GEF IEO Terminal Evaluation Review form (retrofitting of APR2004 cohort)

This form is for retrofitting of the TERs prepared for APR2004. While several topics covered in this form had already been covered in the earlier form, this revised form adds several other performance and impact related concerns.

1. Project Data

Summary project data			
GEF project ID		338	
GEF Agency project ID		541	
GEF Replenishment Phase		GEF-1	
Lead GEF Agency (include all for joint projects)		UNDP	
Project name		Biomass Power Generation: Sugar Cane Bagasse and Trash	
Country/Countries		Brazil	
Region		LAC	
Focal area		Climate Change	
Operational Program or Strategic Priorities/Objectives		7- Reducing the Long-Term costs of low greenhouse gas-emitting energy technique	
Executing agencies involved		Ministry of Science and Technology	
NGOs/CBOs involvement		No involvement	
Private sector involvement		one of the beneficiaries	
CEO Endorsement (FSP) /Approval date (MSP)		2/10/1997	
Effectiveness date / project start		4/1/1997	
Expected date of project completion (at start)		7/1/2000	
Actual date of project completion		1/9/1999	
Project Financing			
		At Endorsement (US $M)	**At Completion (US $M)**
Project Preparation Grant	GEF funding		
	Co-financing		
GEF Project Grant		3.75	3.75
Co-financing	IA/EA own		
	Government		
	Other*		
Total GEF funding		3.75	3.75
Total Co-financing		2.77	7.68
Total project funding (GEF grant(s) + co-financing)		6.52	11.43
Terminal evaluation/review information			
TE completion date		Dec-2002	
TE submission date		4/23/2003	
Author of TE		Eric D. Larson	
Original GEF IEO TER (2004) preparer		Baastel	
Original GEF IEO TER (2004) reviewer		Siv Tokle	
Revised TER (2014) completion date		5/05/2014	
Revised TER (2014) prepared by		Nelly Bourlion	
TER GEF IEO peer review (2014)		Joshua Schneck	

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

2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF EO Review
Project Outcomes	S	N/A	N/A	S
Sustainability of Outcomes	L	N/A	N/A	ML
M&E Design	N/A	N/A	N/A	S
M&E Implementation	N/A	N/A	N/A	UA
Quality of Implementation	N/A	N/A	N/A	UA
Quality of Execution	N/A	N/A	N/A	UA
Quality of the Terminal Evaluation Report	-	-	N/A	MU

3. Project Objectives

3.1 Global Environmental Objectives of the project:

The Global Environmental Objective of the project as stated in the PD is "to reduce global warming by avoiding carbon dioxide emissions which would otherwise be produced by thermal power generation". By using plantation-wood or sugarcane biomass as fuel, the biomass gasifier/gas turbine (BIG/GT) technology would produce electricity with essentially no net carbon emissions to the atmosphere: the amount of CO2 emitted to the atmosphere from a BIG/GT plant is the same amount of CO2 absorbed from the atmosphere in the growing of the plantation wood or the sugarcane residues used to fuel the BIG/GT (TE, pg 2).

The potential environmental impacts that could result from large-scale introduction of green cane harvesting and power production from bagasse and trash with BIG/GT systems at sugar/alcohol mills are net emissions of CO2 in Brazil as a whole (assuming 300 million tonnes of sugarcane harvesting per year) could be reduced by between 26 and 40 million tonnes per year, and total annual emission reductions from reduced cane burning in Brazil, assuming 300 million tonnes of cane harvested annually, were estimated to be 8,500 - 58,500 tonnes of CH4, 527,000 – 1,230,000 tonnes of CO, and 29,000 – 90,000 tonnes of NOx. However no specific information on the precise expected impact of this project is available in the PD or in the PIRs.

3.2 Development Objectives of the project:

This project (which is referred as the SCP project, "sugar cane power" project) was originally designed as an extension of the GEF's Brazil Biomass Gasifier/Gas Turbine Power Plant Demonstration Project (BRA/92/G31) initiated in the early 1990s. The intention of that project (referred as the WBP project) was to demonstrate the commercial viability of biomass-gasifier/gas turbine (BIG/GT) power plant technology.

Building on knowledge generated by the WBP, the SCP is designed to involve analytical work and technology development that would enable future implementation of the WBP-type power plant technology with sugarcane-derived biomass as fuel instead of wood. According to the PD,

the Development objective of this project is therefore "to develop and evaluate the technology needed for the economic integration of cogeneration systems based on sugarcane bagasse and trash".

