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Att: CDM Executive Board

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Response to request for review of project 2144 "Jiratpattana Biogas Energy Project"

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 2144 entitled "Jiratpattana Biogas Energy Project", and we would like to provide the following response to the issues raised.

Comment 1: The DOE shall further justify how it has validated the technological, financial and social barriers to the anaerobic and aerobic alternatives are prohibitive.

DNV Response:

Technological barrier:

The implementation of anaerobic digester technology in tapioca starch processing facilities is not a common practice. A number of barriers make the project activity unviable without CDM benefits.

It has been demonstrated in the project design document and further verified in the validation report that the Covered-In-Ground-Anaerobic-Reactor (CIGAR) technology is not available indigenously and needs to be imported. This has been verified by reviewing the equipment list provided by the technology supplier. In addition further evidences were requested from the project proponent to conclude on the existing few tapioca starch processing facilities that have adopted anaerobic digester technology in Thailand.

A report from 2007 by the Energy Conservation and Renewable Energy Division and Energy Policy and Planning Office of Thailand[1] (EPPO report) was reviewed by DNV to verify that open ponds are prevailing practice for the treatment of wastewater at tapioca starch plants in Thailand. The EPPO report confirms that most manufacturers prefer to retain wastewater from cassava starch plant in open ponds.

The EPPO report also confirms that between 2003 and 2005, the Ministry of Energy started a pilot demonstration of the biogas system in starch industry with 4 different technologies at 9 factories. The participating manufacturers receive financial support from the Energy Conservation (ENCON) Promotion Fund through four agencies that include: Department of Alternative Energy Development and Efficiency (DEDE), Department of Industrial Works (DIW), King Mongkut's University of Technology Thonburi (KMUTT), and Biogas Advisory Union Foundation (BAU).

[1] Seminar Document : The Promotion of Biogas from Wastewater as An Alternative Energy and for Environmental Improvement, published by the Energy Conservation and Renewable Energy Division and Energy Policy and Planning Office (EPPO), 2007

It is DNV's opinion that such support scheme demonstrates that these projects faced significant barriers and would not have been developed in the absence of external support.

In addition to the projects receiving financial support under the ENCON scheme, the project proponents have stated in their response that there are 17 similar projects that have applied for CDM financing, suggesting that CDM incentives are necessary for these projects to take place. DNV was able to cross check this by reviewing a published article from the Thai Tapioca Starch Association (TTSA)[2].

DNV was also provided with a letter from Dr. Saroch Boonyakitsombut, a faculty member of Department of Environmental Engineering, King Mongkut's University of Technology Thonburi (KMUTT) stating that until CDM became reality the open lagoon system was the most cost effective form of wastewater treatment from starch plants over aerobic and anaerobic systems in Thailand.

No similar projects have been identified by DNV outside of the CDM or ENCON scheme. Therefore, it reasonable to confirm that CDM incentives have been a major deciding factor for tapioca plant owners to invest in anaerobic digester and biogas utilization technology. The few tapioca starch processing facilities that have adopted anaerobic digester technology in Thailand either received financial support under the ENCON scheme or were developed considering CDM.

Financial barrier

The project is being funded by Thai Biogas Energy Company Ltd (TBEC), a company specifically created to help facilities in Thailand to develop clean technology biogas projects through CDM process. It has also been confirmed by DNV that the profitability of each of the projects being developed by TBEC relies on income from the CDM. DNV was able to verify this through the Investment Memorandum during validation and has referenced it in the validation report. In the Investment Memorandum it is clear that the financial rate of return is only sufficiently attractive if income from the CDM is included. The memorandum is a specific evidence to support the barrier due to lack of financing in the absence of CDM. The financial barrier is also established in the TBEC Shareholder Agreement signed in April 2004 which states that TBEC will engage in the 'generation and sale of Emission Reduction Certificates'.

