GEFM&E Terminal Evaluation Review Form

1. Project Data

				Review date: 10/27/2003
PROJ ID:	GEF ID #: 819		at endorsement ($ million)	at completion ($ million)
Project Name:	Fuel Cell Bus and Distributed Power Generation Market Prospects and Intervention Strategy Options	GEF financing:	$0.691	Not available
Country:	Global	Co-financing:	$0.225	Not available
Operational Program:	OP7 and OP11	Total Project Cost:	$0.916	Not available
IA	UNEP	Dates		
Partners involved:	UNDP, IFC and Imperial College, London	Work Program date		Jan-00
		CEO Endorsement		4/6/2000
		Effectiveness/ Prodoc Signature		
		Closing Date		10/22/2000 extended to 9/2001

Prepared by:	Reviewed by:	Team Leader:	Team:
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2. Project Objectives and Components as proposed and any changes during implementation

a. Global Environmental Objectives: (Project Brief) The objective is to review the climate change mitigation potential from fuel cell applications in distributed electricity generation and urban buses and develop strategy options for market interventions.

b. Development Objectives: (Project Brief) To define fuel cell market prospects that facilitate GEF decision-making on projects in this technology area and provide publicly available information for national policy makers.

c. Expected outcomes: (Project Brief) Information has been developed and is supporting GEF and national agencies' policy decisions to include fuel cell projects in their mitigation strategies.

d. Outputs/ components/ activities: (Project Brief) 1. Fuel cell bus (FCB) technology, market and policies review; 2. Forecast of market prospects (bottom up) for Fuel Cell Distributed Power Generation (FCDPG); 3. Assessment of policy climate and global market assessment (top down) for FCDPG; and 4. Consolidation of FCB and FCDPG analysis in a final report.

e. Comments on Project Cost, Financing and Dates: UNDP will execute Activity 1 ($170K+60K cofunding); IFC will execute Activity 2 ($319K+$105K cofunding); Imperial College of London will execute Activity 3 and 4 ($202K+$60K cofunding).

3. Analysis of relations between (2.a) through (2.e) including assumptions and risks.

(TER) There was no risk assessment in the project document or FE. One of the key risks that were not assessed was the risk of availability of cost information from fuel cell manufacturers for the market analysis and cost trend forecasts. This proved to be a hindrance to develop these studies.

4. Assessment of compliance with GEF review criteria

a. Implementation Approach: (TE) The project was jointly executed, therefore there was no clear single line of responsibility. In addition, some of the partners had their own agendas and wanted to control the process, and given that the various contractors reported to different partners, coordination was difficult. This had implications also in the outputs of the project. For example, there were strong differences in the market forecasts completed by UNEP and IFC contractors.

b. Country ownership/driveness, and endorsement: (Project Brief) General country interest has been expressed and GEF focal point project endorsements have been received for fuel cell projects from several countries. This global study will focus on GEF eligible country opportunities. This project supports a series of GEF-funded fuel cell projects underway or in development. Brazil, India, China, Egypt and Mexico have endorsed projects that are in development. This demonstrates a country level interest in fuel cell technologies. Transportation, rural electrification, and industrialization are common national priorities in developing countries.

(TE) The preliminary "Fuel cell policy climate assessment" report prepared by the project is a framework for policy development, outlining the policy instruments that can be applied and the ways in which they may fit together to fulfil the requirements of the GEF and to meet the needs of developing countries. However, views and information from multilateral and bilateral agencies were represented in a very general manner. The report concludes that GEF support is more likely to be effective in a market that already has established policies that are favourable to distributed generation. (TER) A summary of policy recommendations was not presented in the TE.

c. Stakeholder Participation/Public Involvement: (TE) Most interviewees considered the level of involvement and participation of stakeholders in project activities, in particular workshops, to be adequate and appropriate to the needs of the project. Several partners commented that with regard to stationary fuel cell applications the manufacturers and users had been very cooperative and provided important insights.

d. Sustainability: (TE) It is too early to determine the impact of the programmes developed in support of the fuel cell technology strategy. The project was successful in attaining significant stakeholder involvement, which improves the likelihood of long-term sustainable results, and the project rating for sustainability is “good". Some multilateral agencies such as IEA are integrating the report findings and recommendations into their plans. The United States Department of Energy, the European Union and the Ministry of Economy, Trade and Industry of Japan have factored the stationary fuel cell project results into their own development and commercialization plans for fuel cell technology. (TER) There was no mention in the TE on whether the GEFSEC or national government agencies were adopting any of the recommendations from the project's reports to increase sustainability.