The original immediate objectives of the SCP are:

(1) Evaluate sugarcane trash availability and quality for utilization in gasification systems.
(2) Evaluate alternative agronomic routes to green cane harvesting with trash recovery.
(3) Test the atmospheric-pressure circulating fluidized bed biomass gasification (ACFBG) process with bagasse and cane trash to verify which modifications, if any, will be required to operate a commercial-scale plant with those fuels. Follow up the development/testing of the bagasse pressurized gasification system in Hawaii.
(4) Analyze the integration of a BIG/GT system with the operation of a typical sugar/alcohol mill, considering the optimum energy balance of both plants together and assessing the impacts of one on the other during normal operation and transients and identifying the modifications required in the BIG/GT plant to operate with bagasse and sugarcane trash. Determine electric energy costs.
(5) Identify and evaluate environmental impacts (and propose mitigation measures for negative impacts) that could result from large-scale introduction of green cane harvesting and power production from bagasse and trash with BIG/GT systems at sugar/alcohol mills.
(6) Disseminate project findings and information to the world's sugarcane producing countries.

3.3 Were there any **changes** in the Global Environmental Objectives, Development Objectives, or other activities during implementation?

According to the TE, there were no changes in the original objectives of the project.

However, one revision to the work plan was made at approximately the 22nd month of what was envisioned originally as a 30 month project. At that time, additional activities (within the framework of the above objectives) were identified as important to improve the chances of achieving economic viability for BIG/GT systems using sugarcane bagasse and trash. The additional activities were related to *i)* better understanding the potential for commercial use of "high-biomass" sugarcane varieties that could make more biomass available per hectare for power generation than existing varieties; *ii)* quantitatively understanding the cost implications of sugarcane trash recovery that involves leaving some trash on the field for its herbicide effect; and *iii)* pilot-plant gasification testing of loose bagasse and trash (TE, pg 7).

4. GEF EO assessment of Outcomes and Sustainability

Please refer to the GEF Terminal Evaluation Review Guidelines for detail on the criteria for ratings.

Relevance can receive either a Satisfactory or Unsatisfactory rating. For Effectiveness and Cost efficiency, a six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess. Sustainability ratings are assessed on a four-point scale: Likely=no or negligible risk; Moderately Likely=low risk; Moderately Unlikely=substantial risks; Unlikely=high risk. In assessing a Sustainability rating please note if, and to what degree, sustainability of project outcomes is threatened by financial, sociopolitical, institutional/governance, or environmental factors.

Please justify ratings in the space below each box.

4.1 **Relevance**	Rating: **Satisfactory**

The key justification for GEF support for both the WBP and SCP projects is that the GEF funded the WBP and the SCP projects as part of its portfolio of projects under Operational Program 7. The OP 7 program supports projects that have the objective of reducing the cost of near-commercial low-greenhouse gas emitting technologies to speed their commercialization and widespread implementation. In addition, according to the TE, the project assumptions have remained valid and the target beneficiaries (Federal Government), have an option for power generation with indigenous renewable fuels, Sugar Cane Sector, an alternative to generate more income and the Population has a good potential to benefit from the BIG/GT technology implementation (lower environmental impact, more qualified jobs in the regions concerned and more reliable electricity supply). Therefore the relevance of the project is satisfactory.

4.2 **Effectiveness**	Rating: **Satisfactory**

Although the SCP was originally designed as an extension of the WBP, the failure of the WBP to be completed as designed has not affected the degree to which the SCP was able to achieve its objectives (TE, pg 2). This can be attributed to two main factors: (1) sufficient progress was made in the WBP in the development of technology to provide a good basis for evaluating the BIG/GT technology for its potential to use sugarcane biomass instead of wood; and (2) a significant component of the SCP dealt with understanding agronomic issues associated with the production, harvesting, storage, and transport of sugarcane biomass as a fuel, which required little, if any, input from WBP findings

The project contributed to market transformation outcomes in terms of information dissemination and awareness. The project also contributed to the development of a stronger understanding of numerous and diverse technical issues as they relate to Biomass power generation in Brazil. The information generated through numerous technical studies has been disseminated to various Brazilian and international institutions.

