GEF EO Terminal Evaluation Review Form

1. PROJECT DATA				
			Review date:	October 2006
GEF Project ID:	940		at endorsement (Million US$)	at completion (Million US$)
IA/EA Project ID:	1030	**GEF financing:**	4.025	2.319 (plus .025 PDF)
Project Name:	Biomass-based Power Generation and Cogeneration in the Palm Oil Industry, Phase I	IA/EA own:		
Country:	Malaysia	Government:		
		Other*:		
		Total Cofinancing	10.734	Cofinancing expenditures not in TE
Operational Program:	6	**Total Project Cost:**	14.759	2.319 (as of end Apr05)
IA	UNDP	Dates		
Partners involved:	Ministry of Energy, Water and Communications Pusat Tenaga Malaysia	Work Program date		02/12/2001
		CEO Endorsement		03/06/2005
		Effectiveness/ Prodoc Signature (i.e. date project began)		01/2003 (TE) 07/26/2002 (PMIS) 10/06/2005 (JE)
		Closing Date	Proposed: 12/31/2004	Actual: 12/31/2005
Prepared by: Anna	Reviewed by: Siv	Duration between effectiveness date and original closing: 2 years	Duration between effectiveness date and actual closing: 4 years	Difference between original and actual closing: 1 year
Author of TE: Rogelio Z. Aldover		TE completion date: 02/2006	TE submission date to GEF EO: 06/05/2006	Difference between TE completion and submission date: 2 months

* Other is referred to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

2. SUMMARY OF PROJECT RATINGS

GEF EO Ratings for project impacts (if applicable), outcomes, project monitoring and evaluation, and quality of the terminal evaluation: Highly Satisfactory (HS), Satisfactory (S), Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U), Highly Unsatisfactory (HU), not applicable (N/A) and unable to assess (U/A). GEF EO Ratings for the project sustainability: Highly likely (HL), likely (L), moderately likely (ML), moderately unlikely (MU), unlikely (U), highly unlikely (HU), not applicable (N/A), and unable to assess (U/A).
Please refer to document "Ratings for the achievement of objectives, sustainability of outcomes and impacts, quality of terminal evaluation reports and project M&E systems" for further definitions of the ratings.

	Last PIR	IA Terminal Evaluation	Other IA evaluations if applicable (e.g. IEG)	GEF EO
2.1 Project outcomes	**S**	**S**	**N/A**	**MS**
2.2 Project sustainability	**N/A**	**N/A**	**N/A**	**L**
2.3 Monitoring	**N/A**	**N/A**	**N/A**	**U/A**

and evaluation				
2.4 Quality of the evaluation report	**N/A**	**N/A**	**N/A**	**MS**

Should this terminal evaluation report be considered a good practice? Why? No. It is an evaluation of a Phase 1 project. Implementation of the project is delayed and according to the TE the main obstacle is the approval of tariff uplift that hinders the implementation of the Full Scale Model (FSM) of biomass based power generation to move ahead. Therefore, the Phase 1 Project Evaluation has focused on this barrier and analyzed the situation in order to prescribe an option and strategy so the Project may proceed with the Project Phase 1 compliance. The structure of the TE is unusual and assessment of sustainability of outcomes, M&E, and lessons learned are missing. The source of emissions reductions is not clear.
Is there a follow up issue mentioned in the TE such as corruption, reallocation of GEF funds, etc.? No.
3. PROJECT OBJECTIVES, EXPECTED AND ACTUAL OUTCOMES

3.1 Project Objectives

- **What are the Global Environmental Objectives? Any changes during implementation?** No.

The project's global environmental objective is to mitigate GHG emissions from the power sector of Malaysia, which presently accounts for a large share of the country's total GHG emissions.

The main goal of this project is the reduction of the growth rate of GHG emissions from fossil fuel fired combustion processes and unutilized biomass waste through the acceleration of the growth of biomass-based power generation and combined heat and power (CHP). The project would help catalyze the implementation of this technology in the palm oil industry to help reduce GHG emissions from the power sector by 3-4% or equivalent 1,300 ktons by the year 2005. The main strategy is to indirectly supplant part of the current fossil fuel consumption of power utilities in Malaysia with the biomass waste and Palm Oil Mill Effluent (POME)-derived biogas in the country's palm oil industry.

