VALIDATION REPORT

LDEO BIOMASS STEAM AND POWER PLANT IN MALAYSIA

REPORT NO. 2006-0590

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DET NORSKE VERITAS

VALIDATION REPORT

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Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Landfill Gas Canada Ltd.	Client ref.: Hamaliuk Gerald

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Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "LDEO Biomass Steam and Power Plant in Malaysia" project 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. This validation report summarizes the findings of the validation.

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

In summary, it is DNV's opinion that the project, as described in the project design document of 18 April, 2006, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodologies AMS I. C and III. E. Hence, DNV requests the registration of the "LDEO Biomass Steam and Power Plant in Malaysia " as a CDM project activity.

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Report title: LDEO Biomass Steam and Power Plant in Malaysia	
Work carried out by: Haoxiang Jiang	
Work verified by: Mari Grooss Viddal	
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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EFB	Empty Fruit Bunches
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LDEO	Lahad Datu Edible Oils Sdn. Bhd.
MP	Monitoring Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organization
SESB	Sabah Electricity Sdn. Bhd.
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

The Landfill Gas Canada Ltd. has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the "LDEO Biomass Steam and Power Plant " project (hereafter called "the project") in Malaysia. This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consisted of the following personnel:

Mr Haoxing Jiang	DNV Certification China	Team Leader, GHG auditor
Mr Tsuyoshi Nakao	DNV Certification Japan	GHG auditor
Mr Michael Lehmann	DNV Certification Norway	Sector expert
Ms Mari Grooss Viddal	DNV Certification Norway	Technical verifier

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 methodologies AMS I.C and AMS III.E. The validation team has, based on the recommendations in the Validation and Verification Manual /7/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

1.3 Description of LDEO Biomass Steam and Power Plant in Malaysia

The purpose of the "LDEO Biomass Steam and Power Plant in Malaysia" project is to use empty fruit bunches (EFB), a waste product of the palm oil milling process, as the fuel for biomass-fired cogeneration system to supply steam and electricity to the Lahad Datu Edible Oils (LDEO) Sdn. Bhd. palm oil refinery in Sabah, Malaysia.

The project will be implemented in two stages. At the first stage, 35 t/h of steam will be generated for the palm oil refinery process consumption. The second stage of the project will be

optimizing the steam energy by installing a steam turbine generator to supply up to 5 MW of electricity for the refinery's own use.

The project activity will be able to reduce emissions in three ways;

i) by displacing fuel oil, which is used to generate 35 t/h of steam,

ii) by displacing electricity from the local grid and

iii) by reducing methane emissions from the rotting EFB waste piles.

The expected amount of emission reductions is approximately 208 871 tCO_{2e}/ year.

2 VALIDATION METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design and the baseline and monitoring methodology
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 customized for the project, according to the Validation and Verification Manual /7/. 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 organizes, 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 "*LDEO Biomass Steam and Power Plant in Malaysia*" project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfillment of validation protocol criteria or where a risk to the fulfillment 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 /1/ dated 31 December 2005 and the revised version dated 18 April 2006 submitted by the Landfill Gas Canada Ltd. and additional background documents /4/-/6/ related to the project design and baseline were assessed as a part of the validation.

2.2 Follow-up Interviews

In the period of 21-25 March 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Landfill Gas Canada Ltd., Lahad Datu Edible Oils Sdn. Bhd. and Tong Len Plantation Sdn Bhd. were interviewed. The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Landfill Gas Canada Ltd. Gerry Hamaliuk – principal engineer	➢ Applicability of selected methodology ➢ Baseline determination ➢ Project additionality ➢ Emission reductions calculation ➢ Emission reduction monitoring plan
Lahad Datu Edible Oils Sdn. Bhd. Daniel Koh King Hoon – Assistant plant Manger Azmer Shamsuddin General Manager	➢ Project background information ➢ Technology used for the project ➢ Project approval status (incl. EIA approval, CDM project approval status) ➢ Stakeholder consultation process
Tong Len Plantation Sdn. Bhd. – Michael Chok Chee Fan, Mill Manager	➢ Baseline determination – availability of EFB in the region

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The Corrective Action Request and requests for Clarification raised by DNV were resolved during communications between the Landfill Gas Canada Ltd. and DNV.

