2004 (start of crediting period). Please confirm if there were any changes in the grid composition since then and corresponding grid emission factors during 2004-06.	

[Reply from project]
Date: 20-03-2007

The Costa Rican grid is represented mainly by hydro power generation. There are no proved fossil fuel storages in the country; still some new capacity has been added to the grid based on imported fossil fuels.

The following image represents the historical distribution of power generation sources. It can be seen that for the 1982-2003 period, the use of thermal power plants has reached a 4.4 %.

Fig. 1 Historical distribution of different power generation sources to the Costa Rican grid.



Source: Expansion plan por power generation 2006-2025 (Instituto Costarricense de Electricidad Centro Nacional de Planificación eléctrica Proceso Expansión Integrada).

Based on additional information from other CDM projects in development, it has been estimated the present representative emission factor value for the Costa Rican grid. The result is of 283 tCO2/GWh. Even though this is a much lower value than the one used in the emission reductions estimation, the PDD has included the highest value available of 488.35 tCO2/GWh. This has been considered as a reliable and conservative approach to estimate the grid emission factor.

[Acceptance and close out by validator]
Date: 12-04-2007

You indicate that some new capacity has been added to the grid based on imported fossil fuels. However based on more recent PDDs, you estimate the real grid emission factor to be significantly lower than the original value applied. Please clarify the reason for this lower value if the recent additions to the grid are fossil fuel based (or is this only caused by the calculation method)

[Reply from project]
Date: 10-05-2007

The new capacity based on fossil fuels has been added since the late nineties, influencing a traditionally hydro-based grid. From that time up till 2004 there has not been a relevant change in the grid as it can be seen from the figure above.
The difference between the value of the emission factor based on previous PDDs (488.35 tCO2/GWh) and the calculated reference (283 tCO2/GWh based on grid information currently developed for other consultancy assignment of our company) relies on the calculation methods as well as on the year of calculation. In order to choose a representative and conservative emission factor we have considered the following reliable references, provided from registered PDDs:

	representative for years	**EF (tonCO2/GWh)**	**method**
Cote hydro power (Registered CDM project)	2004	488.35	AMS.I-D, Simple OM
La Joya hydro power (Registered CDM project)	2004	152	ACM0002, Simple Adjusted OM
Tejona Wind power (Registered CDM project)	2003	180	ACM0002, Simple Adjusted OM (75% OM + 25 % BM)

It can be seen that the highest emission factor value for all of these PDDs (488.35 tCO2/GWh) is the chosen by our calculations.

[Acceptance and close out by validator]
Date: 09/07/07

Revised emission factor of 628.6tCO2e/GWh including details have been provided. NIR2 closed.

Date: 13-01-2007 Raised by: Marco van der Linden / Siddharth Yadav

No.	Type	Issue	Ref
3	NIR	Also provide evidence of the initial assessment of INOLASA of the possible use of palm kernel shells instead of coal and the decision not to proceed with this option because of the existence of the barriers mentioned in the PDD and if the CDM already played a role in that decision. Even although biomass from the palm oil industry might be new to the is company, sufficient knowledge seems available in the country (technological barrier, prevailing practice barrier) and the return on the investment still seems pretty good without the CDM	3.2

[Reply from project]
Date: 20-03-2007

Currently, Inolasa's heat requirements depend on a bunker fuelled boiler. Going on with bunker is highly cost intensive due to increasing world market prices. This fuel alternative is economically

very unattractive, as the financial indicators state in the PDD.
For this reason, it has been decided to switch the fuel source for steam generation. Two alternatives have been raised, considering coal and biomass fuel. Both scenarios have been studied internally and quotations for both systems have been gathered, being the coal boiler always the less risky and financially more attractive option until the last minute inclusion of CDM revenues shifted the balance in favour of biomass. The main indicators are also showed in the PDD. All the supporting information for this analysis has been given during the validation phase.

