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# VALIDATION REPORT

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## “KUNAK JAYA BIO ENERGY PLANT, MALAYSIA” PROJECT

REPORT No. 2007-1002

REVISION No. 02

DET NORSKE VERITAS



## VALIDATION REPORT

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Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: TSH-Wilmar (BF) Sdn Bhd	Client ref.: Lim Fook Hin

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### Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the Kunak Jaya Bio Energy Plant, 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 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 21 February 2007, meets all relevant UNFCCC requirements for the CDM and correctly applies the approved baseline and monitoring methodology ACM0006, version 04. Hence, DNV requests the registration of the "Kunak Jaya Bio Energy Plant, Malaysia" project as a CDM project activity.

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Report title: Kunak Jaya Bio Energy Plant, Malaysia project			
Work carried out by: Lai Chee Keong, Soumik Biswas, Michael Lehmann			
Work verified by: Einar Telnes			
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***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EFB	Empty Fruit Bunches
FFB	Fresh Fruit Bunches
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MFO	Medium Fuel Oil
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NCV	Net calorific value
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PKS	Palm Kernel Shell
SESB	Sabah Electricity Sdn Bhd
UNFCCC	United Nations Framework Convention on Climate Change



## 1 INTRODUCTION

TSH-Wilmar (BF) Sdn Bhd has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the “Kunak Jaya Bio Energy Plant, Malaysia” project in Kunak, Sabah, Malaysia. This report summarises 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 consists of the following personnel:

Mr Lai Chee Keong	DNV Certification Malaysia	Team leader, CDM validator
Mr Soumik Biswas	DNV Certification India	CDM validator
Mr Michael Lehmann	DNV Certification Norway	Sector expert
Mr Einar Telnes	DNV Certification Norway	Technical reviewer

### 1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, 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 and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0006. The validation team has, based on the recommendations in the Validation and Verification Manual /5/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

### 1.3 Description of Proposed CDM Project

The proposed project consists of the installation of a biomass-fuelled cogeneration plant at the TSH Kunak Jaya Palm Oil Refinery and Kernel Crushing Plant in Sabah, Malaysia. The cogeneration plant will combust biomass residue to generate steam and electricity for the refinery. Biomass residue that would be combusted by the project activity includes empty fruit bunches (EFB), palm kernel cake and wood waste for which the majority would have been disposed in an anaerobic landfill in the absence of the project activity. Hence, the project activity reduces CO<sub>2</sub> emissions by (i) the displacement of grid electricity, (ii) the displacement of fossil fuel used to generate steam consumed by the refinery and (iii) methane avoidance by the



controlled combustion of EFB the majority of which, in the absence of the project, would have been left to decay under anaerobic conditions in a landfill.

The proposed project is expected to reduce a total of 1,670,184 tonnes of CO<sub>2</sub> e over its first renewable crediting period of seven years, beginning on 15 May 2007.

## 2 METHODOLOGY

The validation consists of the following three phases:

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

This validation report summarises the findings of the validation.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /5/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

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

The completed validation protocol for the “Kunak Jaya Bio Energy Plant, Malaysia” project is enclosed in Appendix A to this report.

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

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

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



<b>Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference</b>
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (<b>OK</b>), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.</i>	<i>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.</i>

  

<b>Validation Protocol Table 2: Requirement Checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<i>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.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>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.</i>	<i>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.</i>	<i>This is either acceptable based on evidence provided (<b>OK</b>), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). A request for <b>Clarification (CL)</b> is used when the validation team has identified a need for further clarification.</i>

  

<b>Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification</b>			
<b>Draft report corrective action requests and requests for clarifications</b>	<b>Ref. to Table 2</b>	<b>Summary of project participants' response</b>	<b>Final conclusion</b>
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

**Figure 1 Validation protocol tables**



## 2.1 Review of Documents

The PDD (version 1.0 dated 12 December 2006 and version 1.4 dated 15 February 2007) /1/ submitted by TSH-Wilmar (BF) Sdn Bhd and additional background documents such as the project baseline study, CERs reduction calculation, monitoring plan and summary of comments by local stakeholders /4/ related to the project design and baseline were reviewed as a part of the validation.

## 2.2 Follow-up Interviews

On 17 January 2007, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of TSH-Wilmar (BF) Sdn Bhd, HV Carbon Sdn Bhd were interviewed. The DNA of Malaysia was interviewed on 04 January 2007. The main topics of the interviews are summarised in Table 1.

**Table 1 Interview topics**

Interviewed organisation	Interview topics
<b>TSH-Wilmar (BF) Sdn Bhd, HV Carbon Sdn Bhd, Project host (TSH Kunak Jaya Palm Oil Refinery and Kernel Crushing Plant)</b>	<ul style="list-style-type: none"> <li>➤ Annex 1 Party</li> <li>➤ Possible alternative use of EFB, palm kernel cake and wood waste</li> <li>➤ Supply of biomass residue</li> <li>➤ Estimated emission reductions</li> <li>➤ Calculation of CEF</li> <li>➤ Stakeholder consultation process</li> <li>➤ Project investment analysis</li> <li>➤ Project funding</li> <li>➤ Technology applied and operational lifetime</li> <li>➤ Monitoring and reporting procedures</li> <li>➤ Calibration, internal audit and corrective action procedures</li> <li>➤ Provisions for training, operation and maintenance</li> <li>➤ Renewable energy purchase agreement,</li> </ul>
<b>DNA Of Malaysia</b>	<ul style="list-style-type: none"> <li>➤ Common practice with regards to the usage of EFB.</li> <li>➤ Incentives in place to invest in renewable energy and methane recovery projects</li> <li>➤ Process of obtaining host country approval for CDM projects in Malaysia and the status for this project</li> <li>➤ Sustainable development priorities</li> <li>➤ Legal compliance, EIA requirements and existing/ emerging requirements</li> <li>➤ Stakeholder consultation process.</li> <li>➤ Official government funding</li> </ul>

## 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 initial validation identified seven corrective action requests and six requests for clarification, which were





presented to the project participants in the form of a draft validation report (version 0 of 29 January 2007).

The project participant's response to DNV's initial findings, which also included the submission of the final PDD of 21 February 2007, addressed the raised requests 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.

## **2.4 Internal Quality Control**

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

## **3 VALIDATION FINDINGS**

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A. The validation findings relate to the project design document version 1.4.1 dated 21 February 2007.

### **3.1 Participation Requirements**

TSH-Wilmar (BF) Sdn Bhd of Malaysia is the sole project participant. Switzerland has been identified as the Annex 1 party. Malaysia as the host Party meets the requirements to participate in the CDM. Written approval of voluntary participation from the DNA of Malaysia dated 21 March 2007 has been granted.

### **3.2 Project Design**

The objective of the proposed project activity is to reduce greenhouse gas emissions through:

- (i) Displacement of electricity obtained from the Sabah East Coast Grid,
- (ii) Displacement of fossil fuel used to generate steam, and
- (iii) Avoidance of methane emission through controlled combustion of EFB

The above mentioned emission reduction activities will be achieved with the installation of a biomass-fired cogeneration plant that will supply electricity and heat to meet the requirements of the palm oil refinery and kernel crushing plant. The proposed cogeneration facility will replace the existing fossil fuel-fired steam boiler and displace electricity would be purchased from the grid.

The proposed project consists of two biomass-fuelled steam boilers and a multi stage steam turbine. The first boiler generates 52 tonnes / hour of superheated steam at 45 bar(g) and 450 °C to run the 10MW steam turbine. The turbine will generate at least 65,700 MWh of electricity



annually for the refinery and crushing plant. The plant's steam requirements will be met by the second biomass-fuelled boiler, which produces 30 tonnes / hour of saturated steam at 20 bars.

