VALIDATION REPORT

KUNAK BIO ENERGY PROJECT IN MALAYSIA

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DET NORSKE VERITAS

VALIDATION REPORT

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Summary:
Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the Kunak Bio Energy project in Malaysia 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 consists 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 4 March 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 Bio Energy" project as a CDM project activity.

Report No.: 2007-1001	Subject Group: Environment	
Report title: Kunak Bio Energy project in Malaysia		
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_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
FFB	Fresh Fruit Bunch
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
PTM	Pusat Tenaga Malaysia
SESB	Sabah Electricity Sdn Bhd
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

TSH Bio-Energy Sdn Bhd has commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the "Kunak Bio Energy" 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 consisted of the following personnel:

Mr Lai Chee Keong	DNV Industry Malaysia	Team leader, CDM validator
Mr Soumik Biswas	DNV Industry India	CDM validator
Mr Michael Lehmann	DNV Industry Norway	Sector expert
Mr Einar Telnes	DNV Industry 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 version 4. 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 new biomass-fuelled cogeneration plant at the TSH Kunak Palm Oil Mill in Kunak, Sabah, Malaysia. The cogeneration plant will utilise waste products from the milling process such as fires, shells and empty fruit bunches (EFB) to generate steam and electricity for the mill and export excess electricity to the local grid. EFB is a biomass residue generated by the mill and majority of which would have been left to decay under anaerobic conditions in a landfill.

Emission reductions are claimed from (i) the displacement of grid electricity and (ii) methane avoidance by the controlled combustion of EFB. The majority of this would in the absence of the project have been left to decay under anaerobic conditions in a landfill.

The proposed project is expected to reduce a total of 880,935 tonnes of CO_2e over its first renewable crediting period of seven years starting from 1 January 2005, which is an annual average of 125,848 tCO_2e. The operational lifespan of the project is estimated to be 21 years.

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 Bio Energy” project is enclosed in Appendix A to this report.

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

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

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

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below).A request for **Clarification (CL)** is used when the validation team has identified a need for further clarification.*

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

Figure 1 Validation protocol tables

2.1 Review of Documents

The PDD (version 3.2 dated 12 December 2006 and version 4.3 dated 04 March 2007) /1/ submitted by TSH Bio-Energy Sdn Bhd and additional background documents such as the project baseline study, CERs reduction calculation, IRR 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 Bio-Energy Sdn Bhd, HV Carbon Sdn Bhd were interviewed. On 04 January 2007, the DNA of Malaysia was interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
TSH Bio-Energy Sdn Bhd / **HV Carbon Sdn Bhd/ Project host (Kunak Palm Oil Mill)**	➢ Annex 1 Party participation ➢ Possible alternative use of EFB ➢ Supply of biomass ➢ Estimated emission reductions ➢ Calculation of CEF ➢ Stakeholder consultation process ➢ Project investment analysis ➢ Project funding ➢ Technology applied and operational lifetime ➢ Monitoring and reporting procedures ➢ Calibration, internal audit and corrective action procedures ➢ Provisions for training, operation and maintenance ➢ Renewable energy purchase agreement
DNA of Malaysia	➢ Common practice with regards to the usage of EFB. ➢ Incentives in place to invest in renewable energy and methane recovery projects ➢ Process of obtaining host country approval for CDM projects in Malaysia and the status for this project ➢ Sustainable development priorities ➢ Legal compliance, EIA requirements and existing/ emerging requirements ➢ Stakeholder consultation process. ➢ Official government funding

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 three corrective action requests and twelve 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 04 March 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 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 final validation findings relate to the project design document version 4.3 dated 04 March 2007.

3.1 Participation Requirements

The project participants are TSH Bio-Energy Sdn Bhd, EDF Trading Limited of the United Kingdom and Climate Cent Foundation of Switzerland. The Parties involved, i.e. Malaysia as the Host Party and the United Kingdom and Switzerland as the participating Annex I Parties, meet the requirements to participate in the CDM. Written approval of voluntary participation from the DNA of Malaysia has been obtained, dated 13 March 2007.

3.2 Project Design

The objective of the proposed biomass cogeneration plant is to reduce greenhouse gas emissions through:

(i) Dispatch of surplus electricity to the electricity distribution grid, and

(ii) Avoidance of methane by the controlled combustion of EFB which, in the absence of the project, would have been left to decay under anaerobic conditions in a landfill.

The above mentioned activities will be achieved with the installation of a biomass-fired cogeneration plant that will supply electricity and heat to meet the demand of the existing palm oil processing mill.

There are three main component of the proposed cogeneration plant, namely the biomass fired steam boiler, the steam turbine and the fuel preparation system.

The biomass fired steam boiler will be much more efficient as compared to the existing biomass fired boiler with an expected efficiency of 85% and an average steam output of 80 tons/hour.

The steam turbine receives superheated steam at 50 bar, 402 ^{o}C which is used to drive a 14 MW_e generator. About 35 ton/hour of the low-pressure steam is extracted from the turbine for palm oil processing. The plant is contracted to export a minimum of 70,000 MWh/year of electricity to the distribution grid.

The fuel preparation system is designed to have a storage capacity of up to 7 days. It comes with a dewatering system to dewater moisture content from EFB and a cutting system to cut the fibres into consistent length for ease of feeding the biomass into the boiler.

The project will utilise biomass generated from the mill and the incremental biomass needed to fuel the proposed cogeneration plant will be sourced from surrounding mills and plantations.

The project is expected to have an operational lifespan of 21 years. The starting date of the crediting period was stated as 1st January 2005 in the PDD. The project has an intention to claim retro-active carbon as the project (biomass fired cogeneration plant) had requested registration CDM and withdrawn due to commercial circumstances. The project proponent has provided evidence in terms of project start date and submission for DOE's validation.

The calculations of CERs for year 2005 and 2006 have been based on the actual project data and not on estimation.

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 04, EB 27 /6/. The project fulfils the following conditions under which ACM0006 is applicable.

