KIM LOONG POWER SDN BHD

(Co. No.588578-H)

04 September 2008

Your ref: CDM Ref 1737

UNFCCC Secretariat
Martin-Luther-King-Strasse 8
D-53153 Bonn
Germany

Dear Members of the CDM Executive Board,

Subject: Response to Request for Review - Methane Recovery for Onsite Utilisation Project at Desa Kim Loong Palm Oil Mill, Sook, Keningau, Sabah, Malaysia. (CDM Project 1737)

We refer to the request for review of TUEV-SUED's request for registration of the project activity entitled "Methane Recovery for Onsite Utilisation Project at Desa Kim Loong Palm Oil Mill, Sook, Keningau, Sabah, Malaysia. (Version 1.5 November 12, 2007)" (1737), and we would like to provide the following response to the issues raised by this request for review.

The request for review has the following questions:

1. The DOE is requested to provide further details regarding how the methodological choices regarding project emissions have been validated, in particular the assumptions regarding fugitive emissions from the closed tanks and leaks in the system.
2. Further clarification regarding how the PDD complies with the baseline methodology with regard to the estimation of baseline emissions from diesel consumption is required, as the equation applied relates to displacement of heat.
3. Further clarification is required on the conservativeness and applicability of the default methane emission factor 0.21 kgCH4/kgCOD.

The Project Participant has the following response to the issues raised:

Question 1:
The Project Participant maintains that the expected fugitive emissions from the tanks and leaks in the system are zero. This assessment is supported by the following statement from IPCC 2006: *Where technical standards for biogas plants ensure that unintentional CH4 emissions are flared, CH4 emissions are likely to be close to zero*[1]. The following arguments can further support/clarify this conclusion:

1) Possible methane formation in the palm oil mill from formation of the raw POME (Palm Oil Mill Effluent) to entry into the biogas digester (upsteam methane formation) is out side the project boundary as the CODin used for calculation of the methane formation potential is measured at the entry point to the digester. The upstream methane formation is expected to be unchanged (or

[1] IPCC 2006: Volume 5, Chapter 4 p 4

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reduced) compared to the baseline situation. The reduction compared to the baseline could emerge since the acidification pond is closed (see figure 5 p 6 in the PDD).

2) The gas pipeline and digester tank top will be made of stainless steel (SS304) and extensive leakage tests of the welding will performed as described on p 12 in the PDD. A leakage report will be prepared and will be available during the verification by DOE.
3) To further strengthen the confidence that there will not be any leakages the leakage test will be included in the monitoring plan and will be performed every year. If leaks are identified during the annual leak tests 5%[2] of the annual biogas production is deducted as project emissions in any case losses appear and these losses are less or equal to 5 %. In case the measured/monitored leakage would be higher than 5 % then the actual value of the leakage will be deducted.

Question 2:
There is a mistake in the description and the calculation of the baseline emissions of the diesel genset. (p 33 in the PDD)

The calculations have now been revised to follow the prescribed for baseline emissions from power production:

Displaced electricity CO_2 emissions are:
$E_{CO2\_power} = EL*CEF$ **(10)**

Where:

EL is the amount of electricity displaced by the electricity generated from the biogas collected from the anaerobic treatment facility. This is estimated as product of :(1) Average specific electricity consumption for the output of the facility, estimated using 3 years historical data; and (2) the annual production .

CEF is the carbon emission factor for the electricity displaced by the electricity generated from the biogas. If in the baseline situation only one source of power is used (onsite production or grid), then apply the corresponding carbon emission factor.

EL has been calculated based on the power production related to the total processed Fresh Fruit Bunches (FFB) in the palm oil mill for the years 2005-2007. This specific power consumption is calculated as 2.6 kWh per t FFB processed (see Annex 1).

The annual processing of FFB is expected to be 250,000 tFFB/year in 2009 and 260,000 t FFB/year for the following years.

The only power supply to the mill is from the onsite diesel genset. The CEF for the genset is determined using table I.D.1 in AMS I.D (version 13) where 0.8 kg CO2/kWh is the lowest emission factor for diesel generators.