The biomass residue utilised by the project activity will be composed of 80% EFB, 10% palm kernel cake and 10% wood waste. EFB will be sourced from four palm oil mills located within 40km of the project site, while a nearby wood factory will supply the wood waste. Palm kernel cake is a product of the palm kernel crushing process.

The project is expected to begin operation from 1 April 2007. The operational lifetime of the project is estimated to be 21 years and a renewable crediting period of 7 years. The crediting period is anticipated to start on 15 May 2007.

By promoting renewable energy, the project is likely to contribute to sustainable development in Malaysia. The DNA of Malaysia has confirmed that the project assists in achieving sustainable development.

The project currently does not involve any public funding from an Annex I country, and 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 Baseline Determination

The project applies the approved consolidated baseline methodology ACM0006 "Consolidated baseline methodology for grid-connected electricity generation from biomass residues" version 4 of EB27 /6/. The project fulfils the following conditions under which ACM0006 is applicable.

- It is a green field power project,
- Biomass residue (EFB, palm kernel cake and wood waste) is the predominant fuel used in the project plant, though some fossil fuels are used for start up and backup purposes,
- It will not result in an increase in processing capacity or changes in the processes at the refinery and crushing plant,
- Biomass residue is not stored for more than a year, and
- No significant energy quantities are required to prepare the biomass residue for combustion.

The following baseline scenarios were selected in accordance with Scenario 2 of ACM0006:

**For power generation:** The generation of power in existing and/or new grid-connected power plants (P4).

**For heat generation:** The generation of heat in boilers using fossil fuels (H6).

**For biomass residue use:** The biomass residue is dumped at the dump site. According to ACM0006 version 4, this baseline scenario is classified as B1.

For the electricity baseline, the IPCC default emission factor of 0.8 t CO<sub>2</sub>/KWh has been used. The CEF<sub>grid</sub> applied is based on the fact that the existing power plants in the East Sabah Grid are all diesel or HFO based, which makes a CEF at 0.8 kg CO<sub>2</sub>e/kWh reasonable.

The quantity of diesel combusted by the project activity is assumed to be minimal. However, the diesel consumption will be monitored ex-post.

Relevant IPCC default emissions factor are used.



### 3.4 Additionality

Additionality is addressed through the use of “The tool for the demonstration and assessment of additionality”, version 02, dated 28 Nov 2005.

**Step 0:** The project activity will be commissioned on 1 January 2007. Since the project activity does not seek for retro-active credits, this step is not applicable for the project activity.

**Step 1:** The alternative scenarios identified for the project activity are:

#### **Alternative 1:**

This project scenario involves the utilisation of a biomass-fuelled cogeneration system to generate electricity and steam for the refinery and crushing plant.

#### **Alternative 2:**

This baseline scenario includes the utilisation of fossil fuel-fired steam boilers, electricity supply from the grid and dumping of surplus biomass residue in landfills.

Both alternatives are in compliance with relevant legal and regulatory requirements.

**Step 2:** An investment benchmark analysis using internal rate of return (IRR) has been selected to substantiate the financial additionality of the project. A benchmark of 15% internal rate of return (IRR) was selected. The selected benchmark is reasonable and conservative since the palm oil industry in Malaysia expects an IRR of around 20% for any investment.

The IRR was calculated based on the following assumptions:

- Capital costs: RM 42 760 000
- Power price: RM 0.2125 (for the first five years) and RM 0.2338 (after the fifth year)
- Operating costs: RM 7 925 000 / year
- Fuel cost: RM 7 757 000/year
- Interest rate for loan financing: 7%
- Inflation: 3%
- CER price: USD 10/ tonne of CO<sub>2</sub>e

The project activity was found to have a negative IRR based on these input values. The values used in the IRR analysis have been checked during the site visit and found to be correct.

The sensitivity of the project's IRR in relation to the annual power production was analysed. The IRR for the project is negative under the normal and low load factors (75% and 45% respectively). The project shows a positive IRR of 14.6% for the production scenario where the load factor of the plant is a very optimistic 91%. In the base case of 75 % plant load factor, the IRR is only 3.2%. The IRR calculations and the different assumption used have been verified during the validation. It is unlikely that a load factor of 91% will be achieved. Hence it can be concluded that the project activity is financially unattractive without taking CDM revenue into account.



**Step 3:** The technology barrier has been discussed to substantiate the barriers to the project over and above the financial unattractiveness of the project.

**Technology Barriers:** The system used for the large scale dewatering and shredding of EFB is new as it is not a common practice to utilise EFB for combustion. The experience in designing and manufacturing some of the technical project components are not available in Malaysia.

**Step 4:** Common practice analysis

Common practice for palm oil refineries and food processing plants is to use fossil fuel boilers to generate steam and to obtain electricity from the grid. The National Energy Balance demonstrated that the usage of biomass as fuel for energy generation is rare and it is therefore justified that it is not a common practice to use EFB as fuel for power generation in palm oil refineries.

**Step 5:** Impact of CDM registration

The inclusion of income from the sale of CERs increases the IRR of the project to 28.8% for a load factor of 75%. This allows the project to exceed the benchmark IRR of 15%. The CER revenues will also provide considerable financial back-up to the project in case of lower load factors in the plant.

In summary, it is concluded that the project is indeed additional and would not have occurred in the absence of CDM.

### **3.5 Monitoring Plan**

The project correctly applies the approved consolidated monitoring methodology ACM0006 “Consolidated baseline methodology for grid-connected electricity generation from biomass residues”, version 04, EB27.

Most of the data necessary to calculate baseline and project emissions will be directly monitored at respective intervals stipulated in the approved methodology. The following parameters will be monitored:

1. Quantity of electricity displaced by the project activity,
2. Quantity of steam displaced by the project activity,
3. Quantity of biomass residue used in the project activity,
4. Quantity of fossil fuel combusted due to the project activity,
5. NCV of biomass residue,
6. Average round trip distance for trucks transporting biomass residue,
7. Number of truck trips for transportation of biomass,
8. Quantity of heat generated from the combustion of biomass, and
9. Efficiency of the boiler that would generate heat in the absence of the project activity.

The average CO<sub>2</sub> emission factor for trucks used for transporting biomass residue to the plant will be calculated based on the fuel type, fuel consumption and distance travelled by the trucks.



NCV of fossil fuel combusted due to the project activity has been included in the monitoring plan. Procedure for monitoring the quantity of fossil fuel combusted due to the project activity is found to be in accordance with ACM0006.

The project uses the L2 approach of ACM0006, version 4 to rule out leakage for the project activity. It has been demonstrated that the total amount of EFB required by the project is 23% of the biomass available in the region (four districts of Lahad Datu, Tawau, Kunak and Semporna).

Roles and responsibilities for the project management as well as registration, monitoring, measuring and reporting have been addressed. The project proponent has provided specific procedures for training, maintenance of monitoring equipments, internal audits, performance reviews, corrective actions etc. These procedures shall be explained to the relevant employees involved in the project and at least be implemented prior to the crediting period.

All critical data are either measured or calculated and archived for the crediting period plus two years beyond as per the approved monitoring methodology.

### 3.6 Calculation of GHG Emissions

The calculations are in accordance to ACM0006 and were documented in a complete and transparent manner. Emissions from the transportation of biomass fuel, use of fossil fuel by the project activity and methane emissions from the combustion of biomass were included in the project emission calculations. A conservativeness factor of 1.37 was multiplied to the methane emission factor used to calculate the quantity of methane generated from the combustion of biomass. The quantity of diesel combusted for the project activity has been assumed to be minimal. However the actual diesel consumption will be monitored and accounted for ex-post.