- The project activity involves the installation of a new cogeneration plant at a site where currently no power generation occurs. The project activity can be considered as a greenfield power project activity.
- Biomass from Kunak Palm Oil Mill and surrounding areas will be used for this project activity.
- Biomass used for this project is available in the surrounding regions. The biomass is not being stored for more than one year within the plant. The project activity complies with project scenario 3 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 an existing or new grid connected power station in Sabah. In addition, the biomass would in the absence of the project activity (a)

be used for heat generation in boilers at the project site and (b) be dumped or left to decay or burned in an uncontrolled manner without utilizing it for energy purposes.

The following baseline scenarios for project scenario 3 were selected in accordance with ACM0006:
For power generation: The generation of power in existing and/or new grid-connected power plants (P4).
For biomass use: Two alternatives were chosen, these are B1 and B4. The selection has been confirmed.
For heat generation: The generation of heat in boilers using the same type of biomass residues (H4) has been selected. The combination of P4, B1, B4 and H4 as indicted in the PDD qualify for scenario 3 as stipulated in the approved methodology of ACM 0006. The project proponent has confirmed that there was no energy generation on the existing site prior to the implementation of the project.

The quantity of biomass that is brought into the power plant will be weighed. The biomass brought in through the conveyor belt from its neighbouring mill is estimated on the ratio of EFB from every tone of FFB processed. The revised PDD has now segregated the amount of biomass used in baseline scenario, quantity used for mulching and quantity of biomass that would have been landfilled in the absence of the project. 23% of the FFB processed by the palm oil mills would be the available EFB. Out of the 23% of the EFB, 12% would be mulched. The justification and assumptions presented were found to be conservative.

The project activity is displacing predominantly fossil fuel generated electricity from the electricity distribution grid in Sabah. The baseline for this project activity is the function of the generation mix of Sabah electricity distribution grid. 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_{2e}/kWh published by Pusat Tenaga Malaysia (PTM). The current CEF_{grid} 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 CEF_{grid} 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_2e/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_2e/KWh can be used in this case.

Project emissions include CO_2 generated from the combustion of fossil fuels during the off-site transportation of biomass to the project site. The project proponent has substantiated with sufficient data for its claims in terms of number of trucks, distance of transportation, truck loads, including biomass imported to the mill from other surrounding mills.

The average diesel consumption for the existing biomass boiler was 82,992 litre for the year of 2006. However, the diesel consumption will be monitored ex-ante. The actual consumption of diesel for year 2006 has been used in CER calculation. For the crediting period of year 2007 onwards, similar consumption of year 2006 has been anticipated with 7000 operation hours.

Relevant IPCC default emissions factor have been 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 original project of the existing biomass boiler was conceptualised in back in 2003. CDM incentives were seriously considered in the decision to proceed with the project activity. The first application for national approval was submitted to the DNA of Malaysia in September 2002, well before the project commissioning date. The project was constructed before the 18 November 2004. The project proponent has provided evidence in terms of project start date /4/. The first PDD of its biomass boiler was validated starting from 18 June 2004 and final national approval was granted in December 2005. The biomass boiler had requested for registration on 02 December 2005 and withdrawn from the request for registration on 22 December 2005 due to commercial circumstances. The third version of PDD has been developed to include the methane avoidance from the biomass dumped at the landfill. The project fulfils the start date requirements regarding early CDM projects.

Step 1: The alternative scenarios identified for the project activity are, besides the proposed project activity itself:

Alternative 1: The baseline scenario, including onsite production of steam and electricity for own use, and dumping of surplus biomass residue in landfills.

Alternative 2: The project scenario where the surplus biomass residue is combusted in a high efficiency cogeneration system and 10MW of electricity is exported to the grid.

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 50,412,000
- Power price: RM 0.2125 /KWh
- Operating costs: RM 2,420,000 / year
- Interest rate for loan financing: 7%
- Inflation: 3%
- CER price: Euro 10 / tonne of CO_2 e

Under the assumption of a load factor of 7000 load hours the IRR without CDM is as low as 4.5%. This is clearly below the investment benchmark. Even in the event of a maximum

production/LF the IRR at 8.5% is well below the level of a benchmark of 15% IRR. In the case of reduced production the IRR falls below zero and the project becomes unviable without CDM. Values and assumptions used in the IRR calculation have been modified based on the actual operating values of year 2005 and 2006. Depreciation has been excluded in the cash flow analysis and inflation rate used in the spreadsheet has been corrected to reflect the inflation rate reported in the PDD.

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

Investment Barrier:

The investment barriers have been justified as the price for the sale of electricity to Sabah Electricity Sdn. Bhd. (SESB) is fixed over the agreement period, potential increase in cost of purchasing biomass residue and unavailability of grants for renewable energy projects in Malaysia.

Technological Barrier:

It is argued that the technology to develop high efficiency cogeneration plants is not readily available in Malaysia. Portions of the cogeneration system were imported from the technology provider in Denmark. The system used for the large scale dewatering and shredding of EFB is also new as it is not a common practice to utilise EFB for combustion.

Step 4: Common practice analysis

The common practice for palm oil mills is to combust palm kernel shells and mesocarb fibres to generate steam and electricity for onsite consumption. The electricity generated is not exported to the local grid. Kunak Bio Energy project was the first of it's kind to use a high efficient boiler dedicated to deliver power to the grid – as part of the Small Renewable Energy Projects (SREP) programme initiated by the Malaysian Government as part of the 8th Malaysia Plan from 2000-2005.

The Kunak Bio Energy Plant was commissioned by 1 January 2005 and still at the end of 2006 was providing 10 MW out of 12 MW supplied to the grid in Malaysia under the SREP programme.

Thus it is justifiable that the project does not represent common practice.

Step 5: Impact of CDM registration

The IRR increases with 10%-point in the base case and brings the IRR above the investment benchmark. The contribution from CDM is even more pronounced in reducing the risk from years with lower production than the expected.

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 are to be monitored:

- Net electricity generated by the biomass cogeneration power plant;
- Net electricity sold to SESB
- Quantity of biomass combusted used in the project plant;
- On-site fuel consumption for co-firing;
- Net calorific value (NCV) of biomass residue.

