

1. Project Data

Summary project data			
GEF project ID		3891	
GEF Agency project ID		BA-X1001	
GEF Replenishment Phase		GEF-4	
Lead GEF Agency (include all for joint projects)		IDB	
Project name		Sustainable Energy Framework for Barbados	
Country/Countries		Barbados	
Region		LAC	
Focal area		Climate change	
Operational Program or Strategic Priorities/Objectives		Strategic Program 1 - Promote EE in residential and commercial Buildings Strategic Program 3 - Promote market approaches for RE	
Executing agencies involved		Ministry of Environment (MOTE)	
NGOs/CBOs involvement		None	
Private sector involvement		None	
CEO Endorsement (FSP) /Approval date (MSP)		02/31/2010	
Effectiveness date / project start		03/02/2010	
Expected date of project completion (at start)		03/01/2012	
Actual date of project completion		02/2015	
Project Financing			
		At Endorsement (US \$M)	At Completion (US \$M)
Project Preparation Grant	GEF funding	0	0
	Co-financing	0	0
GEF Project Grant		1.0	0.83
Co-financing	IA own	1.0	1.87
	Government	10.435	0.35
	Other multi- /bi-laterals	0	0
	Private sector	0.37	0
	NGOs/CSOs	0	0
Total GEF funding		1.0	0.83
Total Co-financing		11.805	2.23
Total project funding (GEF grant(s) + co-financing)		12.805	3.05

Terminal evaluation/review information	
TE completion date	10/17/2017
Author of TE	Oswaldo Patino
TER completion date	04/15/2018
TER prepared by	Spandana Battula
TER peer review by (if GEF IEO review)	Molly Watts Sohn

2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF IEO Review
Project Outcomes	BLIND REVIEW	BLIND REVIEW	BLIND REVIEW	MS
Sustainability of Outcomes		BLIND REVIEW	BLIND REVIEW	MU
M&E Design		BLIND REVIEW	BLIND REVIEW	S
M&E Implementation		BLIND REVIEW	BLIND REVIEW	MU
Quality of Implementation		BLIND REVIEW	BLIND REVIEW	UA
Quality of Execution		BLIND REVIEW	BLIND REVIEW	MS
Quality of the Terminal Evaluation Report		BLIND REVIEW	BLIND REVIEW	S

3. Project Objectives

3.1 Global Environmental Objectives of the project:

The Global Environmental Objective of the project is “to promote Renewable Energy (RE) and Energy Efficiency (EE) in Barbados, thus reducing the country’s dependency from imported fossil fuels, enhancing security and stability in energy supply, and improving overall environmental sustainability in the country” (PD pg 8)

3.2 Development Objectives of the project:

The Development Objective of the project is to promote and support the development and implementation of sustainable energy sources in Barbados through four main components

Component 1: Preparation of a Sustainable Energy Framework for Barbados (SEFB) and capacity building;

Component 2: Policy and implementation support for EE;

Component 3: Policy and implementation support for RE;

Component 4: Dissemination of findings.

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

The project made changes to the components, and they are: :

Component 1: – EE for public buildings, commercial and residential sector

Component 2: Assessment of the RE potential, cost and viable options to include RE and WE in the energy matrix;

Component 3: Strengthening the Energy Sector in the Bahamas;

Component 4: Institutional Strengthening and capacity building in the areas of EE and RE; and

Component 5: Dissemination of findings

4. GEF IEO 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
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The project is consistent with GEF's focal area on climate change, and its Strategic Program 1 to promote EE in residential and commercial buildings, and Strategic Program 3 to promote market approaches for RE. The TE states that project was relevant to objectives of the Government of Bahamas and its strategic focus in the energy sector on economic efficiency, energy efficiency using less energy to provide the same level of service, clean energy, and diversification and security of energy supply. "The strategy that the country is pursuing for the energy sector seeks to ensure energy security and reduction of imported oil by introducing RE in the energy matrix and maximizing EE measures, diversifying the energy matrix and allowing Independent Power Producers (IPPs) and Small Power Producers (SPPs) to sell power to the grid, achieving environmental benefits such as carbon emission reduction in the long-term" (TE pg 10).

