



*Prepared For:*



## ***APPENDIX A***

### **ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN *Sustainable Energy Investment Program SMART FUND II Barbados***

*September 2017*

*Environmental Resources Management (ERM)  
1776 I St, Suite 200  
Washington, DC 20006*

## TABLE OF CONTENTS

1.0	OBJECTIVE AND SCOPE.....	1
1.1	OBJECTIVE OF THIS ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN.....	1
1.2	BACKGROUND AND DESCRIPTION OF THE PROJECT .....	1
1.3	KEY IMPACTS.....	1
2.0	ENVIRONMENTAL POLICY, ORGANIZATION, AND RESPONSIBILITIES .....	3
2.1	ENVIRONMENTAL POLICY.....	3
2.2	ORGANIZATION AND RESPONSIBILITIES.....	3
2.3	PROJECT STRUCTURE.....	3
2.4	ENVIRONMENTAL, SOCIAL, AND SAFETY TRAINING .....	4
3.0	ENVIRONMENTAL MANAGEMENT PROGRAM .....	5
3.1	MITIGATION MEASURES AND MANAGEMENT CONTROLS .....	5
3.2	MONITORING AND EVALUATION.....	8
4.0	EMERGENCY PLAN .....	9
5.0	COMMUNITY GRIEVANCE MECHANISM .....	11

## LIST OF TABLES

TABLE 3-1 ENVIRONMENTAL MANAGEMENT PROGRAM – PROPOSED MITIGATION MEASURES AND MANAGEMENT CONTROLS .....	6
---	---

## LIST OF ANNEXEX

ANNEX 1 FUTURE CENTER TRUST LIST OF BARBADOS RECYCLING OPTIONS	
--	--

## LIST OF ACRONYMS

BNSI	Barbados National Standards Institute
BWA	Barbados Water Authority
CFC	Chlorofluorocarbon
CO <sub>2</sub>	Carbon dioxide
dB	Decibel
dBA	A-weighted decibels
EA	Environmental Assessment
ECLAC	Economic Commission for Latin America and the Caribbean
EE	Energy Efficiency
EGFL	Enterprise Growth Fund Limited
EHD	Environmental Health Department
EIA	Environmental Impact Assessment
EPD	Environmental Protection Department
ESMS	Environmental and Social Management System
ESMP	Environmental and Social Management Plan
ETD	Energy and Telecommunications Division
EA	Environmental Assessment
ESMP	Environmental and Social Management Plan
GHG	Greenhouse gases
GOB	Government of Barbados
HCFC	Hydrochlorofluorocarbons
IDB	Inter-American Development Bank
Km	Kilometers
KW	Kilowatts
Leq	Equivalent continuous sound pressure level over a given period
m	Meters
MCPA	Marine Pollution Control Act
µg/m <sup>3</sup>	microgram per cubic meter
mph	miles per hour
mm	Millimeter
ODS	Ozone depleting substances
PEU	Project Execution Unit
PM	Particulate matter
PM <sub>10</sub>	Particulate matter with diameter less than 10 micrometers
PM <sub>2.5</sub>	Particulate matter with diameter less than 2.5 micrometers
PPE	Personal protective equipment
PV	Photovoltaic
RE	Renewable Energy
SBRC	Sustainable Barbados Recycling Center

SEFB	Sustainable Energy Framework for Barbados
SFTC	Smart Fund Technical Committee
SWPU	Solid Waste Project Unit
TA	Technical Assistance
TCPA	Town and Country Planning Act
TCPDO	Town and Country Planning Development Order
WHO	World Health Organization

## **1.0 OBJECTIVE AND SCOPE**

### **1.1 OBJECTIVE OF THIS ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

This Environmental and Social Management Plan (ESMP) is designed to establish a framework for the proper management and mitigation measures to be implemented during the implementation and operation of the proposed energy efficiency (EE) improvement Projects. Project activities will be carried out by only contractors, so this Plan includes strategies that will them to manage, mitigate, and avoid adverse effects to environmental and social receptors which could potentially be directly or indirectly affected by Project activities.

### **1.2 BACKGROUND AND DESCRIPTION OF THE PROJECT**

The Government of Barbados is implementing a Smart Fund II program (a follow on to the Smart Fund program) as the basis to promote renewable energy (RE) and EE projects (the Project) in Barbados. These projects are aimed at reducing electricity costs for end users, and improving energy security and environmental benefits.