The monitoring plan adequately addresses all necessary information for monitoring and reporting of emission reductions due to the project activity.

Roles and responsibilities for the project management as well as registration, monitoring, measuring and reporting have been addressed. Training and maintenance needs and procedures were not described in the PDD. The project proponent has provided procedures for training, maintenance of monitoring equipments, internal audits, performance reviews, corrective actions etc. for review and they were found to satisfactory.

All critical data are either measured or calculated and archived for the crediting period plus 2 years beyond this as per the approved monitoring methodology.

The monitoring plan includes monitoring of project emission and the emissions caused by transportation of biomass and ash. All the parameters have been monitored as per the requirement of ACM0006.

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 baseline emissions calculation for the combustion of fossil fuel for steam generation is based on the assumption that the plant will be operational for 7000 hours per year. The calculation of GHG emissions for year 2005 and 2006 are based on the actual operating pattern and the emission reduction calculations have been corrected. The emission reduction arising from the electricity generation has been calculated from the amount of electricity exported to the grid.

In calculating the amount of methane emissions avoided by the project, the methane emissions for the biomass that was used in mulching has been deducted from the emission reduction calculations

Project emissions have included CO_2 generated from the combustion of fossil fuels during the transportation of biomass to the project site, and fossil fuel combustion in the cogeneration plant.

Methane released from the controlled combustion of biomass in the cogeneration plant is the only project emission. Baseline emissions are equal to the emission reductions due to project activity forecast to be average of 125,848 tCO_2e per year with a total of 880,935 tCO_2e for the first seven year crediting period starting from 2005-2011 as indicated in the PDD. It is likely that the aforementioned emission reductions are achievable if the project is implemented as planned.

3.7 Environmental Impacts

No EIA is required by the prevailing law in the country. A letter from the local Department of Environment to proof that the project in not required to perform an EIA was provided during the site visit. It has been confirmed that the project does not required to perform an EIA.

The project is expected to have a positive environmental impact by reducing the amount of fossil fuel combusted to generate electricity, and by reducing methane emissions from EFB landfills. 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.

3.8 Comments by Local Stakeholders

Local stakeholder comments were invited through a public forum on 21 November 2006 at the TSH Kunak Palm Oil Mill. Invitation letters were sent to the stakeholders two weeks before the consultation meeting. Representatives from the local residents, planters, Tawau Town Board, Department of Environment and non-governmental organisation called the Partners of Community Organisation (PACOS) were present.

Comments were mainly related to economic, environmental and social aspects of the project activity, the possibility of the project supplying electricity to the nearby residents, the proportion of total electricity sold to the gird and for internal consumption, number of mills selling biomass to TSH, human and environmental impact of methane without the project, what other gases could be emitted from the EFB, air pollution, noise pollution and the stability of biomass based electricity supply. 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 comments 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) 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. No comment was received.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Kunak Bio Energy" 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. Switzerland and United Kingdom are the participating Annex I countries. The letter of Approval from the host country dated 13 March 2007 has ben obtained.

The project correctly applies the approved baseline and monitoring methodology ACM0006 version 04. The project activity complies with project scenario 3 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 (a) be used for heat generation in boilers at the project site and (b) be dumped or left to decay or burned in an uncontrolled manner without utilizing it for energy purpose.

The monitoring plan is in line with the approved monitoring methodology ACM0006 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 envisaged.

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 125 848 tCO_2e 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 Bio Energy" in Malaysia, as described in the PDD of 04 March 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0006 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 Bio-Energy Sdn Bhd: "Kunak Bio Energy Project" version 3.2 dated 12 December 2006 and version 4 dated 4 February 2007, version 4.3 dated 4th March 2007.

/2/ Conservation and Environmental Management Division, Ministry of Natural Resources and Environment (DNA of Malaysia): *Letter of Approval dated 13 March 2007)*

/3/ Department for Environment, Food and Rural Affairs (DNA of the United Kingdom): *Letter of Approval dated 15 March 2007.*

Swiss Agency for the Environment, Forests and Landscape (DNA of Switzerland): *Letter of Approval dated 23 February 2007.*

/4/ Spreadsheet for CEF calculations

Written approval to the installation of boiler

Letter of confirmation that the project does not required to perform an EIA

Renewable Energy Purchase Agreement

Stakeholders' consultation – minutes of meeting

CERs calculation spreadsheet

IRR calculation spreadsheet

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" version 4 adopted at 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. Nazri Yahaya, DNA of Malaysia

/10/ Mr. Faizal, DNA of Malaysia

/11/ Mr. Soeren Varming, HV Carbon Sdn Bhd

/12/ Mr. Goh Kun Tech, General manager of TSH Resources

/13/ Mr. William A.K.Tan, Executive Director of TSH Resources

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APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirement 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	~~CAR 1~~	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	~~CAR 1~~	The Letters of Approval from the DNA of Malaysia and the Annex 1 country are pending.
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 diversion of official development assistance (ODA) funding towards Malaysia.

Requirement	Reference	Conclusion	Cross Reference / Comment
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	~~CAR 1~~	The Ministry of Natural Resources and Environment is the DNA of Malaysia. Annex 1 party is 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	OK	Malaysia ratified the Kyoto Protocol on 04 September 2002. Annex 1 party is yet to be determined
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	~~CAR 1~~	Annex 1 party is 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	~~CAR 1~~	Annex 1 party is 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 approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	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	CDM Modalities and Procedures §40	OK	The PDD of the "Kunak Bio Energy" project was made publicly available on