- **What are the Development Objectives? Any changes during implementation?** No.

The immediate objectives of this project are:

(a) Design and implementation of a biomass energy technology information services and awareness enhancement program covering the energy applications of biomass and biomass-derived waste materials, particularly biogas;
(b) Conduct and implementation of policy studies and institutional capacity building in the area of biomass energy technology development and application;
(c) Design and implementation of financing assistance program for projects on biomass energy technology applications;
(d) Development and implementation of demonstration schemes for grid-connected power generation and combined heat and power (CHP) using palm oil biomass and Palm Oil Mill Effluent (POME)-derived biogas; and,
(e) Implementation of a biomass energy technology development program.

3.2 Outcomes and Impacts

- **What were the major project outcomes and impacts as described in the TE?**

In a nutshell according to the TE, the BioGen Phase 1 has accomplished satisfactorily the performance of most of the lined-up activities and programs. It has prepared the cornerstones and platforms of the biomass energy utilization program to guide the advocacy and adoption by the private sector. However, in spite of these preparations, the first Full Scale Model (FSM) of biomass-based power generation and combined heat and power (CHP) has not been put up as expected in Phase1.

Among the key achievements that mark the preparedness of the Project to transition to Phase 2 are:

The finalization of the REPPA pro forma: The pro forma model contract, or the Renewable Energy Power Purchase Agreement (REPPA), has been finalized. Once signed by both transacting parties, it is the official document that have been agreed upon to be used by the banks in processing loan applications.

Establishment of the RE Business Facility (REBF): The Project has established the first financing scheme for RE projects, including biomass projects. The REBF will pave the way for other funding mechanisms that will be administered through the facility and encourage more funds to augment the current level of funding, such as the JBIC.

Establishment of the Biomass One-Stop Centre: The Centre provides services, including consultancy for biomass energy utilization projects, technical advisory, financing facilitation and project identification.

4. GEF EVALUATION OFFICE ASSESSMENT

4.1 Outcomes

A Relevance **Rating: S**

- **In retrospect, were the project's outcomes consistent with the focal areas/operational program strategies? Explain.**

The project's outcomes are consistent with OP6 strategies. According to the TE the project has reduced CO2 emissions. Strategies used by the project include: installation of biomass-based power generation; information services and awareness enhancement on biomass energy technology; policy studies and institutional capacity building in the area of biomass energy technology; financial assistance for biomass energy projects; demonstration schemes for biomass-based power generation and combined heat and power (CHP); and, biomass energy technology development.

B Effectiveness **Rating: MS**

- **Are the project outcomes as described in the TE commensurable with the expected outcomes (as described in the project document) and the problems the project was intended to address (i.e. original or modified project objectives)?**

According to the TE, in spite of generally favorable situation and satisfactory compliance by the BioGen Team and stakeholders of the inputs, plans, processes and methodologies prescribed in the Project design and annual plans, however, the delay of crucial milestone of installing the first FSM as expected in Phase 1 has also affected the completion of other major outputs. The first FSM should have fully catalyzed and integrated various other major supportive outputs which include a workable Renewable Energy Purchasing Power Agreement (REPPA) ushering an RE market for the power generated, a viable financing model and RE business facility, a sustainable physical demonstration of commercial-scale biomass/biogas oil-palm-residue utilization and a dependable biomass energy technology. All these are needed to build up the confidence of the private industry and the financial sectors.

C Efficiency (cost-effectiveness) **Rating: MS**

- **Include an assessment of outcomes and impacts in relation to inputs, costs, and implementation times based on the following questions: Was the project cost – effective? How does the cost-time Vs. outcomes compare to other similar projects? Was the project implementation delayed due to any bureaucratic, administrative or political problems and did that affect cost-effectiveness?**

The Project is moving in the right direction as planned to achieve the milestones but with slower pace according to the TE. The main obstacle is claimed to be the approval of tariff uplift and this hinders the implementation of the Full Scale Model (FSM) to move ahead. Since the factors contributing to the project delay are external to the project, a decision has to be made within the Project to break this impasse confronting the financial closure for the first FSM and consequently for the other FSMs. If the tariff cannot be adjusted soon as desired by the industry, the FSM installations will continue to indefinitely drag.

