



Prepared For:



**ENVIRONMENTAL AND SOCIAL
ASSESSMENT**
*Sustainable Energy Investment Program
SMART FUND II
Barbados*

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LIST OF ACRONYMS

BNSI	Barbados National Standards Institute
BWA	Barbados Water Authority
CFC	Chlorofluorocarbon
CO ₂	Carbon dioxide
dB	Decibel
dBA	A-weighted decibels
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
ESA	Environmental and Social Assessment
ESMS	Environmental and Social Management System
ESMP	Environmental and Social Management Plan
ETD	Energy and Telecommunications Division
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 ³	microgram per cubic meter
mph	miles per hour
mm	Millimeter
ODS	Ozone depleting substances
PEU	Project Execution Unit
PM	Particulate matter
PM ₁₀	Particulate matter with diameter less than 10 micrometers
PM _{2.5}	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

EXECUTIVE SUMMARY

Introduction

The Government of Barbados is seeking a loan for the Smart Fund II Program which would continue to use the Smart Fund program as the basis to promote renewable energy (RE) and energy efficiency (EE) projects (the Project) in Barbados, aimed at reducing electricity costs for end users, and improving energy security and environmental benefits. The Executing Agency of the Smart Fund II would be the Energy and Telecommunications Division (ETD) of the Office of the Prime Minister of Barbados. The Government of Barbados is the formal borrower under the Sustainable Energy Investment Program.

Project Description

The objectives of the individual Smart Fund II Projects covered under this Environmental and Social Assessment (ESA) are to design, prepare, and implement commercially and economically viable RE and EE technologies. Programs covered by this fund would include retrofitting of public buildings and programs to promote EE and RE among Barbados residents. The number and location of specific Projects have not been defined yet, but their scope would include:

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

Agency Meetings and Regulatory Requirements

ERM conducted meetings with pertinent regulatory agencies and governmental entities in Barbados to discuss the project and obtain their opinion on the potential project impacts and regulatory requirements.

In regards to environmental and social issues, the Project triggers the following directives of the Environment Safeguard Policy (OP-703):

- B.1, Bank Policies: The Bank will only finance operations and activities that comply with the directives of this policy, and are consistent with the relevant provisions of other Bank policies.
- B.2, Country Laws and Regulations: depending on Project activities, local requirements could include a development permit from Town and Country Planning Office (see Section 2.3.1 above). No ESA or ESIA is required locally.
- B.3, Screening and Classification: The proposed Project will have negligible impacts on the environment or the community. However, the generation and handling of

hazardous wastes involves potential risks, which merits that the Project be classified as Category “B”. In accordance with OP-703, Category B projects “are likely to cause mostly local and short-term negative” impacts, for which “effective mitigation measures are readily available”. Appendix A presents the Environmental and Social Management Plan (ESMP) of the Project.

- B.4, Other Risk Factors: The Project’s executing agency does not have the capacity to assure compliance with the ESA and ESMP requirements of the IDB. Therefore, the Bank will engage with the executing agency and relevant third parties to develop appropriate measures for managing the identified risks.
- B.5, Environmental Assessment Requirements: This ESA addresses the IDB’s requirement for environmental assessment for the project.
- B.6, Consultations: a public consultation was carried out on 19 February, 2019. Consistent with the Bank’s Disclosure of Information Policy (OP-102), this ESA was made available to the public prior and a public consultation was carried out prior to Project execution (see Section 2.3.5).
- B.7, Supervision and Compliance: A monitoring plan will be implemented for the project as part of the Environmental and Social Management Plan of the Project (see Appendix A).
- B.8 Transboundary Impacts: The Project will result in the generation of hazardous materials that cannot be disposed of in Barbados. The Project will comply with the Basel Convention and the Rotterdam Convention.
- B.10, Hazardous Materials: The Project will result in the generation of hazardous wastes, such as air conditioning unit refrigerants, used batteries, used oils, and fluorescent light bulbs. Management of hazardous materials is addressed in the ESMP (see Appendix A).
- B.11, Pollution Prevention and Abatement: Besides the hazardous wastes mentioned above, Project activities have a minimal risk of pollution. Pollution prevention is addressed in the ESMP of the Project (see Appendix A).

Additionally, the Project triggers the IDB’s Access to Information Policy (OP-102), the Gender Equality in Development Policy (OP-761) and the Policy on the Management of Natural Disaster Risks (OP-704). It is the intent of the Bank to be as clear and transparent as possible when it comes to financing projects, and through clear communication with the stakeholders, improve the quality of its operations. Although the Projects will not include any new development or construction, the Policy on the Management of Natural Disaster Risks applies during the transfer and storage of hazardous materials/hazardous waste that could result from Project Activities.

Environmental and Social Baseline

General Conditions

While we know the scope of the interventions proposes, the number and location of Projects have not been clearly defined. Based on the information provided by the ETD, the Projects will take place inside/or at already constructed government owned buildings. There will be

no purchase or development of additional land. Activities will be mostly conducted inside, although air conditioning unit replacements activities could also take place on the roofs or the sides of buildings. These buildings are located in urbanized/developed city areas.

Physical Environment

Barbados has a mild subtropical climate with average temperatures that range from 24 to 28 °C and humidity that ranges from 71 to 76% (Evanson 2014). There is a dry season from January to June and a wet season that starts in late June and goes thru December.

The island of Barbados is the most eastern island of the English Caribbean chain of islands (Lesser Antilles). Topographically the island is relatively flat, composed of coral limestone, crossed with deep river-bed gullies that accommodate the movement of water during heavy rain.

Although the Projects will take place in urbanized areas where ambient noise levels are high due to city traffic, there is the potential for disposal activities at the island's landfill located in Saint Thomas Parish to contribute to the noise levels. This will be further explored in the Impact Assessment section of the document.

Natural Hazards and Risks

The main natural hazard for Barbados is the occurrence of hurricanes. Approximately 12 hurricanes and several tropical storms have crossed the island of Barbados from 1851 to 2010.

The main risks associated with the Project are related to the transportation of wastes generated, including potential impacts from hurricane strikes.

Biological Environment

Barbados is in the Windward Islands Xeric Scrub ecoregion and is included in the Caribbean islands biodiversity hotspot. The biodiversity of Barbados has been influenced since the island was settled in 1627. Numerous species of plants and animals have been introduced, competing against indigenous species. In addition, habitats were altered and fragmented as the island was settled.

Socioeconomic Environment

Barbados is one of the mostly densely populated countries in the world, having a population density of 646 people per square kilometer at the most recent census (2010). In 2010, the population of Barbados was 277,821, of which 47.9% were male and 52.1% female.

There was a general decline in the unemployment rate in Barbados from 1995 when it was 19.7% until 2007 when it was 7.4%. In 2010, the unemployment rate was 10.8% and in 2015 it was estimated at 11.3%. There has been a decline in employment in the agricultural and manufacturing sectors and a rise in employment in the services sector.

A survey conducted in 2010 indicated that 15% of households and 19.3% of individuals in Barbados were below the poverty line. The data indicate that the poverty gap (the extent to which the poor existed below the poverty line) and the severity of poverty compare favorably with those in other Caribbean countries.

Impacts and Mitigation

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. Project operation will have positive impacts from increased energy efficiency and reduced operation costs.

The project is expected to have limited impacts. Each project activity has been evaluated to identify the potential impacts (Table ES-1).

The following potential impacts were identified:

TABLE ES-1: SUMMARY OF PROJECT ACTIVITIES AND POTENTIAL IMPACTS

Activity	Potential Impact	Degree of Impact ¹
Tinting and sealing windows	- Negative effect on human health through inhalation of sealants/adhesives fumes	Negligible
Replacing air conditioning units	- Generation of waste containing Ozone Depleting Substances (refrigerants)	Negligible
Replacing vehicles	- Generation of waste containing heavy metals and acids (used oil, used car batteries) which could negatively affect human health when exposed	Negligible
Replacing fluorescent light bulbs	- Generation of hazardous waste (fluorescent light bulbs that contain mercury), which could contaminate soils, groundwater and air, as well as impact human health through direct contact with broken bulbs	Negligible

Note: (1) Degree of impact after mitigation.

All the identified potential impacts of the project were considered negligible under the assumption that they will be mitigated and managed with the application of industry-standard best practices. An Environmental and Social Management Plan has been prepared for the project and summarizes these best practices. Any contractor 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. Public consultations

did not identify any additional issues or concerns with regards to the implementation of the Project.

Project Impact Category

The proposed Project will have limited impacts on the environment or the community. However, the handling of hazardous wastes involves potential risks, which merits that the Project be classified as Category “B”. In accordance with OP-703, Category B projects “are likely to cause mostly local and short-term negative” impacts, for which “effective mitigation measures are readily available”.

In 2012, The Government of Barbados (the Government) established a Smart Fund to provide financial and technical support to renewable energy (RE) and energy efficiency (EE) projects in Barbados. This Smart Fund was capitalized by a loan from the Inter-American Development Bank (IDB), under an agreement for the Sustainable Energy Investment Program. The Government is now seeking a loan for the Smart Fund II which would continue to use the Smart Fund program as the basis to promote renewable energy (RE) and energy efficiency (EE) projects (the Project) in Barbados.

The objective of the Smart Fund was to increase the use of viable RE and EE technologies in Barbados in order to decrease energy costs of the population, increase the country's energy security by reducing its dependency on imported fossil fuels, and increase local and global environmental sustainability by reducing emissions of polluting substances, particulate matter, carbon dioxide (CO₂) and other greenhouse gases (GHG). This objective is consistent with that of the Government's Sustainable Energy Framework for Barbados (SEFB), the comprehensive policy framework within which the Smart Fund was implemented (ETD 2012).

The Smart Fund II program would include: (i) retrofitting of public buildings using performance based contracts; (ii) promotion of EE and RE through a lending sub program executed by the Enterprise Growth Fund Limited (EGFL) targeting mainly hotels and other SMEs; (iii) demonstration and innovative programs promoting RE and EE such as: (a) smart grids, (b) energy storage; (c) electric mobility, and (d) other innovative forms of renewable energy generation to meet Barbados RE and EE targets.

The Executing Agency of the Smart Fund II would be the Energy and Telecommunications Division (ETD) of the Office of the Prime Minister of Barbados. The Government of Barbados is the formal borrower under the Sustainable Energy Investment Program. 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 Enterprise Growth Fund Limited (EGFL) is the sub-executing agency for the Smart Fund's facilities that issue grants: Technical Assistance (TA) Facility, Pilot Consumer Finance Facility, EE Lighting Distribution Facility, A/C Rebate Trade-In Facility, and loans: EE Retrofit and RE Finance Facility (ETD 2012).

This Environmental and Social Assessment (ESA) addresses the potential impacts associated with the implementation of the Project with the data acquired prior to the date of the ESA (October 2017). This document has since

been updated to include the results of the public consultation held on 19 February 2019 as discussed in Section 4 below.

2.0 *PROJECT DESCRIPTION*

2.1 *SMART FUND I AND SMART FUND II*

The Smart Fund is comprised of six facilities organized under two components based on the entity that executes them. The EGFL executes Component One and the ETD of the Office of the Prime Minister of Barbados executes Component Two.

Component One is comprised of:

1. TA Facility – provides grants to businesses for funding pre-investment studies of RE and EE projects, to assess their technical and financial viability and support their implementation.
2. EE Retrofit and RE Finance Facility – provides subsidized loans to businesses for financing the implementation of viable RE and EE projects (including, but not limited to, projects assessed by studies funded by the TA Facility).
3. Pilot Consumer Finance Facility – provides interest rate rebates or rebates on retail prices (subsidies) to selected retailers that have experience in the ‘hire-purchase’ consumer finance scheme, and that thanks to the rebates offer better hire-purchase terms to their customers for purchasing RE and EE equipment at their stores.
4. EE Lighting Distribution Facility – provides free EE Lights to a limited number of residential customers of Barbados Light and Power, through the issuance of vouchers.
5. A/C Rebate Trade-In Facility – provides a 50 percent instant rebate for households and businesses to purchase energy efficient air conditioners (provided they dispose of old air conditioners), also through the issuance of vouchers.

Component Two:

6. Discretionary Grant Facility – provides funds for the ETD to use on a discretionary basis for institutional support to execute the Smart Fund. This includes paying for awareness programs, paying for the issuance of vouchers and A/C disposal certificates, paying for the PEU, and monitoring the Smart Fund’s performance. At the ETD’s discretion, this facility may also provide grants to private businesses for purchasing small RE systems and EE equipment, replicating the activities of the SEF Pilot Program (which is a separate initiative under the SEFB, funded by the Government and by the IDB through the Global Environment Facility).

The individual Smart Fund II Projects covered under this ESA are those that fall under Component Two to be executed by the ETD. These Projects include:

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

2.2 *INDIVIDUAL PROJECT ACTIVITIES*

2.2.1 *Tinting and Sealing Windows*

Although the number and location of Projects has not been clearly defined, if window tinting is performed, it will consist of placing premade film on windows. Window sealing will likely be done with the application of caulk or sealant around the windows.

2.2.2 *Replacing Air Conditioning Units*

The ETD intends to replace air conditioning unit with more energy efficient units in approximately 50 existing government owned buildings. The old units can either be disposed of or sold if in working condition. Specific information about the types of units or the quantities are not yet defined; however during the site visit, smaller older facilities were observed having both individual wall mounted air conditioning units, whereas larger, newer building had roof mounted central air conditioning units.

2.2.3 *Vehicle Fleet Replacement*

According to the ETD, the proposed Project could include the replacement of currently used diesel vehicles with electric cars; however, this activity would not be carried out in the immediate future. It is unknown if the former vehicle fleet would be sold or disposed of.

2.2.4 *Replacing Fluorescent Light Bulbs*

The final Project activity described by the ETD was the replacement of fluorescent light bulbs with energy efficient LED light bulbs. The exact number of buildings and or light bulbs to be replaced is currently unknown.

2.3 **REGULATORY REQUIREMENTS, SCOPING, AND PUBLIC CONSULTATION**

2.3.1 ***Barbados Regulatory Requirements***

This section describes the environmental laws and regulations in Barbados which would apply to the Project. Barbados is governed by the 1966 Constitution of Barbados (as amended up to 2007). Environmental and health monitoring and enforcement is mostly done through the Ministry of Environment and Drainage and the Ministry of Health. The Ministry of the Environment and Drainage consists of a number of agencies and departments with the combined focus of maintaining the viability, productivity and quality of the various ecosystems on this island. These include the Coastal Zone Management Unit, the Drainage Division, the Environmental Protection Department, the National Conservation Commission, the Natural Heritage Department, the Policy Research and Planning Information Unit, and the Sanitation Service Authority.

Development in Barbados is governed by the Town and Country Planning Act (TCPA, Chapter 240), and its subsidiary legislation, the Town and Country Planning Development Order (TCPDO) of 1972. This Act ensures environmental protection during new and expanded developments. The TCPA requires that new developments and changes to existing developments (i.e., addition of buildings), as well as specific criteria for air emissions and water discharges, be reviewed by the Chief Town Planner. During review of applications for developments, the Chief Town Planner may request an environmental impact assessment (EIA), which should follow the EIA Guidelines and Procedures for Barbados (1998) prepared by the Government of Barbados, Ministry of Health and the Environment. The Health Services (Building) Regulations, 1969 require persons wishing to construct, extend, alter or change the use of a building to obtain the permission of the Minister of Health via the Director of the Environmental Protection Department (EPD). This legal requirement is independent of that requiring permission from the TCDPO. In the case of proposals that do not require approval from TCDPO, such as internal renovations or alterations to approved structures, an application must be submitted directly to the EPD (MOED 2009).

The main government policies and plans that concern sustainable development and biological resources include the:

- Barbados Sustainable Development Policy - outlines strategies for achieving sustainability in a number of sectors
- National Physical Development Plan – has placed emphasis on sustainable development and the protection of natural, environmental, and cultural heritage resources, the containment of damage caused by

scattered urban development, the protection of agricultural land forms, the maintenance of Central Bridgetown as a financial and commercial center, tourism experience and modernization of beach front properties, diversification of the economy, and procedures for EIAs

- Coastal Zone Management Plan - to provide for the more effective management of the coastal resources of Barbados, for the conservation and enhancement of those resources, and the
- National Strategic Plan (2005-2025) - whose fourth goal is to build of a green economy which requires advancement and protection of the environment, resources, infrastructure while advancing social and economic development.

Applicable legislations by resource area are described in the sections below.

2.3.1.1. *Water and Wastewater*

Although the project does not intend to use fresh water sources, depending on the type of activities, fresh water resources could be indirectly affected by the Project. Fresh water resources are managed under the following statutes:

- Three-Houses Spring Act, 1713 - allows inhabitants in the Parish of St. Phillip to retain water for use, provided it does not have negative effects downstream.
- Porey's Spring Act, 1864 - allows the vestry of the parish of St. Thomas to construct and maintain works for the collection and delivery of water to persons other than the inhabitants of the parish.
- The Underground Water Authority Act 1953 [Chapter 283] - stipulates that a license is needed for the abstraction of underground water
- The Barbados Water Authority Act, 1980 [Chapter 274A] – established the Barbados Water Authority (BWA) to manage, allocate and monitor Barbados water resources, to ensuring their best development, utilization, conservation and protection.
- The Town and Country Planning Development Order, 1972 (described above); and
- The Marine Pollution Control Act, 1998 - established discharge standards for all waste water into the groundwater as well as the marine environment.

The BWA is a Statutory Body established by the Barbados Water Authority Act, on October 8, 1980 which commenced operations on April 1, 1981 (replaced the Waterworks Department of Government). The BWA is charged with supplying potable water as well as wastewater treatment and disposal services to the sewered areas of Bridgetown and the South Coast. The BWA is legally responsible for ensuring water quality is protected (BWA 2017).