e. Replication: (TER) There were no explicit and concrete replication plans. Furthermore, several participants believed that more follow-up was needed to implement the recommendations of the reports.

f. Financial Planning: (TER) According to the TE, the project activities were completed under budget. However, the extra funds could have been used to increase participation from developing countries in the workshops and increase their awareness and involvement in OP7 projects. The Te did not present a breakdown of actual disbursements or how much was remaining after the project completion and plans for those funds.

g. Cost Effectiveness: (TER) There was no reference to the cost effectiveness of this effort. In general, it turns out to be very cost effective in the long term to do a deep research on the feasibility of a technology before embarking in financing projects using that technology. This project has brought to light issues regarding market, costs, and policies and other barriers to the widespread adoption of fuel cell technologies that can be useful in setting the strategies for market transformations. The project would have been more cost effective had it been done before the implementation of the several fuel cell bus project under implementation in several countries.

h. Monitoring & Evaluation: M&E activities are more related to backstopping of project deliverables for this project. According to the TE, all project deliverables were of high quality and were produced in time and some under budget.

5. Significant Outcomes/Impacts and contribution towards the achievement of global environmental objectives:

FCB Replication: (TER and TE) The project produced an "Assessment of policies to support fuel cell buses and the transition to the hydrogen economy one”. The report explored the numerous barriers for the viability of FCB throughout the world. The main barriers identified included the low prices of fossil energy, limited global demand for clean technologies, and an inability to achieve economies of scale at current levels of production. It also explored barriers that were unique to fuel cell technology, such as inadequate hydrogen infrastructure, high initial costs, lack of adequate storage technology, inadequate regulatory framework and poor public perception. Finally, it evaluated the additional challenges and barriers to commercial introduction of fuel cell buses in most developing countries, such as lack of investment capital, modest institutional capacity and low levels of awareness. The report concludes with a series of policy recommendations such as fiscal incentives and stricter emission standards.

The project developed a long-term strategic vision outlining GEF's programmatic support of FCBs in developing countries called “Toward a GEF strategy to develop fuel cell buses for the developing world”.

FCB Sustainability: (TER) Another report, "Review of the current state and future projections of fuel cells in the automotive sector”, assesses possible commercialization strategies for fuel cell automobiles, leading towards long-term use of hydrogen. It concludes that hydrogen fuel cell vehicles could become life cycle-cost competitive with other low-polluting vehicle options such as indirect combustion engine hybrids. An optimistic scenario for market penetration of hydrogen fuel cell automobiles, based on rapid technical progress and strong policies to encourage zero emission vehicles, indicated that hydrogen fuel cell vehicles might comprise 8% of the automotive fleet by 2025.

FCDPG Replication (TER) The project also assessed the "Market prospects and intervention strategies to accelerate the deployment of fuel cells in distributed power generation for developing countries". The report estimates the cost of the first generation of fuel cells for fuel cell stationary applications at around $4000/kW (factory cost). These systems do not compare well with conventional power generation technology, which ranges in cost from around $200/kW for large gas turbines to around $1,200/kW for state-of-the-art coal-fired power plants. However, according to the research, factory costs could be reduced to a range of $900/kW to $2,000/kW during 2004-2008.

(TER) The project also conducted a top down global market assessment for fuel cell distributed power generation using IEA projections of overall growth in electricity generating capacity. (TE) The report estimates a global distributed generation market of 380GW in 2020 with a FCDPG market share of 340GW. These estimates are highly speculative but the FCDPG market penetration over the period to 2020 implies an average learning factor (the rate of cost reduction with every doubling of cumulative production) for the various capacity ranges of 89 per cent, which most experts would consider quite reasonable.

(TER) The project also examined policy frameworks to develop a portfolio of policy measures to help the introduction of FCDPG which are included in the "Fuel cell policy climate assessment" report.

6. Significant Shortcomings (including non-compliance with GEF policies and procedures):

Stakeholder involvement: (TE) Fuel cell manufacturers were unwilling to share the costs of their systems and only provided their cost targets. This made the cost analysis speculative and produced some highly optimistic scenarios of cost trends and market penetration.