[2] IPCC 2006: Volume 5, Chapter 4 p 4

These assumptions lead to the following revised calculation of baseline emissions from power production:

Baseline Scenario - CO_2 emissions from fossil fuel use for on site heat generation ($E_{CO2\_power\_BL}$)

Year	Annual FFB throughput (t)	Power consumption (kWh/tFFB)	Calculated annual power consumption (kWh)	Emission factor of the diesel, EF (tCO_2e/kWh)	**CO_2 emissions from fossil fuel use for back up ($E_{CO2\_power\_BL}$)**
2008 (5 months)	95,833	2.60	249,167	0.0008	**199**
2009	250,000	2.60	650,000	0.0008	**520**
2010	260,000	2.60	676,000	0.0008	**541**
2011	260,000	2.60	676,000	0.0008	**541**
2012	260,000	2.60	676,000	0.0008	**541**
2013	260,000	2.60	676,000	0.0008	**541**
2014	260,000	2.60	676,000	0.0008	**541**
2015	260,000	2.60	676,000	0.0008	**541**
2016	260,000	2.60	676,000	0.0008	**541**
2017	260,000	2.60	676,000	0.0008	**541**
2018 (7 months)	151667	2.60	394,333	0.0008	**315**

Question 3:
No reference was provided for the statement in Table 1 – issue 2 (p 9 in PDD) regarding the emission factor of 0.21 kgCH4/kgCOD.

Please find attached a paper from Yacob et al (2006)[3]. The study concerns methane formation in-situ in POME ponds in a palm oil mill and is thus highly relevant for the current project. Based on data for a year with daily COD measurements and continuous methane measurement they get the following relation between COD removed and methane production: "*methane emission from anaerobic ponds A and B were 0.223 and 0.247 kg of methane per kilogram of COD removed.*" These numbers are 6% and 18% higher than the default value used – and the default value used can thus be regarded as conservative.

The responses have been included in an updated version of the PDD. The updated version of the PDD is attached with track changes for easy reference.

[3] Shahrakbah Yacob et al (2006) Baseline study of methane emission from anaerobic ponds of palm oil mill effluent treatment. Science of the Total Environment Vol 366 (1) pp 187-196

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We sincerely hope that the Board accepts our above explanations.

Thank you.

Yours faithfully

Gook Seong Heen

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Annex 1: Calculation of specific power consumption per ton FFB processed

Year	Month	FFB (t)	Power produced	kWh/FFB	
2005	Jan	6,342.13	25790	4.07	
	Feb	6,367.74	25413	3.99	
	Mar	7,584.08	19713	2.60	
	Apr	9,629.76	19401	2.01	
	May	10,548.65	25258	2.39	
	Jun	10,311.35	21761	2.11	
	Jul	10,295.11	19890	1.93	
	Aug	12,220.88	24265	1.99	
	Sep	12,634.27	26223	2.08	
	Oct	14,783.93	20605	1.39	
	Nov	14,328.65	29282	2.04	
	Dec	11,683.07	35,741	3.06	2.47
2006	Jan	8,603.13	45282	5.26	
	Feb	10,531.29	38876	3.69	
	Mar	13,046.46	30850	2.36	
	Apr	16,130.03	42802	2.65	
	May	14,162.72	35187	2.48	
	June	14,536.64	41478	2.85	
	July	13,573.58	48477	3.57	
	Aug	14,021.68	52121	3.72	
	Sep	16,355.83	42534	2.60	
	Oct	18,680.68	49645	2.66	
	Nov	21,650.57	43506	2.01	
	Dec	17,273.65	53,703	3.11	3.08
2007	Jan	17,768.47	60096	3.38	
	Feb	12,506.80	40556	3.24	
	Mar	13943.33	44137	3.17	
	Apr	13888.56	55708	4.01	
	May	17923.79	28129	1.57	
	June	18587.28	38961	2.10	
	July	21561.55	37088	1.72	
	Aug	22162.34	38451	1.73	
	Sep	24871.01	74463	2.99	
	Oct	26198.14	23339	0.89	
	Nov	27615.1	35386	1.28	
	Dec	27793.61	23204	0.83	2.24
					Average kWh/tFBB
					2.60