Groundwater is protected by the National Groundwater Protection Zoning Policy of 1963, which sets up Zones with restrictions and prohibitions for development. These Zones are incorporated into the Town and Country Planning Development Order under the TCPA. Source monitoring is undertaken by the EPD and BWA, as well as via distribution system monitoring by the Environmental Health Department (EHD) and the BWA. The EPD and EHD act as regulators of the BWA (UNEP 2010a).

2.3.1.2. *Energy*

The Energy Division, within the Ministry of Finance, Economic Affairs and Energy, was established in 1978, and is responsible for decision-making in this area. It is comprised of an Administrative Unit, a Legal and Regulatory Unit, the Natural Resources Department, the Renewable Energy and Energy Conservation Unit and the Research and Planning Unit (MOE 2017).

In February 2009, the GOB entered into a Technical Assistance Agreement with the IDB for assistance in developing a Sustainable Energy Framework for Barbados with the objective of promoting renewable energy and energy efficiency (MOE 2017). The GOB then developed the Draft National Sustainable Energy Policy of 2010, consistent with Barbados' Sustainable Energy Framework and geared towards promoting energy conservation practices and the use of renewable energy technologies where possible, and reducing dependency on fossil fuels (UNEP 2010a; GOB 2013). Barbados is committed to reducing its oil dependency with a mandate with a renewable energy target of 29% by 2029 (MOE 2017).

The legislations governing the energy sector in Barbados include:

- The Electricity Act of 1965, Chapter 277 – regarding the supply of electricity;
- The Electric Light and Power Act, Chapter 278, 2013 – promotes the generation of electricity from sources of renewable energy and enhances the security and reliability of the supply of electricity;
- The Fair Trading Commission Act of 2002, Chapter 326B - to regulate, monitor, and investigate utility services; and
- The Utilities Regulation Act of 2002, Chapter 282 – to provide for the regulation of utility services.

2.3.1.3. *Waste Management*

Although there is no comprehensive solid waste management legislation, solid waste management and disposal in Barbados are governed by the Health Services Act (Chapter 44) of 1969. This Act was established to promote and preserve the health of the inhabitants of Barbados by managing waste, including

its Chapter 10: Nuisance Regulations (prohibit nuisance including illegal solid waste disposal) and Disposal of Offensive Matter Regulations (restrict disposal to approved sites only), and the Collection and Disposal of Refuse Regulations (1975) (MOED 2009, UNEP 2010a). These policies are further clearly reinforced by the Barbados Sustainable Development Policy which specifically highlights the issue of waste management (MOED 2009).

Solid Waste is primarily the responsibility of EPD, the Sanitation Service Authority (SSA), and the Solid Waste Project Unit (SWPU):

- The EPD (with its Solid Waste and Hazardous Substances Section) regulates and monitors solid waste management and government operated solid waste disposal facilities; and develops policies for the regulation of solid waste management.
- SSA is responsible for the collection and disposal of non-hazardous solid waste from homes and government agencies around the island. There is also a commercial arm which offers services to the private sector. The SSA was established by the Sanitation Service Authority Act (Chapter 382), amended in 2015.
- The Solid Waste Project Unit (SWPU) is responsible for the implementation solid waste management and education.

There are no hazardous waste treatment or disposal facilities in Barbados; therefore hazardous waste must be transported off the island. The EPD is under mandate to characterize sources of pollution and to develop initiatives geared towards the prevention, reduction and control of pollution (MOED 2009, UNEP 2010a). It is the responsibility of the EPD to undertake characterization of the types of waste generated via environmental audits on a sector by sector basis. The audit process should include a review of practices and procedures, assessment of waste streams and pollution control equipment.

Hazardous waste must be exported offshore for treatment and disposal following the requirements of the Basel Convention (see Section 2.3.2). The Convention requires that the exporting country notify the receiving country and any transit countries of the proposed shipment and can only ship the waste once consent has been given. The Convention also requires that an international movement documentⁱ accompany the waste shipment from its point of origin to its final recycling or disposal location (USEPA 2017).

ⁱ Basel Convention Movement Document for exporting and importing of hazardous wastes: <http://www.basel.int/Procedures/NotificationMovementDocuments/tabid/1327/Default.aspx>

Decision VII/31 (1995) of Montreal Protocol had a direct bearing on the Basel Convention (Section 2.3.2). The Parties decided that international transfers of Protocol-controlled ODS that are recovered but not purified to usable purity specifications by international or national standards should occur only if the recipient country has recycling facilities that can process the received controlled substances to these specifications or has destruction facilities incorporating technologies approved for that purpose (UNEP 2008). Additionally, the receiving country must be a party to the Protocol.

In addition, shipments of hazardous waste must be packaged and labeled properly. In the event that an accident occurs during the shipment of the waste, Basel requires that the responsible parties inform the potentially affected countries of the accident. Finally, parties to the Convention must submit an annual report to the Basel Secretariat summarizing the amounts and types of hazardous waste exported or imported and the destination and disposal methods (USEPA 2017).

2.3.1.4. *Coastal Zone Management*

Although current Project activities do not take place on Coastal Zones, should Project activities change, the following Acts may need to be considered:

- Marine Pollution Control Act (MPCA) of 1998 - this regulation was enacted to control the release of pollutants to the sea by requiring monitoring by the discharger, and establishing regulations prescribing environmental standards and requirements such as effluent criteria (UNEP 2010a).
- The Coastal Zone Management Act of 1998 - covers the management of coastal resources such as the development on shoreline and activities that will impact the beach and the marine environment.

2.3.2 *Applicable International Treaties and Conventions*

In addition to national regulatory requirements, the Project and ESIA process will be consistent with all relevant international standards and requirements. These include international treaties and conventions to which Barbados is a signatory relating to environmental management and community rights (see Table 2-1).

TABLE 2-1 APPLICABLE BARBADOS SIGNATORY INTERNATIONAL TREATIES AND CONVENTIONS

Agreement/Convention	Notes/Comments	Status
Climate Change/Air Quality		
Vienna Convention for the Protection of the Ozone Layer, 1985	Protection of the ozone layer.	Barbados acceded in 1992.
Montreal Protocol on Substance that Deplete the Ozone, 1989	Protection of the ozone layer.	Barbados acceded in 1992.
United Nations Framework Convention on Climate Change (UNFCCC), 1992	Control of greenhouse gas emissions.	Ratified by Barbados in 1994.
Kyoto Protocol, 1977	Greenhouse gas emissions targets.	Ratified by Barbados in 2000.
Hazardous Chemicals/Hazardous Wastes		
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Signed 1989, effective 1992	To protect human health and the environment against the adverse effects of hazardous wastes.	Ratified by Barbados in 1995.
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Signed 1998, effective 2004	To protect human health and the environment from certain hazardous chemicals.	Signed by Barbados in 1998.
Stockholm Convention on Persistent Organic Pollutants, Signed 1998, effective 2004	To protect human health and the environment from persistent organic pollutants.	Accepted by Barbados in 2004.
Marine Protection and Safety		
Convention on the Protection and Development of the Marine Environment in the Wider Caribbean, 1983 (Cartagena Convention)	Protection and development of the marine environment.	Barbados acceded in 1985.
Protocol Concerning Cooperation in Combating Oil Spills in the Wider Caribbean, 1983	Protection of the marine environment from oil spills.	Barbados acceded in 1987.
United Nations Convention on the Law of the Sea, 1982	Protection of the marine environment.	Ratified by Barbados in 1993.

Of particular concern to this Project are the Basel Convention because of the transport of hazardous wastes off the island, the Vienna Convention and the Montreal Protocol in regards to Ozone depleting Substance (ODS), and the Kyoto protocol for greenhouse gas emissions.

As stipulated by the Basel Convention, shipments of hazardous waste must be individually assessed. The EPD monitors shipment of hazardous waste and mandates that a 3 stage protocol (Initial Notification, Pre-Shipment Notification and Post Shipment Notification) be followed. There is an Environmental Management Bill and associated regulations have been drafted which make provisions for the management of hazardous wastes for individuals and

commercial entities. The Draft EMA has a section addressing toxic substances from import to disposal (UNEP 2010a).

2.3.3 *Agency Meetings and Regulatory Requirements*

ERM conducted a fact-finding visit to meet with the Project sponsor, pertinent regulatory agencies and other pertinent governmental entities in Barbados to discuss the scope of the investment program – Smart Fund II - and obtain an understanding on how the collection, separation and disposal of solid waste, hazardous waste, and recycling is conducted on the island.

The visit was aimed to identify information sources and availability, the regulatory climate, and key issues to be addressed to ensure the correct application of the IDB's Environmental and Social Safeguards (see Table 2-2).

TABLE 2-2 AGENCY AND OTHER PERTINENT ENTITIES MEETINGS

Entity	Meeting Date	Comments
Ministry of Health	August 29, 2017	Regulations (the Health Services Act) were provided. Deferred to the Sanitation Service Authority for waste management information.
Sustainable Barbados Recycling Centre Inc. (SBRC)	August 29, 2017	A Public Private Partnership entity that receives and processes the islands solid waste, diverting at least 60-70% that would have gone to the Mangrove Pond Sanitary Landfill. Provided information on their process (collection, separation and disposal).
Subzero Services Ltd.	August 30, 2017	Stated no waste generation. Refrigerant and nitrogen gas supplies are outsourced. Any copper and/or metal waste is sent to Scrap Man Recycling Facility.
Environmental Protection Department (EPD)	August 30, 2017	No regulations for Environmental Protection in Barbados. They still implement the 1969 Legislation – Services Act. For hazardous waste, packing, transportation, and shipping, they must comply with international standards (e.g. Basel Convention), and any applicable regulation in the Physical Development Plan under the Town Planning of Barbados.
Caribbean E-Waste Management Inc.	August 30, 2017	Recycle electronic waste, exclusively. All waste is properly packed and shipped off the island to the U.S. under international regulations provided by exporting companies used by e-Waste (e.g. e-Stewards, and Elemetal Recycling).
Megapower Ltd Barbados	August 30, 2017	Work mainly with electric cars. At least 47% of the batteries material can be reusable. Batteries for electric cars have a good life of 5 years, after this time, they reuse the same batteries for additional 10 – 15 years in PV Panels equipment, and/or golf cars.
Sanitation Service Authority (SSA)	August 31, 2017	Developing a Draft Solid Waste Management Plan for Barbados. All the waste collection from their fleet of trucks (municipal waste) is sent to SBRC.
Caribbean LED	August 31, 2017	Followed EPA Regulations. Process all their

Entity	Meeting Date	Comments
Lighting Inc.		hazardous waste using the appropriate equipment to separate and pack. Ship waste to the U.S.
Division of Energy and Telecommunication (DET)	August 31, 2017	Project sponsor – discussed existing status (work in progress) of the buildings to be retrofitted, in addition of the inefficient equipment to be replaced (e.g. HVAC systems, lighting bulbs, sealing and tinting windows/glass, and replacement of vehicle fleet for electric cars over the long term).
Ministry of Environment and Drainage (MOED)	August 31, 2017	Developing a draft Solid Waste Management Plan for Barbados (with the SSA). Provided information related to an ongoing solid waste management outreach program.
TMR Sales and Service Ltd.	September 1, 2017	Stated no waste generation. Refrigerant and nitrogen gas supplies are outsourced. Any copper and/or metal waste is sent to Scrap Man Recycling Facility.
Barbados Agricultural Development & Marketing Corp. (BADMC)	September 1, 2017	No information provided on waste management. Deferred to EPD for information.
RTEK Refrigeration and Air Conditioning Services Ltd.	September 1, 2017	Stated no waste generation. Refrigerant and nitrogen gas supplies are outsourced. Any copper and/or metal waste is sent to Scrap Man Recycling Facility, and sometimes B's Recycling.

2.3.4 *IDB Policies*

The IDB has established its own policies and safeguards in order to ensure that Projects financed by the IDB group are sustainable. These environmental and social policies are guided by international best practices, and are relatively consistent with widely used International Finance Corporation (IFC) guidelines with regards to environmental, health and social management.

In regards to environmental and social issues, the Project triggers the following directives of the Environment Safeguard Policy (OP-703):

- B.1, Bank Policies: The Bank will only finance operations and activities that comply with the directives of this policy, and are consistent with the relevant provisions of other Bank policies.
- B.2, Country Laws and Regulations: depending on Project activities, local requirements could include a development permit from Town and Country Planning Office (see Section 2.3.1 above). No ESA or ESIA is required locally.
- B.3, Screening and Classification: The proposed Project will have negligible impacts on the environment or the community. However, the handling of hazardous wastes involves potential risks, which merits that the Project be classified as Category “B”. In accordance with OP-703, Category B projects “are likely to cause mostly local and short-term negative” impacts, for which “effective mitigation measures are readily

available.” Appendix A presents the Environmental and Social Management Plan (ESMP) of the Project.

- B.4, Other Risk Factors: The Project’s executing agency does not have the capacity to assure compliance with the ESA and ESMP requirements of the IDB. Therefore, the Bank will engage with the executing agency and relevant third parties to develop appropriate measures for managing the identified risks.
- B.5, Environmental Assessment Requirements: This ESA addresses the IDB’s requirement for environmental assessment for the project.
- B.6, Consultations: a public consultation was carried out on 19 February 2019 (see Section 4). Consistent with the Bank’s Disclosure of Information Policy (OP-102), this ESA was made available to the public prior to the consultation (see Section 2.3.5 below).
- B.7, Supervision and Compliance: A monitoring plan will be implemented for the project as part of the Environmental and Social Management Plan of the Project (see Appendix A).
- B.8 Transboundary Impacts: The Project will result in the generation of hazardous materials that cannot be disposed of in Barbados. The Project will comply with the Basel Convention and the Rotterdam Convention as described in Section 2.3.2 above and in the ESMP of the Project (see Appendix A).
- B.10, Hazardous Materials: The Project will result in the generation of hazardous wastes, such as air conditioning unit refrigerants, used batteries, used oils, and fluorescent light bulbs. Management of hazardous materials is addressed in the ESMP (see Appendix A).
- B.11, Pollution Prevention and Abatement: Besides the hazardous wastes mentioned above, Project activities have a minimal risk of pollution. Pollution prevention is addressed in the ESMP of the Project (see Appendix A).

Additionally, the Project triggers the IDB’s Access to Information Policy (OP-102), the Gender Equality in Development Policy (OP-761) and the Policy on the Management of Natural Disaster Risks (OP-704). It is the intent of the bank to be as clear and transparent as possible when it comes to financing projects, and through clear communication with the stakeholders, improve the quality of its operations. Although the Projects will not include any new development or construction, the Policy on the Management of Natural Disaster Risks applies during the transfer and storage of hazardous materials/hazardous waste that could result from Project Activities.

The IDB has additional Policies that will not be triggered as a result of Project activities. These Policies include:

- The Policy on Indigenous peoples (OP-765) is not triggered as Project activities will take place inside (or on the roof) of already constructed government facilities where there are no Indigenous peoples.
- Policy on Gender Equality in Development (OP-270) is not triggered as this is not a development Project and the facilities affected by the Project have already been constructed.
- The Policy on Involuntary Resettlement (OP-710) is not triggered as land will not be acquired as part of the Project activities.

2.3.5 *Public Consultation*

A public consultation was carried out on 19 February 2019 (see Section 4). Consistent with the Bank's Disclosure of Information Policy (OP-102), this ESA was made available to the public prior to the public consultation which was carried out prior to Board action.

2.4 *INSTITUTIONAL FRAMEWORK AND EXECUTING AGENCY CAPACITY*

The proposed Project will be overseen and developed by the ETD Manager following the Smart Fund Operating Guide developed in August 2012 (ETD 2012) and this ESA and associated ESMP. It will be the responsibility of the ETD Manager to ensure compliance with the requirements listed in this ESA and ESMP during the execution of the individual projects. However, on certain areas, the executing agency may need technical support to meet the compliance requirements.

3.0 *ENVIRONMENTAL AND SOCIAL SETTING*

Due to the nature of the type of activities involved with this Project (mostly internal facility/infrastructure upgrades to improve energy efficiency and decrease environmental impacts), the Baseline Section of this ESA discusses only the relevant existing physical, biological, and socioeconomic environment within Project, as well as the current methods for material management and disposal in Barbados. Because Project activities will be located within already constructed facilities/buildings in highly urbanized areas of Barbados the baseline conditions for the following resources are only discussed in general for the entire island: Flora, Fauna, Geology, Topography, and Soils.

3.1 *CONDITIONS AT THE SITE*

The exact locations of the individual Projects are still unknown; however, activities will take place inside existing government owned buildings within highly developed areas of Barbados. As an example of the types of facilities that will form part of the Project, during the site visit for this ESA, four facilities proposed for improvements were described and included a school, an office tower building, a hospital and the airport. The following figure shows the location of these four facilities.

FIGURE 3-1 FACILITIES PROPOSED FOR IMPROVEMENTS DURING THE SITE VISIT



3.2 CLIMATE AND AIR QUALITY

Barbados has a mild subtropical climate with average temperatures that range from 24 to 28 °C and humidity that ranges from 71 to 76 % (Evanson 2014). There is a dry season from January to June and a wet season that starts in late June and goes thru December. Barbados is on the southern edge of the West Indian hurricane zone and the hurricane season starts in late June and ends in November (The Commonwealth 2015; Government of Barbados 2002b). During this time period there is increased tropical storm activity and the island gets most of its rainfall.

Meteorological data for the area are available from the weather station at Grantley Adams Airport in Christ Church. The airport is 12.9 km from the center of Bridgetown (see Figure 3-1 above). Table 3-1 shows the monthly and average air temperature and precipitation for the weather station. Precipitation averages approximately 1,270 millimeter (mm) annually (Miller 2012).