The technology implemented under the project activity was imported to Thailand. The equipment imported was paid for in US dollars and would have been paid from income from the first years of operation. However, without income from CDM (in dollars), evidenced through the Investment Memorandum, the only income from the project would have been in the local currency (Baht). This would mean that there would be a significant exchange rate risk, which exacerbates the low rate of return and makes the project even more unattractive for investors. This risk was easily mitigated by carbon credit sales that would be paid in US dollars.

Furthermore, in the absence of CDM the only revenue for TBEC was related to the production and utilisation of biogas. It is exposed to the same risks associated with any company developing this kind of project in Thailand, hence it is in our opinion that some barriers to the project could be 'generic' to the sector, but are nevertheless real and significant.

Social barrier

It was explained by the project participant that there are some minor social barriers faced by the project participant, 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 minor

[2] Advance Energy Plus Co., Ltd. presented the pilot project of CDM development program in "bundle" pattern among medium size starch manufacturers and small size starch manufacturers. http://www.thaitapiocastarch.org/co-operation_detail.asp?id=5

but reasonable in the local situation. The two alternatives (anaerobic and aerobic systems) that faced these barriers had other barriers that were much more important and DNV assessed that it was sufficiently demonstrated through those that the project activity faces barriers and concluded on the social barriers to be minor.

We also refer to the validation report (Section 4.3), in accordance with AM0022 (version 04), the project may be considered additional if it can be demonstrated that the baseline is different from the proposed project activity not undertaken as a CDM project activity. The baseline was determined to be the continued use of existing open anaerobic ponds for wastewater treatment without methane capture. This is different from the proposed project activity, which will utilize an anaerobic treatment facility and the extraction of biogas for thermal energy generation. Therefore, even if social barrier is questioned, it is in DNV's opinion that this should not question the overall additionality of the proposed project since it also faces technological and financial barriers.

Comment 2: The DOE shall clarify how it has validated the baseline emission calculations, especially regarding the quantity of the biogas to be generated, and the amount of fuel oil to be saved.

DNV Response:

Amount of fuel oil to be saved

Based on the historical data prior to the start of the project activity, it was found that the corresponding amount of fossil fuel (Heavy Fuel Oil) that would have been displaced by the use of biogas for the generation of on site heat is 1 860 000 dm^3. However, the biogas production at the Jiratpattana facility will not be sufficient to displace all of the fossil fuel consumed in the baseline heating facility, and the site continues to use some HFO in its boilers.

The project participant has provided on-site monitoring data for the period from the project operation start date 12/06/2006 until 30/09/2007. The monitored data shows that the project sent an average of 6 556 Nm^3/day biogas to the heaters, corresponding to 1 174 448 dm^3 of HFO equivalent. The monitoring spreadsheet was provided to DNV during validation and was found appropriate.

In order to be conservative and accurate in estimating baseline emissions, the project participant has applied an adjustment factor to the quantity of fossil fuel displaced, based on monitored data from the facility, given that the project was already operating during validation and the rest of the heat requirements were met by HFO directly. It was found that only 63% of the heat energy was supplied by biogas, hence the project participant has conservatively adjusted the baseline estimations based on 63% of fuel oil displaced by the project activity. It should be noted that this was done to increase accuracy and conservativeness, and is only for the purposes of ex-ante estimations in the PDD, having no impact on CERs since it will be determined by the actual monitored amount of biogas captured and utilized by the project activity in the year "y".

Quantity of biogas to be generated

Since the project was already in operation during the validation process of this project, it was possible to define the amount of biogas produced by the proposed project based on monitored data.

The total volume of biogas is the sum of monitored biogas sent to flare, generation sets and heaters for the period 12/06/2006 to 30/09/2007. The monitoring spreadsheet was provided to DNV during validation and was found appropriate. The total monitored amount is then used for the project emissions calculation to account for the 1% leakage from the digester, which is reasonable.

We sincerely hope that the Board accepts our above explanations.

Yours faithfully
for DET NORSKE VERITAS CERTIFICATION AS

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