According to the TE, the project has met all its original objectives, and has gone beyond these in several areas:

(1) The carrying out of leading-edge technical studies on the co-generation of energy from sugar cane trash helped increase the capacity of various stakeholders involved in that field.
(2) Through rigorous experiments and an analysis of the quality and quantity of recoverable sugar cane trash as a supplemental fuel to bagasse for power generation at sugar cane mills, the project succeeded in providing valuable technical data/information to key stakeholders in the academic and private sectors that should favor increased and more sustainable investment in the field of co-generation at sugar cane mills.
(3) Through information-sharing activities, the project succeeded in triggering the interest of one of the largest private electricity generating companies in Brazil in evaluating in detail the prospective financial viability of a first-of-a-kind plant in anticipation of taking a leading role in putting forward a follow-on project to the SCP to build a demonstration BIG/GT plant operating on sugar cane residues at a mill in southeastern Brazil.
(4) As a result of the awareness activities conducted, some mill managers are now using the information generated by CTC to begin using trash for energy.

There were 2 shortcomings mentioned in the TE:
(1) The lack of pre-defined indices for measuring successes in the project. This was an oversight in the preparation of the project document.
(2) Difficulties with sub-contracting for some inputs to several of the activities. The difficulties in sub-contracting appear to have been due largely to poor coordination and communication among the three key involved institutions: CTC, UNDP and the Ministry of Science and Technology (MCT).

Overall the effectiveness of the project is Satisfactory.

4.3 **Efficiency**	Rating: **Highly Satisfactory**

According to the TE (pg. 8), the project appears to have been implemented smoothly, with only minor difficulties encountered along the way. Activities were completed generally on schedule and under budget while generating the specified substantive results.

One shortcoming was the insufficient budget provided for activities focused on understanding the feasibility and cost of processing bales of trash delivered to a mill into a form suitable for feeding to a gasifier.

No other detail is available in the TE.

4.4 **Sustainability**	Rating: **Moderately Likely**

The overall sustainability of the project is rated as Moderately Likely.

Ecological: Moderately Likely

The main nutrients of interest for cane growing are nitrogen, phosphorus, potassium, calcium, magnesium, and sulfur. The experimental measurements made on nutrient cycling during the project showed that nutrient return to the soil is not significant from green trash left on the soil. Unlike the case with changes in nutrient cycling, changes in soil organic matter can only be observed over extended time periods, so no conclusions could be reached on this topic in the course of the project. However, based on the fact that cane fields in Brazil have been burned for centuries – a process that returns little organic matter to the soil – the impact of trash removal on soil organic matter is probably not large.

A main conclusion from the soil erosion work undertaken during the project was that soil covered with trash would suffer less water erosion than bare soil. Aside from erosion issues, water infiltration into the soil was found to be considerably faster with trash left on the field.

Financial: Moderately likely

The Copersucar Technology Center has recently entered into an agreement with Petrobas to examine the potential use of natural gas at sugar cane mills. Including natural gas in the project (which would involve co-firing the gas turbine with gasified sugarcane residues and natural gas) may make the project attractive enough for Petrobras to participate in it.

On the other hand, the project did not estimate what the investment costs for a BIG/GT plant are likely to be once the technology reaches commercial maturity. Investment costs for a first-of-a-kind commercial-scale demonstration plant will be higher than costs that would be reached after a series of commercial-scale BIG/GT plants have been built. Also, the project did not give sufficient attention to understanding the extent to which vendor-quoted costs were relevant to Brazilian application of the technology. Since most of the equipment could be manufactured in Brazil, where manufacturing costs would be considerably lower than in Europe, Brazilian sourcing of equipment would reduce the estimated investment cost, perhaps considerably.

Socio-political: Likely

Favorable findings on trash availability and cost have been enthusiastically received by sugarcane mill managers and technicians. CTC has even developed a preliminary set of cane trash removal and field-treatment guidelines to facilitate practical implementation of trash recovery. Some mill managers are now using the information generated by CTC to begin using trash for energy.

Institutional: Likely

Government calls for and support of increased thermal generating capacity on the largely-hydroelectric grid and is expected to pass legislation that would provide incentives for renewable electricity. Capabilities and knowledge at Brazilian institutions have been enhanced through direct participation in different aspects of the project. As a result of paper presentations, as well as direct interactions

between CTC engineers and other stakeholders, a wide range of Brazilian and international institutions had the opportunity to build capacity in technical areas relevant to BIG/GT implementation in the sugarcane industries.