Additional supporting information submitted to the validator includes:

- *Financial analysis for each alternative scenario*
- *Quotation for a coal boiler (June 2005)*
- *Quotation and investment details for a biomass boiler (October 2005)*
- *Quotations for the necessary adaptations at the Palo Seco and Naranjo palm oil mills (May 2005)*
- *Description of technological innovations of the biomass firing system in question*

Also from the very beginning that biomass was considered as a potential fuel source, the following barriers were identified as relevant restrictions for the development of this project (and can be found on the references stated above) :

- *Use of biomass from a remote supplier*
- *Uncertainty regarding timely supply of quantities that fulfil the needs, due to dependency on different sources*
- *Risk of interrupting the production process at Inolasa. This in contrary to the supply of Columbian coal in the baseline scenario, an option that would not have involved supply risks at all.*
- *Risk that technological capacity building is insufficient for employers at Inolasa to execute the more complicated processes when operating the new biomass boiler*

[Acceptance and close out by validator]
Date: 12-04-2007; M van der Linden

- One of the documents provided is the quotations for the necessary adaptations at the Palo Seco and Naranjo palm oil mills. Does this mean that the changes at the palm oil mills are directly related to / part of the CDM project (changes to the boilers are only made to create a biomass supply for this project and would not have happened without the CDM?)

If this is the case, please provide further analysis on how this impacts on the additionality of the project and the financial analysis.

If this is not the case please provide more details on the relationship between Grupo Numar and Grupo Oleaginossa (also in relation to possible joint ownership in accordance with figure 2) and why these activities can be considered as separate activities. Furthermore show that the adaptations to the palm oil mils would have happened anyway and the prices of the biomass that Inolasa is paying is market conform or lower (they are not paying higher prices to pay the activities at the mills)

The description of the technical barriers is still anecdotal. Is there any further documented evidence to show that the technical barriers identified where considered as prohibitive by the company when considering the biomass based option in relation to the coal based option

[Reply from project]

Date: 10-05-2007

In fact the only reason for adapting the boilers is to free biomass for the supply of the project. The adaptations would not have been made without CDM because the project would not have happened without CDM. There would not have been a biomass demand without the project because there is no market for biomass in Costa Rica. Consequently the costs of the adaptation have been transferred to the project through the price of 50 $/t. This price has been calculated by Palma Tica taking into account the investment for the adaptations at the two mills (previously provided quotations), costs from the interruption of production during the adaptation of the system and opportunity costs. As further evidence the biomass purchase contract between Palma Tica and INOLASA is submitted. The impact on the additionality of the project has always been considered through the biomass price.

Evidence on the impact of CDM on the decision to take the risk to implement the biomass boiler, a technical and organizational challenging solution, is provided through an Email. The content of the email is the go/no-go request of the technical and commercial manager of the project, Fernando Rojas, to the owner of INOLASA, José Ignacio Gonzalez, and his reply to implement the biomass boiler. From this email it is clear that the additional income from carbon credits is the trigger to take the risk of implementing the technical and organizational challenging project of a biomass boiler that will be supplied with biomass from three different remote facilities.

[Acceptance and close out by validator]
Date: 10-05-2007

Contents and dates of the e-mail checked, NIR3 closed.

Date: 13-01-2007 Raised by: Marco van der Linden / Siddharth Yadav

No.	Type	Issue	Ref
4	NIR	Can you also provide further supporting evidence to support the IRR calculation especially: - coal cost specification (including transport) - price of biomass including transport	3.2

[Reply from project]
Date: 20-03-2007

Costa Rica's coal supply depends mainly on imports, as it does with other fossil fuels. Because of this, the main source of coal consumption has come from other countries such as Colombia. One of the last available records of coal consumption has been used as an official reference for the unitary coal cost, in order to develop the economic analysis for the coal baseline scenario. This is detailed in the following table:

Table 1

Purchase CIF boiler (Compra CIF caldera)	35	US$/t
Taxes (Impuestos)	2.07	US$/t
Quay dues (Muellaje)	0.6	US$/t
Stowing (Estiba)	3	US$/t