The initial validation of the project identified one *Corrective Action Request* and two *Requests for Clarification*. These were presented to the project participant in the form of a draft validation report (rev. 00). The project participant's response to DNV's initial findings, which also included the submission of a revised PDD on 18 April 2006, addressed the raised *Corrective Action Request* and requests for *Clarifications* to DNV's satisfaction. To guarantee the transparency of the validation process, the concerns raised and responses given are summarised in chapter 3 below and documented in more detail in 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 project design documentation, version 2 of 18 April 2006.

3.1 Participation Requirements

The project participants for this project are LDEO Energy Sdn. Bhd. of Malaysia and Landfill Gas Canada Ltd. of Canada. Both participating Parties, Malaysia as the host Party and Canada as the Annex-I Party, meet the requirements to participate in the CDM. The Letter of Approval from the DNA of Canada and the DNA of Malaysia are received /2/-/3/. The written approval from the DNA of Malaysia has confirmed that the project is in line with sustainable development priorities in Malaysia.

3.2 Project Design

The project will use empty fruit bunches (EFB), a waste product of the palm oil milling process, as fuel for the biomass fired cogeneration system in order to produce the steam and electricity. The biomass fuel will be sourced from palm oil mills in the vicinity of the palm oil refinery via fuel purchase agreements.

The biomass fired co-generation is developed and manufactured by a local company and has a total capacity of 35 tonnes steam per hour, equivalent to 23$MW_{th.}$ The technology represents current good practice in Malaysia and is based on the design development from an Annex I country.

LDEO Energy Sdn. Bhd. (LEDO) is currently operating three oil fired boilers to supply steam for the refining process, and is purchasing electric power from the electricity grid. The project will replace the amount of steam and displace the electricity from the grid, thus reduce greenhouse gas emissions from the refinery and the local electricity grid. By burning the currently dumped EFB as fuel for the new co-generation plant, the project activity will also avoid the production of methane from EFB that would otherwise have been left to decay.

By promoting renewable energy, the project is likely to contribute to sustainable development in Malaysia. This has been confirmed by the Malaysian DNA.

The project construction started in April 2006; the operation is expected to start in June 2006. The project lifetime is estimated to 30 years. A renewable crediting period of 7 years is selected. The first crediting period is expected to start on 1 June 2006. The estimated annual emission reductions of the proposed project are on average 208 871tCO_{2e} per year for the first seven-years crediting period.

The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Malaysia.

3.3 Project Baseline

The total capacity of installed biomass fired cogeneration will be approximately 23 MW_{th}. This

is below the 45 MW_{th} limitation which is stipulated in AMS I.C. For the methane avoidance component, the project direct emissions (estimated project emissions are 7 971 tCO_{2e}/year) are less than 15 kilo tonnes of CO_{2e} annually. The project is thus eligible as type I.C. and type III.E. small-scale CDM project activity (*Type I: Renewable energy projects, Category C - Thermal energy for the user*" and "*Type III: Other project activities, Category E - Avoidance of methane*"), as outlined in the simplified modalities and procedures for small-scale CDM project activities.
The project correctly applies the approved methodology AMS I.C. and AMS III. E.

The project boundary for the heat/electricity component (AMS I.C) is defined as the physical, geographical site of the biomass fired cogeneration plant for steam generation that displaces fuel oil in the existing oil-fired boilers and the electricity generation that displace the grid electricity. For the methane avoidance component (AMS III.E), the project boundary is defined as the physical, geographical site where the treatment of biomass takes place.

It has been verified that the project activity is not a debundled component of a larger project activity.

It has also been verified that:

- LEDO would continue to operate three fuel oil fired boilers to supply steam for the refining process, burn diesel in engine electricity generators and purchase power from the electricity grid in the absence of the project activity.
- Open air burning in Malaysia is prohibited by law and the EFB left to decay within the project boundary and methane emitted to the atmosphere is deemed the mostly likely scenario in absence of the project activity.

Therefore, the baseline for the project activity is determined as i) the GHG emissions from continued use of oil-fired boilers to meet the steam demand of LDEO refinery, ii) the GHG emissions from continued use of power from the local electricity grid, and iii) the situation where, in the absence of the project activity, biomass (EFB) is left to decay and methane is emitted to the atmosphere.

