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Your ref: CDM Ref 1016
Our ref: TSH-WILMAR (BF)/CDMEB

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

Dear Members of the CDM Executive Board,

Subject: Response to Request for Review - Kunak Jaya Bio Energy Plant (1016)

We refer to the requests for review raised by three Board members concerning DNV's request for registration of the project activity entitled "Kunak Jaya Bio Energy Plant" (1016), and we would like to provide the following response to the issues raised by these requests for review.

Questions from CDM EB

1. Further justification for the choice of Option III in the investment analysis is required. As the core business will require heat and power to be supplied by other sources in the absence of the project activity an investment comparison (Option II) could be considered more appropriate.

2. For Option III justification is required regarding the suitability of the benchmark.

3. Co firing of the biomass residues should be transparently assessed as a possible baseline for heat production and biomass.

4. The generation of methane from landfilled biomass should commence one year subsequent to the landfilling. Therefore more information should be provided as to why the methane avoidance is estimated to occur in year one of the project activity.

Answers from TSH

Question 1

The power and steam plant is owned by a separate legal entity as compared to the refinery and kernel crushing plant. The decision of the project proponent to build the power and steam plant and supply to the refinery and kernel crushing plant is thus totally contingent upon the expected return on investment that the project activity can yield.

Hence, Option III (Benchmark Analysis) is used as the investment analysis to determine whether the project is financially attractive or not without CDM.

Option II (Investment Comparison Analysis) will only be used if there are several alternatives (more than one alternative).

Option III (Benchmark Analysis) is used appropriately in this case where there are no several alternatives.

Furthermore, the additionality tool does not state any specific requirement for using option II or option III. There are only restrictions to apply option I, but option II and option III are equivalent.

Question 2

The benchmark of IRR 15% applied under investment analysis Option III is a standard investment benchmark used by the project proponent for project evaluation of similar nature as documented by the attached Board Paper (please see attached Board Paper dated 28 December 2004).

The relevance of the IRR 15% benchmark used is also supported by the fact that the average Return on Equity (ROE) based on the audited annual reports for the TSH Group of Companies for the last five years has been 15.2% - as shown in the table below.

Item	**2002 (RM'000)**	**2003 (RM'000)**	**2004 (RM'000)**	**2005 (RM'000)**	**2006 (RM'000)**
PBT	30,174	49,471	83,045	49,361	64,437
Total Equity	222,741	283,220	398,023	457,950	506,326
ROE	14%	17%	21%	11%	13%

This is also in line with the average Return on Equity (ROE) achieved by plantation companies of similar size in the region of 11.2% in 2006 an 11.9% in 2007 (please see attached Equity Research Report by CIMB dated 23 November 2006).

In line with the industry benchmark of 15% for the palm oil industry and also the company's investment policy, the project proponent will only undertake investment in new project of similar nature if the expected IRR is equal or greater than 15%.

Question 3

Cofiring of biomass and fossil fuels (meaning burning of fossil fuels and biomass in the same boiler) is a new technology that has mainly been used in European countries. Co-firing has mainly been undertaken between solid fuels – i.e. coal and biomass. Whereas cofiring of solid biomass (like EFB) and liquid fuels (like MFO) is very rare and even more technically challenging.

A recent report[1] explores the technical issues involved in cofiring coal and EFB under Malaysian conditions. The main challenges faced by such projects are:

1) There is no prior experience in the world of cofiring EFB with fossil fuels
2) Due to the very high moisture content (60%) and very bulky nature of EFB it is necessary with extensive preparation of fuel before it can be used in the boiler. The pre-treatment of the fuel should include shredding and drying. There after possibly packing the fibres in to bales for transport to the power plant. At the plant the fuel will go through a *bale divider, a shredder, a streightener, a stone trap, a hammer mill and then transported pneumatically to the boiler through slightly modified burners.*
3) The composition of EFB as a fuel. "*The ash content and ash composition is a concern in respect to deposit accumulations that may be even more destructive to the boiler if breaking off in big lumps as well as corrosion of the boiler. The boiler performance may be influenced thus affecting the boiler efficiency by higher moisture content in the fuel and a potential lower burn out of the biofuel compared to the coal combustion.*"
4) Corrosion can be a problem with higher percentages of cofiring. "*By co-combustion of 20% straw the corrosion rate is increased by a factor 2 to 3 at moderate metal temperatures and here the corrosion rate is at the upper limit for low-corrosive coals. At higher metal temperatures, and especially at simultaneously higher flue gas temperatures, a large increase in the corrosion rate is seen corresponding to medium-corrosive coals or more. The reason for the higher corrosion rate is probably increased sulphate melt corrosion due to higher K_2SO_4 formation*". This means that only a small fraction – perhaps 10% of the energy content can be co-fired. Such a limitation can be relevant for a 500 MW coal fired power plant, but for a 30 t steam/hour steam boiler the amount of biomass used will be so small that it will not be worthwhile compared to the extra investment costs in fuel preparation equipment.
5) Deposit in the boiler. "*Based upon the visual analyses of deposits from cofiring with straw shares from 0-20%, it was found that the deposit amount and tenacity on the upstream side of the tube increased with increased exposure time, increased straw share, increased flue gas temperature and increased load*"

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[1] Cofiring of 500 MW coal-fired power plant with 10% EFB bales or 5% shells and as a 2015 scenario 10% cofiring of POFF. A report prepared under the **Malaysian - Danish Environmental Cooperation Programme Renewable Energy and Energy Efficiency Component** by Helle Junker and published on the website of the Energy Information Bureau (www.eib.gov.my)

The report concludes "*EFB cannot become economically feasible with the high fuel prices of the pre-processed EFB (drying, baling, transportation, debaling). The many steps for this voluminous fuel have to be investigated and optimized significantly to make cofiring of EFB become feasible*". To achieve a more positive conclusion for EFB the report suggests that further research and development activities are needed. This has not been done so far and the conclusion of the report is thus still valid.

The report suggests that 5% palm kernel shells may be cofired with coal. Although this conclusion is not relevant to the current situation where the fossil fuel to be co-fired with biomass would be MFO and not coal, it suggested the technical difficulties encountered by co-firing fossil fuel and biomass. Furthermore, 5% cofiring is only relevant for large scale application and not for small scale as the present case in Kunak Jaya Bio Energy Plant.

The unavailability of a proven technology using cofiring of biomass with fossil fuels like MFO as fuel for heat production deters the consideration of it as a possible baseline.

Furthermore, it is widely-known that palm oil refineries in the region of Sabah used medium fuel oil (MFO) or diesel for their steam generation. As the operations of refineries require a stable input of steam, the use of traditional fuel for steam generation is opted especially for all new refineries. To substantiate this, at least two projects in palm oil refineries have developed and registered CDM projects (registration number 395 and 402) where diesel/MFO used as baseline have been replaced with biomass in the project scenario.

As also stated in the PDD, the investment cost for a biomass steam boiler is higher than for a MFO boiler. The actual cost of buying the biomass steam boiler was 3.9 million Malaysian Ringgit and for a similar MFO fired steam boiler 1.728 million Malaysian Ringgit. This is more than double the investment.

Question 4

The Meeting Report from EB 26 on approval of the "**Tool for determine methane emissions avoided from dumping waste at a solid waste disposal site**" states the following:

"36. The Board further agreed that the tool mentioned in paragraph 35 above should estimate methane emissions avoided such that it credits emission reductions for waste disposed during the year y, at end of year y"

This text states that the methane emissions from year "y" are credited in year "y" and not "y+1".

Further more the actual conditions in Malaysia support that methane will be developed very fast after deposition of biomass in deep landfills. The validated PDD use a kj factor reflecting a half time of the degradation of organic material of 2 years for EFB. This means that it only takes two years for half the organic matter to degrade and half of the total methane potential to be released. The experience of the project proponent from an ongoing field experiment undertaken to determine the actual degradation of EFB in a simulated landfill situation points to a decay rate that is even faster than the default factors provided in the FOD tool – with a half life significantly less than one year. Therefore it seems credible to claim that methane emission occurs already in the year of deposition.

We sincerely hope that the Board accepts our above explanations.

Thank you.

Yours faithfully
for TSH-WILMAR (BF) SDN. BHD.

Lim Fook Hin
Director