Discharging, transport to the warehouse (Descarga, transporte a bodega)	2.42	US$/t
Warehouse and loading to the plant (Bodegaje y cargada a planta)	0.97	US$/t
Freight to the plant (Flete interno a planta)	2.41	US$/t
Delay in the harbour (Demora en Puerto)	1.5	US$/t
Others (Otros)	0.1	US$/t
Price coal (including transport)	48.07	US$/t

This reference has been provided by a cost specification from INCSA (Industria nacional de Cementos de Costa Rica S.A.), the biggest coal consuming facility in Costa Rica during the past decade, and can be considered reliable. The estimated freight costs to the plant (in comparison with INCSA) are substantially lower than INCSAs real costs since INOLASA is located in Barranca, Puntarenas, nearby the harbour and the INCSA plant is located in Cartago, around 150 km away.

a. price of biomass including transport

Although renewable biomass will be provided from different sources, it has been considered to receive a continuous and confident supply of biomass from mainly three palm oil mills from NUMAR group. One of these palm oil mills, Coto, has already implemented technology measures and an efficient management use of its residues. This investment was undertaken before the start of the CDM project and will consequently not be reflected in a price for the biomass from Coto. But in order to contribute to the development of the community purchase of PKH from the Coto mill is made through a donation-procurement scheme with a nearby rural school. The price of one dollar per ton is meant as a voluntary donation to the school in order to involve the local community in the project and to make a social contribution.
On the other hand the reconditioning measures at Palo Seco and Naranjo to the existing boilers have been undertaken in order to release biomass resources and supply biomass especially for the project following the example of Coto. The following table details the cost associated with boiler's reconditioning and modification:

Table 2: Boiler's reconditioning and modification costs

Boiler's site	**Investment related** *US$*
Palo Seco	*288,044*
Naranjo	*204,278*

Consequently these investments have been transferred to the economic value of the newly available palm oil residues. Due to this reason, a renewable fuels market has developed in the area. The following table details the prices of the renewable resources related to the NUMAR's palm oil mills:

Table 3: Boiler's reconditioning and modification costs

Source of fuels	**Price**

		US$/t	
	Price PKH and EFB from Palma Tica Quepos (Palo Seco & Naranjo)	50	
	Price PKH from Palma Tica Coto	1	

[Acceptance and close out by validator]
Date: 12-04-2007; M. van der Linden

Refer to NIR 3

Coal boiler quotation, the coal cost specification from INCSA and the financials of coal provide evidence that coal was the alternative scenario to the project. In the financial sheets there is also a cash flow for bunker, this shows unattractiveness of continued bunker use compared to coal.

No precedent found for the switch from bunker to coal in Costa Rica nor is there a precedent for the switch from bunker to biomass

NIR3 & NIR 4 closed

Date: 13-01-2007 Raised by: Marco van der Linden / Siddharth Yadav

No.	Type	Issue	Ref
5	NIR	Please provide further evidence that the coal fired boiler is the most likely baseline scenario and not the bunker fuel. This would include a copy of the feasibility study done in 2004 and the decision (board minutes) of the decision of the company to proceed with coal.	3.3

[Reply from project]
Date: 20-03-2007

Please, refer to answer to question 3.

[Acceptance and close out by validator]
Date: Copy of the feasibility study pending, e-mail communication provided.
NIR 5 closed

Date: 13-01-2007 Raised by: Marco van der Linden / Siddharth Yadav

No.	Type	Issue	Ref
6	NIR	For the monitoring of the power produced by the project, the PDD indicated the steam flow will be monitored and the energy will be calculated. Please provide further information in the PDD on this calculation and if this involves monitoring of other parameters, for example steam pressure and temperature to determine steam enthalpy	4.2

[Reply from project]
Date: 20-03-2007

The general steam consumption for heat requirements at INOLASA, is of 525 kg. of saturated steam at 10 bars of pressure per each tonne of soy produced. There are no variations in the characteristics of the consumed steam during the production of soybean. For this reason, only the variables mentioned in the PDD will be monitored.

