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Your ref.:	Our ref.:	Date:
CDM Ref 1285	LAICK/MLEH	30 November 2007

Response to request for review

Tradewinds Methane Extraction and Power Generation Project **(1285)**

Dear Members of the CDM Executive Board,

We refer to the requests for review raised by three Board members concerning DNV's request for registration of the project activity 1285 entitled "Tradewinds Methane Extraction and Power Generation Project" and we would like to provide the following response to the issues raised by these requests for review.

1. Clarification is required on how the DOE has validated the methodological requirement of scoring barriers for potential baseline options.

DNV Response:

DNV has scored the barriers for the potential baseline options based on the arguments provided under Step 2 in the validation report. There were four plausible baseline options identified earlier during Step 1, which are:

Option 1: The continuation of existing open anaerobic pond system (business as usual)
Option 2: Direct release of wastewater to a nearby water body
Option 3: New aerobic treatment facility
Option 4: Proposed anaerobic treatment facility not undertaken as a CDM project activity

The barriers that can be demonstrated to be significant are then identified in Step 2, which are:

1. Legal barriers
2. Technical barriers
3. Financial barriers
4. Social barriers
5. Business culture and other barriers

The respective barriers identified in Step 2 are then scored for the respective potential baseline options identified in Step 1:

<u>Option 1: The continuation of existing open anaerobic pond system</u>

- This scenario does not face any of the barriers indicated in Step 2. During the validation, a clarification (CL 1) was raised on the treated POME being well in excess of the local permissible biological oxygen demand (BOD) for the state of Sarawak in Malaysia (20 mg/L

for water discharge). However, a formal letter from the State Department of Environment[1] confirmed that only 65% of the 39 palm oil mills operating in Sarawak comply with the effluent standard set by the state department of environment.

- In addition to that, the Mill Operating License[2] has been renewed annually by the Department of Environment for the Tradewinds Binu palm oil mill for the last four years indicating that the effluent discharged from the mill comply with the prevailing effluent standard.
- Hence, it is in DNV's opinion demonstrated that the discharge limit of 20 mg/L of BOD is not strictly enforced and that this baseline option does not face a legal barrier. Meanwhile, the 100 mg/L discharge limit stipulated in the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977[3] is the strictly enforced discharge standard.

Option 2: Direct release to nearby water body

- This scenario does not comply with legal requirements as stipulated in the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977[3]. As such, it is not a viable baseline scenario.

Option 3: New aerobic treatment facility

- This scenario has significant technological risks and faces financial barriers due to its high electrical power requirements.
- This scenario also faces minor social barriers due to the lack of understanding of the technology by the host country/industry.
- This scenario also faces minor existing business culture barriers due to the reluctance of existing palm oil mill owners to switch to this technology. This is confirmed by the fact that 85% of the palm oil mills in Malaysia still opt to use the open pond anaerobic system[4].

Option 4: Anaerobic treatment facility not undertaken as CDM project activity

- This scenario faces financial barriers due to its high initial investment.
- The technology required is difficult to purchase through local suppliers and is not commonly used in similar industries (technical barrier).
- This scenario also faces minor social barriers due to the lack of understanding of the technology by the host country/industry.
- This scenario also faces minor existing business culture barriers due to the reluctance of existing palm oil mill owners to switch to this technology. This was observed to be the case where 85% of the palm oil mills in Malaysia still opt to use the open pond anaerobic system[4].

2. Documentary evidences must be provided to substantiate that possible baseline options other than continuation of current practice have prohibitive barriers.

DNV Response:

We refer to the response to the requests for review submitted by the project participants where the following documentary evidences were provided to substantiate the prohibitive barriers that exist for the possible baseline options:

[1] Attachment 14 – Letter from Department of Environment in the State of Sarawak
[2] Attachment 1 – Binu Palm Oil Mill operating license expiring on 30 June 2008
[3] Attachment 2 – Parameter limit from Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977
[4] Attachment 3 - B.G. Yeoh, *'A Technical and Economic Analysis of Heat and Power Generation from Biomethanation of Palm Oil Mill Effluent'*, 2004

a. Legal Barriers
   - Attachment 1 : Mill Operating License which will expire on 30 June 2008 from the Department of Environment
   - Attachment 2 : Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977
   - Attachment 3 : Page 20-66, B.G. Yeoh, *'A Technical and Economic Analysis of Heat and Power Generation from Biomethanation of Palm Oil Mill Effluent'*, 2004)
   - Attachment 14: Letter from the Department of Environment in the State of Sarawak

b. Technical barriers
   - Attachment 3 : Page 20-63 and 20-64, B.G. Yeoh, *'A Technical and Economic Analysis of Heat and Power Generation from Biomethanation of Palm Oil Mill Effluent'*, 2004
   - Attachment 4 : Eco-Ideal Consulting Sdn Bhd, *'Study on Clean Development Mechanism Potential in the Waste Sectors in Malaysia'*, 2004

c. Financial barriers
   - Attachment 3 : Page 20-64, B.G. Yeoh, *'A Technical and Economic Analysis of Heat and Power Generation from Biomethanation of Palm Oil Mill Effluent'*, 2004
   - Attachment 4 : Eco-Ideal Consulting Sdn Bhd, *'Study on Clean Development Mechanism Potential in the Waste Sectors in Malaysia'*, 2004
   - Attachment 5: BPOM Mill running hours 2006 and Aerator Power Rating
   - Attachment 6: IRR Calculations Excel Spreadsheet
   - Attachment 7a - 7e : Project cost and Operations and Maintenance Cost

d. Social barriers
   - It was explained by the PP that there are some minor social barriers faced by the PP, namely perceived risks associated with new technology and safety issues with regards to collection and storage of biogas. It is the opinion of DNV that these barriers are deemed minor but reasonable in the local situation. The two options that mentioned these barriers both had barriers that were much more important and DNV assessed that it was sufficiently demonstrated through those that the project faces barriers.