4.2 Effectiveness	Rating: Moderately Satisfactory
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The project had five main components to build energy efficiency for public buildings, assess the potential of renewable energy, strengthen the energy sector and disseminate the findings. The project managed to moderately achieve the targets in two components and in other three components the project made efforts to carry out the activities but there was no evidence to show if the targets were met. Considering some of the successes and failures, the TER gives a Moderately Satisfactory rating to effectiveness of the project. Below is a detailed assessment of each of the components:

Component 1: Energy efficiency for public buildings, commercial and residential sector:

The aim of the project was to energy efficiency for public buildings, commercial and residential sector with the implementation of demonstration projects in EE, in particular the replacement of incandescent lights with Compact Fluorescent Lamps (CFLs) and installation of Solar Water Heater (SWH) systems at the residential level. The project successfully provided technical assistance and developed National Energy Efficiency Program. The project conducted a study which found that the program included energy audit protocols and procedures, and energy audits for households, hotels and public buildings, as well as the assessment of energy uses and consumption patterns and financial instruments to promote EE. “The study also identified financial options geared toward the promotion of EE in the Bahamas. However, there was no training undertaken for SWH installers or plumbers during the implementation period for the project” (TE pg 11). The project also exceeded its target of buying 150,000 CFLs by purchasing 270,000 CFLS and distributed approximately 121,074 CFLs among the beneficiary households. However, as per the TE, it is estimated that the energy savings from the installed CFLs (121,074 confirmed) was 7,954 MWh/yr., less than the original target envisaged at appraisal, equivalent to 9,855 MWh/yr. In terms installation of SHW system, although the project aimed to achieve savings equivalent to 1,955 kWh/year, it was only able to save 782 kWh/year at project completion. The TE states that although the full outcome was not achieved, the short-term success of the SWH project illustrated the technical viability of the systems to The Bahamas for future operations.

Component 2: Assessment of the RE potential, cost and viable options to include RE and WE in the energy matrix:

The project intended to explore alternatives for RE, and implement pilot projects in RE, in particular a demonstration project for household Photovoltaic (PV) systems connected to the grid using net metering devices. “The RE pilot project was successfully implemented as the output target was achieved as planned with the purchase and installation of the 33 Photovoltaic (PV) systems in selected households- 22 in New Providence, 10 in Grand Bahamas and one in Andros island—including their inverters to allow connection to the household and the electricity grid”

(TE pg 12). The project faced set back due to Hurricane Matthew which damaged 11 photovoltaic systems (PVs) out 22 installed in New Providence. In Grand Bahama the project installed ten PV systems but these were not connected to the electricity grid of the privately-owned Grand Bahamas Power Company (GBPC) due to existing utility fluctuating grid. This shows that the component was only partially successful, although it illustrated the technical viability of the solar energy and improved the acceptance of RE sources in the Bahamas.

Component 3: Strengthen the energy sector in Bahamas:

To strengthen the Bahamas Electricity Corporation (BEC), the project developed a financial model, and alternatives for BEC's Expansion Plan through the provision of financial and operational technical assistance focusing on operational and financial management procedures. "The diagnostic and proposals were completed and handed over to the BEC, however, further analysis of these activities was required" (TE pg 13). During evaluation it was not clear whether BEC had implemented any recommendations from either of the two studies prepared during the project execution period.

Component 4: Institutional Strengthening and capacity building in the areas of EE and RE:

Under this component the project aimed to support the government with a review of energy legislation, regulatory and policy issues to promote sustainable energy as well as institutional strengthening in the areas of Energy Efficiency and Renewable Energy. However, the project found there were obstacles in the existing laws impacting on Energy Efficiency and Renewable Energy and it made recommendations on policies related to both Energy Efficiency and Renewable Energy. "The EE policy recommendations proposed, among other things, efficiency standards, specifically introducing minimum energy standards in all new buildings, tax exemptions— reduced tax rates on EE equipment and appliances, as well as the establishment of a Sustainable Energy Unit and EE programs for the households, hotels and public buildings" (TE pg 13). The TE notes that there was no evidence that the government had implemented the energy legislation and regulatory aspects.

Component 5: Dissemination of findings:

The project was not successful in carrying out activities under this component such as conducting workshops, and in fact the project funds were cancelled at the closing. But the project did manage to perform Dissemination and Awareness raising campaigns while replacing light bulbs with CFLs for low-income households across the islands. It also provided several training programs to the beneficiary householders for raising awareness for changing EE habits (TE pg 13).

4.3 Efficiency	Rating: Moderately Unsatisfactory
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The project's efficiency is rated as Moderately Unsatisfactory because of inefficiency in cost and financing, and significant time delays. The TE states "Project disbursed most of the grant funds assigned, with the exception of the GEF grant, which, out of the US\$1 million granted, had undisbursed funds of US\$174,478 that were cancelled" (TE pg 31). In terms of time efficiency, the project faced delays in procurement activities, and personnel turnover in project managers, project execution and disbursements. This led to the project being granted three extensions, and was completed only in 2015 with three years of delay from its original completion date of 2012.

4.4 Sustainability	Rating: Moderately Unlikely
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The TER rates the sustainability of the project as Moderately Unlikely because of lack of financial resources and environmental mitigation procedures, and weak institutional framework. Below is a detailed assessment of sustainability criteria:

Financial resources: the project helped in identifying financial options geared toward the promotion of EE, and provided financial and operational technical assistance focusing on operational and financial management procedures. However, the TE does not mention any financial commitments by stakeholders to sustain the project benefits. Thus, the financial sustainability is unlikely.