The project proponent has demonstrated that the annual biomass requirement of the project activity is lower than 25% of the biomass available in the region. Hence leakage calculations are not necessary and excluded as per scenario L2 of ACM0006.

The baseline boundaries have been clearly defined and it encompasses the local electricity grid system, the anticipated MFO boiler in the absent of the project and the landfill site. The baseline emissions calculation for the combustion of fossil fuel for steam generation is now calculated based on the optimum 6570 hours of operation per year.

In calculating the amount of methane avoided, the methane emissions for the biomass that was used in mulching and wood wastes have been deducted from the emission reduction calculations. No methane related emission reductions will be claimed for the palm kernel cake and wood waste used in the project since no it could not be substantiated adequately that the wood wastes would be left to decay under anaerobic conditions in the baseline scenario. Only EFB is included in the methane avoidance calculation.

In accordance with ACM0006, a grid emission coefficient is calculated for the power generation baseline scenario in accordance with ACM0002 as a combined margin emission coefficient. The combined margin emission coefficient is calculated as the weighted average of the simple operating margin (OM) emission coefficient and the build margin (BM) emission coefficient. However, the project has chosen to use the default value of 0.8 kg CO<sub>2</sub>e/kWh published by Pusat Tenaga Malaysia (PTM). The current CEFgrid value publish by the Pusat Teneage Malaysia (PTM) was based on the actual operating and built data starting from 2002 until 2004. Option (a)



of using simple operating margin has been chosen due to unavailability of data for option b, c and d. It has been confirmed by PTM that 2004 data is the latest publicly available data. The CEFgrid applied is based on the fact that the existing power plants in the East Sabah Grid are all diesel or HFO based, which makes a CEF at 0.8 kg CO<sub>2</sub>e/kWh reasonable. According to the “Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories” by the Executive Board, the factor of 0.8 kg CO<sub>2</sub>e/KWh can be used in this case.

The CER calculations in the PDD are in accordance with ACM0006. IPCC default values for DOCf (0.5), Kj (0.4), DOCj (0.15), MCF (0.8) and F (0.5) have been used. References for non-IPCC default values used in the calculation, including the NCV of EFB, palm kernel cake and wood waste have been included.

The emission reductions have been calculated based on the base load hours of 6570 hours of the refinery. This is deemed to be conservative and realistic.

The project is likely to reduce 1, 670, 184 t CO<sub>2</sub> e emissions over the first seven years of crediting period. It is likely that the forecast emission reductions will be achieved provided the project is implemented as design and the underlying assumptions do not change.

### 3.7 Environmental Impacts

The Malaysian Department of Environment has confirmed that an Environmental Impact Assessment (EIA) is not required for the project activity. However, it is recommended by the DNA that a letter of confirmation to confirm that the project is not required to perform an EIA from the state Department of Environment should be obtained. The project is not expected to cause adverse environmental impacts. Ash from the incineration of biomass residue will be applied in the palm oil plantations as potash. Pollution control equipment will be installed to ensure that emissions from the combustion of biomass are in compliance with legal requirements.

### 3.8 Comments by Local Stakeholders

A local stakeholder consultation meeting was held on 21 November 2006 at the TSH premises in Kunak, Sabah, Malaysia. Invitation letters were sent two weeks before the meeting to local residents, the local village head, planters, representatives of the Kunak District Office and Forestry Office and a local school principal.

Questions raised by the stakeholders were with regards to the project’s environmental impact, sources of biomass residue, employment opportunities, and traffic safety issues resulting from the trucks transporting biomass to the project site. No adverse comments were received. The summary of comments has been included in the PDD in section E.2 and due account was taken and incorporated in the PDD section E.3.

The local stakeholder consultation process is deemed appropriate and in line with national requirements.





#### 4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 12 December 2006 was made publicly available on DNV's climate change website ([www.dnv.com/certification/climatechange](http://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 22 December 2006 to 21 January 2007. Two comments were received on 24 December 2006 and 18 January 2007 respectively. The comments received (in unedited form) are given in the below text boxes.

<b>Comment by:</b>	G. Hamaliuk, Phascon Technologies
<b>Inserted on:</b>	24th December 2006
<b>Subject:</b>	Kunak Jaya Bioenergy
<b>Comment:</b>	From the other biomass energy plant projects in both Sabah and Peninsular Malaysia, the heat value of the EFB is between 8.4 and 12.1 GJ/t. Why is this project using only 4.2 GJ/t? I would suggest attaching a third party analysis certification to this PDD to substantiate this figure, since the measurement is not in the proposed Monitoring Plan. Is the measurement of each waste to be used in the boilers in the Monitoring Plan?? Does the proponent suggest using Mesocarp Fibres and wood waste in the Methane Avoidance calculation? This would not be appropriate, as there is a good market for both Fiber and wood waste, so they would not be landfilled. In any case, wood waste does not have the same K factor as food wastes.
<b>Comment by:</b>	Dr. Anwar Ahmad, Dabur Ayuvet Ltd.
<b>Inserted on:</b>	18 <sup>th</sup> January 2007
<b>Subject:</b>	CDM
<b>Comment:</b>	The project activity and methodology is socio-economic development. This techniques is applicable all sectors leke methane reduction, waste treatment, electricity generation, employment development, global warming reductions.

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

The value quoted in version 1.2 of the PDD has been corrected in the updated PDD and the current estimate of 5.3 GJ/ton is based on 60% moisture level. This is deemed appropriate. The project proponent will monitor the quantity of each type of waste used in the boilers. A clarification was raised to substantiate with documentary evidence that all the biomass combusted by the project activity would have been land filled in the baseline scenario. As a response to the clarification and taking into account the above comment, PKS and wood wastes have been excluded from the methane avoidance calculations.

As for the comment received on 18 January 2007, this was merely a statement made on the application and function of the approved methodology used in the project.



## 5 VALIDATION OPINION

*Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Kunak Jaya Bio Energy Plant, Malaysia” in Kunak, 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 validation consisted of the following three phases: i) a desk review of the project design, baseline and monitoring plan ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.*

*The host country is Malaysia and Switzerland is its participating Annex I Party. The letter of Approval from the host country dated 21 March 2007 has been granted.*

*The project correctly applies the approved baseline and monitoring methodology AM0006 / version 04. The project activity complies with project scenario 2 of ACM0006, i.e. the project activity involves the installation of a new cogeneration plant at a site where currently no power generation occurs. The power generated by the project plant is fed into the electricity distribution grid or would in the absence of the project activity be produced by the existing or new grid connected power station in Sabah. In addition, the biomass would in the absence of the project activity be dumped or left to decay under anaerobic conditions in dumpsites. Heat required by the plant would in the absence of the project activity be generated in boilers fired with fossil fuels, or by other means not involving the biomass residues.*

*The monitoring plan is in line with the approved monitoring methodology AM0006 /Version 4. The monitoring plan makes sufficient provision for monitoring relevant project and baseline emission indicators. Detailed responsibilities and authorities for project management, monitoring and reporting and QA/QC procedures have also been described.*

*The ex-ante GHG emission estimations are calculated and documented in a complete and transparent manner. The algorithm and methodologies for accounting GHG emissions are appropriate and the total emission reductions from the project are estimated to be on the average 238, 598 tCO<sub>2e</sub> per year over the selected 7 year renewable crediting period.*

*The project is not expected to create any adverse environmental impacts. There is no requirement under Malaysian law for the proposed project activity to undergo an Environmental Impact Assessment.*