For AMS I.C, the baseline emissions are the emissions from fuel consumption of the technologies that would have been used in the absence of the project activity times an emission coefficient for the fossil fuel displaced, i.e. the biomass based steam supply to the refinery to displace oil-fired based steam and electricity. The baseline for the grid electricity displacement is the annual kWh generated by the project times an emission coefficient calculated as the weighted average emissions (in kg CO_2e/kWh) of the current generation mix, in line with AMS I.D.

For the AMS III.E the baseline emissions are the amount of methane from the decay of the same amount of biomass as treated in the project activity.

In summary the baseline determination is transparent, and the application and justification of the selected baseline methodology is correct.

3.4 Additionality

The investment barrier, technological barrier, prevailing practice barrier and other barriers such as limited information, organizational capacity, and financial resources have been discussed for the project.

(a) Investment barrier:

The three existing oil fired boilers are in good maintenance condition and meet the local environmental regulations. The use of oil-fired boilers is in compliance with all applicable legal and regulatory requirements in Malaysia as long as all the local safety and pollution standards are met. At present there is no direct program or regulation limiting the future use of fuel-oil. With regards to the grid generated electricity, there are no national circumstances or policies that would reduce the use of oil and electricity in the baseline. National policies of promoting the use of renewable energy were announced as part of the 8th Malaysia Plan in 2001, and the target is to increase the power production from renewable energy sources. However, there is no direct program or regulation that requires the change of fuel-oil use or the grid generated electricity mix at present or in the near future. Also, the supply of electricity from the local grid has been stable and does not cause any significant outages or problems so far. So there is no immediate need to change the current practice – from oil fired boiler to the biomass fired boiler which requires additional investment.

(b) Technological barrier:

Utilizing EFB for combustion and energy production is fairly new in Malaysia. A special fuel preparation system for drying and shredding the EFB will have to be installed. The technology of such preparation is not mature and quite new in the region. A technology barrier that leads to higher risk and higher costs for the project than in a situation where conventional technologies were to be used is thus acknowledged.

As the technology used by the project is new, LDEO lacks knowledge of this type of biomass fired cogeneration. This situation leads to reluctance in venturing into such a project.

(c) Barrier due to prevailing practice:

The majority of the palm oil refineries in Malaysia are using fossil fuels to generate steam. The project introduces both new technologies and a new fuel resource which is un-familiar to the palm oil refinery management and staff. Hence, there is little willingness to invest or take the risk of such a major change in the energy supply.

Given the above, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions are hence additional.

3.5 Monitoring Plan

The project correctly applies the approved simplified monitoring methodologies AMS I.C and AMS III. E.

The metering of steam and electricity generated, measuring of the amount of biomass combusted in the boiler and measuring the energy content of biomass, will give opportunity for real measurements of achieved emission reductions. EFB will be measured by weighbridge. In addition, the energy content of biomass will be measured annually through a qualified laboratory.

For small-scale biomass projects, leakage needs to be considered. It has been verified that the biomass cogeneration used by the project is not the equipment transferred from another activity. Follow-up interviews have confirmed that there is a surplus of EFB in Malaysia and in the Sabah area. Hence, no leakage effects due to diverting EFB from other uses and thereby increasing

fossil fuel use are likely to occur. Transport of EFB would be required in the baseline for dumping of EFB in landfills and in the project scenario for transport of EFB from the neighbouring palm oil mills to the boiler. Leakage emissions related to transport of EFB and ash are therefore assessed as negligible. The monitoring plan provides for the collection, archiving and recording of all relevant data necessary for determining baseline emissions and project emissions as required by AMS I.C and AMS III.E.

The project is under construction stage. Training of the current workforce will be provided by the technology provider. The management manual including responsibilities and authorities for project management, detailed procedures for monitoring and reporting, QA/QC procedures, procedures for calibration of metering equipment and procedures for training and maintenance will need to be implemented at the latest prior to the start of the crediting period to enable subsequent verification of emission reductions.

3.6 Calculation of GHG Emissions

Baseline emissions have been calculated as follow:

i) Emissions from fuel oil displacement. To estimate fuel oil displacement, the baseline emissions are equal to the fuel consumption times an emission coefficient of the fuel displaced. The fuel consumption is estimated through monitoring of steam production and a boiler efficiency of 85%, which is deemed reasonable. An IPCC default value for the fuel displaced and the steam heat value of 2.36 GJ are used and deemed appropriate.

ii) Emissions from electricity displacement. The baseline emissions from electricity displacement, are the electricity generated/displaced by the project times an emission coefficient for the SESB grid. The grid electricity baseline is calculated by multiplying the electricity (kWh) produced by the renewable generating unit by the weighted average emissions (in $kgCO_2/kWh$) of the current generation mix.