Technical: Likely

The project established the technical suitability of sugarcane bagasse and trash as a fuel for atmospheric-pressure gasification. Because $800K in additional funds for pilot-plant testing of bagasse and trash were made available to the gasification company, much more extensive pilot-plant gasification testing was completed than originally envisioned. This gives a very sound basis for scaling up the gasifier design from pilot-plant size to a commercially-relevant scale.

5. Processes and factors affecting attainment of project outcomes

5.1 Co-financing. To what extent was the reported co-financing essential to the achievement of GEF objectives? If there was a difference in the level of expected co-financing and actual co-financing, then what were the reasons for it? Did the extent of materialization of co-financing affect project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

According to the TE, the originally estimated cost of the project was US$7.4 million, consisting of $3.75 million from GEF and the balance from the Brazilian government or CTC. However, CTC invested considerably more of its own resources than originally envisioned, and additional in-kind resources were contributed by sugar mills and equipment suppliers that cooperated with CTC in carrying out the work. The actual project cost exceeded $11 million.

New activities were included in the project, however, no new GEF funding was required to undertake the additional activities, because some cost savings were achieved in the original work plan. The savings came from several sources:

(1) Some purchases of equipment or services that were originally to be done with GEF funds were done instead using Centro de Tecnologia Copersucar (CTC) funds, since delays in approval of the use of GEF funds for such purchases threatened to introduce long delays in the project.
(2) Some equipment originally intended to be purchased was loaned to the project by the equipment manufacturer, at no cost to the project.
(3) The original work plan included a second round of gasifier testing, but the work plan specified a mid-course decision as to which specific tests would provide the most useful information for the project. The originally envisioned second-round tests were replaced in the revised work plan with a different set of tests.

5.2 Project extensions and/or delays. If there were delays in project implementation and completion, then what were the reasons for it? Did the delay affect the project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

The project scheduling was determined in large part by the requirements for meeting the first two objectives. The main considerations in this regard were the time required for growing a crop of sugarcane and the window of time for normal harvesting of the cane. Activities were carried out over the course of two or more growing seasons, and according to the TE, the activities were generally completed on schedule. Therefore, there was no delay or extension reported.

5.3 Country ownership. Assess the extent to which country ownership has affected project outcomes and sustainability? Describe the ways in which it affected outcomes and sustainability, highlighting the causal links:

According to the TE, the SCP project was strongly supported by the Brazilian government, through the executing agency, the Ministry of Science and Technology (MCT). The strong governmental interest in the project can be explained by the lack of indigenous fossil fuels in Brazil and consequent heavy reliance on hydroelectricity supplies that are unreliable from year-to-year due to rainfall variations. Government interest also stems from the fact that both plantation wood production and sugarcane production are important industries in Brazil from social, economic, and energy perspectives (TE, pg.2). The commercial introduction of BIG/GT technology offers possibilities for strengthening and expanding business opportunities in these industries, with related positive impacts on employment, national economy, and energy supply.

Therefore, country ownership was strong in this project.

6. Assessment of project's Monitoring and Evaluation system

Ratings are assessed on a six point scale: Highly Satisfactory=no shortcomings in this M&E component; Satisfactory=minor shortcomings in this M&E component; Moderately Satisfactory=moderate shortcomings in this M&E component; Moderately Unsatisfactory=significant shortcomings in this M&E component; Unsatisfactory=major shortcomings in this M&E component; Highly Unsatisfactory=there were no project M&E systems.

Please justify ratings in the space below each box.

6.1 **M&E Design at entry**	Rating: **Satisfactory**

In the PD, each objective was associated with a set of well-defined outputs, which were generated, according to the TE, through well-coordinated and logically designed activities. Each activity is well

documented in one or more of the more than 100 detailed technical reports that were prepared in the course of the project.

However, there was one issue in the M&E design that created minor difficulties; the lack of pre-defined indices for measuring successes in the project. This was an oversight in the preparation of the project document. According to the TE, this shortcoming was recognized during the project implementation-reporting period (1999), and CTC, UNDP, and MCT (Ministry of Science and Technology) agreed at that point that a criterion for success of any particular activity would be the percentage of that activity completed. CTC subsequently identified broader indicators of project success, impact, and sustainability.

6.2 **M&E Implementation**	Rating: **Unable to Assess**

According to the TE, observation of the reporting requirement led to the existence of a comprehensive and detailed set of project reports documenting every aspect of the work. This set of documents will likely prove very valuable in the future as additional work is undertaken at CTC and elsewhere towards commercializing the application of bagasse and trash BIG/GT systems at sugarcane factories (TE, pg 9).