The objectives of the individual Smart Fund II Projects are to design, prepare, and implement commercially and economically viable RE and EE technologies. Although the Projects have not been clearly defined, they are limited to:

- Energy efficient lighting replacement in approximately 50 Government owned businesses and facilities,
- Replacement of government vehicles with electric cars,
- Replacement of existing air conditioning units with higher efficiency units in approximately 50 Government owned businesses and facilities, and
- Sealing and tinting windows to improve building energy efficiency.

### **1.3 KEY IMPACTS**

The proposed Projects have the potential to affect the environmental and socioeconomics conditions of the project area. Project activities are limited to improvement and replacement of equipment and no actual construction activities are planned. Additionally, because Project activities will be confined to inside existing government owned buildings, with no disturbance to new,

undeveloped areas, no operational changes are expected once Project activities are implemented. Therefore, negative impacts are strictly limited to the implementation phase and none are expected during the operational phase. Potential negative impacts were determined to be negligible to minor, and include the following:

- Potential release of refrigerants which are an ozone depleting substance (ODS);
- Inappropriate disposal of refrigerants;
- Fire hazards;
- Accidental release of hazardous materials (battery contents, used oil, mercury containing fluorescent bulbs ) into the environment during transportation and/or storage; and
- Inappropriate disposal of hazardous materials (batteries, used oils, fluorescent bulbs)

The Environmental Assessment (EA) for the project determined that the proposed expansion is not expected to have impacts on flora or fauna or cultural resources in the project area.

## **2.0 ENVIRONMENTAL POLICY, ORGANIZATION, AND RESPONSIBILITIES**

### **2.1 ENVIRONMENTAL POLICY**

There are no specific environmental policies under the Smart Fund II program; however, Project activities must comply with relevant local regulations, international agreements, as well as International Development Bank (IDB) policies and safeguards.

### **2.2 ORGANIZATION AND RESPONSIBILITIES**

The Executing Agency of the Smart Fund II Projects covered by this ESMP would be the Energy and Telecommunications Division (ETD) of the Office of the Prime Minister of Barbados. Under the ETD, a Program Manager will lead the Project Execution Unit (PEU), in the operationalization of the Smart Fund. In addition, a Smart Fund Technical Committee (SFTC) assesses eligibility for Smart Fund support and assists the PEU in other technical matters.

The ETD Program Manager is responsible for:

- Planning and budgeting the Projects.
- Directing the preparation and implementation of sustainable energy projects.

The PEU Program Manager is responsible for:

- Ensuring that all contractors hired to perform the work comply with local and international regulations regarding the handling and disposal of hazardous materials and hazardous wastes. These requirements must be spelled out in all tender documents and contracts.
- Data collection and monitoring.
- Ensuring contracts include payment schedules based on quantifiable deliverables (documentation for the appropriate transportation and disposal of wastes).

### **2.3 PROJECT STRUCTURE**

Prior to initiating the work, the individual Projects must be defined by the PEU. The buildings requiring upgrades must be identified and an inventory of required upgrades must be created. Contractors can then use this detailed list of upgrade activities to prepare a formal quote. It is the responsibility of the PEU

to verify that all contractors meet the requirements set forth in this ESMP. All work will be carried out by contractors and suppliers who specialize in and have the appropriate training to conduct these types of Projects.

The PEU should prepare a list of available contractors (a sample list is provided as an Annex to this Appendix) as well as establish pre-classification criteria for the contractors.

## 2.4 *ENVIRONMENTAL, SOCIAL, AND SAFETY TRAINING*

As must be specified in the contract documents, all contractors must be trained in the appropriate handling and disposal of the hazardous materials that relate to their specific tasks. These include, but are not limited to:

- Excess window sealants
- Used car batteries
- Used oil
- Mercury contaminated bulbs, and
- Refrigerants

Contractors must be trained in emergency response procedures which must include spills, releases, and fires. The PEU Manager is responsible for ensuring that contractors hired guarantee that training is up-to-date for all pertinent personnel.



### **3.0 ENVIRONMENTAL MANAGEMENT PROGRAM**

#### **3.1 MITIGATION MEASURES AND MANAGEMENT CONTROLS**

If mitigation measures are properly implemented, Projects impacts are considered to be negligible. There are no construction activities related to the Projects, as they are limited to replacement of existing equipment.