*In summary, it is DNV's opinion that the “Kunak Jaya Bio Energy Plant, Malaysia” in Malaysia, as described in the PDD of 21 February 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0006 (Version 4). DNV thus requests the registration of the project as a CDM project activity.*





## REFERENCES

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

- /1/ TSH-Wilmar (BF) Sdn Bhd: “Kunak Jaya Bio Energy Plant, Malaysia Project” version 1.0 dated 12/12/2006 and version 1.4.1 dated 21 February 2007.
- /2/ Conservation and Environmental Management Division, Ministry of Natural Resources and Environment (DNA of Malaysia): Letter of Approval dated 21 March 2007.
- /3/ Swiss Agency for the Environment, forests and Landscape (SAEFL), Economics and Climate Section: Letter of Approval dated 23 February 2007.
- /4/ Spreadsheet for CEF calculations  
Spreadsheet for IRR calculations  
Written approval to the installation of boiler  
Stakeholders’ consultation – minutes of meeting

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

- /5/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /6/ CDM Executive Board “*Consolidated baseline methodology for grid-connected generation from biomass residues*” ACM 0006, version 4 of EB27
- /7/ CDM Executive Board: “*The tool for the demonstration and assessment of additionality*”, version 02, dated 28 Nov 2005.
- /8/ CDM Executive Board: “*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*” ACM0002, Version 03 of 19 May 2006.

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

- /9/ Dr. Nadzri Yahaya, DNA of Malaysia
- /10/ Mr. Faizal, DNA of Malaysia
- /11/ Mr. Soeren Varming, HV Carbon Sdn Bhd
- /12/ Mr. Tay Chong Leong, Senior GM of TSH-Wilmar Sdn Bhd

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## **APPENDIX A**

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### **CDM VALIDATION PROTOCOL**

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

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	CAR 1	Table 2, Section E.4.1 Annex 1 party is yet to be determined.
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, CDM Modalities and Procedures §40a	<del>CAR 4</del>	Table 2, Section A.3 Confirmation from the DNA of Malaysia is pending.
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, CDM Modalities and Procedures §40a	<del>CAR 4</del>	The Letters of Approval from the DNA of Malaysia is pending. Participation from Annex 1 country has yet to be determined.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
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 result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	The project does not involve any public funding from an Annex I Party, and the validation did not reveal any information that indicates that the project can be seen as a

Requirement	Reference	Conclusion	Cross Reference / Comment
			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	<del>CAR-4</del>	The Ministry of Natural Resources and Environment is the DNA of Malaysia. Annex 1 country has yet to be determined.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	<del>CAR-4</del>	Malaysia ratified the Kyoto Protocol on 04 September 2002. Annex 1 country has yet to be determined.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	<del>CAR-4</del>	Annex 1 country has yet to be determined.
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	<del>CAR-4</del>	Annex 1 country has yet to be determined.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F The project is not subjected to EIA regulations and is not expected to result in adverse environmental impacts.
14. Baseline and monitoring methodology shall be previously	CDM Modalities and	OK	Table 2, Section B.1.1 and

Requirement	Reference	Conclusion	Cross Reference / Comment
approved by the CDM Executive Board	Procedures §37e		D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD of the “Kunak Jaya Bio Energy Plant, Malaysia” project was made publicly available on <a href="http://www.dnv.com/certification/climatechange">www.dnv.com/certification/climatechange</a> and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during the period from 22 December 2006 to 21 January 2007. Two comments were received.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	

**Table 2 Requirements Checklist**

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
<b>A. General Description of Project Activity</b> <i>The project design is assessed.</i>					
<b>A.1. Project Boundaries</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	Yes. The project is located in the town of Kunak Jaya, in the state of Sabah, Malaysia.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The project's system boundaries include two biomass fuelled steam boilers and a 10 MW condensing steam turbine.		OK
<b>A.2. Technology to be employed</b> <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR, I	Yes. The project combusts empty fruit bunches (EFB), palm kernel cake and wood waste to generate steam and electricity and in the process also avoids methane emission from the biomass that would have decayed in the absence of the project. The boilers are supplied by Vickers and Mckenzie of UK and the turbine is supplied by Siemens of Germany. All the equipment		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			suppliers are of international repute. Hence the project design reflects good engineering practices.		
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	The technologies employed include two high efficiency biomass-fuelled steam boilers, a 10 MW steam turbine and a fuel preparation system. This technology is superior to the current practice where the electricity is obtained from the grid and steam is generated in a fossil fuel boiler utilising MFO.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The project is unlikely to be substituted by other more efficient technologies within the seven year crediting period.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR, I	The project required extensive initial training and maintenance efforts. However, these requirements have not been elaborated in the PDD. The project proponent is requested to identify the training needs for the proper operation of the project.	GL-4	OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR, I	Please refer to A.2.4.	GL-4	OK
<b>A.3. Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR, I	Relevant documentary evidence of compliance with legislations such as written approvals and consents have been reviewed and found to be in order.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR, I	The project proponent is requested to submit the LoA from the DNA of Malaysia.	CAR-4	

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	Yes. The project contributes to sustainable development by: <ul style="list-style-type: none"> <li>- Generating employment,</li> <li>- Utilisation of biomass residues for electricity generation, and</li> <li>- Displacing the use of fossil fuel for generating steam.</li> </ul>		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes, the project is likely to create other environmental and social benefits.		OK
<b>B. Project Baseline</b> <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
<b>B.1. Baseline Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies the approved baseline methodology ACM0006, version 4 of EB27, "Consolidated methodology for grid-connected electricity generation from biomass residues".		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	The project fulfils the following conditions under which ACM0006 is applicable. <ul style="list-style-type: none"> <li>- It is a green field power project,</li> <li>- Biomass residue is the predominant fuel used in the project plant, though some fossil fuels are used for start up and backup purposes,</li> <li>- It will not result in an increase in</li> </ul>		OK

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



Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			processing capacity or changes in the processes at the refinery and crushing plant, - Biomass residue is not stored for more than a year, and - No significant energy quantities are required to prepare the biomass residue for combustion.		
<b>B.2. Baseline Determination</b> <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR	The project correctly applies the approved baseline methodology ACM0006 "Consolidated baseline methodology for grid-connected electricity generation from biomass residues", version 4 of EB27.		OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR, I	The baseline has been established on the basis of an IRR calculation. The values of the different parameters used in the calculations such as price of EFB, total capital cost etc has been reviewed and found to be correct.		OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	The following baseline scenarios were selected in accordance with project scenario 2 of ACM0006: <b>For power generation:</b> The generation of power in existing and/or new grid-connected power plants (P4).	CAR-2	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p><b>For heat generation:</b> The generation of heat in boilers using fossil fuels (H6).</p> <p><b>For biomass residue use:</b> The biomass residue is dumped or left to decay under anaerobic conditions. According to ACM0006 version 4, this baseline scenario is classified as B2, while the PDD classifies it as B1. The definitions of B1 to B6 shown in the page 12 of the PDD should be amended so as to be in accordance to ACM0006 version 4. The project proponent is requested to modify the PDD accordingly.</p>		
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR, I	Relevant documentation and evidence of environmental compliance have been reviewed. The baseline scenario complies with relevant environmental regulations and current prevailing practices.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR, I	Yes, the baseline determination is compatible with the available data. The data available during the site visit supports the selection of scenario 2 as the baseline scenario for the project activity.		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR, I	As evidenced during the site visit, the selected baseline scenarios P4, H6 and B2 respectively for the power generation, heat generation and biomass usage are the most likely scenarios in the absence of the project activity.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR, I	The additionality of the project is addressed through the use of "The tool for the demonstration and assessment of additionality", version 02, dated 28 Nov 2005.	CL-2	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p><b><u>Step 0:</u></b> The project activity will be commissioned on 1 January 2007. Evidence that CDM incentives were seriously considered in the decision to proceed with the project activity have been reviewed during the site visit. However since the project activity does not claim for retro-active credits, this step is not applicable.</p> <p><b><u>Step 1:</u></b> The alternative scenarios identified for the project activity are:  <b>Alternative 1:</b>  The project activity, involving the utilisation of a biomass-fuelled cogeneration system.  <b>Alternative 2:</b>  The baseline scenario, including the utilisation of fossil fuel-fired steam boilers, electricity supplied from the grid, and dumping of surplus biomass residue in landfills.  Both alternatives are consistent with existing laws and regulations.</p> <p><b><u>Step 2: Investment analysis</u></b></p> <p><b><u>Sub-step 2a: Determine appropriate analysis method</u></b>  Investment benchmark analysis using internal rate of return (IRR) was chosen.  <b><u>Sub-step 2b: Apply benchmark analysis</u></b>  A benchmark of 15% internal rate of return</p>		