Since no official Malaysian grid carbon emission factor (CEF) is publicly available, the emission factor for the project is calculated based on SESB grid electricity generation data for 2005, IPCC default values for net calorific values and carbon emission factors and conservative estimates of power plant efficiencies, i.e. 50% for natural gas, 33% for heavy fuel oil and 33% for diesel oil.

In the revised PDD of 18 April 2006, the grid emission factor has been calculated to 0.531 tCO_2/MWh. This is deemed appropriate and is also in line with the guidance provided in ACM0002 footnote 3 /8/ and the latest clarification from EB for the Brazilian grid on a similar situation /6/.

Actual steam and electricity produced will be monitored *ex-post*.

iii) Methane emissions from the decay of EFB in the baseline scenario are calculated based on the amount of biomass treated in the project activity and using IPCC default values for DOC, DOC_f, MCF and F as given in the simplified baseline methodology for type III.E small-scale CDM project activities. In the absence of other more specific data, IPCC default values are deemed acceptable. The biomass treated by the project is estimated to 122 500 tonnes of EFB per year. The actual amount of biomass combusted will be monitored *ex-post* and be applied to determine project and baseline emissions.

Project emissions have been calculated as follows:

- CH_4 and N_2O emissions related to the combustion of biomass are calculated by using IPCC default values.
- CO_2 emissions related to the power used by the project facilities are calculated by applying the weighted grid emission factor of 0.531 tCO_2/MWh.

Emissions related to transport of EFB and ash are assessed as negligible as transport of EFB would be required in the baseline and project scenario. This is verified and deemed appropriate.

3.7 Environmental Impacts

The project is located in the centre of Lahad Datu Industrial Park, Sabah, Malaysia. As the plant is located in a designated industrial park approved by the Malaysian government, there will not be any significant impact on neighbours or the environment. As the biomass waste will be used for energy production with efficient combustion and emission control, no significant environmental impacts are foreseen for the project activity. An environmental impact assessment is not required for this type of project in Malaysia.

The project activity has received the approval letter by the local environmental authority on 23 June 2005.

3.8 Comments by Local Stakeholders

The project is located within the boundary of the existing plant sites of LDEO in Lahad Datu Industrial Park, Sabah, Malaysia.

The stakeholder consultation process includes official reports announcing a Public Forum of the project in four different local newspapers. The local key stakeholders from the energy sectors and stakeholders from the local community have been consulted.

Due account was taken of the comments received, and this has been elaborated in the PDD.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 31 December 2005 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 31 January 2006 to 1 March 2006.

One comment was received on 22 February 2006. The comment received (in unedited form) is given in the below text box.

Comment by: Mark Meyrick, EDF Trading Ltd

Inserted On: 2006-02-22

Subject: LDEO Biomass Steam & Power Plant in Malaysia

Comment:

As detailed in february's WWF publication 'Action', and geographical magazine for March 2006, destruction of forest in the mountains of Kalimantan between Indonisia & malaysia is having a devastating effect on Orang-utan populations. This is also recognised by Sabah Forestry Director Datuk Sam Mannan (6 Feb) http://sabahtravelguide.com/news/details.asp?newsid=352

The concern here must be that allowing this use of palm nut detritus will encourage more palm oil plantations, by improving the rate of return to such plantations. It must be ensured that any such palm oil waste, that is used, is not coming from new plantations which have been made from recent forest clearances. However, this assurance cannot be given, as such material is homogenous, and its origin impossible to prove. Our recommendation is that any such CDM activity relating to palm oil, should not be approved in this province, or indeed in the adjacent Indonesian provinces.