Project activities will be confined to inside existing government owned buildings, with no disturbance to new, undeveloped areas. There will be no operational changes once the Project activities are implemented so impacts are strictly limited to the implementation phase and no negative impacts are expected during the operational phase.

The negligible impacts of the project will be mitigated and managed with the application of industry-standard best practices. Table 3-1 summarizes these best practices. Any contractor or supplier that may be involved in the project will be required to incorporate the proposed mitigation measures and management controls within their own working procedures and plans.

**TABLE 3-1 ENVIRONMENTAL MANAGEMENT PROGRAM - PROPOSED MITIGATION MEASURES AND MANAGEMENT CONTROLS**

Impact	Resource	Source of the Impact	Recommended Mitigation/ Management Measure or Embedded Control	Responsible to Execute
<i>Physical</i>				
Refrigerant leaks/discharge	Climate and Air Quality	<ul style="list-style-type: none"> <li>Removal of refrigerants during air conditioning unit removals</li> <li>Transportation of refrigerants both on and off the island either in gas cylinders or inside the AC unit itself.</li> <li>Improper disposal of refrigerants</li> </ul>	<ul style="list-style-type: none"> <li>Ensure only trained personnel recover refrigerants into the appropriate gas cylinders.</li> <li>Ensure personnel conducting the refrigerant removal are trained on response to leaks.</li> <li>Utilize refrigerant recovery equipment is used to evacuate the system into a recovery gas cylinder.</li> <li>Ensure cylinders are appropriate for the material recovered, and in good working conditions (level gauges, valves)</li> <li>Ensure gas cylinders are handled appropriately (i.e. use of carts for moving)</li> <li>Implementation of the appropriate transportation requirements (securing gas cylinders inside trucks, use certified transport companies that meet international shipping requirements, if shipping).</li> <li>Provide the appropriate storage for cylinders prior to disposal.</li> <li>If transporting AC units with refrigerants, ensure the appropriate handling and transportation of the units so as to not damage the refrigerant containers.</li> <li>Document the entire disposal process including: quantities removed, transferred, stored, and final disposal, company and personnel conducting removal, transport, and/or disposal, request certification of destruction of the material.</li> </ul>	PEU Project Manager and contractors that may participate in the Project.
Hazardous waste disposal	Soils/Hydrology	<ul style="list-style-type: none"> <li>Removal and disposal/recycling of used batteries</li> <li>Removal and disposal/recycling of used oil</li> <li>Disposal of fluorescent light bulbs</li> </ul>	<ul style="list-style-type: none"> <li>Ensure batteries are recycled by an authorized recycler and request documentation.</li> <li>If battery recycling is not available, ensure they are disposed of accordingly by a certified disposal facility (do not landfill). If materials need to be shipped off the island for appropriate disposal, ensure containers, shipping company, and disposal destination are in compliance with international regulations. Request certification and documentation as back up.</li> <li>Ensure used oil is recycled by an authorized recycler and request documentation.</li> </ul>	PEU Project Manager and contractors that may participate in the Project.

Impact	Resource	Source of the Impact	Recommended Mitigation/ Management Measure or Embedded Control	Responsible to Execute
			<ul style="list-style-type: none"> <li>• Ensure fluorescent bulbs are packaged appropriately for transport and are taken to a facility with the equipment to appropriately dispose of them.</li> <li>• If bulbs are shipped overseas, ensure packaging, shipping company, and disposal destinations are in compliance with international regulations. Request certification and documentation as back up.</li> </ul>	
Soil and groundwater contamination from spills	Soils/Hydrology	<ul style="list-style-type: none"> <li>• Contamination from accidental spills (e.g., used oils and lubricants, used battery acid), during collection and transportation</li> <li>• Contamination from accidental breaking of fluorescent bulbs during collection and transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure removal contractor is trained in spill response</li> <li>• Provide spill kits with the appropriate spill response equipment depending on the types of materials handled: oil, battery acid, broken bulbs, etc. Spill kits should also contain the appropriate personal protective equipment (PPE) necessary for the type of spill (such as gloves and eye protection).</li> <li>• Ensure transportation equipment is in good working condition to avoid spills and leaks</li> <li>• If a spill occurs, remove spilled materials and place it in an appropriate container for disposal.</li> <li>• Request documentation and certification of spill removal and disposal of materials</li> </ul>	PEU Project Manager and contractors that may participate in the Project.
<b>Social</b>				
Fire and explosion	Fire hazard risk	<ul style="list-style-type: none"> <li>• Accident release of refrigerants classified as highly flammable gas.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure personnel conducting the refrigerant removal are trained on response to leaks.</li> <li>• Prohibit smoking or ignition sources near refrigerant storage and transportation vehicles.</li> </ul>	Contractors that may participate in the Project.
Exposure to hazardous chemicals	Human health	<ul style="list-style-type: none"> <li>• Accidental spills (e.g., used oils and lubricants, used battery acid), during collection and transportation</li> <li>• Accidental breaking of fluorescent bulbs during collection and transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure removal contractor is trained in spill response</li> <li>• Provide spill kits with the appropriate personal protective equipment (PPE) necessary for the type of spill (such as gloves and eye protection).</li> <li>• Request documentation and certification of spill removal and disposal of materials</li> </ul>	Contractors that may participate in the Project.
Benefits to the local and national economy	Socioeconomic	<ul style="list-style-type: none"> <li>• Project induced economic activity will result from contracting services during the implementation of the Projects.</li> <li>• Decrease dependency on fossil fuels.</li> <li>• Increase energy efficiency.</li> </ul>	No additional mitigation measures are proposed.	Not Applicable