Sociopolitical: The project had strong ownership from the government and the TE does not state any apparent adverse sociopolitical change to hamper sustainability.

Institutional framework and governance: The project provided recommendations to strengthen laws on energy efficiency and gave technical assistance to Bahamas Energy Corporation. However, it is not clear whether any practical activities were undertaken to strengthen institutional governance, therefore, the sustainability under this criterion is moderately unlikely.

Environmental: The TE states that the project did not design mitigation measures for CFLs final disposal. As CFLs contain mercury and if disposal is not carefully handled, CFLs can potentially represent a health and environmental threat to The Bahamas. Also, the project failed to develop a plan for disposal of incandescent light bulbs.

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?

The actual co-financing amount of \$2,226,559 was much less than the expected co-financing of \$11,805,000. The TE does not mention if this affected project outcomes.

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 had considerable delays in procurement activities and personnel turnover in project managers, project execution and disbursements. The delays caused extension of the project for three years.

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:

The Government of Bahamas showed strong ownership towards increasing the introduction of renewable energy sources facilitated by the implementation of the pilot projects envisioned at project appraisal.

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
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The project had a M&E design with outputs and outcomes in the Logical Framework with responsibility given to the executing agency for monitoring of day-to-day activities. The plan had provisions for annual Project Implementation Review, as well as a mid-term and final evaluation (PD pg 8). "The development and installation of an M&E system was planned in order to have

an integrated and cost-effective M&E system at the PEU and to be able to disseminate the findings of the technical studies and pilot projects” (TE pg 32). The indicators for measuring progress were designed adequately from a technical and operational point of view. Thus, the M&E design of the project is rated as Satisfactory.

6.2 M&E Implementation	Rating: Moderately Unsatisfactory
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The M&E implementation was not carried out well and the project faced difficulties in collecting data and supervising outputs and outcome indicators. The TE states the “Government counterparts did not provide data for all indicators. The evaluation reports prepared by former Project Managers did not consider the Project Results Framework Matrix” (TE pg 33). Even the utilization of M&E data had mixed results because of the fact that there were three project managers. The project would have benefited if the M&E system was placed in one unit or division. Therefore, the TER gives a Moderately Unsatisfactory rating to M&E implementation.

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: UA
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The project’s implementing agency was the Inter-American Bank (IDB) which gave co-financing worth \$1,874,652. The TE does not assess the quality of implementation, but states that the project design was adequate and its outcomes were linked to the operation, specifically the activities financed by the GEF and IDB grants. Due to lack of sufficient information on implementation, the TER is unable to assess and rate the quality of project implementation.

7.2 Quality of Project Execution	Rating: Moderately Unsatisfactory
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The project’s executing agency was Ministry of Environment (MOTE). The TE states there were delays due to issues in project execution, and that project M&E implementation was poor. The agency was also given responsibility for procurement, but the project faced severe delays in procurement activities, high turnover of project managers, and issues with disbursements.

However, the executing agency effectively organized some of the project activities such as conducting the first event on Energy Awareness in 2011. Nevertheless, considering the delays and weak M&E implementation, the TER gives a Moderately Unsatisfactory rating to project execution.

8. Assessment of Project Impacts

Note - In instances where information on any impact related topic is not provided in the terminal evaluations, the reviewer should indicate in the relevant sections below that this is indeed the case and identify the information gaps. When providing information on topics related to impact, please cite the page number of the terminal evaluation from where the information is sourced.

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 installed 121, 074 CFLs which resulted in energy savings of 7,954 MWh/yr. In terms of Solar Water Heater (SWH) system, the project had savings of 782 kWh/year.

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.

The TE states “at the household level, the project contributed to a decrease in the monthly electricity bill with the CFLs and SWHs and in some cases a generation of a small income for households that invested in the PV solar systems that are currently fully operational at New Providence and Grand Bahama once the PV solar system would be connected to the grid with the Grand Bahama Electricity Company” (TE pg 31).

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: The TE mentions that the project provided technical assistance to BEC which helped the “company to strengthen its financial and operational performance, and to identify RE potential and RE future project options. At the private sector level, it contributed to the creation of technical and operational capacity, with the implementation of the SWH and PV solar system pilots in New Providence and Grand Bahama” (TE pg 31).

b) Governance: There are no reported changes in governance.

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.

There are no unintended impacts reported.

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.

The project has had a “catalytic role in the GoBH committing to the promotion of sustainable energy practices, mainly (i) using renewable energy (RE) sources, and encouraging energy efficiency (EE) and energy conservation (EC) as means to reducing the country’s dependency on fossil fuels, and (ii) improving the economy’s competitiveness, and achieving greater environmental sustainability” (TE pg 32).