Otherwise, the TE does not provide enough details on M&E activity undertaken during project implementation or on project management to properly assess the accomplishments and shortcomings of the project's M&E system.

7. Assessment of project implementation and execution

Quality of Implementation includes the quality of project design, as well as the quality of supervision and assistance provided by implementing agency(s) to execution agencies throughout project implementation. Quality of Execution covers the effectiveness of the executing agency(s) in performing its roles and responsibilities. In both instances, the focus is upon factors that are largely within the control of the respective implementing and executing agency(s). A six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess.

Please justify ratings in the space below each box.

7.1 **Quality of Project Implementation**	Rating: **Unable to Assess**

The quality of project implementation is not discussed in the TE. The implementing agency for this project was UNDP, and the only mentions of UNDP performance was the issue in sub-contracting that

appear to have been due largely to poor coordination and communication among the three key involved institutions: CTC, UNDP, and MCT.

It is therefore not possible to assess the quality of implementation of the project.

7.2 **Quality of Project Execution**	Rating: **Unable to Assess**

The executing agency of this project was the MCT (Ministry of Sciences and Technology). Very little information is given in the TE on the quality of project execution; therefore this aspect cannot be assessed.

8. Assessment of Project Impacts

8.1 Environmental Change. Describe the changes in environmental stress and environmental status that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

The project in itself does not have environmental impact yet significant, however, it assess the potential environmental impacts that could result from large-scale introduction of green cane harvesting and power production from bagasse and trash with BIG/GT systems at sugar/alcohol mills:

(1) Net emissions of CO2 in Brazil as a whole (assuming 300 million tonnes of sugarcane harvesting per year) could be reduced by between 26 and 40 million tonnes per year,
(2) Total annual emission reductions from reduced cane burning in Brazil, assuming 300 million tonnes of cane harvested annually, were estimated to be 8,500 - 58,500 tonnes of CH4, 527,000 – 1,230,000 tonnes of CO, and 29,000 – 90,000 tonnes of NOx.

8.2 Socioeconomic change. Describe any changes in human well-being (income, education, health, community relationships, etc.) that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

No socio economic changes are reported in the TE.

8.3 Capacity and governance changes. Describe notable changes in capacities and governance that can lead to large-scale action (both mass and legislative) bringing about positive environmental change. “Capacities” include awareness, knowledge, skills, infrastructure, and environmental monitoring systems, among others. “Governance” refers to decision-making processes, structures and systems, including access to and use of information, and thus would include laws, administrative bodies, trust-building and conflict resolution processes, information-sharing systems, etc. Indicate how project

activities contributed to/ hindered these changes, as well as how contextual factors have influenced these changes.

a) Capacities

There is a widespread awareness of the project amongst government agencies, private industry, universities, and non-governmental organizations in Brazil, as well as amongst sugarcane industries worldwide. According to the TE, capabilities and knowledge at Brazilian institutions have been enhanced through direct participation in different aspects of the project, including at CENBIO (which assisted in disseminating project information), the University of Campinas (which now has a gasifier laboratory at CTC supported by CTC staff), the Centro Tecnico Aero-Espacial and the Instituto Tecnologico de Aeronautica at Sao Jose dos Campos, SP, Brazil (which developed expertise in the design and analysis of cane cleaning processes in the course of the project), ESALQ (which undertook work relating to trash availability), Brazilian equipment suppliers such as Dedini and Codistil (which contributed to designing more steam-efficient sugarcane processing plants), and CPFL, the private electric utility in Sao Paulo state (which has developed an interest in sugarcane-BIG/GT technology as a commercial opportunity).

In addition to involving a number of institutions directly in the project, awareness of the work in the project was raised via a widely-distributed regular newsletter.

Finally, internally at CTC, aside from more-substantive capacity building that has occurred, project management and reporting practices used for the SCP project are being incorporated as standard practice for a wide range of projects inside CTC.

b) Governance

There is no governance impact reported in the TE.

8.4 Unintended impacts. Describe any impacts not targeted by the project, whether positive or negative, affecting either ecological or social aspects. Indicate the factors that contributed to these unintended impacts occurring.

According to the TE (pg.19), an “unanticipated but welcome result of the project was that the favorable findings on trash availability and cost have been enthusiastically received by sugarcane mill managers and technicians”. The CTC work has provided detailed results, based on clear and transparent methodologies, on the availability, quality, and cost of trash. CTC has developed a preliminary set of cane trash removal and field-treatment guidelines to facilitate practical implementation of trash recovery. Some mill managers are now using the information generated by CTC to begin using trash for energy.