## 3.2

### *MONITORING AND EVALUATION*

During implementation of the Projects, ETD, and more specifically the PEU, will verify that activities are conducted in compliance with this ESMP and applicable regulatory requirements.

The PEU Project Manager will verify the following:

- Appropriate transportation and disposal of refrigerants.
- Appropriate transportation and disposal of hazardous waste.
- Maintenance of transportation and disposal documentation
- Health and safety procedures.

Upon completion of the individual Projects, the ETD will provide the IDB with Environmental and Social Compliance Reports (ESCR). The ESCR will be a concise document, addressing the main potential impacts and risks of the project:

- Physical environment: report any event related to the physical environment, such unanticipated atmospheric releases.
- Occupational health and safety: discuss the OHS performance and detail any event or incident, its causes and consequences, an analysis of root causes, and measures taken to prevent similar events in the future.
- Community grievances: provide details of community grievances including list of grievances, how grievances were solved, list of any pending grievances, and root causes of grievances.

In addition to the ESCR, an annual report will be provided to the IDB which describes all of the Project activities carried out to date.

To respond to emergencies, including spills or leaks during replacement of the equipment or during transport of the hazardous wastes, or from fires, the Contractors hired must prove that they have an emergency response plan to handle and mitigate any emergency. This emergency response plan must be made available to all employees working on tasks for this Project. The following activities should be carried out in case of emergencies:

Spills and leaks:

- Provide spill kits with the appropriate spill response equipment depending on the types of materials handled: oil, battery acid, etc. Spill kits should also contain the appropriate personal protective equipment (PPE) necessary for the type of spill (such as gloves and eye protection).
- During an emergency spill, use the emergency kit to contain the spill. If required, contain the spill using available materials such as soil berms and/or wood planks.
- If refrigerants are leaked, contain the leak and evacuate the area until it has dissipated.
- Remove spilled materials and place it in an appropriate container for disposal, only if able to do so safely.
- Investigate and report the cause of the spill and retroactively implement procedures to prevent it from happening again.

Fires:

- Provide training to personnel on the causes of fires, extinguishing methods, and equipment use.
- Evacuate the area if refrigerants are near as some can lead to explosions.
- Prohibit smoking anywhere near the equipment (especially near the refrigerants).
- Assist anyone affected, performing first aid if needed, and transport them to the nearest hospital/clinic if necessary.
- After the fire and once it is safe to enter, ventilate the areas and remove any remaining residual materials for their proper disposal.
- Investigate and report the cause of the fire and retroactively implement procedures to prevent it from happening again.

Work Accidents:

- Provide information and/or training to all employees who are at risk.

- Ensure the used of PPE when required and provide a first aid kit for minor accidents/lesions at the work place.
- In case of an emergency, report the emergency to the supervisors and if needed, transport affected personnel to the nearest hospital/ clinic.
- Investigate and report the cause of the accident and retroactively implement procedures to prevent it from happening again.