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.

Some key lessons learnt are (TE pgs 37-39):

- 1) Develop a Program’s Operations Manual (POM): POM would help in transfer of knowledge to the various project managers assigned to the project, and would have assisted in counteracting the negative impact of high staff turnover, as well as help to align project monitoring and oversight of project outputs and outcome indicators, which for this grant were too many indicators to track;
- 2) Ensure robust project administration: The project would have benefitted from the assignment of a larger team commensurate with the project scope to be achieved within the allotted timeframe. At minimum, the unit should have included, a project assistant

who would have been responsible for, among other things, follow ups, ensuring that the project records and minutes are kept current and ensuring that regular project reports are prepared

- 3) Ensure the buy-in of key stakeholders: Securing the full support of the BEC and GBPC would have helped to minimize the delays in approval for the PV systems to be connected to the grid, as well as the transfer of data to the MOTE for the monitoring of impact of the CFLs. Further, it would also have helped to ensure that the BEC staff assisted with the distribution and installation of the CFLs as originally planned.
- 4) Continuous awareness raising and incentives are essential to sustain consumers' use of energy efficient technology: Continuous awareness campaigns are required to ensure that the beneficiary households that received the CFLs would voluntarily purchase additional or replacement CFLs and change consumption habits at home;
- 5) Procedures for recycling of incandescent lights bulbs should be established prior to distribution of CFLs: it is important that prior to distributing CFLs to the beneficiaries, procedures and guidelines for record keeping, disposal and recycling of old light bulbs be established;
- 6) Procedures and guidelines for safe disposal of CFLS should be established prior to distribution of CFLs: It is important that prior to implementing EE measures, procedures and guidelines for disposal and mitigation of non- EE equipment be established;
- 7) Improve qualifications criteria to attract bidders and enhance product testing such as with the inverter: Having testing centers will allow manufacturers to compare products and will allow products to be tested against the specific grid conditions thereby facilitating the purchase of the correct inverters based on the specifications of the country's electricity grid;
- 8) Technical diagnostics of water conditions should be performance prior to purchasing SWH system and in accordance with the country environment: Prior to procurement of SWHs a robust technical diagnostic must be carried to define clear the materials and design of the SWHs in accordance with the conditions of the county's environment;
- 9) Technical Design and Installation of the PVs and SWHs for greater protection against Hurricanes: All PVs and SWH installations and racking systems should be hurricane certified;
- 10) RE systems should have insurance for hurricanes: Due to the fact that hurricanes affect the Bahamas almost every year, all renewable energy systems, especially those that are affixed to the building roofs should be insured. This can either be added to an existing home insurance or an additional insurance can be acquired to insure against damage or loss;
- 11) Train beneficiaries in basic maintenance of RE systems: The provision of basic maintenance training to beneficiary households for the RE systems introduced into their homes would have helped to maximize the longevity of the systems and the sustainability of the impacts derived from the pilot projects;
- 12) Include all relevant technical personnel in the development of specifications for RE systems: The inclusion of stakeholders with the relevant technical training and experience in the process to develop specifications for RE systems would minimize the instances of systems being installed in environments which surpass their ability to withstand the environment's level of wear and tear on them;

- 13) Training should be provided to installers prior to installation of SWHs: The provision of installation training to the chosen installation firms would have resulted in the application of appropriate installation techniques, thereby reducing the instances of SWH-related leakages developing in the homes of beneficiaries;
- 14) Implementing an M&E system within the Government's executing unit: Having a M&E team on the project execution unit, or at least a team within the executing agency, would have had a strong impact on improving project implementation and oversight of the results on the ground; and
- 15) Focus on M&E during project implementation/supervision needs: The PEU of the ME&H experienced difficulties in collecting data with respect to M&E, which although noted during the design and appraisal, were not adequately focused on during project implementation and supervision.

9.2 Briefly describe the recommendations given in the terminal evaluation.

The TE does not provide any recommendation for the project.

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 IEO 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?	The report provides adequate information on relevant outcomes and their outputs achieved. However, the impact section is short and needs more analysis.	MS
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	The report is internally consistent, and provides evidence but the ratings cannot be substantiated as this is for a blind review.	S
To what extent does the report properly assess project sustainability and/or project exit strategy?	The report does not provide an assessment of financial and sociopolitical criteria for sustainability; however, it gives information on environmental sustainability which needs some more explanation. It also does not give an exit strategy.	MS
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	The lessons learnt are sufficient and well supported by evidence.	S
Does the report include the actual project costs (total and per activity) and actual co-financing used?	The report provides actual and expected co-financing amounts and costs per outcomes.	S
Assess the quality of the report's evaluation of project M&E systems:	The report gives adequate assessment of M&E design and implementation of the project.	S
Overall TE Rating		S

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

The TER did not use any other sources for preparation.