***How DNV has considered the comment received in its validation**:*

This project only applies biomass waste that would have been produced also in the absence of the project. Hence, the project is not seen to have any effect on the Malaysian forest. The approved methodologies, AMS I.C and AMS III.E have no requirements on the origins of biomass used as fuel for the project. The only relevant requirement is that there is an abundant supply of biomass in the region. The abundant supply of EFB in Sabah and in the neighbourhood has been verified during the validation. It has also been verified that the project will be sourcing the biomass waste from neighbouring palm oil mills via fuel purchase agreements.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "LDEO Biomass Steam and Power Plant" project in Malaysia. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is Malaysia and the Annex I Party is Canada. Malaysia and Canada fulfil the participation criteria of the CDM. By promoting renewable energy, the project is likely to contribute to sustainable development in Malaysia. Approval letters by the Malaysian DNA and Canadian DNA, including a confirmation by the Malaysian DNA that the project assists in achieving sustainable development are provided.

The project is eligible as type I.C. and type III.E. small-scale CDM project activity ("Thermal energy for the user" and "Other project activities/Avoidance of Methane", respectively) as outlined in the simplified modalities and procedures for small-scale CDM project activities, and the project correctly applies the simplified baseline and monitoring methodologies given for these types of small-scale CDM project activities.

By providing carbon-neutral electricity and steam for own use, the project activity will displace fossil fuel-based steam and electricity generation, thereby reducing greenhouse gas emissions. At the same time, the project also avoids methane emissions due to empty fruit bunches being burned and no longer being left for decay. The metering of steam and electricity generated and measurement of biomass combusted, will give opportunity for real measurements of achieved emission reductions.

The additionality of the project is demonstrated through the existence of investment, technology and prevailing practice barriers. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

Given that the project is implemented as designed and applies the approved baseline and monitoring methodologies, the project is likely to achieve the estimated amount of emission reductions.

In summary, it is DNV's opinion that the "LDEO Biomass Steam and Power Plant in Malaysia" project in Malaysia, as described in the project design document of 18 April 2006, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology under category AMS–I.C. and III.E. DNV thus requests the registration of the "LDEO Biomass Steam and Power Plant in Malaysia" project as a CDM project.

REFERENCES

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

/1/ CDM PDD, version 1 of 31 December 2005 and version 2 of 18 April 2006

/2/ Letter of Approval from DNA Malaysia, 14 April 2006.

/3/ Letter of Approval from DNA Canada, 24 April 2006

/4/ Feasibility Study on Grid Connected Power Generation Using Biomass Cogeneration Technology, Jan 2000, by Pusat Tenaga Malaysia, PTM.

Noel Wambeck, Oil Palm Process Synopsis ed. 2, 2001.

/5/ The official website of the Malaysian Palm Oil Board: http://econ.mpob.gov.my/economy/annual/stat2004/Stactitle_04.htm

/6/ SESB Generation Mix 2005: http://www.sesb.com.my/profile.htm

The latest clarification from EB for the Brazilian grid, based on request for guidance from DNV dated 7 October 2005; (http://cdm.unfccc.int/UserManagement/FileStorage/AM_CLAR_M64EHVL0ORCZ63BG7HIRZYJSF4HRZ4)

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

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

/8/ ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources." Version 5: 3 March 2006.

/9/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*. Version 07, 28 November 2005

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

/10/ Landfill Gas Canada Ltd. - Gerry Hamaliuk – principal engineer

/11/ Lahad Datu Edible Oils SDN. BHD. - Daniel Koh King Hoon, Assistant plant Manger

Azmer Shamsuddin, General Manager

/12/ Tong Len Plantation SDN. BHD. – Michael Chok Chee Fan, Mill manager

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APPENDIX A

VALIDATION PROTOCOL
FOR SMALL-SCALE CDM PROJECT ACTIVITIES

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

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

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		project can be seen as a diversion of official development assistance (ODA) funding towards Malaysia.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	The Malaysian DNA is the Conservation and Environmental Management Division, Ministry of Natural Resources and the Environment. The Canadian DNA is Canada's Clean Development Mechanism and Joint Implementation Office, Environment, Energy and Sustainable Development Bureau Foreign Affairs, Canada
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	Malaysia has ratified the Kyoto protocol on 4 September 2002. Canada has ratified the Kyoto Protocol on 17 December 2002.
10. The participating Annex I Party's assigned amount	CDM Modalities and	OK	Canada's assigned

Requirement	Reference	Conclusion	Cross Reference/ Comment
shall have been calculated and recorded	Procedures §31b		amount is 94% of the emissions in1990.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	The validation has not in detail assessed Canada's compliance with article 5 and 7 of the Kyoto Protocol. Canada has in place a national registry and submits its inventory to the UNFCCC.
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	SSC PDD version 02
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F