The following table synthesises the characteristics of saturated steam at 10 bar of pressure:
Table 4: Main characteristics of saturated steam at 10 bar

[Acceptance and close out by validator]
Date: 13-04-2007; M van der Linden

Normally a boiler operates in a range of pressure. However, the pressure (simultaneously temperature) varies depending on the fluctuation in steam demand which can vary depending on the amount of output (tonnes of soy). Unless you can show the plant is always operating at the same load factor, for saturated steam at least one parameter out of pressure and temperature is expected to estimate enthalpy. The measurement of these parameters should be very common in industries.

[Reply from project]
Date: 13-04-2007

This is wrong. The boiler has to operate always at the same pressure because the steam consuming equipment operates at a design pressure. The demand from the plant affects the flow (measurement of this variable is included in the monitoring plan) but not the pressure since a variation in pressure will cause a breakdown of the plant. Evidence on this is provided through a couple of extracts of the plant equipments manufacturer specifications. These documents clearly state that the required pressure at the plant site has to be at least 10 bar. Since the boiler is located on a distance from the plant the operating pressure needs to be 12 bar in order to always guarantee the supply of steam at 10 bar at the plant site. To prove this one measurement of the conditions of the steam at the outlet of the boiler shall be undertaken after due start of operations of the biomass boiler. This measurement will be supervised by an independent local official. The state of the steam at this one time measurement, in combination with the continuously measured steam flow, shall be used for the calculation of the generated energy for monitoring.

[Reply from project]
Date: 20-04-2007

The general steam consumption for heat requirements at INOLASA, is of 525 kg. of saturated steam at 10 bars of pressure per each tonne of soy produced. There are no variations in the characteristics of the consumed steam during the production of soybean. For this reason, only the variables mentioned in the PDD will be monitored.

The following table synthesises the characteristics of saturated steam at 10 bar of pressure:

Table 4: Main characteristics of saturated steam at 10 bar.

Absolute pressure	Boiling point	Specific volume (steam)	Density (steam)	Specific enthalpy of liquid water (sensible heat)		Specific enthalpy of steam (total heat)		Latent heat of vaporization		Specific heat	Dynamic viscosity
bar	℃	m3/kg	kg/m3	kj/kg	Kcal/kg	kj/kg	Kcal/kg	kj/kg	Kcal/kg	kj/kg	kg/m.s
10	179.88	0.194	5.147	762.60	*182.14*	2776.16	663.07	2013.56	*480.93*	2.5944	0.000015

The actual steam flow will be related to the energy delivered by the boiler through the following equation:

$E_{ss} = h_{ss} \times Q_{ss}$

Where

E_{ss} *: energy delivered by the boiler (kJ)*

h_{ss}*: enthalpy of the saturated steam at 10 bar (2776.16 Kj/kg set as a default value).*

Q_{ss} *: steam flow monitored (kg/yr)*

[Acceptance and close out by validator]
Date: 20-04-2007; M van der Linden

Normally a boiler operates in a range of pressure. However, the pressure (simultaneously temperature) varies depending on the fluctuation in steam demand which can vary depending on the amount of output (tonnes of soy). Unless you can show the plant is always operating at the same load factor, for saturated steam at least one parameter out of pressure and temperature is expected to estimate enthalpy. The measurement of these parameters should be very common in industries.

[Reply from project]
Date: 10-05-2007

This is not always true.. The boiler has to operate at the same pressure because the steam consuming equipment operates at a design pressure. The demand from the plant affects the flow (measurement of this variable is included in the monitoring plan) but not the pressure since a variation in pressure will cause a breakdown of the plant. Evidence on this is provided through a couple of extracts of the plant equipments manufacturer specifications. These documents clearly state that the required pressure at the plant site has to be at least 10 bar. Since the boiler is located on a distance from the plant the operating pressure needs to be 12 bar in order to always guarantee the supply of steam at 10 bar at the plant site. To prove this one measurement of the conditions of the steam at the outlet of the boiler shall be undertaken after due start of operations of the biomass boiler. This measurement will be supervised by an independent local official. The state of the steam at this one time measurement, in combination with the continuously measured steam flow, shall be used for the calculation of the generated energy for monitoring.