The project development for the first FSM has been delayed for more than a year according to the TE. The first FSM will be hosted by EKO Synthesis Sdn Bhd (ESSB) in partnership with Kluang Oil Palm Processing Sdn Bhd (KOP), or ESSB-EKO. In spite of all the preparatory work by the BioGen Team and ESSB-EKO, the award of contract was deferred until financial closure is achieved. ESSB-EKO has been concerned with the low financial returns projected from the existing tariff of 16.8 sens/kWh and has decided to wait until an uplift of the tariff can be provided to the project. The Bank Pembangunan Malaysia Berhad (BPMB) has not proceeded to process the loan application because ESSB-EKO has to comply with several things.

Only about 42% of the project's total budget has been spent as of end 2005. The TE recommends that phase 1 be extended by 9 months (to September 2006) to complete phase 1 activities.

D Impacts

- **Has the project achieved impacts or is it likely that outcomes will lead to the expected impacts?**

According to the TE the impact of the project has been the reduction of CO2 emissions by 1,514.8 ktons as reported in the May 2005 PIR. This exceeds the target of 1,300 ktons for phase 1. The TE does not describe how this impact was achieved, must be from projects outside the BioGen project.

The BioGen Project has become the centerpiece of the Government's RE program under the auspices of the Ministry of Energy, Water and Communication/Malaysian Energy Center (MEWC/PTM). Partnerships were started to be forged in bringing in the banking and private sector involvement as co-financing and business facilities are established. It has started to be recognized in the country as a credible source of knowledge and expertise. Its assistance is starting to be requested in technical and financial matters by the palm oil industry.

4.2 Likelihood of sustainability. Using the following sustainability criteria, include an assessment of **risks** to sustainability of project outcomes and impacts based on the information presented in the TE.

A Financial resources **Rating: L**

The BioGen Project, according to the TE has established the first financing scheme for RE projects, including biomass projects. At present, the RE Business Facility (REBF) uses funds available from the UNDP/GEF to support biogas from palm oil biomass which is provided at 4% p.a. under a Memorandum of Agreement with the Bank Pembangunan Malaysia Berhad (BPMB). The REBF will pave the way for other funding mechanisms that will be administered through the facility and encourage more funds to augment the current level of funding, such as the JBIC. Alternative financing means are also being explored by the BioGen Project, such as CDM credits. Phase 2 of the project will continue work on the financing modalities.

Risks are lowered to sustainability of financial resources (according to the PIR05) because RE projects are seriously promoted by the government of Malaysia. The government also recognizes RE as an important alternative source of energy. The business opportunities in financing the RE projects are being recognized by the financial insitutions.

B Socio political **Rating: L**

According to the TE, following changes in project management recommended by the mid-term review the Project saw the renewed interest and more active participation of all stakeholders in pursuing the goals of the Project. There are also developments that somehow improved to the advantage of the biomass utilization projects, and the BioGen Project, in particular. The finalization of the basic terms of the Renewable Energy Purchasing Power Agreement (REPPA), escalating costs of petroleum, improved economic conditions, heightened interest in environmental compliance and energy conservation and the fifth fuel policy of the Government of Malaysia have also contributed to wider acceptance of the technology.

C Institutional framework and governance **Rating: L**

The pro forma model contract which is referred to as the Renewable Energy Power Purchase

Agreement (REPPA) has been finalized. Once signed by both transacting parties, according to the TE, it is the official document that has been agreed upon to be used by the banks in processing loan applications. At the present tariff rate of 16-17 sens/kWh, however, there are around seven companies which signed by the REPPA but are not implementing their projects because of their claim of the need to uplift the tariff by at least 5 sens/kWh. The BioGen Project provides the important venue and policy study support for coordination and discussion of issues through the National Steering Committee. Work on policies will continue under Phase 2 of the project.
D Environmental **Rating: L**
Environmental impact will be greater once the Full Scale Models are installed during Phase 2.The satisfactory compliance of the Phase 1 outputs of the BioGen Project is the precondition for continuing implementation of Phase 2, according to the TE. The issue therefore is how to go about the transition from Phase 1 to Phase 2. The next phase includes three more FSMs to be installed and operated for the purpose of further exemplifying the other typical situations of the oil palm mills in Malaysia. The overall strategy is towards a sustainable program of replication of palm oil biomass energy projects to tap the maximum energy potential of oil palm biomass resources.