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>(IRR) was selected. The selected benchmark is reasonable for the palm oil mills in Malaysia where the expected rate of return is actually around 20%.</p> <p><b><u>Sub-step 2c: Calculation and comparison of financial indicators:</u></b></p> <p>The IRR was calculated based on the following assumptions:</p> <ul style="list-style-type: none"> <li>- Capital costs: RM 42,760,000</li> <li>- Power price: RM 0.2125 (first five years) and RM 0.2338 (fifth year onwards)</li> <li>- Operating costs: RM 15,682,000 / year</li> <li>- Interest rate for loan financing: 7%</li> <li>- Inflation: 3%</li> <li>- CER price: USD 10/ tonne of CO<sub>2</sub> e</li> </ul> <p>The project activity was found to have a negative IRR based on these input values. The IRR calculations have been checked and found to be correct.</p> <p><b><u>Sub-step 2d. Sensitivity analysis</u></b></p> <p>The sensitivity of the project's IRR in relation to the annual power production was analysed. The IRR for the project is negative under the normal and low load factors (75% and 45% respectively). The project only shows a positive IRR of 5% under the high production scenario, where the load factor is 91%.</p> <p><b><u>Step 3: Barrier Analysis</u></b></p> <p><b><u>Sub-step 3a: Identify barriers that would</u></b></p>		

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p><b><u>prevent the implementation of type of the proposed activity</u></b></p> <p>Technology barrier has been selected to substantiate the barrier analysis.</p> <p><b><u>Technology Barriers</u></b></p> <p>The system used for the large scale dewatering and shredding of EFB is new as it is not a common practice to utilise EFB for combustion. The experience in designing and manufacturing of some of the project components are not available in Malaysia.</p> <p><b><u>Step 4: Common practice analysis</u></b></p> <p>Common practice for palm oil refineries and food processing plants is to use fossil fuel boilers to generate steam and to obtain electricity from the grid. However, the project proponent is requested to provide documentation about the number of palm oil mills that already use biomass as fuel for energy generation and justify why the project activity is not a common practice.</p> <p><b><u>Step 5: Impact of CDM registration</u></b></p> <p>The inclusion of income from the sale of CERs increases the IRR of the project to 24% for a load factor of 91%. This allows the project to exceed the benchmark IRR of 15%. The CER revenues will also provide considerable financial back-up to the project in case of lower load factors in the plant.</p>		
B.2.8. Have the major risks to the baseline been	/1/	DR,	Risks associated with the project's power		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
identified?		I	output and other data used in the IRR calculations have been identified and addressed in the PDD.		
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes.		OK
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR	The expected starting date of the project is 1 January 2007. The operational lifetime of the project is estimated to be 21 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A renewable crediting period of seven years with two possible renewals starting from 1 January 2007 has been selected. However, the project proponent is requested to delay the start of the crediting period since the crediting period for the project can only start after the registration of the project.	<del>CAR-3</del>	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
<b>D. Monitoring Plan</b> <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
<b>D.1. Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies the approved baseline methodology ACM0006, version 4 of EB27. "Consolidated baseline methodology for grid-connected generation from biomass residues".		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	The monitoring methodology is selected in conjunction with the baseline methodology ACM0006, version 4 of EB 27.		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR, I	In general, the monitoring methodology allows for the collection of relevant GHG indicators, and applies the relevant measurement procedures, monitoring intervals, and QA/QC procedures. However, NCV of fossil fuel combusted due to the project activity has not been included in the monitoring plan, and the procedure for monitoring the quantity of fossil fuel combusted due to the project activity is not in accordance with ACM0006. The project	CAR-4	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			proponent is requested to modify the monitoring plan accordingly. The project uses the L2 approach of ACM0006, version 4 to rule out leakage for the project activity. However, as required by this approach, the annual availability and usage of biomass have not been monitored. The project proponent is requested to include the leakage monitoring in the monitoring plan.	CAR-5	
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes. The monitoring methodology selected is in accordance to ACM0006.		OK
<b>D.2. Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
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	Yes, the monitoring plan provides for the collection and archiving of all relevant data necessary for estimating project GHG emissions. Only the NCV of the fossil fuel used has not been monitored. The project proponent is requested to incorporate the same in the monitoring plan and modify the monitoring of the fossil fuel used according to ACM0006. The following parameters will be monitored to estimate the project emissions: 1. Quantity of fossil fuel combusted due to the project activity, 2. NCV of biomass residue, 3. Average round trip distance for trucks	CAR-4	OK

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



Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			transporting biomass residue, 4. Number of truck trips for transportation of biomass, 5. Quantity of heat generated from the combustion of biomass.		
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	CO <sub>2</sub> and CH <sub>4</sub> are the only two GHG indicators that are required to be monitored and both of them have been accounted for.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR, I	Yes, the parameters mentioned in D.2.1 are sufficient for proper monitoring of the above indicators.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes. These indicators will allow the monitoring of GHG emissions from onsite consumption of fossil fuels by the project activity, fugitive methane emissions from the combustion of biomass, and CO <sub>2</sub> emission from the transportation of biomass residue.		OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Yes.		OK
<b>D.3. Monitoring of Leakage</b> <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR, I	Leakage resulting from the project activity has not been monitored as per the requirement of alternative L2 of ACM0006. The project proponent is requested to include this in the monitoring plan.	CAR-5	OK
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	Please refer to D.3.1		

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	Please refer to D.3.1		
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	Please refer to D.3.1		
<b>D.4. Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
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	Yes. The data collected and archived is in accordance to ACM0006 and will allow for the determination of baseline emissions. The following baseline parameters will be monitored: 1. Quantity of electricity displaced by the project activity, 2. Quantity of steam produced by the project activity, and 3. Quantity of biomass residue used in the project activity. The project proponent is requested to clarify the monitoring frequency for the boiler efficiency of the MFO boiler that was used in the baseline.	<del>CL-3</del>	OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	CO <sub>2</sub> and CH <sub>4</sub> are the only two GHG indicators that are required to be monitored and both of them have been accounted for.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR, I	Yes. The above monitoring parameters will ensure proper monitoring of the baseline indicators. However, the project proponent is requested to substantiate with	<del>CL-4</del>	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			documentary evidence that all the biomass combusted by the project activity would have been landfilled in the baseline scenario.		
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes. The indicators will allow for the estimation of methane emissions due to the anaerobic decomposition of biomass in landfills, CO <sub>2</sub> emissions from the consumption of grid electricity, and CO <sub>2</sub> emission from the combustion of fossil fuels for steam generation.		OK
<b>D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	The DNA of Malaysia does not require the monitoring of sustainable development parameters.		OK
<b>D.6. Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	Yes, the authority and responsibility of project management has been described in Section B.7.2 of the PDD and found to be adequate in during the site visit.		OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	It was indicated in the PDD that the project developers will form an Operational and Management Team which will carry out the		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			Monitoring Implementation Plan.		
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR, I	The procedures for training of monitoring personnel were not included in the PDD.	CL-4	OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR, I	No emergencies leading to unintended emissions are likely to occur.		OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR, I	Procedures for the calibration of monitoring equipment in accordance to industry standards and/or manufacturer's established procedures have not been incorporated in the project design. The project proponent is requested to implement the relevant procedures.	CL-4	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR, I	Procedures for the maintenance of monitoring equipment in accordance to industry standards and/or manufacturer's established procedures have not been incorporated in the project design. The project proponent is requested to implement the relevant procedures.	CL-4	OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR, I	The monitoring plan contains general statements regarding the procedures for monitoring, measurement and reporting. The project proponent is requested to detail the relevant procedures.	CL-4	OK
D.6.8. 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	The monitoring plan contains general statements regarding the procedures for records handling. The project proponent is requested to detail the relevant procedures.	CL-4	OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR, I	Procedures for possible monitoring data adjustments and uncertainties have not been identified. The project proponent is	CL-4	OK