The ETD will establish a grievance mechanism prior to the implementation of the Projects. This grievance mechanism will include the following best practice elements:

- A transparent grievance receipt and registration system to provide culturally appropriate ways for stakeholders to register grievances and confirm they have been received;
- Grievance eligibility assessment to determine if the issues raised in the grievance fall within the scope of the grievance mechanism and the grievances are eligible to file in the grievance mechanism;
- Grievance evaluation to clarify the issues and concerns raised in the grievance, gather information, and identify whether and how the issues may be resolved;
- Problem solving, with or without the assistance of independent, third parties, that include:
  - Internal decision-making processes, whereby issues are handled by designated members of the Project Management Team or other company officials, using clearly articulated standards and criteria, to develop and propose a company response to the grievance and to allow for an appeals process;
  - Joint problem solving, in which the company and the complainant engage in direct dialogue arranged by an Environmental and Social Responsibility Officer; or
  - Third-party mediation to determine a solution when a voluntary agreement is not possible;
- Grievance tracking, monitoring, and reporting, consisting of an internal grievance documentation and tracking system, monitoring of the status of each grievance, and monthly reporting and evaluation of the grievance mechanism, key issues and areas for improvement;
- Company-community feedback and information sharing to strengthen the grievance resolution processes, including asking stakeholder how the grievance mechanism may be strengthened, and ensuring that the mechanism is understood, accessible and appropriate for all stakeholders; and
- Organizational learning and identification of systemic problems and the need for changes to policies and procedures to prevent recurrent future disputes, as identified in monthly and annual evaluations and reports.

## **ANNEX 1**

### **FUTURE CENTER TRUST LIST OF BARBADOS RECYCLING OPTIONS**



# Barbados Recycling Options

## Food & Drink Packaging, Office Items, Bulky Goods

Name of Entity	Items Recycled	Phone & Address	Collection or Drop Off/ Bins	Payments	Hours open
ACE Recycling	Paper (office paper and magazines, old books, newspapers), Cardboard & Car Batteries	423 0510 Massiah Street, St. John	Free collection, provide bins for recycling	No payment for paper, \$12 per batteries	8am-4:30pm Mon-Fri
B's Recycling	Cardboard, All Plastics, All Glass, All Cans, Car bumpers, Scrap Metals (cars, fridges, stoves, A/C units, washing machines, freezers, etc), Car Batteries, Bottle Covers	438 9285 Cane Garden, St. Thomas	Free collection, some bins provided - Say it is for the FCT and your donation will come to us!	Payments vary on materials, contact B's for more information	8:00am-5:00pm Mon-Sat
Sustainable Barbados Recycling Centre (SBRC)	All paper including Phonebooks and Cardboard! All Plastics, All Glass, Tins, Green Waste	425 2255 Vaucluse, St. Thomas	Public drop off area only	No payment	6am-6pm 7 days per week
Caribbean E Waste Management	Electronic Waste (all computer components, ink cartridges, small electronic appliances, TV's, etc)	823 5334 (call from cell phone) E: mcummings629@hotmail.com	Collection available depending on items	No Payment, \$10 charge to collect monitors	9am-5pm Mon- Fri 9am-2pm Sat
Machinery & Allied Engineering Services	Automotive Oil, Gas & Diesel	430 0207 2nd Ave Deighton Road, St Michael	Collection - A charge of \$19 per 55 gallon drum is payable to dispose of the oil		8am -5pm Mon-Fri
Recycling Preparation Inc (RPI)	Non Ferrous Metals ie: Brass, Copper and Aluminum, Stainless steel	425 2541 Warrens, St. Michael	Collection available, some bins available	Rates Vary - Call for current information	8am-4pm Mon-Fri
Paradise Green Energy	Waste Cooking Oil	Joseph Del Castilho 230 5695 Green Hill, St. Michael	Collection available	No payment	7:30am-5:30pm Mon-Fri
Solid Waste Solutions & Services	Waste Cooking Oil	Tennyson Babb 424 8508 7 Antrum Close, Grazettes	Collection available	No payment	8am-5pm Mon-Fri
InkTech Inc	Collects and Refills Ink Jet Cartridges	421 7844 or 231 1377	Bins can be arranged on site	Drop Offs Available/ Amounts vary depending on cartridge	8am-5pm Mon-Fri



Last Updated Sep 2011 - Subject to change without notice

future centre trust  
Little Edgehill, St Thomas T: 625 2020  
E: [info@futurecentretrust.org](mailto:info@futurecentretrust.org)  
W: <http://www.futurecentretrust.org>