Requirement	Reference	Conclusion	Cross Reference / Comment
comments have been made publicly available			www.dnv.com/certification/climatechange 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. No comment was 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
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	Yes. The project is located in the town of Kunak, 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 a 80 tons/hour biomass-fuelled steam boiler and a 14 $MW_{electrical}$ steam turbine.		OK
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR, I	Yes. The project combusts empty fruit bunches (EFB), fibres and shells to generate electricity to displace grid electricity. EFB is a renewable biomass which would have been left to decay in anaerobic landfills in the absence of the project activity. All the equipment suppliers are of international repute. Hence the project design reflects good engineering practices.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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 a high efficiency biomass-fuelled steam boiler, a 14 MW steam turbine and a fuel preparation system used to reduce the EFB's size and moisture content. This technology is superior to the current practice where the EFB is not utilised for electricity generation.		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	The project required extensive initial training and maintenance efforts. Relevant trainings have been executed prior to the implementation of project in January 2005.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Please refer to A.2.4		OK
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR, I	Relevant documented evidence of compliance such as written approvals have been be reviewed and found to be incompliance with the prevailing legal requirements.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR	Letter of Approval (LoA) from the Malaysian DNA are to be submitted to the DOE.	~~CAR 1~~	
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: - Generating employment, - Displacing the use of fossil fuel for generating power (displacement of grid		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			supplied electricity), and - Utilising of biomass residues for electricity generation.		
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. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Is the baseline methodology previously approved by the CDM 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
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. - It is a grid-connected electricity generation project which is fuelled by biomass residue (EFB), - Biomass residue 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 of the mill or changes in the processes,		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			- 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.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	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	Yes, the baseline has been determined using conservative assumptions.		OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR, I	The following baseline scenarios were selected in accordance with project scenario 3 of ACM0006: ***For power generation:*** The generation of power in existing and/or new grid-connected power plants (P4). ***For biomass residue use:*** Two alternatives were chosen, they are B1 and B2. However, it was found that during the site visit, the baseline prior to the project (before 1 January 2005) there was no heat and electricity generation. The selection has to be corrected.	~~CL 1~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			For heat generation: The generation of heat in boilers using the same type of biomass residues (H4). The PDD has also mentioned that the more likely scenario would be H5. However, the combination of P4, B1, B2 and H5 does not lead to any suitable scenario as stipulated in the approved methodology of ACM 0006. The project proponent has confirmed that there was no energy generation on the existing site prior to the implementation of the project.		
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	The project activity takes into account the Fifth Fuel Policy, which introduces renewable energy as a new fuel for the power sector in Malaysia. Relevant documentation evidence of environmental compliance will be reviewed to determine if 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	Available data supports the selection of Scenario 3 except for the heat generation portion as the baseline scenario for the project activity.	~~CL 1~~	OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	Yes. The majority of oil palm mills in Malaysia do not export electricity to the local grid, and do not utilise EFB for electricity generation. EFB is usually mulched in the plantations or dumped in landfills.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR	Additionality is addressed through the use of "The tool for the demonstration and		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			assessment of additionality", version 2, dated 28 Nov 2005. **Step 0: Preliminary screening based on the starting date of the project activity** CDM incentives were seriously considered in the decision to proceed with the project activity. The first application for national approval was submitted to the DNA of Malaysia in September 2002, well before the project commissioning date. The project has been constructed before the 18th Nov. 2004 and the crediting period starts from 1 January 2005. **Step 1: Identification of alternatives to the project activity consistent with current laws and regulations** The alternative scenarios identified for the project activity are: **Alternative 1:** The baseline scenario, including onsite production of steam and electricity for own use, and dumping of surplus biomass residue in landfills. **Alternative 2:** The project scenario where the surplus biomass residue is combusted in a high efficiency cogeneration system and 10MW of electricity is exported to the grid. Both alternatives are consistent with		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			existing laws and regulations. **Step 2: Investment analysis** **Sub-step 2a: Determine appropriate analysis method** The Investment Benchmark Analysis method was chosen. **Sub-step 2b: Apply benchmark analysis** A benchmark of 15% internal rate of return (IRR) was selected. This is a reasonable benchmark for the palm oil industry. **Sub-step 2c: Calculation and comparison of financial indicators:** Without CDM, the project activity will achieve an IRR of 5.8%. The IRR was calculated based on the following input values: - Capital costs: RM 50,412,000 - Power price: RM 0.2125/KWh - Operating costs: RM 2,560,000 / year - Interest rate for loan financing: 7% - Inflation: 3% - Load factor: 73% (6400 hours) Values and assumptions used in the IRR calculation should be done in a more transparent manner. **Sub-step 2d. Sensitivity analysis** The sensitivity of the project's IRR in relation to the annual power production was analysed. An IRR of 15% was achieved only if the project is able to achieve the maximum theoretical production of 8000	~~CL 2~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			hours/year (91% load factor). At half of the theoretical maximum load, the IRR falls below zero. **Step 3: Barrier Analysis** Investment Barriers The investment barriers identified in the PDD include: - A fixed price of for the sale of electricity to Sabah Electricity Sdn. Bhd. (SESB), - Potential increase in cost of purchasing biomass residue, - Unavailability of grants for renewable energy projects in Malaysia, Values and assumptions used in the IRR calculation should be based on the actual operating values of year 2005 and 2006. Technology Barriers The technology to develop high efficiency cogeneration plants is not readily available in Malaysia. Portions of the cogeneration system were imported from the technology provider in Denmark. The system used for the large scale dewatering and shredding of EFB is also new as it is not a common practice to utilise EFB for combustion. This barrier applies to the baseline scenarios prior to the implementation of the project. **Step 4: Common practice analysis** The common practice for palm oil mills is to combust palm kernel shells and mesocarp fibres to generate steam and electricity for onsite consumption. The electricity	~~CL 2~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			generated is not exported to the local grid. As of 2005. EFB from the milling process is not utilised due to the abundance of more easily combustible palm kernel shells and mesocarb fibres. They are commonly mulched in the oil palm plantations, or disposed in landfills. 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. **Step 5: Impact of CDM registration** The inclusion of income from the sale of CERs increases the IRR of the project by 10%-points from 5.8% (based on 6400 hours/year of operations). This allows the project to achieve the benchmark IRR of 15%. If the project is only able to produce power for 4000 hours/year, the revenue from CER sales will prevent the IRR from falling below zero. Further justification is needed to demonstrate that the project is indeed additional.	~~CL 3~~	
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	Risks associated with the project's power output and other data used in the IRR calculations have been identified and they have been reviewed.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR	The project was constructed before 18 November 2004 and the crediting period starts from 1 January 2005. The operational lifetime of the project is estimated to be 21 years. The project has to provide evidence that the retro-active carbon could be claimed as the initial project did not cover methane avoidance due to biomass left to decay in the landfill in the absence of the project. The calculation of CERs for year 2005 and 2006 should be based on the actual project data and not on estimation.	~~CL 4~~	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 2005 has been selected. The project has to provide evidence that the retro-active carbon could be claimed as the initial project did not cover methane avoidance due to biomass left to decay in the landfill in the absence of the project. The actual amount of retro-active carbon to be claimed should be clearly identified in the PDD.	~~CL 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM 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	Yes. Please refer to B.1.2		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	GHG emissions from the transportation of EFB and ash are not included in the monitoring plan due to the assumption the distance travelled under the baseline and project scenarios are similar. This should be evidenced. Leakage resulting from the project activity is not monitored.	~~CL 5~~ ~~CAR 2~~	OK