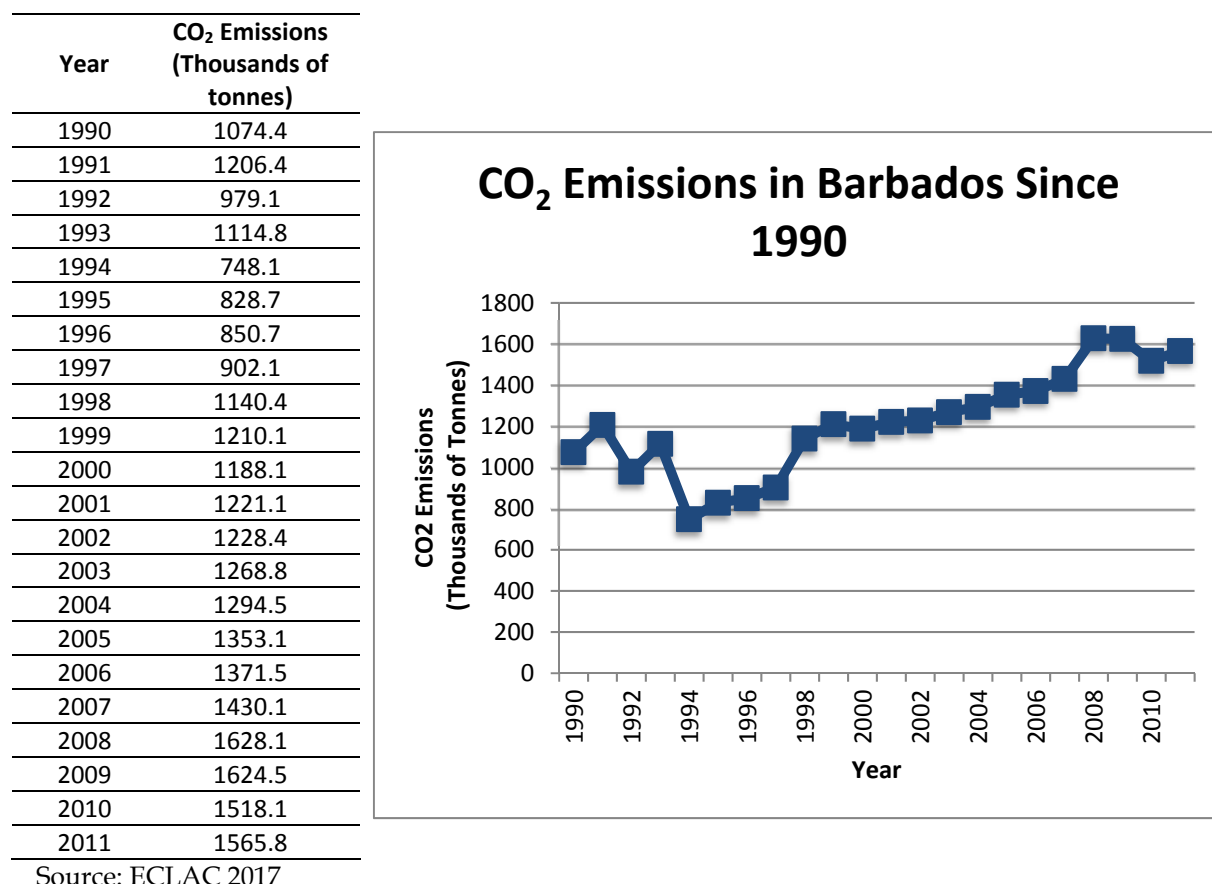
TABLE 3-1 MONTHLY MEAN AIR TEMPERATURE AND PRECIPITATION AT GRANTLEY ADAMS AIRPORT (1981-2010)

Month	Mean Wind Speed (Knots)	Mean Relative Humidity (%)	Mean Temperature (°C)	Mean Rainfall (mm)	Mean Rain Days (Days)
January	11	77	25.8	70.1	11
February	11	77	25.7	41.3	8
March	11	75	26.2	37.4	8
April	11	77	26.8	60.8	8
May	12	78	27.6	79.0	8
June	12	80	27.7	103.0	11
July	11	81	27.6	132.9	15
August	9	81	27.8	141.9	15
September	8	81	27.7	157.6	14
October	9	82	27.5	185.1	16
November	9	83	27.0	171.6	14
December	9	79	26.4	89.6	12

Source: Miller 2012

There is limited air quality data available for Barbados. Existing regulations in Barbados do not provide specific levels or standards for air emissions, including those from vehicles. The Ministry of Transport and Works, in collaboration with the EPD and the Barbados National Standards Institute (BNSI), is conducting research in order to establish a policy with actual numerical standards (UNEP 2010a). According to the Economic Commission for Latin America and the Caribbean (ECLAC) (ECLAC 2017), carbon dioxide (CO₂) emissions have generally increased since the 1990s (see Figure 3-2 below).

FIGURE 3-2 CARBON DIOXIDE EMISSIONS IN BARBADOS



Source: ECLAC 2017

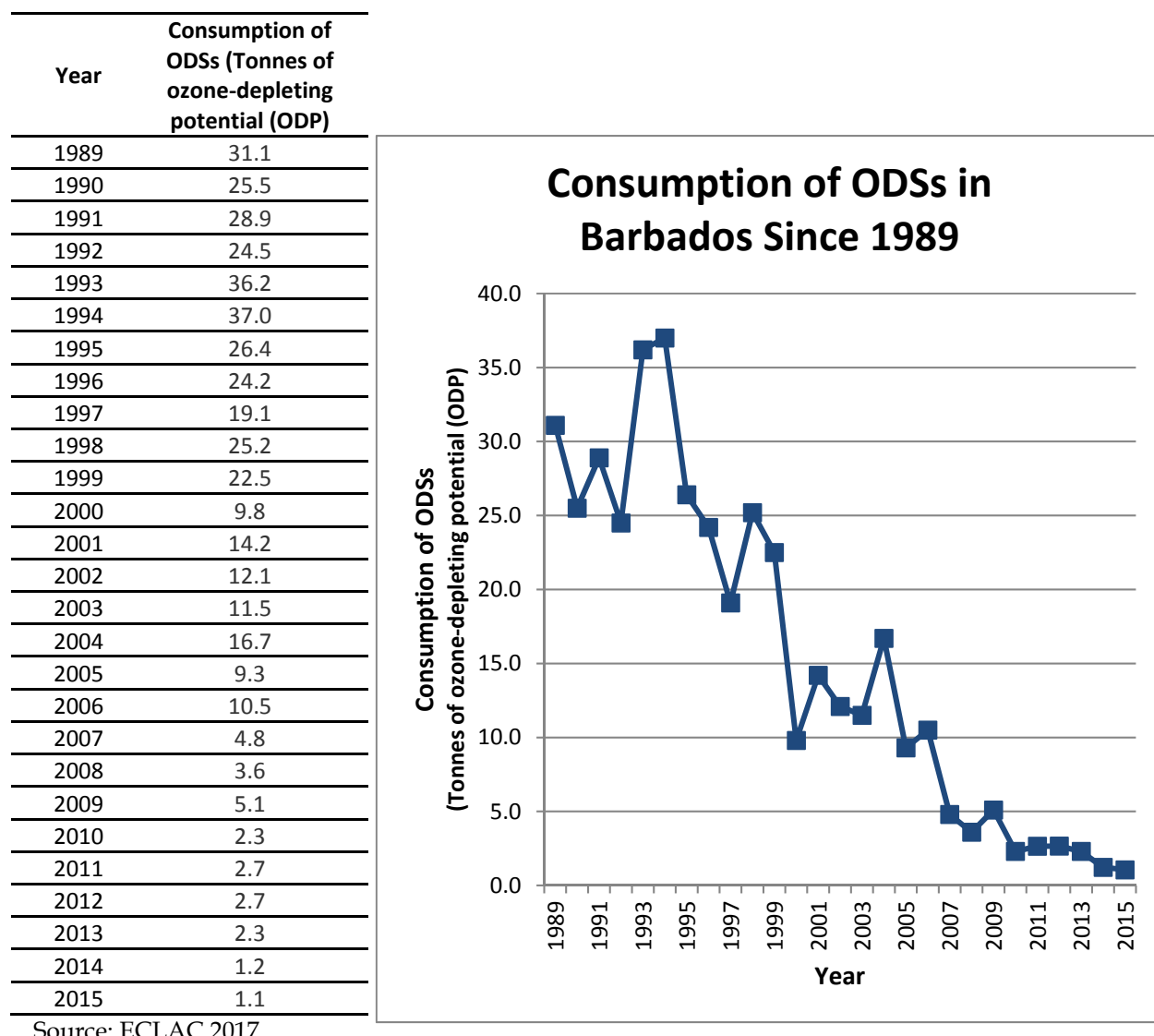
The World Health Organization (WHO) has guidelines for air quality that are designed to reduce the health impacts of air pollution. The guidelines relate to four common air pollutants including particulate matter (PM). The mean annual concentration of PM of less than 2.5 microns in diameters (PM_{2.5}) is a common measure of air pollution. The WHO guidelines state that mean concentrations of PM_{2.5} should not exceed 10 microgram per cubic meter (µg/m³) annually or 25 µg/m³ in a 24-hour period. These are the lowest levels at which total, cardiopulmonary and lung cancer mortality have been shown to increase with more than 95 % confidence in response to long-term exposure to PM_{2.5} (WHO 2005). In 2014, in Barbados the mean annual PM_{2.5} concentration was 14 µg/m³ (WHO 2014), which exceeds the WHO guideline value.

Other air contaminants of concern relevant to the Project include ozone depleting substances (ODS). As mentioned in Section 2.3.2 above, the Government of Barbados is signatory to the Montreal Protocol on Substances that Deplete the Ozone Layer. This Protocol was designed to reduce the production and consumption of ozone depleting substances in order to reduce their abundance in the atmosphere, and thereby protect the earth's fragile ozone Layer.

In the U.S., ODS are regulated as class I or class II controlled substances. Class I substances, chlorofluorocarbons (CFCs), have a higher ozone depletion potential and have been completely phased out in the U.S.; with a few exceptions, this means no one can produce or import class I substances. Class II substances are all hydrochlorofluorocarbons (HCFCs), which are in the process of being phased out by 2020 (USEPA 2017). Worldwide, parties to the Montreal Protocol accelerated the phase-out schedule for these HCFCs through Decision XIX/6 in September 2007 (UNEP 2010b). Developing countries operating under Article 5 of the Protocol (Article 5 countries includes Barbados) now have to freeze by 2013 their HCFC production and consumption to the average of their 2009-2010 levels, followed by a 10 percent reduction by 2015, a 35 percent by 2020, a 67.5 percent by 2025, and a 100 percent phase-out by 2030 (with 2.5 percent allowed, if necessary, for servicing existing equipment until 2040) (UNEP 2010b).

Historically, refrigerants used in air conditioning units were typically CFCs and HCFCs, both of which are known ODCs. They are now being replaced with non-chlorine containing refrigerants that have no ozone depleting potential such as ammonia, carbon dioxide and hydrocarbons (ethane, propane, butane, isobutene, and propylene) (AGDOE 2013). According to the statistics published by ECLAC, ODS consumption in Barbados has been on a relatively steady decline since 1989 (see Figure 3-3 below).

FIGURE 3-3 CONSUMPTION OF ODSs IN BARBADOS



Source: ECLAC 2017

3.3

HYDROLOGY

Barbados has a network of ephemeral streams, which flow from the highest parts of the island towards the western coast. The streams are connected through fractures in the carbonated rock, which covers the majority of the island, and in combination with surface runoff and infiltration into aquifers and underground caverns, they form the main hydrological system of the island (Evanson 2014). While aquifer recharge in Barbados is rapid (15 to 30% of average rainfall) due to infiltration, it only takes places during the wettest 1-3 months of each year (Jones et al., 1998).

3.3.1 *Potable Water Supply*

There are three potable waters sources utilized by the BWA (BWA 2014):

- Springs: two (2) spring sources – Codrington College Spring & Benn Spring.
- Wells: A network comprised of 22 wells (17 sheet and 5 stream water wells) and 8 boreholes, all ranging in depth from 119.5 to 322 feet.
- Desalination Plant: Water produced at the Desalination Plant using a reverse osmosis process is mixed with the groundwater from wells to complement BWA's general supply.

Approximately 99% of the public supply of water in Barbados is groundwater extracted from large reservoirs within the aquifers (Evanson 2014). The remaining percentage although not directly connected have access to potable water. Groundwater quality is good and a reasonably effective disinfection system provides a biologically safe water supply (UNEP 2010a). Generally, groundwater extraction wells in Barbados are located as far inland as possible, since ground water quality decreases rapidly towards coastline supply wells and the coastline also supports the greatest density of residential and tourism facilities.

Barbados is one of the world's most water scarce countries (i.e., less than 1,000 cubic meters/person/year) and the Barbados Water Authority pumps near maximum capacity to meet demand (Evanson 2014; GOB, 2014). Available water resources are currently rated at 390 cubic meters/person/year (BWA 2017). Barbados' freshwater supply is primarily a function of rainfall and the island's geomorphology - that is, a low-lying coral-based island where groundwater supplies, located in aquifers, are protected only by a thin layer of permeable soil. The wet season replenishes the aquifers (UNEP 2010a).

A zoning system is used to protect ground water against bacterial contamination; however the zones are not protected against chemical pollution. This system divides the island into five water protection zones---Zone 1 to Zone 5---with Zone 1 being the most restrictive with respect to 'allowed' physical development, and Zone 5 having no such restrictions (UNEP 2010a).

3.3.2 *Wastewater*

There are currently two Sewage Treatment Plants on the island, one in Bridgetown and another in Graeme Hall on the South Coast, although the entire island is not connected to the sanitary sewer system. Other disposal methods include underground septic tanks, and well or earth pits. Effluent from the treatment plants are to the sea or underground via a well after primary treatment (BWA 2017).

3.4

GEOLOGY, TOPOGRAPHY, AND SOILS

The island of Barbados is the most eastern island of the English Caribbean chain of islands (Lesser Antilles) and topographically the island is a relatively flat. The island is the top of a seamount that rises 300 meters above sea level (masl) from the Barbados Ridge and was formed as an accreted wedge created by the movement eastwards of the Eastern Caribbean plate over the South American plate. The highest elevation point in the island is located in Mount Hillaby at approximately 340 masl in the Parish of Saint Andrew. The gradient at this location increases in a series of terraced tablelands until reaching the mount.

In the northeast region, the terrain is characterized as eroded and rocky with steep broken slopes; the rocks are sedimentary. In the rest of the island, the terrain is relatively flat composed of coral limestone, crossed with deep river-bed gullies that accommodate the movement of water during heavy rain. The coral limestone area composed of a series of gently sloping, step-like terraces. There are no permanent rivers in Barbados (Government of Barbados 2002a).

The coral limestone layer varies in thickness from approximately 10 to 100 meters (m) and consists of coral and coralline limestone bedrock with sporadic occurrences of sand deposits. Beneath the coral limestone layer are oceanic beds consisting of marl and ash covering the "Wedge Cover Unit" comprised of mudstones, sandstones and marls that weather to form silty clay to sandy clay soils. The most frequent soil type is fertile clay or clayey loam (Donovan 2005).

3.5

NOISE

The Project is located within the city in already existing government owned facilities (industrial/commercial/residential). The baseline noise levels in the vicinity of the Project are expected to be high, consistent with noise levels in highly populated cities. The major source of ambient noise at the Project area is from vehicular traffic on the neighboring roadways.

Typical outdoor sound level by land use category is presented in Table 3-2. Ambient day-night noise levels in areas with some commerce or industry are expected to range from 55 to 65 A-weighted decibel (dBA). Ambient day-night noise levels in rural and suburban towns with infrequent traffic are expected to range from 40 to 45 dBA.

TABLE 3-2 TYPICAL OUTDOOR SOUND LEVELS BY LAND USE CATEGORY

Land Use Category	L_d (dBA)^a	L_n (dBA)^b	L_{dn} (dBA)^c
Wilderness areas	35	25	35
Rural and outer suburban areas with negligible traffic	40	30	40
General suburban areas with infrequent traffic	45	35	45
General suburban areas with medium density traffic or suburban areas with some commerce or industry	50	40	50
Urban areas with dense traffic or some commerce or industry	55	45	55
City or commercial areas or residences bordering industrial areas or very dense traffic	60	50	60
Predominantly industrial areas or extremely dense traffic	65	55	65

Source: Cavanaugh and Tocci 1998; Bies and Hansen 2009

dBA = A-weighted decibel

^a L_d, or daytime L_{eq}, is the average equivalent sound level for daytime (7 a.m. to 10 p.m.).

^b L_n, or nighttime L_{eq}, is the average equivalent sound level for nighttime (10 p.m. to 7 a.m.).

^c L_{dn}, or day-night average sound level, is the average equivalent A-weighted sound level during a 24-hour time period with a 10-dB weighting applied to equivalent sound level during the nighttime hours of 10 p.m. to 7 a.m.

$$L_{dn} = 10 \log_{10} \left(\frac{15}{24} 10^{L_d/10} + \frac{9}{24} 10^{(L_n+10)/10} \right)$$

The International Finance Corporation (IFC) recommends that noise levels in residential areas should not exceed 55 dBA during the daytime or 45 dBA during nighttime. In industrial/commercial areas, the World Bank recommends noise levels not exceed 70 dBA during daytime or nighttime (IFC 2007).