Requirement	Reference	Conclusion	Cross Reference/ Comment
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 the UNFCCC CDM website via www.dnv.com/Certification/ClimateChange , and parties, stakeholders and NGOs have been invited to provide comments on the validation requirements during a period of 30 days, from 31 January until 01 March 2006. One comment received and considered during the validation.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. **Project Description** The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	The project involves generation of steam and electricity for on-site use, by applying biomass which would have been otherwise left to decay. The project qualifies as AMS-I.C and AMS-III-E project activity and is within the eligibility limits of 45 MW_{th} and 15 tCO_2 of annual project emissions respectively.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR I	The project is not a debundled component of a larger project activity. There is no registered SSC project activity in Sabah, Malaysia. No SSC CDM project activities are: - With the same project participants; and - In the same project category and technology/measure; and - Registered within the previous 2 years; and - That has a project boundary within 1 km of the project boundary of the proposed SSC project activity at the closest point of a larger project activity.		OK
A.1.3. Does proposed project activity confirm to	/1/	DR	Yes. The project activity conforms to AMS I.C and		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
one of the project categories defined for small scale CDM project activities?			AMS III.E criteria.		
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The site of the project activity is clearly defined.		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR	For AMS I. C, the physical, geographical site of the renewable energy generation delineates the project boundary. For the AMS III. E part, the project boundary is defined as the physical, geographical sites where the treatment of biomass takes place.		OK
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR I	The pre-treatment of the EFB to reduce the moisture content (dewater system) reflects current good practices.		OK
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR I	Yes. The technology used for the project activity results in technology transfers from an Annex I Party.		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 I	Training is needed and will be provided by the supplier of the cogeneration unit.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes. The project activity creates less environmental impacts (air pollution) than oil fired boiler and less methane from EFB left to decay as in the current situation. Additional work positions are foreseen.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	The project is unlikely to create any adverse environmental or social effects than the current situation.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	The final confirmation by Malaysia DNA has been received.	~~CAR 1~~	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/	DR I	Yes. The approval letter from the local environmental authority has been verified.		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	/1/	DR	The project correctly applies the approved small scale methodologies AMS-I.C. and AMS-III.E.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
provided for the relevant project category?					
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	For the AMS I.C part, the installed boiler capacity will be approximately 23 MW_{th}, lower than the 45 MW_{th} limitations as required by AMS I. C. For the AMS III. E part, the project direct emissions (estimated to 7 971 tCO_{2e}/year) are less than 15 kilo tonnes of CO_{2e} annually as required by AMS III.E.		OK
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	/1/	DR I	The investment barrier, technological barrier, prevailing practice barrier and other barriers such as managerial resources, have been discussed. (a) Investment barrier: The three existing oil fired boilers are in good maintenance condition and meet the local environmental regulations. At present there is no direct program or regulation limiting the future use of fuel oil and grid generated electricity in the baseline. Also, the supply of electricity from the local grid has been stable and does not cause any significant outages or problems so far. So there is no immediate need to change the current practice – from oil fired boiler to biomass fired boiler.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			(b) Technological barrier: Utilizing EFB for combustion and energy production is new in Malaysia. A special fuel preparation system for drying and shredding the EFB will have to be installed. The technology of such preparation is not mature and not common technology in the region. There is a technology barrier that leads to higher risk and higher costs for the project than in a situation where conventional technologies were to be used. The technology used by the project is new; LDEO lacks of knowledge of biomass fired cogeneration. This situation leads to reluctance in venturing into such a project. (c) Barrier due to prevailing practice: The majority of the palm oil refineries in Malaysia are using fossil fuels to generate steam. The project introduces both new technologies and a new fuel resource which is unfamiliar to the palm oil refinery management and staff. Hence, they are not willing to invest or take the risk of such a major change in the energy supply. Given the above, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions are hence additional.		