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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	Yes, the monitoring plan provides for the collection and archiving of all relevant data necessary for estimating project GHG emissions. The monitoring of the fossil fuel used is not as required by ACM0006. The project proponent is requested to modify the monitoring plan accordingly. The following parameters are monitored to estimate the project emissions: 1. Net quantity of electricity generated in a year, 2. Net electricity sold to SESB, 3. Quantity of fossil fuel combusted by the project activity, 4. Quantity of biomass fuel combusted in the boiler, 5. Global warming potential of methane, 6. Net calorific value (NCV) of biomass residue. Various default values for the ex-ante calculation of emission reductions have been used. Some of the default values used are DOC_f (0.5), K_j (0.4), DOC_j (0.15), MCF (0.8) and F (0.5). GHG emissions from the transportation of EFB and ash are not included in the	~~CAR 3~~ ~~CL 5~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			monitoring plan due to the assumption the distance travelled under the baseline and project scenarios are similar. This should be evidenced.		
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	CO_2 and CH_4 are the only two GHG indicators that need 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	Yes.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes. These indicators will allow the measurement of GHG emissions from onsite consumption of fossil fuels for boiler start up and backup and fugitive methane emissions from the combustion of biomass. However, it was assumed by the project that the CO_2 emissions due to transportation in both the baseline and project scenarios are similar.	~~CL 5~~	OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Yes.		OK
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Leakage resulting from the project activity is not monitored as per alternative L2 of ACM0006. This should be included in the monitoring plan.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
				~~CAR 2~~	
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	Please refer to D.3.1	~~CAR 2~~	OK
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	Please refer to D.3.1	~~CAR 2~~	OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	Please refer to D.3.1	~~CAR 2~~	OK
D.4. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	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 biomass residue used in the project activity.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	CO_2 and CH_4 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	Yes. The quantity of biomass that is brought into the power plant will be weighed. The biomass brought in through the conveyor belt from its neighbouring mill is estimated on the ration of EFB from every tone of FFB processed. However, this method does not differentiate between the biomass residue	~~CL 6~~ ~~CL 10~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			that would be landfilled in the baseline scenario, and the biomass residue that would normally be combusted to produce steam and power for the mill. Justification is needed to justify why the IPCC default value of EF_{grid} (0.8 $kgCO_2/kWh$) 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. In addition, the CEF value published in Danida's report was calculated based on 2002-2004 data. The latest operating and built data should be used in the CEF calculation.		
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?			Yes. These indicators will allow for the estimation of methane emissions due to the anaerobic decomposition of EFB in landfills in the baseline scenario.		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	There is no specific requirement from the local DNA.		OK
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	/1/	DR	Please refer to D.5.1.		OK
D.5.3. Will it be possible to monitor the specified sustainable development indicators?	/1/	DR	Please refer to D.5.1.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	Please refer to D.5.1.		OK
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	Yes, the authority and responsibility of project management is described in Section B.7.2 of the PDD		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 Monitoring Implementation Plan.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	The procedures for training of monitoring personnel were not included in the PDD	~~CL 7~~	OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	No such emergencies were identified in the monitoring plan. It is not clear if such emergencies are likely to occur.	~~CL 7~~	OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Procedures for the calibration of monitoring equipment in accordance to industry standards and/or manufacturer's established procedures were not included in the PDD. Calibration procedures should be provided for review.	~~CL 7~~	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Procedures for the maintenance of monitoring equipment in accordance to industry standards and/or manufacturer's established procedures were not included in the PDD. Maintenance procedures should be provided for review.	~~CL 7~~	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	The Monitoring Plan only contains general statements regarding the procedures for monitoring, measurement and reporting.	~~CL 7~~	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	The Monitoring Plan only contains general statements regarding the procedures for day-to-day record handling.	~~CL 7~~	OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	The PDD does not identify procedures for possible monitoring data adjustments and uncertainties.	~~CL 7~~	OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	The monitoring reports will be reviewed by the General Manager on a monthly basis. However, the review procedures were not elaborated in the PDD.	~~CL 7~~	OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	The PDD does not identify procedures for internal audits of GHG project compliance.	~~CL 7~~	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	Details of the performance reviews were not included in the PDD.	~~CL 7~~	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Details of the corrective action procedures were not included in the PDD.	~~CL 7~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Project GHG Emissions *The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	GHG emissions from the transportation of EFB and ash are not included in the project emissions calculations due to the assumption that the distance travelled under the baseline and project scenarios are similar. This should be evidenced.	~~CL 5~~	OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	The calculations of methane emissions from burning of biomass was documented in a complete and transparent manner		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	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 EFB.		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 was 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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.*					
E.2.1. Are 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 leakage calculations are not necessary and excluded as per scenario L2 of ACM0006.		OK
E.3. Baseline Emissions *The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	The quantity of biomass residue used in the methane avoidance calculations includes palm kernel shells and mesocarb fibres. Palm kernel shells and mesocarb fibres are not disposed in anaerobic landfills in the baseline scenario. Therefore, they should not be included in the methane avoidance calculations. The baseline emission calculation assumes that all of EFB <u>imported</u> by the project activity would be dumped in a landfill under baseline conditions. However, the prevalent practice is to mulch a portion of the EFB	~~CL 8~~ ~~CL 9~~	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			that is produced by the mills in the plantations. It should be evidenced that the EFB combusted by the project activity was not diverted from this mulching process. The current Danida's report sows that the CEF of grid was calculated based on 2002-2004 data. Grid EF should be calculated using the latest publicly available data.	~~CL 10~~	
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	The baseline boundary was clearly defined as the local electricity grid system and the anaerobic landfill site.		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	The CER calculations in the PDD is in accordance to ACM0006, however, the actual spreadsheet used for calculation should be reviewed and revised if needed to ensure accuracy and consistency.	~~CL 11~~	OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR, I	The baseline emission calculation assumes that the project will generate 80,000MWh of electricity for export to the grid. This is the project's maximum theoretical production. The actual power output for year 2005 and 2006 was much lower due to some operational and technological challenges. Justification for not using a more conservative power output in the calculations should be provided for the crediting period of year 2007 onwards.	~~CL 12~~	OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR, I	The uncertainties with regards to the parameters used in the calculation of methane avoidance, such as DOC_j, DOC_f and k_j, were addressed in the PDD.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
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
E.4. Emission Reductions *Validation of ex-ante estimated emission reductions*.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	Yes, the project is expected to reduce 1,078,420 tCO_2e over the 7 years renewable crediting period starting from 2005 to 2011.		OK
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/		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 with the letter from the Sabah Department of Environment.		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 amount of fossil fuel combusted to generate electricity, and by reducing methane emissions from EFB landfills.		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	There are no adverse transboundary environmental impacts.		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	Pollution control systems will be installed for the project activity to ensure stack emissions from the combustion of biomass		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			residue complies with the local environmental regulations.		
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Yes.		OK
G. Stakeholder Comments *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR, I	Yes. A local stakeholder consultation meeting was held on 21 November 2006 at the TSH Kunak Oil Palm Mill in Kunak, Sabah.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR, I	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