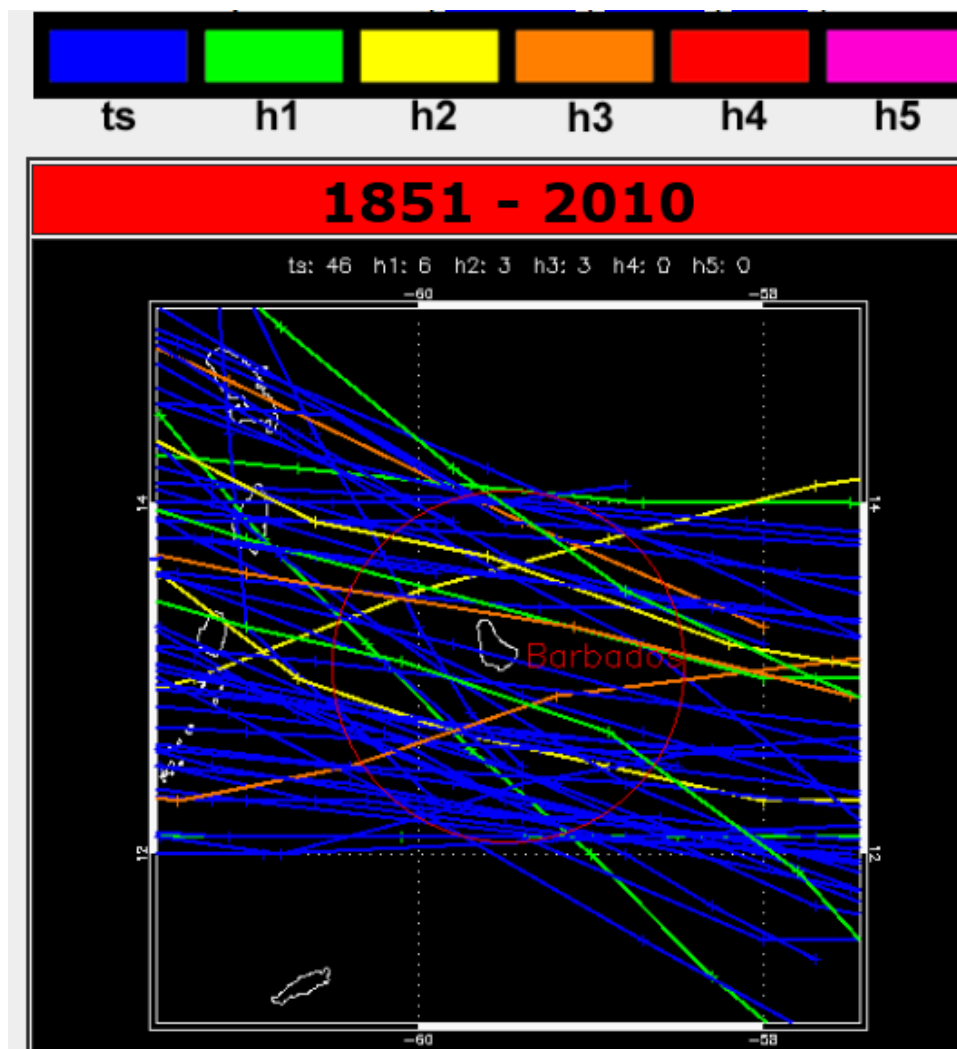
There is limited air noise data available for Barbados. The existing noise environment at properties in the Parish of Saint Lucy at the northern end of the island was characterized by sound level measurements taken for another project in May 2006 (AMEC 2006). Baseline noise measurements taken at four sites near the Parish of Saint Lucy ranged from 45 to 60 dBA at residences during daytime hours and 37 to 55 dBA overnight. Measured sound levels at these four sites correspond to general suburban areas with medium density traffic or suburban areas with some commerce or industry (as presented in Table 3-3). It is expected that noise levels in Bridgeport are similar or higher than those at the Parish of Saint Lucy.

3.6

NATURAL HAZARDS AND RISKS

In the Caribbean, there are three hurricane tracks. The Island of Barbados is located within the Eastern Caribbean track (CHN 2011). The Eastern Caribbean track includes the Lesser Antilles. Approximately 12 hurricanes and several tropical storms have crossed the Island of Barbados from 1851 to 2010 (see Figure 3-4). Hurricane Janet, a category h3 (moderate to extreme), passed just south of Barbados with 121 miles per hour (mph) winds from east to southeast on 22 September 1955, impacting the southern of Barbados while Hurricane Allen, also a category h3, passed north of Barbados and made landfall with 127 mph winds on 4 August 1980. Allen heavily affected Barbados, causing \$US 6 million in damages and destroying over 500 homes.

FIGURE 3-4 HURRICANES AND TROPICAL STORMS AFFECTING BARBADOS (1851-2010)



Source: CHN 2011

3.7 *FLORA AND FAUNA*

Barbados is in the Windward Islands Xeric Scrub ecoregion and is included in the Caribbean Islands biodiversity hotspot. The biodiversity of Barbados has been influenced since the island was settled in 1627. Numerous species of plants and animals have been introduced, competing against indigenous species. In addition, habitats were altered and fragmented as the island was settled. The proposed Projects will all take place inside already existing government owned facilities where there are no flora and fauna.

3.8 *SOCIOECONOMICS*

Barbados is one of the mostly densely populated countries in the world, having a population density of 646 people per square kilometer at the most recent (2010) census. In 2010, the population of Barbados was 277,821, of which 47.9 % were male and 52.1 % female. Bridgetown, where the Projects will be located, is in the Parish of St. Michael, which has the highest population (88,529) of the parishes (see Table 3-3). Within the productive population (15 - 64 years) there are 187,095 persons, while there are 54,757 within the 0 - 14 age group and 35,969 at 65+ years. The median age is 38 years (Barbados Statistic Service 2013).

TABLE 3-3 POPULATION OF BARBADOS CENSUS (2010)

Parish	Population	Percent of Total (%)
St. Michael	88,529	31.9
Christ Church	54,336	19.6
St. George	19,767	7.1
St. Philip	30,662	11.0
St. John	8,963	3.2
St. James	28,498	10.3
St. Thomas	14,249	5.1
St. Joseph	6,620	2.4
St. Andrew	5,139	1.8
St. Peter	11,300	4.1
St. Lucy	9,758	3.5
Total Barbados	277,821	100

Source: BSS 2017

For the past five decades Barbados has been able to control its rate of population growth through the successful implementation of an island-wide family planning program. This has contributed to the attainment of an average rate of population growth of 0.3 % between 1980 and 2008, which is comparable with that of most developed countries (GOB 2014).

The population of Barbados is predominantly black (92.4 %) or mixed (3.1 %) and 2.7 % of the population is white and 1.3 % is South Asian. The remaining

population includes East Asians (0.1%) and Middle Easterners (0.1 %) (BSS 2017).

There was a general decline in the unemployment rate in Barbados from 1995 when it was 19.7 % until 2007 when it was 7.4 %. In 2010, the unemployment rate was 10.8 % and in 2015 it was estimated at 11.3 % (CBD 2012; GOB 2012; BML 2016). There has been a decline in employment in the agricultural and manufacturing sectors and a rise in employment in the services sector. There has also been an improvement in the educational attainment of the labor force with a decline in the number of adults with no certification from 60 % in 1990 to 57 % in 2000 and an estimated 54 % in 2009. In Barbados there is universal primary and secondary education and the adult literacy rate is 99.7 % (CBD 2012; GOB 2012).

A survey conducted in 2010 (2,425 households and 6,973 individuals with 5,618 of them being adults 15 years and over) indicated that 15 % of households and 19.3 % of individuals in Barbados were below the poverty line of BDS\$ 7,861 (annual). For all individuals reporting some form of income (employment and other sources), monthly income averaged BDS \$2,496, with 50 % of the people surveyed having a monthly income of BDS \$2,000 or less. The data indicates that the poverty gap (the extent to which the poor existed below the poverty line) and the severity of poverty compare favorably with those in Caribbean countries that conducted poverty assessments around the same time. In general, over the 1995 to 2010 period living conditions in Barbados have improved with steady but moderate economic growth and a decreasing unemployment rate (CDB 2012; GOB 2012).

3.8.1 *Energy Use*

Barbados has universal access to electricity generated using a number of fuel sources comprised of approximately 92% Bunker C, 7% diesel and less than 1% natural gas (UNEP 2010a). The Energy Division has stated that the energy intensity in Barbados has been falling as the country shifts to GDP growth sectors that rely less and less on energy, however despite the reduced use of energy, factors of population growth and the increased cost of fossil fuels have increased the percentage of the import bill spent on fossil fuels. These are resources that could be employed elsewhere to combat other development issues (UNEP 2010a).

3.8.2 *Waste Management*

The main method of solid waste disposal in Barbados is by sanitary landfill at a main facility in Mangrove, Saint Thomas Parish (see Figure 3-5). In spite of an established system of waste management comprising several government programs, private entities and business initiatives, according to interviews,

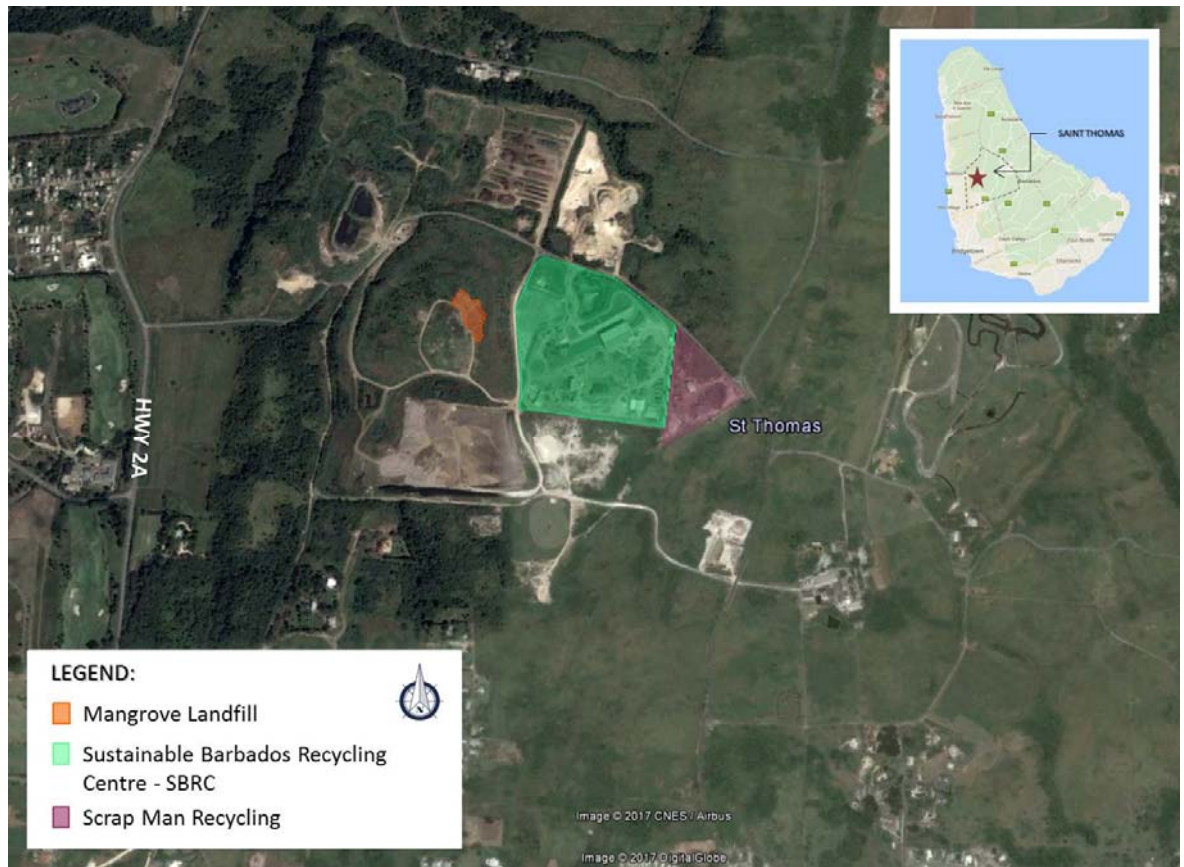
waste management has been a major challenge with illegal dumping taking place in gullies, quarries and on roadsides around the island. The SSA is responsible for the collection and disposal of non-hazardous solid waste from homes and government agencies around the island, and also operates the four Government solid waste disposal sites:

- Mangrove Pond Landfill (main disposal site);
- Bagatelle Bulky Waste Disposal Site;
- Rock Hall Asbestos Disposal Site; and the
- Lonesome Hill Blood and Grease Disposal Site.

As discussed above, Barbados is one of the mostly densely populated countries in the world. Therefore, each of these waste disposal sites experience some level of human populations in their vicinity.

The Mangrove Pond Facility is an engineered landfill fitted with a clay liner and a leachate collection system. In the past there have been incidents such as fires and offensive odors at this site, which has caused concern and discomfort to the surrounding population. However, management of the landfill has improved considerably in the last decade. Also in the last decade, the significant increase in construction and development projects countrywide have almost doubled the generation of waste such as demolition debris. Mangrove Pond landfill went from receiving approximately 400 tons of waste per day in 2003 to 1,000 tons per day in 2010. Therefore, to address the fact that this facility was nearing the end of its useful life, a new landfill facility has been constructed at Greenland (Elias and Elias 2010). Construction of the Greenland facility was met with much controversy throughout. The facility is currently not operational. The Mangrove Pond landfill receives approximately 90% used tires on the island (UNEP 2010). The Sustainable Barbados Recycling Centre (SBRC) waste management solution came on-stream to compensate for not using the Greenland facility.

FIGURE 3-5 LOCATION OF THE MANGROVE POND LANDFILL AND RECYCLING CENTER



In addition to the Mangrove Pond Landfill, there is also a recycling center at this location, the Sustainable Barbados Recycling Center SRL (SBRC) which is under a Public Private Partnership Agreement with the Government of Barbados (GOB). The Centre is divided into two compounds, the compound housing the facilities operated by SBRC and the Northern Depot of the Sanitation Service Authority. The SBRC was originally supposed to include a storage facility for hazardous waste (UNEP 2010a); however, it is unable to accept or process hazardous waste. Acceptable wastes include all household/municipal solid waste (msw); construction and demolition waste, green waste, and rocks and soil.

The Bagatelle bulky waste landfill site is used for the disposal of waste such as building materials, rubble, scrap, automobiles, old appliances, and other noncombustible items. These items don't produce unpleasant odors or large amounts of leachate with contaminants of health or environmental concern, so the requirements and constraints for disposing of bulky waste are not as stringent as those for other types of wastes (Elias and Elias 2010).

4.0 PUBLIC CONSULTATION

Consistent with the Bank's Disclosure of Information Policy (OP-102) and Directive B.6 of the Environment Safeguard Policy (OP-703), a public consultation was held for the Sustainable Investment Programme II (Smart Fund) on the 19th of February 2019, at the Hilton Barbados Resort from 2:30 to 4:30 pm. A Public Consultation Plan was developed for the purpose of these meetings and is included in Appendix B of this report.

4.1 PREVIOUS STAKEHOLDER ENGAGEMENT ACTIVITIES

As part of the ESA process, meetings were conducted with pertinent regulatory agencies and governmental entities in Barbados to discuss the Project and obtain their opinion on the potential Project impacts and regulatory requirements. Results from those meetings are included in this ESA and the ESMP.

4.2 DISCLOSURE AND ENGAGEMENT METHODS AND MATERIALS

The public consultation process encourages meaningful participation by stakeholders (see Public Consultation Plan in Appendix B). The Project executing agency employed a range of methods and channels for disclosing information in order to tailor disclosure to the interests and needs of the various stakeholder groups, and produced materials appropriate for the specific stakeholders types (see Appendix C the Consultation Meeting Report).

Consultation with informed stakeholders to discuss the plans and activities of the Project including the potential impacts and opportunities associated with them, is a two-way process that allows the incorporation of feedback from interested parties in the design and Project planning. The Project included the following considerations for participation activities:

- **Programming:** All forms of participation were carried out in a timely manner. Invitations to meetings were sent in advance of participation activities, to ensure that interested parties had the opportunity to participate without interruption in their meetings, personal schedules. A stakeholder list was developed for this Project and is included in Appendix C. Because of the nature of Project activities and the specific stakeholders which could be affected, invitations for the public consultation event were tailored specifically to these stakeholders (see Appendix C for the Consultation Meeting Invitation);
- **Location:** The consultation meeting was carried out in a place of easy access, and where the attendees could arrive without greater difficulty,

cost or travel time. As previously mentioned, the meeting took place at the Hilton Barbados on Tuesday 19th of February, 2019.

- Cultural Adequacy: All forms of participation of stakeholders in the activities were designed to meet the needs of the beneficiaries, in order to ensure that everyone had the opportunity to participate freely and informally;
- Recording and Feedback: all group participation activities were recorded using meeting minutes and photography, and an attendee sign in sheet to ensure the transparency of the consultation process (see Appendix C).

The consultation allowed for ample time for a live questions and comments period so that stakeholders could freely express their concerns. All questions and comments were recorded and are included in Appendix C of this ESA.

4.3 MONITORING AND REPORTING

4.3.1 Monitoring

It is important to monitor stakeholder engagement to ensure that consultation and disclosure efforts are effective, and in particular that stakeholders have been meaningfully consulted. During the public consultation event, the following key issues were monitored:

- Consultation activities were conducted with government authorities and non-governmental stakeholders;
- Effectiveness of the engagement processes by tracking feedback received;
- Analysis of grievances received;
- Recording the level of participation including by specific stakeholder categories and groups (e.g. women);
- Recording the number of comments by topic and type of stakeholder, and details of feedback provided;
- Recording and tracking commitments made to stakeholders; and
- Recording community attitudes and perceptions on Project activities.