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	Yes. The use of oil fired boilers is in compliance with all applicable legal and regulatory requirements in Malaysia as long as all the local safety and pollution standards are met. Although national policies of promoting the use of		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			renewable energy was announced as a part of the 8th Malaysia Plan in 2001 and the target is to increase the power production from renewable energy sources. However there is no direct program or regulation limiting the future use of fuel-oil and grid generated electricity. Therefore, there are no national circumstances or policies that require the project developer to reduce the use of oil and electricity in the baseline. For calculating the steam displacement baseline, fuel consumption and an IPCC emission coefficient of the fuel displaced are applied as required by AMS-I.C. For calculating the electricity displacement baseline, the project has selected the weighted average emission factor as per option b of AMS–I.D. The emission factor of the SESB grid has been calculated. As a fully integrated grid connecting the existing West Coast Grid to the East Coast Grid of Sabah will be completed by the middle of the year 2006, the selection of the SESB grid is appropriate. For calculating the baseline emissions from the decaying biomass, IPCC default formulas as of AMS–III.E. and IPCC default values have been used. This is deemed appropriate.		
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	Yes. See above The project activity conforms to the Malaysian government policy by providing steam and electricity from biomass and utilising empty fruit bunches which were left to decay.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.2.4. Is the baseline selection compatible with the available data?	/1/	DR	Yes. The grid emission factor for the SESB grid has been calculated from data from the SESB annual report.		OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR	Yes.		OK
C. **Duration of the Project / Crediting Period** It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/1/	DR	The project activity has been started in April 2006 and expected to started the operation in June 2006		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	The renewable crediting period (3*7 years) selected is expected to start on 1 June 2006.		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	Yes. The selected monitoring methodology is in line with AMS I. C and AMS III. E		OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes. The AMS I. C part, the capacity of installed biomass fired cogeneration is 23 MW_{th} which is less than 45 MW_{th}, the limitation required for AMS I.C. The AMS III.E part project directly emits less than 15 kilo tones CO_{2e}/year, the limitation required by AMS III. E		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	Yes. The application of monitoring methodology is in line with AMS I. C and III. E		OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	For the AMS I. C part, the emissions reductions will be monitored through directly monitoring and measuring the thermal and electricity generated by the project activity. For the AMS III.E part, the emission reductions will be monitored through monitoring and		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			measuring the baseline emissions, project emissions and leakage.		
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/	DR I	The project emissions are: - CH4 and N2O emissions related to the combustion of the biomass - CO2 emissions related to the power used by the project activity facilities,		OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	CO_2, CH_4 and N_2O are included.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes.		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 I	For biomass projects, the abundant supply of EFB in Sabah and in the region has been checked and deemed sufficient. The use of EFB is therefore unlikely to cause any leakage. It has been confirmed that the equipment used by		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			project is not transferred from another activity and the existing equipment will not be transferred to another activity. Transport of EFB is deemed negligible as this would also occur in the baseline scenario. Leakage is assessed and found negligible. No monitoring is therefore required.		
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 steam and electricity generated and the energy content of biomass will be monitored. Further information is needed on how to estimate and monitor the CH_4 and N_2O emissions.	~~CL 1~~	OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes. See above		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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	The project is under construction stage. The responsibility will be with t LDEO Energy Sdn. Bhd. Detailed responsibilities and procedures have not been developed yet. These will be in place and maintained and implemented at the latest prior to the start of the crediting period to enable subsequent verification of emission reductions.		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR I	Idem		OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR I	Idem Training will be provided by the technology supplier.		OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	Idem		OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR I	Idem The electrical and thermal energy meters will be calibrated according to Malaysian standards to have a high accuracy in measurement. The EFB weighing will be done with a government approved scale for truck weighing to commercial standards.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR I	Idem		OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR I	Idem The electrical and thermal energy parameters can be monitored and verified from monthly invoice issued by biomass plant operator to refinery as this is a part of energy purchase agreement between the two parties. Electricity consumed by the biomass energy plant can be obtained from SESB. Weigh scale will be by an attendant who will compile daily readings into a monthly report format		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		OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR I	Idem		OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR I	Idem		OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR I	Idem		OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR I	Idem		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E. **Calculation of GHG emission** It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions The validation of 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	The project emissions include: - CH4 and N2O emissions related to the combustion of the biomass - CO2 emissions related to the power used by the project activity facilities		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 calculation is in line with AMS III. E and AMS I.C		OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	Yes.		OK