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
CAR 1 The Letter of Approvals from the DNA of Malaysia and the Annex 1 country are pending. The Annex 1 party has not been identified	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. UK and Switzerland have been identified as the participating Annex 1 countries.	**OK.** The Project Participant has now identified UK and Switzerland as its Annex 1 Parties. Letter of Approval from the host country dated 13 March 2007 has been obtained. This CAR is thus closed.
CAR 2 Leakage resulting from the project activity is not monitored as per alternative L2 of ACM0006. This should be included in the monitoring plan.	D. 1. 3, D. 3. 1 until D. 3. 4	Leakage is included in the monitoring plan. The analysis of the alternative L2 has been modified to more clearly be in compliance with the ACM0006.	**OK.** The justification for the selection of L2 has now been provided with estimation of EFB available in the 4 districts where the biomass is imported from, namely Lahad Datu, Semporna, Kunak and Tawau. The amounts of EFB used for mulching and quantity used by the mill have been estimated conservatively. It has been justified that the project complies with alternative L2. This CAR is thus closed.
CAR 3 The monitoring of the fossil fuel used is not as required by ACM0006. The project proponent is requested to modify the monitoring plan accordingly.	D. 2. 1	The monitoring plan has been updated to take into account the comment.	**OK.** Monitoring plan has been up-dated and it now conforms to the requirement ACM0006. This CAR is thus closed.
CL 1 The combination of P4, B1, B2 and H5 does not lead to any suitable scenario as stipulated in the approved methodology of ACM 0006. The project proponent has confirmed that there is no energy generation on the existing	B. 2. 3 B. 2. 5	The scenarios have been reanalysed and the project boundary revised so the project is demonstrated to be a scenario 3 based on the combination P4, H4 and B1+B4.	**OK**. The project complies with Scenario 3 as stipulated in ACM0006, version 4. This CL is thus closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
site prior to the implementation of the project. Thus the project proponent is requested to clarify on the baseline alternatives for the project activity.			
CL 2 Values and assumptions used in the IRR calculation should be based on the actual operating values of year 2005 and 2006.	B. 2. 7	The IRR calculations have been updated with the actual data for 2005 and 2006. The calculation shows that the IRR without CDM is lower using the actual numbers than by using the budget figures. (The inflation rate has been rectified in the PDD as 3%. Depreciation was added back as income in the cash flow forecast for IRR calculation purpose).	**OK.** The IRR calculations have been up-dated with actual data of year 2005 and 2006. The inflation rate in both the spreadsheet and PDD has been corrected and depreciation has been removed from the project cash flow calculation. This CL is thus closed.
CL 3 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.	B. 2. 7	Basically all Malaysian palm oil mills are using biomass in low efficient boilers for production of steam and in many cases also for their own use of electricity. As explained in step 4 of the additionality test is the unique feature of the Kunak Bio Energy project that it was the first to use a high efficient boiler dedicated to deliver power to the grid – as part of the Small Renewable Energy Projects (SREP) programme initiated by the Malaysian Government as part of the 8th Malaysia Plan from 2000-2005. The Kunak Bio Energy Plant was	**OK.** It is justifiable that the project is not a common practice. At the time of project inception this was the first project in Malaysia that was using biomass in a high efficiency boiler to deliver power. This CL is thus closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		commissioned by 1 January 2005 and still at the end of 2006 was providing 10 MW out of 12 MW supplied to the grid in Malaysia under the SREP programme. See attached a speech by the Malaysian Minister of Energy, Water and Communication on the National Renewable Energy Forum on September 20, 2006.	
CL 4 The project has to provide evidence that the retro-active carbon could be claimed as the initial project did not cover methane avoidance due to biomass left to decay in the landfill in the absence of the project. The calculation of CERs for year 2005 and 2006 should be based on the actual project data and not on estimation. Diesel consumption of year 2004 and 2005 should be used in calculating the retro-active carbon to be intended to claim. Amount of retro-active carbon to be claimed should be clearly identified in the PDD.	C. 1. 1 C. 1. 2	A specific document attached has the full arguments for the claim on retroactive credits, but basically the projects fulfil the criteria – a start date between 1 January 2000 and 14. November 2004 since the construction of the project started in August 2003. The PDD was first validated as seen in a validation report from DNV dated June 18, 2005 – clearly before the deadline for submission for validation by 31 December 2005. The calculation of CERs for 2005 and 2006 based on actual data is inserted as Annex 5 in the PDD. The present PDD for the Kunak Bio Energy Project has changed the methodology for calculation of baseline and monitoring plan from the small scale methodology AMS I.D to	**OK.** The project proponent has indicated the changes in terms of approved methodology applied and inclusion of methane avoidance in the current PDD as compared to the previous PDD submitted for validation. The project has been justified in compliance of starting date and validation dates. This CL is thus closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		ACM0006_v4. This change of methodology allows the inclusion of avoided methane emissions from landfilling of biomass wastes in the baseline. However, the project proponent only claims retroactive credits for the saved emission reductions from the electricity supplied to the grid and not from methane avoidance through landfilling of biomass wastes. The claim for emission reductions from electricity supplied to the grid was also covered by the original PDD validated before 31 December 2005. Emission reductions on the methane avoidance will be claimed from the period after the registration of the project as a CDM project activity.	
CL 5 GHG emissions from the transportation of EFB and ash are not included in the monitoring plan due to the assumption the distance travelled under the baseline and project scenarios are similar. This should be evidenced.	D. 1. 3 D. 2. 1 D. 2. 4 E. 1. 1	Transport emissions has been included in project emissions	**OK**. Conservative assumptions have been made for the emissions related to transportation of biomass. This CL is thus closed.
CL 6 The quantity of biomass that is brought into the power plant will be weighed. The biomass brought in through the conveyor belt from its neighbouring mill is estimated on the ratio of	D. 4. 3	The PDD suggests that the amount of fuel used for energy production in the baseline is subtracted from the total fuel use in each year. This suggestion has been made clearer	**OK.** The revised PDD has now segregated the amount of biomass used in baseline scenario, quantity used for mulching and quantity of biomass that would have been