4.3.2 Reporting

This ESA and the ESMP were updated to include the results of the consultation process. Complaints and/or concerns received were addressed during the meeting and no additional impacts and mitigation measures resulted from the consultation. As mentioned above, a list of attendees, as well as a short summary report of the consultation process, and the presentation are included as Appendix C.

During Project implementation, upon completion of the individual Projects, the ETD will provide the IDB with Environmental and Social Compliance Reports (ESCR). The ESCR will include any community grievances received and provide details including detailed description of the grievances, how grievances were solved, list of any pending grievances, and root causes of grievances.

4.4 RESULTS OF THE PUBLIC CONSULTATION MEETING

4.4.1 Attendance and Execution

The public consultation event had approximately 40 attendees (almost 1:1 female to male ratio), and included key stakeholders from government organizations as well as recyclers and disposal companies. Attendance to the meeting was significant and attendees were very participative and showed interest and support for the Project.

A brief presentation of the Sustainable Energy Investment Programme II (Energy Smart Fund II) was made within the broader context of Programme and then the results of the Environmental and Social Analysis of the project and its respective Environmental and Social Management Plan were presented. Finally, attendees were given the opportunity to ask questions and comments, and Project representatives offered necessary answers. The event lasted one and a half hours.

4.4.2 Key Questions and Comments from the Participants

Key issues and concerns expressed by the stakeholders present during the public consultation revolved more around the execution of the Program itself and the type of projects, how different projects would be identified, approved and funded (private sector versus public sector, etc.). Questions with regards to the ESA and mitigation and management measures included the following:

- Concerns with regards to enforcing the proper handling and disposal of hazardous waste
- Concerns with regards to the local challenges of hazardous waste management (training) and disposal (lack of disposal facilities in Barbados)
- Protocols for handling of AC units and accidental release of ODSs
- Concerns with regards to tracking and recording amounts of hazardous waste and mercury going to landfills as well as ODSs and batteries.

4.4.3

Conclusion of the Public Consultation

Based on the types of questions raised during the public consultation, there does not appear to be any discontent or apprehension with the Project. With regards to environmental and social issues, the main concerns raised revolved around ensuring hazardous wastes and materials are appropriately handled and disposed of, specially knowing the current in-country limitations (with regards to waste disposal/material recycling). It will be the responsibility of the PEU of the Energy and Telecommunications Division, to ensure that all contracts include the appropriate clauses for the handling, management and disposal of wastes, and that the contractors comply with all of these requirements as described in the Project's ESMP. According to the ETD, the Smart Fund II Programme will assist up-front with the development of protocols to be implemented by all contractors. The PEU will make sure that waste haulers and handlers are aware and sensitized to these protocols and requirements.

Information on potential impacts generated from the proposed Projects was obtained from various sources, including consultation with the DET and EPD and local sources, discussions with pertinent local agencies, and literature review. To assess the impacts associated with or resulting from the proposed Projects the project team used professional judgment, fieldwork, stakeholder meetings, and desktop analysis. The significance of potential impacts of the project was determined.

The proposed Projects will affect environmental and socioeconomic conditions in the project area. Project effects on physical, biological, and socioeconomic resources are summarized in this Section and in Table 5-2 (at the end of this Section). The table provides the significance of potential Project impacts on environmental and social resources, assuming that proposed and recommended mitigation measures, industry best management practices and embedded controls, and management plans are implemented.

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 limited to the implementation phase and no negative impacts are expected during the operational phase. Project operation will lead to positive impacts from increased energy efficiency and reduced operation costs.

The negative impacts of the project will be mitigated and managed with the application of industry-standard best practices. Table 3-1 of the Environmental and Social Management Plan, prepared for the project and attached to this ESA as Appendix A, 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.

5.1.1 *Potential Impacts by Activity*

5.1.1.1. *Tinting and Sealing Windows*

Window tint will consist of placing premade film on windows. This process does not produce residual materials and application is easily done without the use of chemicals or equipment; therefore no impacts are expected from the installation of window tints.

Window sealing will likely be done with the application of caulk or sealant around the windows. Because the Projects have not been defined, the exact

materials to be used are unknown. Although there is no waste generated from this activity, there could be leftover unused sealant which can either be used elsewhere or may need to be disposed of. Typical sealants used include silicone sealants/adhesives. Silicone sealants can be land-filled once cured or burned in a chemical incinerator equipped with afterburners and scrubbers. As far as impacts to human health with regards to air quality, as long as sealants are applied in well ventilated areas (typically applied to the window on the outside of the building), there should not be any impacts. Personal protective equipment (PPE) such as gloves and protective glasses should be worn to prevent any other impacts to human health.

The potential impact of this activity without any mitigation mechanism would be expected to be small. If the appropriate mitigation measures are in place with regards to material handling and disposal, tinting and sealing windows should have a **negligible** impact.

5.1.1.2. *Replacing Air Conditioning Units*

The ETD has indicated that approximately 50 existing government owned buildings will have their air conditioning units replaced to more energy efficient units. Although the exact activities have not been defined, if the old units need to be disposed (an alternative would be to sell them if they are still functioning), refrigerant contents need to be extracted, contained, and disposed of accordingly. If they are not disposed of appropriately the risk is that the refrigerants could eventually leak and be released into the atmosphere.

As previously discussed in Section 3.2 above, the commonly used refrigerants are ODSs and they cannot be vented to the atmosphere for disposal. Used refrigerants can be reclaimed and reused or they must be disposed via incineration or chemical separation/treatment; however, there are currently no treatment or disposal facilities in Barbados. Used refrigerants must be collected in gas cylinders and shipped off the island for appropriate disposal. There are multiple companies in Barbados that install and repair heating, venting, and air conditioning (HVAC) units; however, during interviews, their disposal practices for spent refrigerants were unclear and their final destinations were either unknown or long term storage.

According to the U.S. Environmental Protection Agency (USEPA), household refrigerators and freezers manufactured before 1995 typically contain chlorofluorocarbon (CFC) refrigerant and many window air-conditioning units and dehumidifiers contain HCFC refrigerant (USEPA 2016b). Commonly used refrigerants in older wall mounted units include refrigerant (R)-134A (1,1,1,2-Tetrafluoroethane) or R-22 (Chlorodifluoromethane). Although most refrigerants can be recycled, HCFCs (also known as Class II) are in the process of being phased out in some countries and can therefore not be reused, this

includes R-22 (USEPA 2016a). The only option for these types of ODSs is disposal. It is important to note that due to the phase out of CFCs and HCFCs (see Section 3.2), there are restrictions on the types of refrigerants and units that can be imported, so if the new units are going to be purchased internationally, they must comply with the requirements in the Montreal Protocol and not contain any of the refrigerants on the phase out list.

Typical wall mounted air conditioning units contain approximately 1-2 pounds of refrigerant (see Figure 5-1). Larger roof mounted air conditioning units can contain approximately 20-30 pounds of refrigerants (see Figure 5-1 below). In order to dispose of the refrigerants, refrigerant recovery equipment is used to evacuate the system into a recovery gas cylinder.

Removal of the refrigerants can take place on site prior to removal of the unit, or at a recovery facility if the unit can be moved safely without damaging the containers (for individual wall units). Recovery gas cylinders are typically either 50 or 30 pounds and can recover approximately 40 and 24 pounds of refrigerant respectively. Recovery cylinders must be used and handled appropriately and only by those familiar with the hazards and who are trained in proper handling techniques.

Currently the island's storage and transport capacity for these gases seems to be insufficient. Consequently, the refrigerant will need to be shipped for disposal. Therefore, international regulations for controlled substances must be followed. Under the Montreal Protocol, ODSs are considered a "controlled substance." Although the Protocol controls trade in newly produced or never used ODS, also referred to as virgin ODS, it provides recommendations for the control of trade in recovered, recycled and reclaimed ODS (UNEP 2008). Decision IV/24 of the Montreal Protocol defines these key terms:

TABLE 5-1 MONTREAL PROTOCOL - DEFINITIONS OF USED, RECOVERED, RECYCLED AND RECLAIMED ODS BASED ON DECISION IV/24

Title	Definition
Used ODS	Recovered, recycled or reclaimed ODS.
Recovery	Collection and storage of ODS from machinery, equipment, containment vessels and so forth during servicing or prior to disposal.
Recycling	Re-use of a recovered ozone-depleting substance following a basic cleaning process such as filtering and drying. For refrigerants, recycling normally involves recharge back into equipment; it often occurs on-site.
Reclamation	Re-processing and upgrading of a recovered ozone-depleting substance through mechanisms such as filtering, drying, distillation and chemical treatment in order to restore the substance to a specified standard of performance. It often involves processing off-site at a central facility.

Source: UNEP 2008

Because the refrigerants recovered by the project will not be purified, and because they will have to be shipped off the island, the requirement set by Decision VII/31 (1995) must be complied with.

Exporters must have an export license or permit and approval from the receiving country in order to export ODSs. The approval should state the chemical, the quantities and the country of destination. Exporters should keep records and report exported quantities of each substance to the Government of Barbados (UNEP 2010b). International shipping requires following both the regulations of the country of origin and the destination country, which vary. Because of these varying regulations, depending on the mode of transportation, international standards are codified in the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Airⁱⁱ and the International Maritime Dangerous Goods (IMDG) Codeⁱⁱⁱ, for transport by vessel.

Based on the information provided by the ETD, if all 50 retrofitted buildings have roof top units, it would amount to an estimated 1,500 pounds of refrigerant to be disposed of in approximately 38 (50 pound) gas cylinders. Based on our observations, it appears most facilities have individual wall mounted air conditioning units. Assuming a 3-story government facility has approximately 50 offices per story, it would amount to 150 individual units per building, or an estimated total of 15,000 pounds of refrigerant to be disposed of in approximately 375 (50 pound) gas cylinders for all 50 buildings.

The potential impacts identified from this activity are:

- The ODSs contained in the refrigerants would negatively affect the ozone layer if released into the atmosphere
- Hazardous effect on human health if there is prolonged exposure to refrigerant
- Impact on human health and safety because these chemical are flammable

However, because of the nature of these chemicals and the scale of the activities of the Project, any leaks from the small individual air conditioning units would dissipate quickly, so the potential impacts on human health are considered

ⁱⁱ ICAO Technical Instructions For The Safe Transport of Dangerous Goods by Air (Doc 9284): <https://www.icao.int/safety/DangerousGoods/Pages/technical-instructions.aspx>

ⁱⁱⁱ IMDG Code, 2016 Edition Amendment 38-16: <http://www.imo.org/en/Publications/IMDGCode/Pages/Default.aspx>

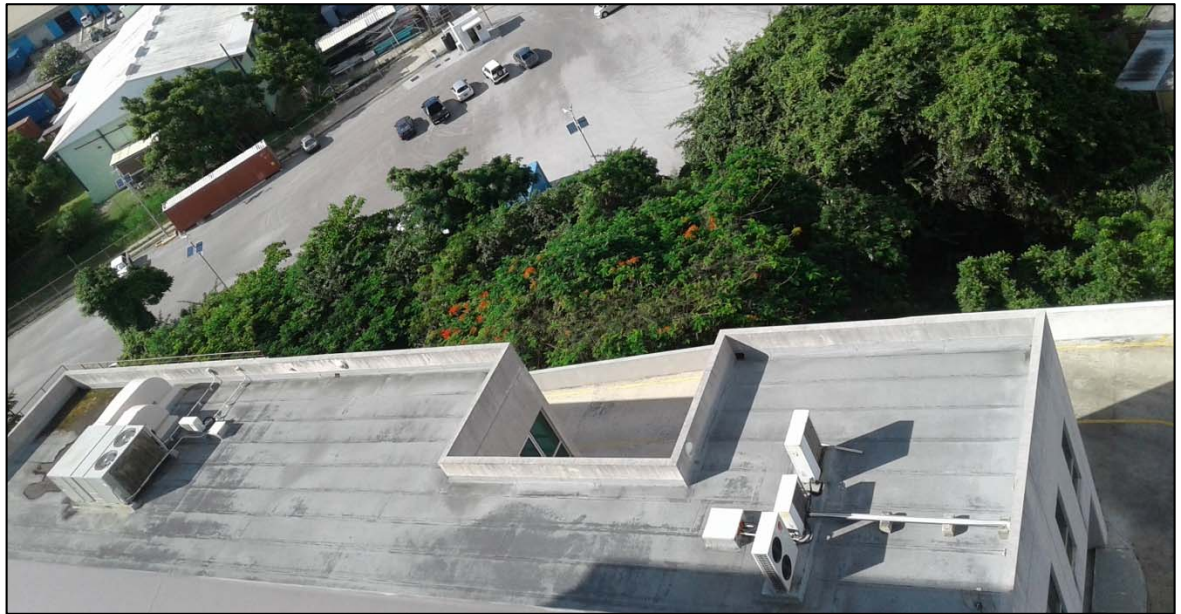
negligible. The potential impact on the ozone layer could be small, but since mitigation measures will be applied, the impact is considered to be negligible. The potential impact of burns or fires that could be caused by the flammability of these chemicals could be of medium significance if not preventive measures are taken. Therefore, the appropriate mitigation measures (i.e. procedures, manuals, training) will be used and the potential impact significance is considered negligible.

Overall, if appropriate mitigation measures are in place with regards to material handling and disposal, the negative impacts associated with the replacement of air conditioning units are considered **negligible**. Positive impacts from the unit replacement include less energy consumption for the buildings retrofitted with new units.

FIGURE 5-1 TYPICAL WALL MOUNTED INDIVIDUAL AIR CONDITIONING UNIT



FIGURE 5-2 ROOF MOUNTED CENTRAL AIR CONDITIONING UNIT AT THE BAOBAB TOWER



5.1.1.3. *Replacing Vehicles*

According to the ETD, the proposed Project could include the replacement of currently used diesel vehicles with electric cars; however, this activity would not be carried out in the immediate future. If the vehicles are disposed of, there is a potential for impacts from the improper disposal of used batteries and used oil.

Used batteries can be recycled and there are companies in Barbados that will accept used batteries (and will pay to receive them). Batteries contain a mixture of chemicals that can include cadmium, lead, zinc, manganese, nickel, silver, mercury, lithium, as well as various acids.

Used oil can also be recycled on the island. The chemicals in used oil include hydrocarbons, heavy metals such as zinc, lead, copper and cadmium, as well as small amounts of gasoline, antifreeze, and chemicals that come from gasoline when it burns inside the engine.

In the event that these items would need to be shipped elsewhere for disposal, then Basel Convention requirements must be followed (Section 2.3.2). However, all indicates that there will be no need to ship these items off the island. ETD will have to present a defined disposal plan for the old vehicles that will be replaced.

If improperly disposed, used batteries and used oils have the following potential impacts:

- Contamination of soils and groundwater, a precious resource for Barbados.
- Battery contents, oils and fuels are hazardous to humans and if improperly managed or disposed could negatively impact human health.

The contamination of soils and groundwater would be a potential impact of large significance. However, because mitigation measures will be followed to assure proper disposal, the potential impact is considered negligible.

The potential negative effect on human health of the acids contained in batteries and heavy metals contained in used oil and fuels, would make this potential impact of medium significance. However, mitigation measures such as preparing procedures and training personnel so that they will be required to wear personal protective equipment (PE) (i.e. gloves and protective glasses) while handling these waste materials, will make this impact's significance negligible.

Overall, because both used batteries and oils can be recycled, if the appropriate mitigation measures are in place with regards to material handling and disposal, the impacts associated with the replacement of the vehicle fleet are considered **negligible**. On the other hand, using electric vehicles will lead to a positive impact from reduced dependency on fuels and reduced vehicle emissions and GHGs.

5.1.1.4. *Replacing Fluorescent Light Bulbs*

The final Project activity described by the ETD was the replacement of fluorescent light bulbs with energy efficient LED light bulbs. The exact number of buildings and or light bulbs to be replaced is currently unknown.

Fluorescent lightbulbs contain a low pressure mercury-vapor that uses fluorescence to produce visible light. With time, the mercury is slowly adsorbed onto the glass, phosphor, and electrodes, until such small quantity is left in the gas that it no longer functions. At the end of its useful life, because of the absorption of the mercury, the entire light bulb is considered hazardous (even if the gas is no longer present).

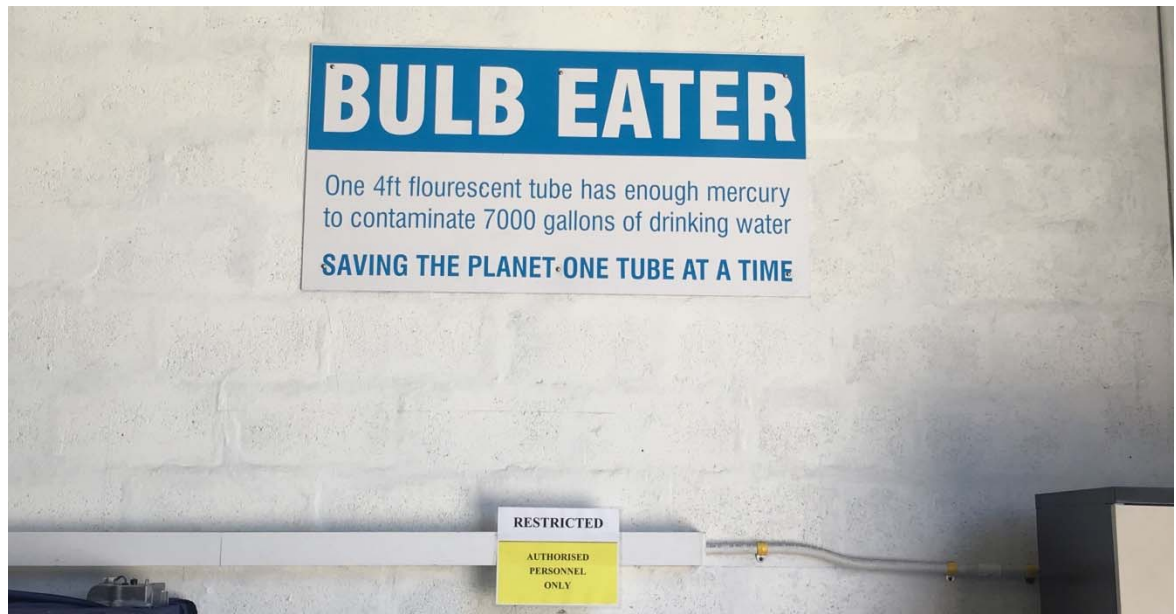
If improperly disposed, fluorescent light bulbs could cause the following potential impacts:

- Contamination of soils, groundwater, and air (gas and fine particulate matter that can go airborne if broken)
- Negative impact on human health (see Figure 5-3 below)

If no mitigation measures are taken and mercury contaminates soils, groundwater and air, the potential impact significance would be medium to large. However, if mitigation requirements are followed the impact's significance will be negligible.