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

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			requested to incorporate the same in the project design.		
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR, I	The monitoring reports will be reviewed by the General Manager on a monthly basis.		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR, I	The PDD does not identify procedures for internal audits of GHG project compliance. The project proponent is requested to incorporate the same in the project design.	CL-1	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR, I	Details of the performance reviews were not included in the PDD. The project proponent is requested to incorporate the same in the project design.	CL-1	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR, I	Details of the corrective action procedures were not included in the PDD. The project proponent is requested to incorporate the same in the project design.	CL-1	OK
<b>E. Calculation of GHG Emissions by Source</b>					
<i>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.</i>					
<b>E.1. Project GHG Emissions</b>					
<i>The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	Yes. Emissions from the transportation of biomass fuel, use of fossil fuel by the project activity and methane emissions from the		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			combustion of biomass were included in the project design.		
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes. The calculations are in accordance to ACM0006 and were documented in a complete and transparent manner.		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR, I	A conservativeness factor of 1.37 was multiplied to the methane emission factor used to calculate the quantity of methane generated from the combustion of biomass. The quantity of diesel combusted for the project activity has been assumed to be minimal. However the actual diesel consumption will be monitored and accounted for <i>ex-post</i> .		OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	Uncertainties with regards to the methane emission factor for biomass combustion were properly addressed in the documentation.		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes		OK
<b>E.2.Leakage</b> <i>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.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	The project proponent has demonstrated that the annual biomass requirement of the project activity is lower than 25% of the biomass available in the region. Hence		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			leakage calculations are not necessary and excluded as per scenario L2 of ACM0006.		
<b>E.3.Baseline Emissions</b> <i>The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR, I	<p>The baseline emissions calculation for the combustion of fossil fuel for steam generation is based on the assumption that the plant will be operational for 8000 hours per year. However it is most likely that the plant will be operational for 6570 hours only. The project proponent is requested to modify the emission reduction calculations accordingly.</p> <p>Also the calculations do not reflect that not all the biomass was land-filled in the baseline and some amount of it was used in mulching as well. The methane emissions for the biomass that was used in mulching should be deducted from the emission reduction calculations.</p>	CAR-6  CL-4	OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR, I	<p>The baseline boundaries have been clearly defined and it encompasses the local electricity grid system, the MFO boiler and the landfill site.</p> <p>The project proponent is requested to justify that the electricity grid should be limited to the East Coast Grid. Justification is needed to substantiate why the IPCC default value of EF<sub>grid</sub> (0.8 kgCO<sub>2</sub>/kWh) has been used</p>	CL-5	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			instead of the actual grid CEF. Other projects in the state of Sabah has utilised a much lower factor, generated by PTM.		
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	<p>The CER calculations in the PDD are in accordance with ACM0006. IPCC default values for <math>DOC_f</math> (0.5), <math>K_j</math> (0.4), <math>DOC_j</math> (0.15), MCF (0.8) and F (0.5) have been used. The project proponent is requested to provide adequate references for non-IPCC default values used in the calculation, including the NCV of EFB, palm kernel cake and wood waste.</p> <p>The decay rate of biomass residue (<math>k_j</math>) and the average distance travelled by trucks for biomass transportation (ADV) used in the emissions calculations does not reflect that 10% of the biomass residue is composed of wood waste. Also the amount of biomass used in the methane emission calculations reflects the maximum amount of biomass required in the project. This leads to an un-conservative estimate of the emission reductions. The project proponent is requested to recalculate the methane emissions avoided due to the project based on the base load requirement of biomass.</p>	<del>CL-6</del>  CAR-7	OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR, I	The project assumes that 80,000 MWh of electricity and 656,000 tons of steam are required to operate the refinery. The assumptions made are based on the maximum operation condition of the refinery. The project proponent is requested to estimate the emission reduction	<del>CAR-6</del> CAR-7	OK

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



Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			calculations based on the base load hours of 6570 hours of the refinery to provide a conservative and realistic estimate.		
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	The uncertainties with regards to the parameters used in the calculation of methane avoidance, such as $DOC_j$ , $DOC_r$ and $k_j$ , were addressed in the PDD.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	Yes.		OK
<b>E.4.Emission Reductions</b> <i>Validation of ex-ante estimated emission reductions.</i>					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	Yes the project will result in fewer GHG emissions than the baseline scenario. The final amount will be concluded in the final validation report.	<del>CAR-6</del> <del>CAR-7</del> <del>CL-4</del> <del>CL-5</del> <del>CL-6</del>	OK
<b>F. Environmental Impacts</b> <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR. I	Yes		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR, I	No EIA is required by the host country. This has been confirmed from the DNA of Malaysia.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	The project is expected to have a positive environmental impact by reducing the		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			amount of fossil fuel combusted to generate electricity and steam, and by reducing methane emissions from EFB landfills.		
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR, I	There are no adverse transboundary environmental impacts.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/ /4/	DR, I	Pollution control systems will be installed for the project activity to ensure stack emissions from the combustion of biomass residue complies with the local environmental regulations.		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR, I	Yes.		OK
<b>G. Stakeholder Comments</b> <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	Yes. A local stakeholder consultation meeting was held on 21 November 2006 at the TSH premises in Kunak, Sabah.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Invitation letters were sent to the stakeholders two weeks before the consultation meeting.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Yes		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	Yes. It is incorporated into Section E.2 of the PDD		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	Yes. It is incorporated into Section E.3 of the PDD		OK