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
EFB from every tonne of FFB processed. However, this method does not differentiate between the biomass residue that would be landfilled in the baseline scenario, and the biomass residue that would normally be combusted to produce steam and power for the mill.		in PDD.	landfilled in the absence of the project. Assumptions were found to be conservative. This CL is thus closed.
CL 7 Specific details of the following procedures should be review, revised and incorporated into the Monitoring Plan. a. Procedure for handling of emergencies situations, b. Procedures for calibrating and maintaining monitoring equipment, c. Procedures for monitoring, measurement and reporting, d. Procedure for handling of day-to-day records, e. Procedure for handling of monitoring data adjustments and data uncertainties, f. Procedure for review of reported results/data, g. Procedure for Internal audit of GHG project based on operational requirements; h. Procedures for project performance review; and i. Procedures for corrective actions in order to provide for more accurate	D. 6. 3 until D. 6. 13	Procedures as attached due to large file size.	**OK.** Relevant procedures have been established prior to the implementation of the project. They have been provided for review and were found to be satisfactory. The implementation of such procedures should be verified during the verification process. This CL is thus closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
future monitoring and reporting.			
CL 8 The quantity of biomass residue used in the methane avoidance calculations includes palm kernel shells and mesocarb fibres. Palm kernel shells and mesocarb fibres are normally combusted to generate electricity and steam for the mill, and are not disposed in anaerobic landfills in the baseline scenario. Therefore, they should not be included in the methane avoidance calculations.	E. 3. 1	There is usually excess supply of mesocarp fibre and /or palm kernel shell (PKS) in palm oil mills in Malaysia. This scenario is supported by literature such as "Danida/PTM 2005: Renewable Energy Resources" that can be downloaded from www.eib.org.my. The Danida/PTM 2005: Renewable Energy Resources report is representative of the entire Malaysia and it illustrates the experience of palm oil mills in Malaysia including Sabah and the region of the proposed project. This is also true for this specific project - there was clearly an excess of mesocarp fibre and PKS in the baseline of this project after meeting the fuel need in the 1 MW biomass boiler in the neighbouring mill (as seen in the PDD p 16 – Table B6). The excess of mesocarp fibre and PKS was dumped in a landfill. This was a normal practice in the area especially before the Kunak Bio Energy Plant was operating – since it was the most convenient way of getting rid of the waste. Open burning of the biomass waste was not possible as open burning was banned in Malaysia. The calculation methane avoidance from the amount of waste deposited in a landfill in the baseline has taken into	**OK.** The literature from Danida is presented on the whole of Malaysia. No segregation has been made for those mills operating in the state of Sabah. It does provide some indication on the availability of mesocarp fibre and /or palm kernel shell (PKS) in the country. In the case of Sabah, the situation in such that there is no market for PKS and mesocarp. The utilisation of biomass was not that common until recent 3-4 years after the initiation of CDM project utilising various biomass from the palm oil mills.. The Project Proponent has decided to exclude PKS and mesocarp fibres from the calculation of methane avoidance, which is deemed conservative. The CL is now closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		account (deducted) the Palm Kernel Shell (PKS) and Mesocarp Fibre used for the 1MW biomass boiler energy consumption in the baseline. Since the disposal of biomass - mesocarp fibre and PKS has stopped 2 years ago after the commissioning of the Kunak Bio Energy Plant in January 2005, it would not be possible to sight the residues of the biomass at the landfill where it is dumped. The mesocarp fibre and PKS were dumped in the same landfill as the EFB before the commissioning of the Kunak Bio Energy Plant. In the absence of the Project, the excess mesocarp fibre and PKS would have been dumped in the same landfill of more than 5 meter depth. There were no other major uses of bio fuels in the Kunak/Tawau region than the Kunak Bio Energy Plant – and no formal market exists for these products in the region. The fact that the Kunak Bio Energy project could purchase shell and fibre from other mills indicate clearly that there is excess shell and fibre from what the millers could used in their mills for energy consumption. The millers would not stop their own mills to	