As far as impacts to human health with regards to air quality, if waste disposal is not done properly, the impact's significance would be medium. However, as long as the bulbs are handled and transported according to established procedures, there should not be any impacts. PPE such as gloves and protective glasses should be worn to prevent any other impacts to human health.

FIGURE 5-3 HAZARD WARNING AT BULB DISPOSAL FACILITY



There are facilities in Barbados, both private (i.e. Caribbean LED) and public (i.e. Sustainable Barbados Recycling Center – SBRC) that could receive, properly breakdown, and package fluorescent tubes for shipment off the island for proper disposal in the U.S. in compliance with all transboundary movement of hazardous waste requirements as well as final treatment and disposal requirements (See Figure 5-4). As previously mentioned in Section 5.1.1.3 above, the transboundary movement of hazardous waste must comply with Basel Convention requirements.

Because it is confirmed that fluorescent bulbs can be properly disposed of by companies on the island, if the appropriate mitigation measures are in place with regards to material handling and disposal, the impacts associated with the replacement of these bulbs are **negligible**.

FIGURE 5-4 FLUORESCENT BULB BREAKDOWN EQUIPMENT



TABLE 5-2 SUMMARY OF PROJECT POTENTIAL IMPACTS AND RECOMMENDED MITIGATION/MANAGEMENT MEASURES

Resource	Source of the Impact and Existing Vulnerability	Recommended Mitigation/ Management Measure	Impact Significance After Mitigation
<i>Physical</i>			
Climate and Air Quality	<ul style="list-style-type: none"> Accidental release of refrigerants into the environment during air conditioning unit removal. Inappropriate disposal of refrigerants. 	<ul style="list-style-type: none"> Use the appropriate refrigerant recovery equipment and only trained professionals to remove the refrigerant from the units. Include Contractual Clauses that describe the requirements for removal of refrigerants, their containment, and disposal instructions so that they are handled appropriately. Implement a “cradle-to-grave” approach where documentation for accountability is maintained from removal all the way to final disposal (noting quantities, types of materials, and names of people and companies handling the material). Monitor documentation to ensure the appropriate disposal of refrigerants (ETD) 	Negligible
Climate and Air Quality	<ul style="list-style-type: none"> Reduction of the use of ODS. Reduction of the emission of greenhouse gases. 	No additional mitigation measures are proposed.	Positive
Hydrology, Geology, Topography, and Soils	<ul style="list-style-type: none"> Accidental release of hazardous materials into the environment during transportation and/or storage. Inappropriate disposal of hazardous materials. 	<ul style="list-style-type: none"> Include Contractual Clauses that describe the requirements for transportation and disposal instructions so that they are handled appropriately, as discussed in the ESMP. Implement a “cradle-to-grave” approach where documentation for accountability is maintained from removal all the way to final disposal (noting quantities, types of materials, and names of people and companies handling the material). Monitor ESMP implementation (ETD). Monitor documentation to ensure the appropriate disposal of hazardous materials (ETD). 	Negligible
Natural Disasters	<ul style="list-style-type: none"> Hurricanes and natural fires. 	<ul style="list-style-type: none"> Prohibit the transportation of any hazardous materials during any severe weather event (tropical storms, floods, hurricane, etc.). 	Negligible

Resource	Source of the Impact and Existing Vulnerability	Recommended Mitigation/ Management Measure	Impact Significance After Mitigation
Biological			
Flora and Fauna	<ul style="list-style-type: none"> Accidental release of hazardous materials Inappropriate disposal of hazardous materials 	<ul style="list-style-type: none"> Include Contractual Clauses that describes the requirements for transportation and disposal instructions so that they are handled appropriately. Implement a “cradle-to-grave” approach where documentation for accountability is maintained from removal all the way to final disposal (noting quantities, types of materials, and names of people and companies handling the material). Monitor ESMP implementation (ETD). Monitor documentation to ensure the appropriate disposal of hazardous materials (ETD). 	Negligible
Human Resources			
Hazardous materials related effects on the public	<ul style="list-style-type: none"> Inappropriate handling of hazardous materials. 	<ul style="list-style-type: none"> Ensure that all contractors are trained in the appropriate handling of material. Ensure that all contractors are provided with the appropriate PPE if needed (i.e., gloves, protective glasses, steel toe shoes, etc.) Employ best available work practices on-site to minimize occupational exposure. 	Negligible
Fire hazard risk	<ul style="list-style-type: none"> Accident release of refrigerants or used oils. 	<ul style="list-style-type: none"> Provide emergency response procedures in case of accidental releases 	Negligible
Socioeconomic	<ul style="list-style-type: none"> Project induced economic activity will result from contracting of materials and services during the construction Decrease in fossil fuel dependency. Increase use of renewable energy in Barbados. Reduction of the emission of greenhouse gases. 	No additional mitigation measures are proposed.	Positive

TABLE 5-3: SUMMARY OF TYPES OF WASTE THAT WILL BE GENERATED AND THEIR APPROPRIATE MANAGEMENT MEASURES

Activity	Waste Type	Waste material	Management Measure	Waste Facility in Barbados	Final Destination	Policies, International Regulations
Treating and sealing windows	Non-hazardous waste	Silicone sealants and adhesives waste	Dispose of appropriately in waste receptacles.	Mangrove Pond Landfill	Barbados	None
Replacing air conditioning units	Hazardous waste / Controlled substance	Used refrigerants containing ODSs	The refrigerant should be collected in gas cylinders and shipped off the island to a facility that will ensure appropriate disposal.	TBD ¹	United States	Montreal Protocol
Replacing vehicles	Hazardous solid waste	Used batteries Used oil	Used batteries can be recycled by local companies Used oil can also be recycled by local companies	Recycling facility	Barbados	Basel and Rotterdam Convention ²
Replacing fluorescent light bulbs	Hazardous	Light bulbs containing mercury gas	Collect and package the bulbs carefully to prevent them from breaking during transport to the facilities where they will be appropriately crushed and where the mercury gas will be collected for later transport off the island. If bulbs do break, personnel handling them should have “mercury spill kits” and the necessary PPE readily available in order to contain the spill and safely transport it to its final destination.	Caribbean LED (private) Sustainable Barbados Recycling Center – SBRC (public)	United States	Basel and Rotterdam Convention

Notes: (1) Currently, there is no facility in the island with sufficient capacity for storage and transport of this waste

(2) Only if the waste is to be shipped off the island to another country would these conventions be triggered

As previously discussed in Section 2.3.4 above, the proposed Project will have negligible impacts on the environment or the community. However, the handling of hazardous wastes involves potential risks, which merits that the Project be classified as Category "B". In accordance with OP-703, Category B projects "are likely to cause mostly local and short-term negative" impacts, for which "effective mitigation measures are readily available." Appendix A presents the ESMP of the Project.

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**APPENDIX A ENVIRONMENTAL AND SOCIAL
MANAGEMENT PLAN**



Prepared For:



APPENDIX A

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

September 2017

*Environmental Resources Management (ERM)
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LIST OF ACRONYMS

BNSI	Barbados National Standards Institute
BWA	Barbados Water Authority
CFC	Chlorofluorocarbon
CO ₂	Carbon dioxide
dB	Decibel
dBA	A-weighted decibels
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
ESA	Environmental and Social Assessment
ESMP	Environmental and Social Management Plan
ETD	Energy and Telecommunications Division
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 ³	microgram per cubic meter
mph	miles per hour
mm	Millimeter
ODS	Ozone depleting substances
PEU	Project Execution Unit
PM	Particulate matter
PM ₁₀	Particulate matter with diameter less than 10 micrometers
PM _{2.5}	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 and Social Assessment (ESA) 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"> • Removal of refrigerants during air conditioning unit removals • Transportation of refrigerants both on and off the island either in gas cylinders or inside the AC unit itself. • Improper disposal of refrigerants 	<ul style="list-style-type: none"> • Ensure only trained personnel recover refrigerants into the appropriate gas cylinders. • Ensure personnel conducting the refrigerant removal are trained on response to leaks. • Utilize refrigerant recovery equipment is used to evacuate the system into a recovery gas cylinder. • Ensure cylinders are appropriate for the material recovered, and in good working conditions (level gauges, valves) • Ensure gas cylinders are handled appropriately (i.e. use of carts for moving) • Implementation of the appropriate transportation requirements (securing gas cylinders inside trucks, use certified transport companies that meet international shipping requirements, if shipping). • Provide the appropriate storage for cylinders prior to disposal. • If transporting AC units with refrigerants, ensure the appropriate handling and transportation of the units so as to not damage the refrigerant containers. • 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. 	PEU Project Manager and contractors that may participate in the Project.
Hazardous waste disposal	Soils/Hydrology	<ul style="list-style-type: none"> • Removal and disposal/recycling of used batteries • Removal and disposal/recycling of used oil • Disposal of fluorescent light bulbs 	<ul style="list-style-type: none"> • Ensure batteries are recycled by an authorized recycler and request documentation. • 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. • Ensure used oil is recycled by an authorized recycler and request documentation. 	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"> • Ensure fluorescent bulbs are packaged appropriately for transport and are taken to a facility with the equipment to appropriately dispose of them. • 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. 	
Soil and groundwater contamination from spills	Soils/Hydrology	<ul style="list-style-type: none"> • Contamination from accidental spills (e.g., used oils and lubricants, used battery acid), during collection and transportation • Contamination from accidental breaking of fluorescent bulbs during collection and transportation 	<ul style="list-style-type: none"> • Ensure removal contractor is trained in spill response • 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). • Ensure transportation equipment is in good working condition to avoid spills and leaks • If a spill occurs, remove spilled materials and place it in an appropriate container for disposal. • Request documentation and certification of spill removal and disposal of materials 	PEU Project Manager and contractors that may participate in the Project.
Social				
Fire and explosion	Fire hazard risk	<ul style="list-style-type: none"> • Accident release of refrigerants classified as highly flammable gas. 	<ul style="list-style-type: none"> • Ensure personnel conducting the refrigerant removal are trained on response to leaks. • Prohibit smoking or ignition sources near refrigerant storage and transportation vehicles. 	Contractors that may participate in the Project.
Exposure to hazardous chemicals	Human health	<ul style="list-style-type: none"> • Accidental spills (e.g., used oils and lubricants, used battery acid), during collection and transportation • Accidental breaking of fluorescent bulbs during collection and transportation 	<ul style="list-style-type: none"> • Ensure removal contractor is trained in spill response • Provide spill kits with the appropriate personal protective equipment (PPE) necessary for the type of spill (such as gloves and eye protection). • Request documentation and certification of spill removal and disposal of materials 	Contractors that may participate in the Project.
Benefits to the local and national economy	Socioeconomic	<ul style="list-style-type: none"> • Project induced economic activity will result from contracting services during the implementation of the Projects. • Decrease dependency on fossil fuels. • Increase energy efficiency. 	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 Castillo 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



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APPENDIX B PUBLIC CONSULTATION PLAN



Prepared For:



PUBLIC CONSULTATION PLAN
Sustainable Energy Investment Program
SMART FUND II
Barbados

February 2019

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LIST OF ACRONYMS

EE	Energy Efficiency
EHD	Environmental Health Department
EIA	Environmental Impact Assessment
EPD	Environmental Protection Department
ESA	Environmental and Social Assessment
ESMS	Environmental and Social Management System
ESMP	Environmental and Social Management Plan
ETD	Energy and Telecommunications Division
GOB	Government of Barbados
IDB	Inter-American Development Bank
OP	Operational Policy
PEU	Project Execution Unit
RE	Renewable Energy
TCPA	Town and Country Planning Act
TCPDO	Town and Country Planning Development Order

1.0

INTRODUCTION

This Consultation Plan provides the approach that the Project will follow to implement a public consultation event that meets the Inter-American Development Bank's (IDB) transparent and meaningful, two-way dialogue and stakeholder engagement, consultation policy requirements and international good practice.

A stakeholder is defined by the IDB as "...individuals, groups, or institutions that have a stake, or an interest, in the project: They may be affected by it (either positively or negatively), or they may have an interest in it and be in a position to influence its outcomes."

1.1

OBJECTIVES

The public consultation process (including the public consultation event and the disclosure of information) is a key element of project planning, development, and implementation. Effective stakeholder engagement assists good design, builds strong relationships with local communities, and reduces the potential for delays through the early identification of issues to be addressed as a project progresses.

The aims of a meaningful public consultation process are to:

- Capture the views and perceptions of people who may be affected or have an interest in the project, and provides a means to take their views into account as inputs to improved project design and implementation, thereby avoiding or reducing adverse impacts, and enhancing benefits;
- Provide an important source of validation and verification of data obtained elsewhere, and improves the quality of environmental and social impact assessments;
- Enables people to understand their rights and responsibilities in relation to a project;
- Provide greater transparency and involvement of stakeholders to enhance trust, project acceptance, and local ownership, which are key to project sustainability and development outcomes; and
- Support compliance requirements for public consultation and disclosure in alignment with IDB and other financing standards and guidelines for environmental and social policies and stakeholder engagement.

It is important to note that key points to be covered during the public consultation event include:

- An explanation of the objectives of the discussion, how the event will be structured, and expected follow up;
- An agenda for the discussion. In some circumstances, particularly where there are low levels of trust, a formal protocol may need to be agreed on before real discussions can take place;
- A summary of the project;
- A clear description of expectations the role the consultations play in decision making, ensuring that at a minimum, the discussion covers people's perceptions and expectations about project benefits and potential adverse impacts; how adverse impacts may be avoided or minimized; what the appropriate mitigation mechanisms may be; and what people consider to be appropriate institutional and organizational mechanisms;
- A summary of points made and how follow up actions and feedback will take place; and
- An explanation of how people can communicate with the project, and what their right to remedy is if the project fails to meet its obligations or is perceived to cause harm.

The public consultation event should provide sufficient time for people to express their views and could lead to follow up discussions if needed.

Facilitators of the public consultation event should be selected on the basis of their ability to listen, explain, and be empathetic. When possible, facilitators who are known and trusted locally should be utilized, especially if translations are needed.

1.2 PROJECT BACKGROUND

The Government of Barbados is seeking a loan for the Smart Fund II Program which would continue to use the Smart Fund program as the basis to promote renewable energy (RE) and energy efficiency (EE) projects (the Project) in Barbados, aimed at reducing electricity costs for end users, and improving energy security and environmental benefits. The Executing Agency of the Smart Fund II would be the Energy and Telecommunications Division (ETD) of the Office of the Prime Minister of Barbados. The Government of Barbados is the formal borrower under the Sustainable Energy Investment Program.

PROJECT DESCRIPTION

The objectives of the individual Smart Fund II Projects covered under this Consultation Plan are to design, prepare, and implement commercially and economically viable RE and EE technologies. Programs covered by this fund would include retrofitting of public buildings and programs to promote EE and RE among Barbados residents. Specific Projects have not been defined yet, but would include:

- Energy efficient lighting replacement in approximately 50 Government owned businesses and facilities: the final Project activity as described by the ETD is for the replacement of fluorescent light bulbs with energy efficient LED light bulbs. The exact number of buildings and or light bulbs to be replaced is currently unknown.
- Replacement of existing air conditioning units with higher efficiency units in approximately 50 Government owned businesses and facilities: the ETD intends to replace existing air conditioning units with more energy efficient units in approximately 50 government owned buildings. The old units can either be disposed of or sold if in working condition. Specific information about the types of units or the quantities are not yet defined; however during the site visit, smaller older facilities were observed having both individual wall mounted air conditioning units, whereas larger, newer building had roof mounted central air conditioning units.
- Sealing and tinting windows to improve building energy efficiency: although the Project has not been clearly defined, if window tinting is performed, it will consist of placing premade film on windows. Window sealing will likely be done with the application of caulk or sealant around existing windows (windows will not be replaced). And,
- Replacement of government vehicles with electric cars: according to the ETD, the proposed Project could include the replacement of currently used diesel vehicles with electric cars; however, this activity would not be carried out in the immediate future. It is unknown if the former vehicle fleet would be sold or disposed of.

1.4 INSTITUTIONAL FRAMEWORK AND EXECUTING AGENCY

1.4.1 Regulatory Requirements

1.4.1.1. IDB Policies

The IDB has established its own policies and safeguards in order to ensure that Projects financed by the IDB group are sustainable. This Consultation Plan was prepared in accordance with the following Project triggered IDB Operational Policies (OPs):

Environment Safeguard Policy (OP-703)

These guidelines establish the basic principles that should guide public consultations and the commitment of interested parties in projects financed by the IDB. The objective of this policy with regards to consultation is to implement public consultations more effectively and uniformly.