8.5 Adoption of GEF initiatives at scale. Identify any initiatives (e.g. technologies, approaches, financing instruments, implementing bodies, legal frameworks, information systems) that have been mainstreamed, replicated and/or scaled up by government and other stakeholders by project end. Include the extent to which this broader adoption has taken place, e.g. if plans and resources have been established but no actual adoption has taken place, or if market change and large-scale environmental

benefits have begun to occur. Indicate how project activities and other contextual factors contributed to these taking place. If broader adoption has not taken place as expected, indicate which factors (both project-related and contextual) have hindered this from happening.

CTC has ongoing information exchanges and discussions with several important universities and research centers in Brazil and abroad. These exchanges are leading to the implementation of several related research programs. According to the TE, such efforts will broaden the world's understanding of key issues relating to sugarcane trash use for energy, help create a critical mass of people working on these subjects, and increase awareness more broadly of the climate change problem and potential contributions of the sugarcane sector toward sustainable development, including mitigating climate change.

9. Lessons and recommendations

9.1 Briefly describe the key lessons, good practices, or approaches mentioned in the terminal evaluation report that could have application for other GEF projects.

These are the lessons learned presented in the TE:

(1) Flexibility in the original design of the project has been an important factor with respect to the success of the project when the GEF's Brazil Biomass Gasifier/Gas Turbine Power Plant Demonstration Project did not move forward as expected.
(2) Clear, reliable and appropriate indicators are essential to accurately measure the success of the project.
(3) Thorough documentation and the communication of project results to stakeholders contribute to their participation and appropriation.
(4) In the GEF's OP7 projects such as the SCP project (which are designed to accelerate commercialization of new technology), special attention must be paid to understanding prospective investment costs and optimizing the reduction of these.
(5) For project activities tied to seasonal cycles, such as sugarcane harvest cycle, it is especially important that equipment procurements and other preparations be done in a timely fashion. Otherwise, there is the risk of significant delays in the project (due to having to wait until the next season).
(6) There is considerable interest in Brazil and around the world in seeing successful sugarcane biomass BIG/GT technology commercialized. This is evidenced by funding and in-kind contributions from outside organizations (e.g., EU funding for gasification tests) and the consistent interest in CTC's results exhibited by companies and research organizations in Brazil and worldwide.

9.2 Briefly describe the recommendations given in the terminal evaluation.

The following recommendations are given in the TE:

(1) Indicators for measuring success of the project should be clearly defined at the outset of the project.
(2) Because the original cost estimate for a first-of-a-kind commercial demonstration plant does not reflect what it would cost in practice in Brazil, it is important that a thorough analysis be undertaken to determine costs if cost-reduction optimization were pursued.

10. Quality of the Terminal Evaluation Report

A six point rating scale is used for each sub-criteria and overall rating of the terminal evaluation report (Highly Satisfactory to Highly Unsatisfactory)

Criteria	GEF EO comments	Rating
To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	TE provides a very detailed assessment of the project outputs but assessment of the project outcomes and impacts is not detailed enough.	**MS**
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	The TE seems internally consistent but affirmations are not always strongly supported by facts. TE does not provide many details on project shortcomings. The methodology used to carry out the evaluation is not presented, and there is no ratings given for any of the categories.	**MU**
To what extent does the report properly assess project sustainability and/or project exit strategy?	Assessment of the potential sustainability of project outcomes is only partial and is only analyzed in the context of a subsequent phase to the project.	**MU**
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	The lessons learned presented are useful and supported by evidences. Recommendations are rare and do not give the reader a solid grasp of what should be done to avoid the mistakes made or to emulate the good moves made by the implementers.	**MU**
Does the report include the actual project costs (total and per activity) and actual co-financing used?	The report includes the actual project cost and actual co-financing used. However the cost was not broken down per activity.	**MS**
Assess the quality of the report's evaluation of project M&E systems:	The M&E system is not described at all, there is no narrative and/or analysis presented in the TE.	**HU**
Overall TE Rating		**MU**

7*0.3 + 11*0.1 = 2.1+1.1 = 3.2 = MU

11. Note any additional sources of information used in the preparation of the terminal evaluation report (excluding PIRs, TEs, and PADs).