[Acceptance and close out by validator]
Date: 12-05-2007

OK. NIR 6 closed

Date: 13-01-2007 Raised by: Marco van der Linden / Siddharth Yadav

No.	Type	Issue	Ref
7	NIR	For the monitoring of the project emissions from the transport of the biomass please clarify how you would account for the differences in truck load or truck size. Also provide information on how this information can be verified later on (will slips with origin be available for each truck?)	

[Reply from project]
Date: 20-03-2007

There is going to be only one type of trucks used for this project. These are the common trucks used for palm oil residues transportation in the area, and they are always filled up its full capacity with load. Calculations in the PDD assume the highest load and the highest fuel consumption, in order to preserve conservativeness. Their characteristics are synthesized in the following table:

Table 5: Main characteristics of double axis trucks

Variable	***value***	***Unit***
Length	*13,72*	*m*
Load capacity	*25 - 28*	*TM*
Fuel consumption	*0,4 - 0,6*	*Diesel lt/ km*
Number of vehicles used	*4*	
Average distance traveled by one vehicle	*200*	*Km.*
Calorific value of Diesel	*46,000*	*MJ/kg*

Rented trucks are used to import the palm oil plant, rice husk or any type of biomass to the site. The following pictures characterize further these types of trucks.

Fig. 2 & 3 : Trucks for biomass transportation purposes.

The transport management involved in fuel transportation considers records of each trip done by the truck, storing variables such as date of the trip, supply number and total load weight. Although these data is registered and recorded, these variables are not part of the CDM project's monitoring plan.

[Acceptance and close out by validator]
Date: 12-04-2007; M. van der Linden

As indicated in the PDD, the trucks are travelling a long distance from part of the country where the palm oil mills are located to INOLASA. Will they be driving back empty? In the calculation of emissions from the trucks you have used one-way distances but would the drive back also be attributable to the project (and therefore should emission be taken into account).
[Reply from project] Date: 10-05-2007 The trucks will drive back empty. Calculations have been adjusted in the resubmitted spreadsheets. NOTE: In the calculations the specific fuel consumption has also been updated. In the PDD body the actual value of 0,4-0,6 l/km was stated but it was not updated in the calculations and in the table VF_{cons} in section B.6.2. Former value: 2.08 l/km; new conservative value: 0.6 l/km. Evidence of this value from the transport company is submitted as well. The update leads to a change in project emissions and thus to a change in the estimated amount of emission reductions. The respective sections have been updated in the PDD.
[Acceptance and close out by validator] Date: 12-05-2007 Calculation revised to reflect changes, NIR 7 Closed

Date: 13-01-2007 Raised by: Marco van der Linden / Siddharth Yadav

No.	Type	Issue	Ref
8	NIR	Can you please provide further information on QA/QC procedures for the management of the project and to ensure the quality of the data including: - authority and responsibility of project management - authority and responsibility for registration, monitoring, measurement and reporting - training of monitoring personnel? - maintenance of monitoring equipment and installations? - day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) - monitoring data adjustments and uncertainties? - internal quality checks	

[Reply from project]
Date: 20-03-2007

INOLASA is responsible for the operation of the biomass boiler and administration of the data, also for the costs of the operation and maintenance of the boiler's control system.

The commissioning of the boiler is done by the technology provider PETRA. INOLASA will be responsible for the installed technology. INOLASAs personnel will be trained by PETRA that afterwards will support INOLASA's technical team. A training plan is carried out by PETRA during the first weeks of operation.