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		supply to the Kunak Bio Energy Plant and they would only supply excessive mesocarp fibre and PKS that they used to dump in a landfill. As of now, the project owner is purchasing biomass waste (including mesocarp fibre and PKS) on an ad hoc basis from neighbouring mills. In the future, long-term purchase contracts will be entered into by the project proponent with the current suppliers to secure supply of biomass as fuel. There was no quoted price for mesocarp fibre and PKS before the commissioning of the bio energy plant as there were no significant demand or alternative uses for these biomass wastes. However, in taking a conservative position, the calculation in methane avoidance has not included mesocarp fibre and palm kernel shell (PKS).	
CL 9 The baseline emission calculation assumes that all of EFB imported by the project activity would be dumped in a landfill under baseline conditions. However, the prevalent practice is to mulch a portion of the EFB that is	E. 3. 1	The total available amount of EFB in the region has been calculated in the Leakage section of the PDD. An estimate of the amount of EFB used for mulching has been made and the result is that there is a huge excess of EFB in	**OK.** The calculation used to estimate the amount of FFB being process in the 4 neighbouring districts, percentage of EFB generated, percentage used for mulching was deemed conservative. The justification and assumptions were

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
produced by the mills in the plantations. It should be evidenced that the EFB combusted by the project activity was not diverted from this mulching process.		the region, so that there is still ample room for mulching of parts of the EFB and still supply the Kunak Bio Energy plant – and other CDM projects. The readily available amount of EFB for the plant also indicates that millers and plantation owners are not in need to change existing practice to provide EFB for the project.	found to be conservative. This CL is thus closed.
CL 10 The current Danida's report shows that the CEF of grid was calculated based on 2002-2004 data. Grid EF should be calculated using the latest publicly available data.	D. 4. 3 E. 3. 1	A formal letter has been send to Pusat Tenaga Malaysia (The Malaysian Energy Centre) with a request for data for 2005. The response letter replies that 2005 data are still not publicly available. According to a personal communication with SESB will there not be any significant difference between 2005 and the preceding years. The lack of data for 2005 will thus not compromise the validity of the baseline calculation. The letter from PTM will be forwarded to the DOE.	**OK**. A formal response from PTM indicated that the latest available data is year 2004.
CL 11 The conservativeness of the values used in the calculations, including the total operating hours of the plant, CEF value, NCV of EFB etc. should be reviewed to ensure conservativeness.	E. 3. 3	The CEF value for diesel and for methane emissions from combustion of biomass are calculated from IPCC default values. The use of diesel per km has been revised based on the actual use in the logistics department of TSH	**OK.** The laboratory test results only indicate the Gross Calorific Value of sampled supplied by the PP for testing. The link from the laboratory test result to the calculation of NCV of EFB has been revised.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
The CER calculations in the PDD is in accordance to ACM0006, however, the actual spreadsheet used for calculation should be reviewed and revised to ensure accuracy and consistency.		Tawau. The methane emission factor is utilising the highest conservativeness factor. The NCV values for EFB have been recalculated based on data available from the Kunak Bio Energy Plant. The calculations as well as the result of a laboratory test of the heating value are attached for review. Comparisons between the expected use of biomass as calculated in the PDD and the actual used biomass in the 2006 indicates that the heating values used in the PDD are on the high side. More biomass is used that expected from the calculations. This indicates that the values used in the PDD are conservative – as they underestimate the amount of biomass will actually be used – and thus are on the low side of the methane emissions saved. The spreadsheet have been edited and simplified. The operations hours of the plant are discussed in CL 12. The back ground document "Moisture content and heating values for biomass	This CL is thus closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		fuels" has been further developed to clarify the link between the lab result for Gross Heating Value and the NCV used in the calculation. The NCV used – also in the spreadsheet – is based on the lab test (17 MJ/kg) and NOT the literature (which states 18 MJ/kg – p.6 in the quoted report).	
CL 12 The baseline emission calculation assumes that the project will generate 80,000MWh of electricity for export to the grid. This is the project's maximum theoretical production. The actual power output for year 2005 and 2006 was much lower due to some operational and technological challenges. Justification for not using a more conservative power output in the calculations should be provided for the crediting period of year 2007 onwards.	E. 3. 4	The Kunak Bio Energy Plant had some serious technical challenges in the first two years of operation which led to reduced utilisation of the installed capacity. A number of modifications have been undertaken to improve the reliability of the system, not least the fuel preparation. In 2007, the fuel storage will further be expanded to allow for up to one week of storage. These efforts will contribute to bringing the expected operations hours up for the future. As indicated by the IRR calculations in the additionality test it is also necessary for the plant to have a high utilisation in the coming years to catch up with the losses in the initial phases. This leads to an operations target of achieving 7000 full load hours per year.	**OK.** It is proven that the project faced some technological challenges. It is uncertain if year 2007 onwards there would not be any technological challenges, the has anticipated a 7000 hours of operation. A reasonable and conservative assumption has been made and incorporated into the CERs computation. This CL can be considered closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		The diesel consumption of the project is expected to be 82,922 litre per annum from 2007 onwards – the same amount as actual diesel consumption in 2006. This is a conservative assumption since the operation is expected to improve from 2007 onwards.	

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APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Einar Telnes

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	Yes
CDM Verifier:	Yes	***JI Verifier:***	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3,6 & 10		
Technical Reviewer for (group of) methodologies:			
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-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	Yes
CDM Verifier:	Yes	***JI Verifier:***	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3 & 9		
Technical Reviewer for (group of) methodologies:			
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

Soumik Biswas

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	-
CDM Verifier:	-	***JI Verifier:***	-
Industry Sector Expert for Sectoral Scope(s):		-	

Chee Keong Lai

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

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 6 November 2006

Einar Telnes
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