7. Ratings

	IA Terminal Evaluation	Other IA evaluations if applicable (e.g. OED)	GEF M&E	Comments
Implementation Approach			MU	Refer to relevant section
Stakeholder Participation/Public Involvement			S	Refer to relevant section
Sustainability	3 out of 5 (with 1 being the highest rating)		Unable to assess	Refer to relevant section
Monitoring & Evaluation			N/A	(Project deliverables) Refer to 4 h
Quality of the TE			MU	Partial assessment of achievement of objectives. Incomplete information on actual costs and sustainability
Outcome of major objectives	2 out of 5 (with 1 being the highest rating)		S	Refer to sections: expected and significant outcomes, and shortcomings

Ratings: Highly Satisfactory, Satisfactory, Marginally Unsatisfactory, Unsatisfactory, and N/A.

8. Lessons and recommendations for on-going and future GEF projects

Implementation approach (TE) Some key lessons could be distilled from the body of the report regarding the viability of fuel cell technologies. For example, STAP was concerned with the cost and timing of using hydrogen as a transportation fuel in relation to a broad transition to an integrated hydrogen economy that includes hydrogen production and refueling stations, capacity to service and maintain the units, etc.; which would have to be addressed to support a market transformation to FCB.

Sustainability (TE and TER) Given the current level of spending in the fuel cell industry which ranges from $500 million to $1 billion, the GEF and other multilateral agencies should focus on catalyzing changes in policies and creating markets in developing countries for these technologies rather than sponsoring them except for very specific subsidies. Indiscriminate large capital subsidies may not produce sustainable market transformations in the long run.

Replication: (TE) The “Market prospects and intervention strategies to accelerate the deployment of fuel cells in distributed power generation for developing countries” report recommends that the immediate objective of an IFC/GEF program should be the development and financing of fuel cell applications and that the program should engage fuel cell market actors, support them with concessionary investments and technical assistance, and use business methods with strong prospects of becoming fully commercial and replicable. The program is expected to have the following three major components: targeted subsidies, reflecting the fact that fuel cell systems are pre-commercial and not yet economic; concessionary co-finance, which uses commercial methods and is tied to commercial capacity building; and direct assistance for a range of capacity-building, policy-making and market-organizing activities.

9. Is a Post Completion Evaluation/Impact Evaluation recommended? (Yes or No)

No

10. Comments on the quality of Terminal Evaluation according to the attached checklist

(TER) The TE was too oriented towards the process of the study as opposed to the outcomes or reports of the study. It would have been more useful for the TE to provide a summary of findings, lessons, recommendations and conclusions regarding the objectives of the project, in a format that can be easily used by the GEF and other stakeholders. A second workshop was conducted to understand the perspective of the developing countries regarding FCDPG and FCB projects but the main conclusions and comments from these countries regarding market penetration potential and policy interventions needed was not discussed in the TE.

TERMINAL EVALUATION QUALITY CHECK LIST

	Question	Yes/No	Comment
1	Have all parts of the Terms of Reference been addressed?	No	
2	Does the main report, plus any Annexes, comply with the GEF Guidelines for Terminal Evaluation, including an assessment of the 8 GEF criteria and the requested ratings?	No	
3	Does the report contain a comprehensive executive summary?	No	
4	Is the evaluation methodology described and adequate?	Yes	
5	Have all the major stakeholders been consulted and their views reflected in the report?	No	The views of developing countries were not explicitly reflected
6	Have all the major documents been reviewed and their contents adequately reflected in the report?	No	The portfolio of policies to promote FC technology in developing countries was not presented
7	Are the statements presented in the report substantiated?	Not always	
8	Are the conclusions/lessons supported by the evidence presented?	Not always	
9	Does the report include the actual project costs (total and per activity) and actual co-financing used?	No	
10	Does the report contain an assessment of all relevant results and impacts of the project?	Partially	It would have been more useful for the TE to provide a summary of findings, lessons, recommendations and conclusions regarding the objectives of the project
11	Is the terminal evaluation/ICR team independent from the project?	Yes	
12	Do the IA/EA and the GEF grant recipient agree with the findings of the terminal evaluation?		Unable to assess
13	Has dissemination of the report ensured that the findings are accessible to all the major stakeholders and to the accountable parties?		Unable to assess
14	Is the role of the GEF adequately presented in the report?	Yes	