Provide only ratings for the sustainability of outcomes based on the information in the TE:

A Financial resources	**Rating: L**
B Socio political	**Rating: L**
C Institutional framework and governance	**Rating: L**
D Environmental	**Rating: L**

4.3 Catalytic role

1. Production of a public good - The UNDP/GEF funding support and inputs have been very valuable in developing the capacity of the stakeholders and the target beneficiaries of the program and ushering in new technical approaches and financing innovations that will be applied to the Full Scale Models (FSMs) and the replication of projects in the long term.
2. Demonstration - The Project has not installed the first Full Scale Model (FSM) of biomass-based power generation and combined heat and power (CHP) intended as a demonstration project yet. The first FSM is intended to demonstrate the technology and to integrated various other major supportive outputs such as a workable Renewable Energy Power Purchase Agreement (REPPA) ushering an RE market for the power generated, a viable financing model and RE business facility, a sustainable physical demonstration of commercial-scale biomass/biogas oil-palm-residue utilization and a dependable biomass energy technology. All these are needed to build up the confidence of the private industry and the financial sectors. Phase 2 of the project is expected to install three additional FSMs.
3. Replication - The overall strategy is towards a sustainable program of replication of palm oil biomass energy projects to tap the maximum energy potential of oil palm biomass resources. As designed in the BioGen project document, the four FSMs under the whole project are expected to influence the replication of more palm oil biomass projects to constitute a pipeline of firmed-up projects. The FSMs will demonstrate a progression of designs and applications in order to cover possible typical configurations of the palm oil biomass/biogas for the industry to follow. It maybe assumed that the supply of biomass Fresh Fruit Bunches (FFB) can either be sourced internally from own Palm Oil Mill (POM) or procured totally or partially from nearby POMs, depending on the individual cases.
4. Scaling up - The pro forma model contract which is referred to as the Renewable Energy Power Purchase Agreement (REPPA) has been finalized on July 31, 2005. Once signed by both transacting parties, it is the official document that have been agreed upon to be used by the banks in processing loan applications. Through the facilitation and inputs by the BioGen Project, this output has been made possible with the close coordination and cooperation of the Malaysian Government, the private sector, and the banking institutions, in consultation with the target participants. The REPPA represents the preparedness for commercialization of RE power.

The BioGen Project provided the template of the power purchase agreement through Component 2 on the Pricing Study on RE Tariff. Through the recommendations, the relevant issues were addressed and were used in the current amendments. The study also brought about the submission by the Malaysian Energy Center/BioGen Project to the Ministry of Energy, Water and Communication of the proposal for an RE tariff uplift that is being justified to make biomass projects viable.

At the present tariff rate of 16-17 sens/kWh, however, there are around seven companies which signed by the REPPA but are not implementing their projects because of their claim of the need to uplift the tariff by at least 5 sens/kWh. The BioGen Project provides the important venue and policy study support for coordination and discussion of issues through the National Steering Committee.

4.4 Assessment of the project's monitoring and evaluation system based on the information in the TE

A. In retrospection, was the M&E plan at entry practicable and sufficient? (Sufficient and practical indicators were identified, timely baseline, targets were created, effective use of data collection, analysis systems including studies and reports, and practical organization and logistics in terms of what, who, when for the M&E activities) **Rating: U/A**
The project document has a detailed M&E plan (but no budgeted amount) including objectively verifiable indicators for each activity of the project. The TE on the other hand, provides no assessment of the M&E plan.
B. Did the project M&E system operate throughout the project? How was M&E information used during the project? Did it allow for tracking of progress towards projects objectives? Did the project provide proper training for parties responsible for M&E activities to ensure data will continue to be collected and used after project closure? **Rating: U/A**
According to the TE, in September 2004, a Mid-Term Evaluation of Phase 1 was conducted wherein the main recommendation is fast-tracking to ensure timely achievement of target outputs. The National Steering Committee decided as endorsed by the BioGen Project Team, a re-aligning of implementation activities to undertake the remaining activities within the remaining 46 weeks before Phase 1 completion date of end of December 2005. No Further information about the implementation of the M&E plan is provided in the TE.
C. Was M&E sufficiently budgeted and was it properly funded during implementation? **Rating: U/A**
The budget allocated $268,278 to M&E and as of end 2005, only 5% had been spent according to the TE. The TE does not provide an explanation why only 5% of the budget has been spent.
Can the project M&E system be considered a good practice? No, because very little information about the M&E system is provided in the TE.