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

**Table 3 Resolution of Corrective Action and Clarification Requests**

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>CAR 1</p> <p>The Letter of Approvals from the DNA of Malaysia and the Annex 1 country are pending.</p> <p>The Annex 1 party is yet to be determined.</p>	Table 1 A.3.2	PDD and supporting information has been submitted to the DNA for approval. A draft validation report is required to obtain the national approval. Negotiations are ongoing and in final stages to identify an Annex party	<p><b>OK.</b> Swiss Agency for the Environment, forests and Landscape (SAEFL), Economics and Climate Section has been identified as the Annex 1 Party for the project. Switzerland was ratified to Kyoto Protocol on 09 July 2003 and Switzerland has in place a National Registry. Letter of Approval from Switzerland has been granted dated 23 February 2007. Letter of Approval from the host country dated 21 March 2007 has been received.</p> <p>This CAR is thus closed.</p>
<p>CAR 2</p> <p>According to ACM0006 version 4, this baseline scenario is classified as B2, while the PDD classifies it as B1. The definitions of B1 to B6 shown in the page 12 of the PDD should be amended so as to be in accordance to ACM0006 version 4. The project proponent is requested to modify the PDD accordingly.</p>	B. 2. 3	Table B4 (p12) in the PDD has been modified accordingly.	<p><b>OK.</b> The selection of baseline scenarios has been corrected. Scenario 2 is appropriate for the project.</p> <p>This CAR is thus closed.</p>
<p>CAR 3</p> <p>The project proponent is requested to delay the start of the crediting period since the crediting period for the project can only start after the registration of the project.</p>	C. 1. 2	The PDD has been modified to a start of the crediting period 01/04/2007.	<p><b>OK.</b> The start date of crediting period is estimated to be 15 May 2007, which would be after the project has been registered.</p>
<p>CAR 4</p> <p>NCV of fossil fuel combusted due to the</p>	D. 1. 3 D. 2. 1	PDD has been updated with monitoring requirements for NCV of fossil fuel (p	<p><b>OK.</b> The monitoring plan has been revised to include the usage of fossil</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
project activity has not been included in the monitoring plan, and the procedure for monitoring the quantity of fossil fuel combusted due to the project activity is not in accordance with ACM0006. The project proponent is requested to modify the monitoring plan accordingly.		35) And the procedure for monitoring the quantity of used diesel (p40) has been made to conform with the methodology	fuel and the NCV of fossil fuel has been included in the PDD. This CAR is thus closed.
CAR 5 The project uses the L2 approach of ACM0006, version 4 to rule out leakage for the project activity. However, as required by this approach, the annual availability and usage of biomass have not been monitored. The project proponent is requested to include the leakage monitoring in the monitoring plan.	D. 1. 3 D. 3.1	The analysis of leakage has been updated and the necessary data included in the monitoring plan.  Further the text on p 32 has been clarified to avoid ambiguity and a wrong number in table B11 has been replaced.	<b>OK.</b> The analysis of leakage has been up-dated and deemed to be appropriate. The availability of biomass in the area will be monitored annually.. This CAR is thus closed.
CAR 6 The baseline emissions calculation for the combustion of fossil fuel for steam generation is based on the assumption that the plant will be operational for 8000 hours per year. However it is most likely that the plant will be operational for 6570 hours only. The project proponent is requested to modify the emission reduction calculations accordingly.	E. 3. 1 E. 3. 4 E. 4. 1	The calculation has been adjusted in the PDD to 6570 hours. This has an impact on both the amount of fuel used and power produced. Calculations for all elements of the project and baseline emissions have been updated.	<b>OK.</b> Calculation for all elements of the project and baseline emissions have been reviewed and found to be appropriate. The calculations have been based on 6570 hours of operation. This is deemed conservative. This CAR is thus closed.
CAR 7 The decay rate of biomass residue ( $k_j$ ) and the average distance travelled by trucks for biomass transportation (ADV) used in the emissions calculations does not reflect that 10% of the biomass residue is composed of wood waste. Also the amount of biomass used in the methane emission calculations	E. 3. 3 E. 3. 4 E. 4. 1	The calculations of transportation need have been adjusted in the PDD (p 23) and the amount of biomass used in the DOC has been changed in table B12-B14 (p 37-38).	<b>OK.</b> The calculation of transportation has been reviewed and found to be acceptable. Relevant quantity of biomass needed for the project has been corrected. This CAR is thus closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
reflects the maximum amount of biomass required in the project. This leads to an un-conservative estimate of the emission reductions. The project proponent is requested to recalculate the methane emissions avoided due to the project based on the base load requirement of biomass.			
<p>CL 1</p> <p>Training and maintenance needs and procedures were not described in the PDD. The project proponent is requested to provide specific details of the following procedures in the PDD.</p> <ol style="list-style-type: none"> <li>Procedures for calibrating and maintaining monitoring equipment,</li> <li>Procedures for monitoring, measurement and reporting,</li> <li>Procedure for handling of day-to-day records,</li> <li>Procedure for handling of monitoring data adjustments and data uncertainties,</li> <li>Procedure for Internal audit of GHG project based on operational requirements;</li> <li>Procedures for project performance review; and</li> <li>Procedures for corrective actions in order to provide for more accurate future monitoring and reporting.</li> </ol>	<p>A.2.4 A.2.5 D.6.3 until D.6.13.</p>	<p>Procedures have been developed and sent to the validator.</p> <p>These procedures are summarised as follows:</p> <p>Procedure for handling of emergencies situations, covering:</p> <ul style="list-style-type: none"> <li>• Mobilisation of emergency team.</li> <li>• Implementation of action plan.</li> <li>• Review effectiveness of plan</li> <li>• Review effects on CERs.</li> </ul> <p>Procedures for monitoring, measurement and reporting, covering:</p> <ul style="list-style-type: none"> <li>• Monitoring of all parameters and recording of readings according to defined schedule as required in this PDD.</li> <li>• Assignment of responsibilities for monitoring and recording.</li> <li>• Incorporation of QA/QC to enhance data quality.</li> </ul> <p>Procedures for maintenance,</p>	<p><b>OK.</b> All procedures shall be implemented and the effectiveness of implementation shall be verified during the verification phase of the project. This CL is thus closed.</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>covering:</p> <ul style="list-style-type: none"> <li>• Regular checking and maintenance of all equipment and treatment units.</li> <li>• Close monitoring of required parameters to ensure optimum treatment efficiency.</li> </ul> <p>Procedures for handling of day-to-day records, covering:</p> <ul style="list-style-type: none"> <li>• Recording, handling, safe keeping and achieving of records.</li> </ul> <p>Procedure for handling of monitoring data adjustments and data uncertainties, covering:</p> <ul style="list-style-type: none"> <li>• Immediate checking and verification of data uncertainties.</li> <li>• Review effects on CERs.</li> <li>• Prompt reporting of data uncertainties to management.</li> </ul> <p>Procedure for review of reported results/data, covering:</p> <ul style="list-style-type: none"> <li>• Scheduled review by management.</li> <li>• Directives for plant operation and maintenance in keeping up with CDM obligations.</li> </ul> <p>Procedure for Internal audit of GHG project based on operational requirements, covering:</p> <ul style="list-style-type: none"> <li>• Set up of audit programme and</li> </ul>	

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		<p>assign person responsible.</p> <ul style="list-style-type: none"> <li>• Use of audit checklist on monitoring and operation requirements.</li> <li>• Reporting of audit findings.</li> </ul> <p>Procedures for project performance review, covering:</p> <ul style="list-style-type: none"> <li>• Set up of a schedule for performance review.</li> <li>• Review of operation and monitoring aspects to ensure continuing suitability and effectiveness.</li> </ul> <p>Procedures for corrective actions in order to provide for more accurate future monitoring and reporting, covering:</p> <ul style="list-style-type: none"> <li>• Identification and investigation of doubtful monitoring data.</li> <li>• Determination of the root cause of the problem.</li> <li>• Implementation of actions that most likely to eliminate the problem and to prevent recurrence.</li> </ul> <p>Training for operational staff before commencement of project has been included in the Monitoring Implementation Plan (see Annex 4),</p>	