This Policy requires timely and appropriate consultations that must be carried out in the context of environmental impact assessments, or EIA, with at least two consultations for all Category A projects and one consultation for all Category B projects. This project has been classified as Category B, so one public consultation will be organized. OP-703 recommends that the consultations be preceded by an analysis of the parties involved to identify the parties that have an interest in the matter and that may be affected by it (see Section 2.1).

Access to Information Policy (OP-102)

The objective of OP-102 is to maximize access to information by making information related to IDB projects available to the public. This information must be disclosed in a timely and appropriate manner to improve transparency.

Gender Equality in Development Policy (OP-761)

The objective of this Policy is to strengthen promoting gender equality and the empowerment of women. In the context of this Policy, gender equality means that women and men have the same conditions and opportunities to exercise their rights and to achieve their potential in social, economic, political and cultural terms.

1.4.1.2. *Barbados Regulatory Requirements*

This section describes the environmental laws and regulations in Barbados which would apply to the Project and were key in determining the pertinent stakeholders (see Section 2.1 below).

Environmental and health monitoring and enforcement is mostly done through the Ministry of Environment and Drainage and the Ministry of Health. The Ministry of the Environment and Drainage consists of a number of agencies and departments with the combined focus of maintaining the viability, productivity and quality of the various ecosystems on this island. These include:

- Coastal Zone Management Unit,
- the Drainage Division,
- the Environmental Protection Department,
- the National Conservation Commission,
- the Natural Heritage Department,
- the Policy Research and Planning Information Unit, and
- the Sanitation Service Authority.

Development in Barbados is governed by the Town and Country Planning Act (TCPA, Chapter 240), and its subsidiary legislation, the Town and Country Planning Development Order (TCPDO) of 1972. The TCPA requires that new developments and changes to existing developments, as well as specific criteria for air emissions and water discharges, be reviewed by the Chief Town Planner.

The Health Services (Building) Regulations, 1969 require persons wishing to construct, extend, alter or change the use of a building to obtain the permission of the Minister of Health via the Director of the Environmental Protection Department (EPD). This legal requirement is independent of that requiring permission from the TCDPO. In the case of proposals that do not require approval from TCDPO, such as internal renovations or alterations to approved structures, an application must be submitted directly to the EPD (MOED 2009).

1.4.2 *Executing Agency, Roles and Responsibilities*

The Executing Agency of the Smart Fund II Projects covered by this Consultation Plan would be the Energy and Telecommunications Division (ETD) of the Office of the Prime Minister of Barbados. Under the ETD, a Program Manager will be responsible in ensuring compliance with the requirements listed in this Consultation Plan as described in the following sections. Under the ETD, a Program Manager will lead the Project Execution Unit (PEU), in the operationalization of the Smart Fund.

The ETD Program Manager is responsible for:

- Preparing a list of Project specific stakeholders;
- Preparing and distributing the consultation invitation;
- Reserving and preparing the appropriate venue for the consultation meeting;
- Preparing the Project introduction and description slides to be presented to the stakeholders;
- Coordinating with the environmental and social consultant on the presentation of Project impacts, mitigation, and management measures to be presented to the Project stakeholders;
- Ensuring the consultation meeting is recorded as appropriate;
- Coordinating with the environmental and social consultant on the integration of consultation results in the final environmental and social documents for the Project.

2.0 *PUBLIC CONSULTATION PLAN*

A public consultation has not been carried out to-date. Consistent with the Bank's Disclosure of Information Policy (OP-102), the Environmental and Social Assessment (ESA) for this Project has been published on the IDBs web site and will be made available to the public prior to a public consultation which will be carried out prior to Board action.

2.1 *STAKEHOLDER IDENTIFICATION*

2.1.1 *Local Context Overview*

It is helpful to group stakeholders based on common interests and characteristics. Use of a number of 'stakeholder categories' helps structure activities for stakeholders of the Project, including a summary of the anticipated interest of these groups with respect to the Project and within the local context. Typical stakeholder categories include:

- National government
- Regional and local governments
- Local population
- Local community groups
- Land and resource users and rights holders
- Local businesses
- Business development or worker associations
- Providers of local services and infrastructure
- Interested non-governmental organizations
- Media
- Academic and research organizations

2.1.2 *Identification and Mapping*

The process of stakeholder identification includes identifying individuals, groups, local communities and other stakeholders who may be affected by the project; identifying broader stakeholders who may be able to influence the outcome of the project; identifying legitimate stakeholder representatives (such as elected officials, non-elected community leaders, etc.); and, mapping the impact zones by placing the Affected Communities within a geographic area.

Because the Project activities will be carried out in government buildings already in-use, the list of stakeholders for this Project has been narrowed down

to specific stakeholders that could be affected by its implementation. A list of stakeholders for the project has been prepared and is included in this Plan as Appendix A. Stakeholders identified include people from the following groups:

- Town and Country Planning and Development Office
- Environmental Protection Department
- Ministry of Housing
- Public Investment Unit
- Fair Trading Commission
- Barbados Light & Power Co. Ltd.
- Ministry of Education
- Barbados Defense Force and Coast Guard
- Barbados Agricultural Development Management Company
- Ministry of Health
- Ministry of Social Care
- EU Delegation
- Caribbean Development Bank
- Ministry of Environment
- Barbados National Oil Company Limited
- Barbados Hotel and Tourism Association
- Barbados National Standards Institute
- Barbados Renewable Energy Association
- Ministry of Energy and Water Resources
- Enterprise Growth Fund Limited
- Ministry of Agriculture
- Ministry of Home Affairs
- Chamber of Commerce
- Barbados Investment Development Cooperation
- Small Business Association

2.1.3 *Previous Stakeholder Engagement Activities*

As part of the ESA process, meetings were conducted with pertinent regulatory agencies and governmental entities in Barbados to discuss the Project and obtain their opinion on the potential Project impacts and regulatory requirements. Results from those meetings have already been included in the Project's ESA and ESMP.

2.1.4 *Disclosure and Engagement Methods and Materials*

The public consultation process encourages meaningful participation by stakeholders. The Project executing agency will employ a range of methods and channels for disclosing information in order to tailor disclosure to the interests

and needs of the various stakeholder groups, and will also produce materials appropriate for the specific stakeholders types (see Appendix B for a Sample Consultation Meeting Preparation Checklist).

Consultation with informed stakeholders to discuss the plans and activities of the Project including the potential impacts and opportunities associated with them, will be a two-way process that allows the incorporation of feedback from interested parties in the design and Project planning. The Project must include the following considerations for participation activities:

- **Programming:** All forms of participation will be carried out in a timely manner. Invitations to meetings will be in advance of participation activities, to ensure that interested parties have the opportunity to participate without interruption in their meetings, personal schedules. As previously mentioned, a stakeholder list has already been developed for this Project and is included in Appendix A. Because of the nature of Project activities and the specific stakeholders which could be affected, invitations for the public consultation event will be tailored specifically to these stakeholders (see Appendix C for a Sample Consultation Meeting Invitation);
- **Location:** All participation activities will be carried out in places of easy access, and where the attendees can arrive without greater difficulty, cost or travel time. These places should also be free of political or other associations, so that interested parties feel free to participate openly in the discussions. A meeting place has not been determined for the Project's Consultation Meeting although a convenient time based on prior experience has been selected (Tuesday 19th of February, 2019, at 2:30 pm);
- **Transportation:** When necessary, and depending on the circumstances and conditions, the Project will provide transportation for participation activities;
- **Cultural Adequacy:** All forms of participation of stakeholders in the activities will be designed to meet the needs of the beneficiaries, in order to ensure that everyone has the opportunity to participate freely and informally;
- **Language:** In all cases, the activities will be conducted in the local language using simple terminology (non-technical and concise) and effective communication tools (including verbal alternatives, based on images or other, written format). This ensures that all participants have the opportunity to understand Project information and participate actively in the discussions;
- **Recording and Feedback:** all group participation activities will be recorded using meeting minutes, photography and/or video (with the

consent of the participants at the initiation of the meeting), and an attendee sign in sheet. This will ensure the transparency of the consultation process.

Consultations will allow for ample time for a live questions and comments period so that stakeholders can freely express their concerns. All questions and comments will be recorded to be included in the final Project environmental and social documents. In addition to questions and comments gathered from the consultations, feedback mechanisms (also referred to as Project contact vehicles) will be provided to give stakeholders easy and convenient access to the Project. The following contact vehicles should be considered:

- Toll-free number for general Project inquiries
- General email address
- Mailing address

The contact vehicles must be monitored regularly and response protocols will be developed to ensure all inquiries are tracked for reporting purposes and that responses are provided. Designated personnel from the PEU should serve as identified points of contact for stakeholders.

3.0 *MONITORING AND REPORTING*

3.1 *MONITORING*

It is important to monitor stakeholder engagement to ensure that consultation and disclosure efforts are effective, and in particular that stakeholders have been meaningfully consulted. During the public consultation event, the following key issues will be monitored:

- Consultation activities are conducted with government authorities and non-governmental stakeholders;
- Monitoring the effectiveness of the engagement processes by tracking feedback received;
- Monitoring and analyzing any grievances received;
- Recording the level of participation including by specific stakeholder categories and groups (e.g. women);
- Recording the number of comments by topic and type of stakeholder, and details of feedback provided;
- Recording and tracking commitments made to stakeholders; and
- Recording community attitudes and perceptions on Project activities.

3.2 *REPORTING*

Prior to Project implementation and upon completion of the public consultation event, the Project's ESA and ESMP will be updated to include the results of the consultation process including all key points provided in Section 3.1 above. Any complaints or concern received will be addressed, and any additional impacts and mitigation measures will be included. A list of attendees (with personal information redacted), as well as a short summary report of the consultation process, and the presentation will be included as an annex to the ESA.

During Project implementation, upon completion of the individual Projects, the ETD will provide the IDB with Environmental and Social Compliance Reports (ESCR). The ESCR will include any community grievances received and provide details including detailed description of the grievances, how grievances were solved, list of any pending grievances, and root causes of grievances.

Ministry of the Environment, Water Resources and Drainage (MOED). 2009. National Report to the United Nations Commission for Sustainable Development (UNCSD) Cycle 18/19 (2009/2010), Chemicals, Mining, Transport, Waste Management and the Ten Year Framework of Programmes on Sustainable Consumption and Production Patterns. Prepared by the Environment Division of the MOED, Government of Barbados. October 2009.

APPENDIX A PROJECT STAKEHOLDERS LIST

Proposed List of

Attendees for the Environmental Impact for the Sustainable Investment Programme II

	Organisation
1.	Town and Country Planning and Development Office
2.	Environmental Protection Department
3.	Ministry of Housing, Lands and Rural Development
4.	Public Investment Unit
5.	Fair Trading Commission
6.	Barbados Light & Power Co. Ltd.
7.	Ministry of Education, Technological and Vocational Training
8.	Barbados Defence Force and Coast Guard
9.	Barbados Agricultural Development Management Company
10.	Ministry of Health and Wellness
11.	Ministry of People Empowerment and Elder Affairs
12.	EU Delegation
13.	Inter-American Development Bank
14.	Caribbean Development Bank
15.	Ministry of Environment and National Beautification
16.	Barbados National Oil Company Limited
17.	Barbados Hotel and Tourism Association
18.	Barbados National Standards Institute
19.	Barbados Renewable Energy Association
20.	Ministry of Energy and Water Resources
21.	Enterprise Growth Fund Limited
22.	Ministry of Agriculture and Food Security

	Organisation
23.	Ministry of Home Affairs
24.	Barbados Chamber of Commerce and Industry
25.	Barbados Investment Development Cooperation
26.	Small Business Association
27.	Ministry of Maritime Affairs and Blue Economy
28.	Caribbean LED Lighting Inc.
29.	Sustainable Barbados Recycling Centre (SBRC)
30.	Sanitation Service Authority
31.	Smart Fund Partners

**APPENDIX B SAMPLE CONSULTATION MEETING
INVITATION**

Dear [Insert Stakeholder Name],

The Energy and Telecommunications Division (ETD) of the Office of the Prime Minister of Barbados is pleased to invite you to attend an information session and stakeholder consultation on the proposed Smart Fund II Program which would continue to use the Smart Fund program as the basis to promote renewable energy (RE) and energy efficiency (EE) projects (the Project) in Barbados.

The purpose of the meeting will be to present a description of the Project as well as the results of the Environmental and Social Assessment (ESA) prepared by the independent international environmental consulting group Environmental Resources Management (ERM), Inc. The ESA is available for public review at [INSERT LOCATION].

The meeting will take place on 19 February 2019, at 2:30 pm, at the [INSERT LOCATION].

For more information please contact:

[INSERT CONTACT INFORMATION].

Sincerely,

[INSERT CONTACT NAME, TITLE, AND SIGNATURE].

**APPENDIX C SAMPLE CONSULTATION MEETING
PREPARATION CHECKLIST**

The Executing Agency should ensure the following items are ready/available for the stakeholder consultation meetings:

- ☐ Invitations have been sent, and receipt acknowledged
- ☐ Venue has been reserved (including catering/refreshments if provided)
- ☐ Projector for presentation has been reserved/acquired
- ☐ Sound system has been reserved/acquired, and tested
- ☐ Projection screen for presentation has been reserved/acquired
- ☐ Flip chart/markers available for recording information
- ☐ Presentation is ready and approved
- ☐ Note taker has been identified (this person will be responsible to capture all the questions and answers discussed in the meeting)
- ☐ Photographer/videographer has been identified and reserved
- ☐ Sign-in Sheet has been prepared
- ☐ Writing utensils
- ☐ Presentation copies are available for stakeholders, includes Project contact information

APPENDIX D SIGN-IN TEMPLATE

Consultation Meeting for the Sustainable Energy Investment Program
SMART FUND II
February 19th 2019, 2:30 pm, [Insert Location]
Sign-in Sheet

No.	Name	Institution/Organization	Email	Phone No.	Signature
1					
2					
3					
4					
5					
6					
7					
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APPENDIX C PUBLIC CONSULTATION REPORT

Public Consultation Event

Organization and Execution of the Public Consultation Event

In accordance with IDB Directive B.6, a public consultation was held for the Sustainable Investment Programme II (Smart Fund) on the 19th of February 2019, at the Hilton Barbados Resort from 2:30 to 4:30 pm.

The event was led by the Ministry of Energy and Water Resources of the Government of Barbados in order to present a short description of the Programme as well as the results of the Environmental and Social Assessment (ESA). The public consultation event had approximately 40 attendees (almost 1:1 female to male ratio), and included key stakeholders from government organizations as well as recyclers and disposal companies. Attendance to the meeting was significant and attendees were very participative and showed interest and support for the Project.

A brief presentation of the Sustainable Energy Investment Programme II (Energy Smart Fund II) was made within the broader context of Programme and then the results of the ESA of the project and its respective Environmental and Social Management Plan (ESMP) were presented. Finally, attendees were given the opportunity to ask questions and comments, and Project representatives offered the necessary answers. The event lasted one and a half hours.

Attachments to this report include the presentations given at the consultation (a description of the Programme facilitated by the Government of Barbados as well as the environmental and social portion facilitated by ERM), the invitations sent, a list of attendees, and photographs of the event.

Key Questions and Comments from the Participants

Key issues and concerns expressed by the stakeholders present during the public consultation revolved more around the execution of Programme II itself in comparison with the execution of Programme I, the type of projects that would be funded, and how different projects would be identified, approved, and funded (private sector versus public sector, etc.).

With regards to the ESA, key questions included the following.

1. Question: What guarantee do we have that the country where the hazardous waste is shipped is disposing of it properly?
Response: The commitment to dispose of the hazardous waste will be followed up with the paper trail which will follow the disposal.
2. Question: The local perspective of hazardous waste management and disposal is that there are challenges in handling the hazardous waste. What measures will be put in place to mitigate

these measures? We should start with training.

Response 1: ERM looked at some of the capacity in the country and cannot tell if it is the highest efficiency/capacity however contracts with suppliers will have to ensure that things are done properly and the project Smart Fund II can include capacity building to provide training and when the tender documents are published they can apply, they will know what's coming so that the project is successful.

Response 2: We do intend to take this approach by making sure that waste haulers and handlers are aware and sensitized.

3. Question: if this is the same AC Rebate mentioned in Smart Fund I or is it a switch-out program where you identify buildings which require AC units changed and not the public coming for rebates?

Response 1: The Ministry does not have a protocol for AC disposal and is current working on one however if it is a switch out they can handle it but if it is a rebate they cannot handle it. The issue is trying to find a company which is willing to accept the waste, companies in the USA were being examined and thought should be given to companies to take the waste. They also have to get over the issue of how to handle storage and will inform the Ministry of Energy and Water on what they are doing.

Response 2:

We will be doing both by working with the Ministry of Environment and Health and the Switching out in Component 2 to make ACs more efficient in government buildings.

Response 3

We are looking at developing the protocol and this program will assist with that.

Response 4:

The Smart Fund II programme will assist up-front with the development with the protocols for this component prior to roll out.

4. Question: The Caribbean LED Lighting Inc. does not capture all of the bulbs being disposed because there is a cost attached to this; the Barbados Light and Power Co. Ltd. bring bulbs for crushing. Do you have any ideas on how to capture all of this hazardous waste and mercury going into the landfill? The disposal of ozone depleting chemicals needs greater attention; has seen more electric vehicles on the island and thought should be given to the electric vehicles as they will need to increase the local supply of power by the utility and there is a need to train technicians regarding these vehicles. A plan should be implemented now for the disposal of batteries for the electric vehicles because there are currently no facilities on the island for this. Question: Methods of accountability must be in place to ensure that the correct amount of gas released. Regarding the talk about swapping out Ac units which rely on the control and interior systems of buildings, if the windows are sealed etc. how can you measure and be sure of your results if you have no way of monitoring other than with your electricity bill?