E.1.5. Have conservative assumptions been used?	/1/	DR	The project emissions will be monitored and measured ex post. The methodologies for calculating project emissions and the use of IPCC default values comply with AMS-I.C and AMS-III.E		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/	DR	Yes.		OK
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed 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 I	Leakage calculation is required for small scale biomass projects. Due to sufficient biomass available on the local market, the project is not expected to have an impact on the EFB availability. The cogeneration equipment is not transferred from another activity and the existing oil boiler will not be transferred to another activity. Transport emissions are deemed negligible as transport of EFB to be dumped would also have occurred in the baseline, as the EFBs would have to be transported to landfills. No other leakage effects are foreseen.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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	For AMS I. C part the physical, geographical site of the renewable energy generation delineates the boundary. For the electricity displacement, the SESB grid is included in the baseline emissions boundary. For the AMS III. E part the boundary is defined as the physical, geographical sites where the treatment of biomass takes place.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	Yes. Baseline emissions include: - Baseline emissions due to steam displacement - Baseline emissions due to electricity displacement - Baseline emissions due to biomass decay		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes.		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	Yes. - Baseline emissions due to steam displacement are calculated as fuel consumption times an emission coefficient of fuel displaced - Baseline emissions due to electricity displacement are calculated as electricity	~~CL 2~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			displaced by project times emission coefficient for grid. The emission coefficient is calculated as the weighted average of the SESB grid as required by AMS I. D. - Baseline emission factor for methane avoidance is calculated as methane correction factor times degradable organic carbon times fraction of degradable organic carbon disseminated to landfill gas times fraction of methane in landfill gas times mass conversion factor. This is in line with AMS III.E Further information on the grid emission factor for the electricity displacement component is needed.		
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	The calculation of baseline emissions is in line with AMS I.C, AMS I.D and AMS III.E		OK
E.3.6. Have conservative assumptions been used?	/1/	DR	The calculation of baseline emissions is in line with AMS I.C, AMS I.D and AMS III.E		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	Yes. IPCC default values and the weighted average of the SESB grid are in line with AMS I.C, AMS I.D and AMS III.E		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	The estimated annual average emission reductions for the first 7 years crediting period are 208 871 tCO_{2e}.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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 I	According to the Malaysian regulations, renewable energy projects below 10 MW are not required to prepare an Environmental Impact Assessment.		OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR I	The project activity has received the approval letter from local environmental authority.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	The project is unlikely to create any adverse environmental effects compared to the existing oil boiler.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	The project is unlikely to create any adverse environmental effects compared to the existing oil boiler. A stakeholder comment given is also considered. For this comment, the project and baseline situations would be identical.		OK
G. **Comments by Local Stakeholder** Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR I	Yes. The list of attendants shows that relevant stakeholders have been consulted.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Yes. Through local newspapers.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation	/1/	DR	A stakeholder consultation process is not mandatory requirement.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
process been carried out in accordance with such regulations/laws?					
G.1.4. Is a summary of the comments received provided?	/1/	DR	A summary is elaborated in the PDD.		OK
G.1.5. Has due account been taken of any comments received?	/1/	DR	No negative comments have been 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 LoA from Malaysian DNA and Canadian DNA are pending.	Table 1	Letter of Approval from Malaysian DNA is provided. Letter of Approval from Canadian DNA is provided.	OK. LoA from Canadian DNA of 24 April 2006 and LoA from Malaysian DNA of 14 April 2006 are received.
~~CL 1~~ Further information is needed on how to estimate the CH_4 and N_2O emissions.	D 4.1	This is included in the revised PDD of 18 April 2006. The CH_4 and N_2O will be estimated through measuring the energy content of biomass and incoming EFB. Energy content of biomass will be measured annually according to international standards through a qualified laboratory. Incoming EFB will be measured by weighbridge.	OK. The revised PDD of 18 April 2006 is deemed appropriate.
~~CL 2~~ Further information on the SESB grid is needed to conclude on the grid emission factor.	E 3.4	The emission factor is updated in the revised PDD of 18 April 2006.	OK. Since no official Malaysia grid carbon emission factor (CEF) is publicly available, the emission factor is derived from the grid generation data for 2005 as of the publicly available source; http://www.sesb.com.my/profile.html , IPCC default factors and the conservative efficiency data for natural gas, heavy fuel oil and diesel oil are applied. This is in line with guidance

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
			given in ACM 0002 and in line with the latest clarification from EB for the Brazilian grid. The grid emission factor has been calculated as 0.531 tCO_2/MWh as of the revised PDD of 18 April 2006. This is deemed conservative and n line with ACM0002, version 5, footnote 3.

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