e. Business culture & other barriers
   - Attachment 3 : Page 20-64, B.G. Yeoh, *'A Technical and Economic Analysis of Heat and Power Generation from Biomethanation of Palm Oil Mill Effluent'*, 2004

3. Further clarification is required as to how the prior consideration of the CDM was validated by the DOE as required by the guidelines for completing Sec. B.5 of the CDM-PDD.

DNV Response:
DNV has validated that the CDM was considered in the decision to proceed with the project activity.

We refer to the response to the requests for review submitted by the project participants which states that the Tradewinds project is the first CDM-project for BioX Carbon Malaysia Sdn Bhd. The project activity started on 27 October 2006 and came into operation around May 2007. The project was financed by the BioX Group (the mother company of BioX Carbon Malaysia) under

the condition that the project would be able to generate income from the sales of CER units upon successful registration as a CDM project[5].

The sole intention of the financial arrangement with BioX group was to establish a CDM-project. This was duly stated in the Business Collaboration Agreement[6] between BioX Carbon Malaysia Sdn Bhd and Tradewinds Plantation Management Sdn Bhd signed on 16th May 2006 to develop CDM projects at six (6) of the palm oil mills owned by Tradewinds. The Binu Palm Oil Mill is one of the palm oil mills included in Schedule 1, page 14 of this Business Collaboration Agreement.

4. The PP/DOE must provide further justification how following requirement of the approved methodology AM0022 has been met considering that project activity is covering up an existing open lagoon for collecting biogas: "The project activity foresees the introduction of a new anaerobic treatment facility into an existing lagoon-based treatment system for industrial organic waste water treatment. The output of partially treated water of the new anaerobic treatment facility will be fed into the existing lagoon system."

DNV Response:
We refer to the response to the requests for review submitted by the project participants which clarifies that the anaerobic reactor that has been installed is a type of in-ground reactor. It has been constructed with one of the existing pond covered and the equipment necessary to capture the biogas. No extension of the existing pond has been done in terms of depth, width and the length of the pond. It is therefore, confirmed that the project is neither a newly excavated pond nor any pond that has been built to extend the existing site capacity.

As the project is covering up one of its existing lagoon which is considered as deviation/medication of the original plant submitted the authority, the project proponents applied for a written approval[7] with the local Department of Environment. The application of the written approval for the project activity depicts that the effluent from the project (in-ground anaerobic treatment facility) will be fed into the existing lagoon system. The PDD will be revised to include the layout diagrams (Figure 1 and Figure 2) presented in the response to the request for review by the project participants.

5. Justification is required as to why the R_{lagoon} was not determined through a series of biochemical tests prior to project implementation as the methodology requires.

DNV Response:
We refer to the response to the requests for review submitted by the project participants where the project developer has assumed the R_{lagoon} based on a series of biochemical tests performed by Yacob *et al.*, 2006[8] for determining the methane emission from anaerobic ponds of palm oil mill effluent treatment.

We acknowledge that AM0022 requires that R_{lagoon} should be determined by carrying out a series of biochemical tests prior to project implementation. However, the figures for the overall removal rate identified in the study by Yacob *et al*. were considered more reliable as the study carried out measurements taken over a whole year while only a series of measurements would have been

[5] Attachment 9 – Historical e-mailing and loan confirmation letter
[6] Attachment 8 – Business Collaboration Agreement
[7] Attachment 11 – Application of Written Approval from the Department of Environment
[8] Attachment 12 – Yacob, Hassan, Sirai,Wakisaka and Subash, *'Baseline study of methane emission from anaerobic ponds of palm oil mill effluent treatment'*, 2006

taken within a specific period in time if project specific measurements would have been carried out. Based on the journal published by Yacob, approximately 97.8% of COD removal is achieved by the anaerobic treatment system before being channelled to the facultative ponds for further treatment.

Moreover, a series of in-house BOD measurements[9] have been conducted by the project proponent. Assuming a correlation between BOD and COD established by PTM (Pusat Tenage Malaysia) which calculated this correlation to be 92% based on average values for BOD treatment efficiency and COD treatment efficiency, the project specific BOD measurements support the adoption of COD removal rate of 95% (R_{lagoon}) derived from the series of biochemical tests performed by Yacob *et al.*, 2006. This has been done in absence of direct project specific COD measurements as described by the methodology.

Due to the above, DNV accepted the use of the COD removal rate of 95% (R_{lagoon}) derived from the series of biochemical tests performed by Yacob *et al.*, 2006.

We sincerely hope that the Board accepts our above explanations.

Yours faithfully
for DET NORSKE VERITAS CERTIFICATION AS

Michael Lehmann
Technical Director
International Climate Change Service

Lai Chee Keong
Regional Hub Manager

[9] Attachment 13 – In-house BOD test results