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		covering the following aspects: <ul style="list-style-type: none"> <li>• Personnel requiring training</li> <li>• Areas of training</li> </ul>	
<p>CL 2</p> <p>The project proponent is requested to provide documentation about the number of palm oil mills that already use biomass as fuel for energy generation and justify why the project activity is not a common practice.</p>	B.2.7	<p>The present project is not a palm oil mill, but a refinery. This is different from a palm oil mill in the sense that it does not have the excessive amounts of biomass wastes normally found in a palm oil mill.</p> <p>Statistics for fuel use in palm oil refineries does not exist. We have been in touch with MPOB (Malaysian Palm Oil Board) and have just started a study on the issue. MPOB has sent out a questionnaire but do not have the results yet. The understanding is that refineries in general are using fossil fuels – except for the few CDM projects.</p>	<p><b>OK.</b> The PTM's 2003 official statistics on distribution of fuel used in industrial sector in Malaysia shows that only 0.6% of the total fuel used in industrial sector come from biomass. Energy use in industry in Malaysia is dominated by use of fossil fuels. Very few companies have been using biomass as fuel. Most of the biomass fuel has been palm kernel shells used in i.e. cement industry whereas the use of EFB has been very limited. It clearly demonstrated that the usage of biomass as fuel for energy generation is rare.</p> <p>This CL is thus closed.</p>
<p>CL 3</p> <p>The project proponent is requested to clarify the monitoring frequency for the boiler efficiency of the MFO boiler that was used in the baseline.</p>	D.4.1	<p>Since this is a greenfield project it is not possible to monitor the baseline boiler. It has been assumed that the baseline would have been a very efficient boiler with economizer and an efficiency of 90%. Most industrial fuel oil boilers have efficiencies around 80-85% and the assumption of a 90% efficiency in the baseline is thus conservative – as it will reduce the amount of fossil fuel</p>	<p><b>OK.</b> The assumption used in computing the fossil fuels needed for steam generation is found to be conservative. This CL is thus closed.</p>



Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		used in baseline (PDD edited p 26 and 36)	
<p>CL 4</p> <p>The project proponent is requested to substantiate with documentary evidence that all the biomass combusted by the project activity would have been land filled in the baseline scenario.</p>	<p>D. 4. 3</p> <p>E. 3. 1</p> <p>E. 4. 1</p>	<p>The section on leakage in the PDD is making a comprehensive analysis of the EFB and demonstrating that there is a huge excess amount of EFB in the region and that it is demonstrated that excess EFB is deposited in landfills since open burning is banned and incineration is discouraged.</p> <p>Wood waste from the nearby saw mills was demonstrated deposited during the site validation. Wood waste is separated in the methane avoidance calculations and Palm Kernel Cake will be traded in the market and not deposited.</p> <p>The analysis of EFB availability is only covering 4 districts around the project activity. Ambiguity in the text and table on p. 32 has been removed</p> <p>Methane emissions from wood waste has been removed from the baseline (p.36/37)</p> <p>The energy needed for chopping of the wood to chips is 5 kWh/ton (Data from project site – will be included in monitoring plan). With the expected amount of wood fuel this will give an annual power consumption of 83,783 kWh and with an EF of 0.8 kg/kWh the annual project emissions</p>	<p><b>OK.</b> The calculation used in the estimation of availability of biomass is deemed reasonable. In the absence of the project the amount of biomass used in the plant would have been land-filled since it has no alternate use and is available in excess.</p> <p>This CL is thus closed.</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		from the wood chopper will be 67 t CO <sub>2</sub> . This has been included in the PDD as project emission (p 25).	
<p>CL 5</p> <p>The project proponent is requested to justify that the electricity grid should be limited to the East Coast Grid. Justification is needed to substantiate why the IPCC default value of EF<sub>grid</sub> (0.8 kgCO<sub>2</sub>/kWh) has been used instead of the actual grid CEF. Other projects in the state of Sabah has utilised a much lower factor, generated by PTM.</p>	<p>E. 3. 2</p> <p>E. 4. 1</p>	<p>As the electricity production is less than 15 MW the ACM0006 allows to calculate the <math>EF_{electricity,y}</math> by using an average Operating Margin as defined in ACM0002 – step 1 d). The carbon emission coefficient is determined by the emissions from the electricity generation in the grid system that the bio-energy plant is to export its electricity to.</p> <p>The project proponent has chosen to use ex-ante calculation of the power baseline (in accordance with ACM0002 version6) based on the latest 3 years of available data. The latest available data for the electricity grid in East Sabah are from 2002-2004</p> <p>The project proponent has not had actual fuel data available for the Sabah East Coast grid and has as such had to rely on IPCC default values.</p> <p>This is also the approach used for East Sabah in the Danida/PTM report on power baselines in Malaysia.</p> <p>A letter has been obtained from PTM stating that data for 2005 were not available by 25. January 2007. A conversation with SESB confirms that data for 2005 and 2006 would</p>	<p><b>OK.</b> It has been confirmed by PTM that the latest available data related to the grid is year 2004.</p> <p>This CL is thus closed.</p>

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		essentially give the same pattern as the previous years.	
<p>CL 6</p> <p>The project proponent is requested to provide adequate references for non-IPCC default values used in the calculation, including the NCV of EFB, palm kernel cake and wood waste.</p>	<p>E. 3. 3</p> <p>E. 4. 1</p>	<p>A specific document has been prepared documenting the values used for EFB, Wood waste and palm kernel cake.</p> <p>There was a mistake in the first CER calculation whereby the heating values for PKS and fibre were used in stead of wood and palm kernel cake. The final value for the palm kernel cake has only been obtained recently and has further been updated.</p> <p>The NCV and moisture content for wood waste is quoted from table 2.6 (p25) in EPU/MECW/Danida (2005) Renewable Energy Resources.</p> <p>Values for palm kernel cake are values from MPOB website</p>	<p><b>OK.</b> The references used have been reviewed and found to be reliable. The reported NCV for EFB, palm kernel cake and wood wastes were 5.3 MJ/kg (60% moisture content), 16 MJ/kg (10% moisture content) and 10 MJ/kg (42% moisture content) respectively.</p> <p>This CL is thus closed.</p>

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## **APPENDIX B**

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### **CERTIFICATES OF COMPETENCE**



## CERTIFICATE OF COMPETENCE

### *Einar Telnes*

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	Yes
<b>CDM Verifier:</b>	Yes	<b>JI Verifier:</b>	Yes
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1,2,3,6 & 10		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes  
Director, International Climate Change Services

Michael Lehmann  
Technical Director



## CERTIFICATE OF COMPETENCE

### *Michael Lehmann*

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJ1-i1)

<b>GHG Auditor:</b>	Yes		
<b>CDM Validator:</b>	Yes	<b>JI Validator:</b>	Yes
<b>CDM Verifier:</b>	Yes	<b>JI Verifier:</b>	Yes
<b>Industry Sector Expert for Sectoral Scope(s):</b>	Sectoral scope 1,2,3 & 9		
<b>Technical Reviewer for (group of) methodologies:</b>			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes  
Director, International Climate Change Services

Michael Lehmann  
Technical Director



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## CERTIFICATE OF COMPETENCE

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***Soumik Biswas***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1)

<b><i>GHG Auditor:</i></b>	Yes		
<b><i>CDM Validator:</i></b>	Yes	<b><i>JI Validator:</i></b>	-
<b><i>CDM Verifier:</i></b>	-	<b><i>JI Verifier:</i></b>	-
<b><i>Industry Sector Expert for Sectoral Scope(s):</i></b>			-

***Chee Keong Lai***

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1)

<b><i>GHG Auditor:</i></b>	Yes		
<b><i>CDM Validator:</i></b>	Yes	<b><i>JI Validator:</i></b>	--
<b><i>CDM Verifier:</i></b>	--	<b><i>JI Verifier:</i></b>	--
<b><i>Industry Sector Expert for Sectoral Scope(s):</i></b>	--		

Høvik, 6 November 2006

Einar Telnes  
*Director, International Climate Change Services*

Michael Lehmann  
*Technical Director*