INOLASA will be in charge of monitoring the performance of the project activity related to carbon

emission. Since no leakage is expected from the project activity, the emission reductions will be monitored by installing the adequate and calibrated meters according to the standards of Costa Rica.
The procedures for data collection and monitoring management will include:

- *Management structure for monitoring*
  - *Monitoring team*
  - *Changes in monitoring team*
- *Introduction to baseline calculations*
- *Project Management calculations:*
  - *Data collection for monitoring*
  - *Data record and storage*
  - *Emission reduction calculation*
- *Procedures*
  - *Monitoring*
  - *Calibration*
- *Reporting*
  - *Monitoring reporting*
  - *Regular manual update*

Internal Auditing: Procedures for internal auditing will be implemented in order to assure that the monitoring methodology is being performed in the correct manner, describing the non-conformities and proposing correctives measures when needed. The person in charge of following these auditing procedures will be determined with the monitoring team.
Since the monitoring equipment is the same as the Operation equipment, the maintenance will be performed in the same way. Specific training for the Monitoring Team will be provided prior to the boiler's operation.

[Acceptance and close out by validator]
Date: 12-05-2007; M van der Linden
Information is included in the revised PDD (version 2) and is accepted.

NIR8 closed out

Date: 12-04-2007 Raised by: Marco van der Linden

No.	Type	Issue	Ref
9	NIR	On the use of the CDM PDD template (version 3), it was noted that section D2 was not completed. If this section is left blank on purpose, can you please indicate this in the PDD Also ensure in section B.6.2 you complete the row with source of data used. Specifically interested in source and assumptions for the VF_{cons}	1.6

[Reply from project]
Date: 10-05-2007

Regarding section D.2: This has been included in the PDD as :
After determining the project's feasibility, SETENA agreed that the project didn't require preparing an Environmental Impact Study (EsIA) because there was no evidence of significant environmental impacts.

Regarding Section B.6.2 this has been completed and specified as required in the attached PDD
[Acceptance and close out by validator] Date:12/05/07 NIR9 Closed

Date: 12-04-2007 Raised by: Marco van der Linden

No.	Type	Issue	Ref
10	NIR	It was noted that the expected lifetime of the project is 25 years. However, in the calculation of the NPV/IRR you have only taken into account 10 years. Is there a reason why you have selected not to calculate the IRR of the full lifetime of the project	3.2
[Reply from project] Date: 10-05-2007 10 years is the typical period on which investment decisions are taken throughout this company and the type of industry involved.			
[Acceptance and close out by validator] Date:12/05/07 NIR 10 closed			

Date: 12-04-2007 Raised by: Marco van der Linden

No.	Type	Issue	Ref
11	NIR	It was noted that the sensitivity analysis in table B2 (5% on O&M) does not affect the IRR outcome compared to table B1. Have you also performed a sensitivity analysis for variations in other parameters such as fuel prices (also refer to NIR 3)?	3.2

[Reply from project]

The following table has been included in the PDD, adjusted with two additional analysis where it is shown that none of this options surpass. The respective calculations are submitted in the updated spreadsheets.

Option	**Description**	**Sensitivity in O&M**	**IRR (10 years)**
2	Implement coal-fired boilers for heat generation	+5%	62%
3	Develop the project activity without CDM revenue	-5%	61%
Option	**Description**	**Sensitivity in fuel cost**	**IRR (10 years)**
4	Implement coal-fired boilers for heat generation	+5% (in cost of coal)	61%
5	Develop the project activity without CDM revenue	-5% (in cost of biomass)	61%

[Acceptance and close out by validator] Date: 12/05/07 NIR 11 closed

Date: 12-04-2007 Raised by: Marco van der Linden

No.	Type	Issue	Ref
12	NIR	In section A4 of the PDD it is described that the steam is currently produced with two bunker-fuelled boilers. However, in the account of the discussion during the local stakeholder consultation, there is reference to three boilers being currently operated. Please clarify what will happen with this third boiler and how this impacts on steam requirements, baseline selection etc.	2.3
[Reply from project] Date: 10-05-2007 The third boiler was used as backup. None of the three boilers will be used when the biomass boiler is operating. They might be used during maintenance though. This will not affect project emission reduction calculations since during maintenance there will be no steam flow from the biomass boiler.			
[Acceptance and close out by validator] Date: 12/05/07 NIR12 Closed			