4.5 Lessons

Project lessons as described in the TE

What lessons mentioned in the TE that can be considered a good practice or approaches to avoid and could have application for other GEF projects?
The TE does not have a section of lesson, but does however provide recommendations for Phase 2. These could be considered lessons that may also be applicable to other similar GEF projects. • **Conduct follow-through activities in order to assist the government in arriving at pragmatic approaches in tariff setting** e.g. comprehensive financial feasibility studies and case analyses that will redound to the benefit of the biomass renewable energy program.

- **Continue to develop alternative financing mechanisms such as CDM credits, grace period extension, loan guarantee coverage and others**, to suit the varied and unique situations of the Palm Oil Mills (POMs) and Combined Heat and Power (CHP) requirements.

- **Continue to strengthen the network and organizational linkages among the stakeholders, particularly the members of the NSC and the PRC** so that they can respond effectively, innovatively and timely to the changing and continuing needs of all the target projects specially in coming up with flexible terms and conditions for the physical and financial requirements of the four Full Scale Models (FSMs).

- **Develop, establish and sustain an effective monitoring and evaluation system for the pipeline of biomass/biogas** projects in support of the national renewable energy target within the institutional structure that includes the Ministry of Energy, Water and Communication (MEWC), the Malaysia Energy Center (PTM), the Malaysian Palm Oil Board (MPOB), the Bank Pembangunan Malaysia Berhad (BPMB) and other relevant stakeholders of the Project during its duration and for the continuing RE Program Management beyond the Project.

- **Enhance the design and fast-track the establishment of the biomass information database and exchange system through the Biomass One-Stop Centre** that will facilitate decision making and business transactions, with regards to information needed in e.g. fuel supply availability and pricing, financing mechanisms, technology supply and services, best practices and lessons learned, M&E indicators and achievements, promotion and advocacy, etc. that will lead to a market-oriented biomass-based power generation and cogeneration in the palm oil industry.

4.6 Quality of the evaluation report Provide a number rating 1-6 to each criteria based on: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, and Highly Unsatisfactory = 1. Please refer to the "Criteria for the assessment of the quality of terminal evaluation reports" in the document "Ratings for the achievement of objectives, sustainability of outcomes and impacts, quality of terminal evaluation reports and project M&E systems" for further definitions of the ratings.

4.6.1 Comments on the summary of project ratings and terminal evaluation findings
In some cases the GEF Evaluation Office may have independent information collected for example, through a field visit or independent evaluators working for the Office. If additional relevant independent information has been collected that affect the ratings of this project, included in this section. This can include information that may affect the assessment and ratings of sustainability, outcomes, project M&E systems, etc.
None.

4.6.2 Quality of terminal evaluation report	**Ratings**
A. Does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives? The TE completed in February 2006 relies heavily on the May 2005 PIR and could be more up-to-date. Impact (i.e. improvements in energy production, emissions avoidance, expansion of businesses, increase of financing, policy development, etc.) is reported by the TE citing the PIR without a clear explanation of these accomplishments.	**MS**
B. Is the report internally consistent, is the evidence complete/convincing and are the IA ratings substantiated? The TE completed in February 2006 relies heavily on the May 2005 IPR. Ratings for sustainability and M&E are missing.	**S**
C. Does the report properly assess project sustainability and /or a project exit strategy? Being a Phase 1 project sustainability depends on Phase 2.	**S**
D. Are the lessons learned supported by the evidence presented and are	**MS**

they comprehensive? Although no lessons are presented in the TE, some recommendations for Phase 2 could be considered lessons that may also be applicable to other similar GEF projects.	
E. Does the report include the actual project costs (total and per activity) and actual co-financing used? Co-financing expenditures are missing.	**MS**
F. Does the report present an assessment of project M&E systems? No. Reference is only made to a mid-term review and subsequent realigned actions.	**U**

4.7 Is a technical assessment of the project impacts described in the TE recommended? Please place an "X" in the appropriate box and explain below.	**Yes:**	**No: X**
Explain: Phase 2 of the project needs to be completed before a technical assessment of the impacts could be done.		

4.8 Sources of information for the preparation of the TE review in addition to the TE (if any)

Project document, PIR05.