Date: 12-04-2007 Raised by: Marco van der Linden

No.	Type	Issue	Ref
13	NIR	Start of crediting period can only be following registration. PDD currently indicates 01/03/2007 and this is therefore not possible. Please select new starting date of crediting period.	8.3.1
[Reply from project] Date: 10-05-2007 This has been corrected in the PDD as required.			
[Acceptance and close out by validator] Date: 11/07/07 NIR 13 closed			

Observations:

Observation 1

The PDD is claiming sustainable development benefits through the buying of biomass via the school and in terms of employment, however the monitoring plan does not foresee in monitoring these effects so they cannot be quantified.

Annexure IV - Statement of Competence

Statement of Competence

Name:Marco van der Linden SGS Affiliate:SGS Netherlands

Status

- Product Co-ordinator ☒
- Operations Co-ordinator ☒
- Technical Reviewer ☒
- Expert ☒

	Validation	Verification
- Local Assessor	☐	☐
- Lead Assessor	☒	☐
- Assessor / Trainee Lead Assessor	☒	☒

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	☒
2. Energy Distribution	☐
3. Energy Demand	☒
4. Manufacturing	☐
5. Chemical Industry	☐
6. Construction	☐
7. Transport	☐
8. Mining/Mineral Production	☐
9. Metal Production	☐
10. Fugitive Emissions from Fuels (solid,oil and gas)	☐
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	☐
12. Solvent Use	☐
13. Waste Handling and Disposal	☒
14. Afforestation and Reforestation	☒
15. Agriculture	☐

Approved Member of Staff by 08/12/05 Date: Gareth Phillips

Statement of Competence

Name:Siddharth Yadav SGS Affiliate:SGS United Kingdom Ltd.

Status

- Product Co-ordinator ☒
- Operations Co-ordinator ☐
- Technical Reviewer ☒
- Expert ☒

	Validation	Verification
- Local Assessor	☐	☐
- Lead Assessor	☒	☒
- Assessor / Trainee Lead Assessor	☒	☒

Scopes of Expertise

1. Energy Industries (renewable / non-renewable) ☒
2. Energy Distribution ☐
3. Energy Demand ☐
4. Manufacturing ☒
16. Chemical Industry ☐
17. Construction ☐
18. Transport ☒
19. Mining/Mineral Production ☒
20. Metal Production ☐
21. Fugitive Emissions from Fuels (solid,oil and gas) ☐
22. Fugitive Emissions from Production and ☐

Consumption of Halocarbons and Sulphur Hexafluoride

23. Solvent Use ☐
24. Waste Handling and Disposal ☒
25. Afforestation and Reforestation ☐
26. Agriculture ☐

Approved Member of Staff by Marco van der Linden Date: 24-04-07

Statement of Competence

Name:Emilio Doens SGS Affiliate:Panama

Status

- Product Co-ordinator ☒
- Operations Co-ordinator ☐
- Technical Reviewer ☐
- Expert ☒

	Validation	Verification
- Local Assessor	☒	☒
- Lead Assessor	☒	☒
- Assessor / Trainee Lead Assessor	☐	☐

Scopes of Expertise

1. Energy Industries (renewable / non-renewable) ☒
2. Energy Distribution ☐
3. Energy Demand ☐
4. Manufacturing ☐
27. Chemical Industry ☐
28. Construction ☐
29. Transport ☐
30. Mining/Mineral Production ☒
31. Metal Production ☐
32. Fugitive Emissions from Fuels (solid,oil and gas) ☐
33. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride ☐
34. Solvent Use ☐
35. Waste Handling and Disposal ☐
36. Afforestation and Reforestation ☐
37. Agriculture ☐

Approved Member of Staff by Siddharth Yadav Date: 15-06-2007