Response 1: The ERM has presented on sealing, tinting etc. but does not know how government will do this

Response 2: We have an idea of the current building stock and will have the contractor responsible for the position before he goes into the building and will report on his results.

Conclusion

Based on the types of questions raised during the public consultation, there does not appear to be any discontent or apprehension with the Project. With regards to environmental and social issues, the main concerns are with ensuring hazardous wastes and materials are appropriately handled and disposed of specially knowing the current in-country limitations (with regards to waste disposal/material recycling). It will be the responsibility of the Project Executing Unit (PEU) of the Energy and Telecommunications Division, to ensure that all contracts include the appropriate clauses for the handling, management and disposal of wastes, and that the contractors comply with all of these requirements.

Attachment 1 – Question and Answer Session

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA) Public Consultation for the
Environmental Impact for the Sustainable Investment Programme II
Held at the Hilton Barbados, February 19, 2019
Question and Answer Session

Question

European Union – Mr. Bogdan Stefanescu

Glad to see the project starts with this assessment and the disposing of hazardous waste as this is a global problem. What guarantee do we have that the country where the hazardous waste is shipped is disposing of it properly?

Response

ERM - Mr. Ricardo Calvo, Consultant

The commitment to dispose of the hazardous waste will be followed up with the paper trail which will follow the disposal.

Comments

Barbados National Standards Institution – Mr. Fabian Scott, Technical Officer

Component 1 of SmartFund II focuses on the Tourism and SMEs Sectors which drives what goes on in the Barbados Economy. With respect to the disbursement profile there is a dire need for SMEs to be housed in a BIDC estate and have very little opportunity to grow within an operating context where expenditure may need to be cut and salaries is usually the first area to be cut. How do we track the energy uses of SMEs and how do we get them to apply to the project because they may not have the resources or exposure to do so because they are currently tenants of the BIDC.

Question

Have the concerns been addressed in relation to the AC Units?

Response 1

Ministry of Energy and Water Resources – Mr. Marlon Moore, Project Coordinator SEFB III

The concerns raised in question 1 are not unique to this programme and relates to social impacts, Component 3 of Smart Fund II would make persons aware of what the project offers; they can approach their landlord and have EGFL speak to the process.

Response 2

Ministry of Energy and Water Resources - Ms. Keisha Reid - Project Manager

The BIDC and other government agencies have programmes to address these issues and Government and private companies can apply for funding under this project.

Question

Fair Trading Commission – Dr. Marsha Atherley-Ikechi, Director, Utility Regulation

The local perspective of hazardous waste management and disposal is that there are challenges in handling the hazardous waste. What measures will be put in place to mitigate these measures? We should start with training.

Response 1

ERM - Mr. Ricardo Calvo, Consultant

The ERM looks at some of the capacity in the country and cannot tell if it is the highest efficiency/capacity however contracts with suppliers will have to ensure that things are done properly and the project Smart Fund II can include capacity building to provide training and when the tender documents are published they can apply, they will know what's coming so that the project is successful.

Response 2

Ministry of Energy and Water Resources – Mr. Marlon Moore, Project Coordinator SEFB III

We do intend to take this approach by making sure that waste haulers and handlers are aware and sensitized.

Question

Ministry of the Environment and National Beautification – Ms. Gina Belle, Project Coordinator

Works in the section implementing the Montreal Protocol and wants to clarify if this is the same AC Rebate mentioned in Smart Fund I or is it a switch-out program where you identify buildings which require AC units changed and not the public coming for rebates?

The Ministry does not have a protocol for AC disposal and is current working on one however if it is a switch out they can handle it but if it is a rebate they cannot handle it. The issue is trying to find a company which is willing to accept the waste, companies in the USA were being examined and thought should be given to companies to take the waste. They also have to get over the issue of how to handle storage and will inform the Ministry of Energy and Water on what they are doing.

Response 1

Ministry of Energy and Water Resources – Ms. Sherry Waithe, Project Officer

We will be doing both by working with the Ministry of Environment and Health and the Switching out in Component 2 to make ACs more efficient in government buildings.

Response 2

ERM - Mr. Ricardo Calvo, Consultant

We are looking at developing the protocol and this program will assist with that.

Response 3

Ministry of Energy and Water Resources – Ms. Sherry Waithe, Project Officer

The Smart Fund II programme will assist up-front with the development with the protocols for this component prior to roll out

Comments

Small Business Association (SBA) - Senator Lynette Holder, Chief Executive Officer

Could not allow the meeting to conclude without putting the thoughts in perspective; in Smart Fund I pie chart 34% of the loans was represents the agro-processing sector which suggests that the SMEs accessed the funding and draws attention to the data on the SBA's website by Salises which shows the SME sector is the biggest contributor to employment on the island and less than 200 are in the BIDC estates 900 are not tenants of the BIDC and are in the services sector.

Question 1

Is the Fund Manager able to complete an analyst on the loan applications, loan underwriting process and can lessons learnt from Smart Fund I be used in Smart Fund II to shorten the underwriting time for access to loans and improve the process for accessing the funds?

Question 2

Of the \$50M it was noticed that \$11M will be focused on the Tourism Sector and SMEs, some industries need incentivizing besides Tourism which is the low hanging fruits regarding foreign exchange; incentivize key areas that need to be developed to diversify our foreign exchange earners.

Response 1

Ministry of Energy and Water Resources – Ms. Sherry Waithe, Project Officer

We have started initial discussions with the Fund Manager with regard to access to clients, we are shortening the evaluation time on Economic Analysis and will put systems in place to streamline the process including the actual application process to make this easier and it is envisioned that the application form will be available digitally.

With regard to the SMEs and Tourism Sector yes we would want to focus on these sectors but the Fund is accessible to all commercial sectors. With aggressive advertising and heavy promotional efforts we can, and it would also be undertaken as early as possible to reach as many applicants as we can. We had a competitive interest rate and payback period in Smart Fund I and this will also be reviewed.

Question

Caribbean LED Lighting Inc. – Mr. David Tindale, Chief Operating Officer

The Caribbean LED Lighting Inc. does not capture all of the bulbs being disposed because there is a cost attached to this; the Barbados Light and Power Co. Ltd. bring bulbs for crushing. Do you have any ideas on how to capture all of this hazardous waste and mercury going into the landfill? The disposal of ozone depleting chemicals needs greater attention; has seen more electric vehicles on the island and thought should be given to the electric vehicles as they will need to increase the local supply of power by the utility and there is a need to train technicians regarding these vehicles. A plan should be implemented now for the disposal of batteries for the electric vehicles because there are currently no facilities on the island for this.

Question

RennTek Energy Solutions - Mr. George Nicholson, Technical Director

Regarding the AC technician releasing gas there is a cost to this and if there is an incentive more effort will be made.

Methods of accountability must be in place to ensure that the correct amount of gas released. Regarding the talk about swapping out Ac units which rely on the control and interior systems of buildings, if the windows are sealed etc. how can you measure and be sure of your results if you have no way of monitoring other than with your electricity bill?

Response 1

ERM - Mr. Ricardo Calvo, Consultant

The ERM has presented on sealing, tinting etc. but does not know how government will do this,

Response 2

Ministry of Energy and Water Resources – Mr. Marlon Moore, Project Coordinator SEFB III

We have an idea of the current building stock and will have the contractor responsible for the position before he goes into the building and will report on his results.

Comments

RennTek Energy Solutions - Mr. George Nicholson, Technical Director

Will be surprised that the audits of 50 buildings were to be done will be done especially at the airport and the Queen Elizabeth Hospital.

Response 2

Ministry of Energy and Water Resources – Mr. Marlon Moore, Project Coordinator SEFB III

We are looking at performance-based contracts to ensure that the work is completed.

Question

Barbados Light and Power Co. Ltd. – Mr. Antonio Sealy

Is interested in the monitoring and tracking of the benefits derived; is there a publically available location to see the benefits of the implementation of Smart Fund I and would like to see date and know the target and what more needs to be done to achieve the targets.

Response 1

Ministry of Energy and Water Resources – Mr. Marlon Moore, Project Coordinator SEFB III

Will show the information that we have for Smart Fund I and the data collection is an ongoing process which we need to address more firmly and will have more tangible information for Smart Fund II to present.

Response 2

Ministry of Energy and Water Resources - Ms. Keisha Reid - Project Manager

The Ministry is in the process of updating our website. The Technical Specialist is collating the data and trying to get information from the BL&P not just for Smart Fund I but for all of the Renewable Energy Retrofits. We are working on a digital platform to share information digitally. In Smart Fund II we want the process to be digital and move away from the paper-based system to be more user friendly to help reduce the application process.

Question

Barbados Renewable Energy Association/Williams Solar – Mr. Stephen Worme, Director

Does not know if he missed the roll out plan for the project, do you have a summary to share with the public and different partners? How long, 2 months, 3 months...

Response

Ministry of Energy and Water Resources – Ms. Sherry Waithe, Project Officer

We are working with the IDB to complete the preparation phase of the project and will work on the operation guide next with the IDB.

Response

Inter-American Development Bank – Veronica Rodrigues do Prado – Energy Specialist


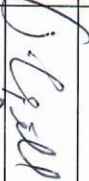







We are in the preparation stage and the IDB's internal process have to be completed before seeking board approval, next the IDB and the Government of Barbados will sign the project documents and this may take 6-8 months however other requirements have to be implemented first because it is a negotiation. We can start with awareness in the next few months to ensure that the private sector is informed regarding the project, its application process, how, when and where etc. we can get that out within the next few months.

Attachment 2 – Public Consultation Photos




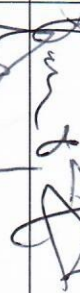
















Attachment 3 – Sign-in Sheet

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA)
Public Consultation for the Environmental Impact for the
Sustainable Investment Programme II











No.	NAME	SIGNATURE	POST	ORGANISATION
GOVERNMENT AGENCIES				
1.	Ms. Glendene Bartlett / Mr. Frederick Inniss ✓		Chief Executive Officer	Barbados Agricultural Management and Development Co. Ltd. (BADMC)
2.				Barbados Defence Force (BDF)
3.	Mrs. Jacqueline Gill		Business Development Consultant	Barbados Hotel and Tourism Association (BHTA)
4.	Mr. Modou Diagne		Senior Business Development Officer	Barbados Investment and Development Corporation (BIDC)
5	Mr. Richard Goddard		Renewable Energy Officer	Barbados National Oil Co. Ltd. (BNOCL)
6.	Mr. Fabian Scott		Chief Technical Officer	Barbados National Standards Institution (BNSI)
7.	Mr. Ferdinand Straughn		Fund Manager	Enterprise Growth Fund Ltd.
8.				Environmental Protection Department (EPD)
9.	Dr. Marsha Atherley-Ikechi		Director. Utility Regulation	Fair Trading Commission (FTC)
10.	Ms. Kathy-Ann Belle		Financial Analyst	Fair Trading Commission (FTC)
11.	Mr. Rickardo Ward		Senior Environmental Officer	Ministry of Environment and National Beautification
12.	Ms. Gina Belle		Project Coordinator	Ministry of Environment and National Beautification
13.	Ms. Julia Coppin		Economist	Ministry of Agriculture and Food Security

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA)
Public Consultation for the Environmental Impact for the
Sustainable Investment Programme II

No.	NAME	SIGNATURE	POST	ORGANISATION
GOVERNMENT AGENCIES				
14.	Mr. Damian Coppin		Economist	Ministry of Agriculture and Food Security
15.	Ms. Sophia Grimes		Chief Research Officer	Ministry of Maritime Affairs and Blue Economy
16.	Mrs. Angela Newton-Jean Baptiste		Administrative Officer I	Ministry of Home Affairs
17.	Mr. David Thorne		Senior Technical Officer	Ministry of Health and Wellness
18.	Mr. Gay Lewis		Maintenance Supervisor	Ministry of Health and Wellness
19.	Ms. Rean Gibson		Research Analyst	Ministry of People Empowerment and Elder Affairs
20.	Mrs. Marica Strickland		Chief Project Analyst	Public Investment Unit (PIU)
21.	Ms. Gia Howell		Project Analyst	Public Investment Unit (PIU)
22.				Sanitation Service Authority (SSA)
DEVELOPMENT AGENCIES				
23.	Mr. Joseph Williams		Head of Renewable Energy and Energy Efficiency	Caribbean Development Bank (CDB)
24.	Mr. Bogdan Stefanescu		First Secretary, Head of the Green Economy, Energy and Resilience Team	European Union (EU)
25.	Mr. Kyle Farnum		Programme Manager, Energy Green Economy, Energy and Resilience Team	European Union (EU)
26.	Ms. Veronica Rodrigues do Prado		Energy Specialist	Inter-American Development Bank (IDB)

No.	NAME	SIGNATURE	POST	ORGANISATION
DEVELOPMENT AGENCIES				
27.	Ms. Rochelle Franklin		Operations Senior Associate	Inter-American Development Bank (IDB)
28.	Ms. Yajaira Archibald		Communications Consultant	Inter-American Development Bank (IDB)
29.	Mr. Ricardo Calvo		Consultant	Environmental Resource Management
SMARTFUND PARTNERS				
29.	Mr. Omar Allahar		Director	Allahar Associates
30.	Mr. Donnie Prescott		Chairman/Main Representative	Allahar Associates
31.	Mr. Hallam Edwards		Chairman/Main Representative	Enernmax/Barbados Chamber of Commerce and Industry (BCCI)
32.	Mr. Erwin Edwards/ Ms. Cindy Edwards		Chief Executive Officer/ Representative	Atom Solutions
33.	Mr. Terrence Haynes		Managing Director	Goldfield Solar
34.	Mr. Vancourt Rouse		Chief Executive Officer	Innogen
35.	Mr. Julian Jordan		Commercial Director	RENNTEK Energy Solutions

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA)
Public Consultation for the Environmental Impact for the
Sustainable Investment Programme II

No.	NAME	SIGNATURE	POST	ORGANISATION
PRIVATE AGENCIES				
36.	Mr. Jerry Franklin		Representative	Barbados Chamber of Commerce and Industry (BCCI)
37.	Antonio Sealy		Systems Engineer customer solutions	Barbados Light and Power Co. Ltd. (BL&P)
38.	STEPHEN WORMS		Director.	Barbados Renewable Energy Association (BREA)
39.	Joshua Hunt		Director	Barbados Renewable Energy Association (BREA)
40.	Mr. David Tindale		Chief Operating Officer	Caribbean LED Lighting Inc.
41.	Mr. Oliver Jones		Dr. Sheryl King	Caribbean LED Lighting Inc.
42.				Sustainable Barbados Recycling Centre (SBRC)
43.	Sen. Lynette Holder		Chief Executive Officer	Small Business Association (SBA)
MINISTRY OF ENERGY AND WATER RESOURCES				
	Ms. Keisha Reid		Project Manager	
	Ms. Sherry Waithe		Project Officer	
	Mrs. Rosalind Griffith		Project Officer	
	Ms. Claire Best		Senior Economist	
	MR. JAMAR WHITE		DIRECTOR, NAT. RESOURCES	ENERGY

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA)
Public Consultation for the Environmental Impact for the
Sustainable Investment Programme II

No.	NAME	SIGNATURE	POST	ORGANISATION
MINISTRY OF ENERGY AND WATER RESOURCES				
45.	Mrs. Lana Chandler		Programme Advisor (PSSEP)	
46.	Mr. Marlon Moore		Project Coordinator SEFB III	
47.	Ms. Samantha Thompson		Financial Consultant	
48.	Ms. Jillian Willoughby		Project Administrator	
49.	George Nicholas		CHIEF OF OFFICE	RENEWABLE ENERGY SOLUTIONS
50.	MARNO LITTLE		Procurement Specialist	MEUR
51.	Gina Patrick		TOURISMS & PLANNING	TOUR PLANNING
52.	AIDAN ROGERS		V.P.	BREA
53.	Samuel Henderson		SENIOR BUSINESS DEVELOPMENT OFFICER	BIDC
54.	Kevin Devanisy		Technical Consultant	MEUR
55.				
56.				
57.				
58.				

Attachment 4 – Invitation Letters



**MINISTRY OF
ENERGY AND WATER RESOURCES
GOVERNMENT OF BARBADOS**

Trinity Business Centre Inc., Country Road, St. Michael, Barbados

Tel. Nos.: (246) 535-2500 ••• **Fax No.:** (246) 429-7489



Ref.: MEE 36/2/1/7/3 Vol. I

Date: February 12, 2019

Managing Director
Barbados Light and Power Co. Ltd.
The Garrison
ST. MICHAEL

Dear Sir/Madam

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA)
Public Consultation for the Environmental Impact for the Sustainable
Investment Programme II

The Ministry of Energy and Water Resources is in the preparation stage of the Sustainable Energy Investment Programme II (Energy Smart Fund II). This Programme will be funded through a US\$30 million and US\$5 million in loan resources from the Inter-American Development Bank and the Caribbean Development Bank respectively, as well as \$13 million Euros in grant funds from the European Union.

In this regard, this Ministry invites your organization to attend an information session and stakeholder consultation on the proposed Energy Smart Fund II Programme on **Tuesday, February 19, 2019 at the Hilton Barbados Resort from 2:30 pm – 4:30 pm.**

The purpose of the meeting will be to present a description of the Programme as well as the results of the Environmental Assessment prepared by the independent international environmental consulting group Environmental Resources Management Inc. funded by the Inter-American Development Bank.

Accordingly, please indicate the name and position of your organization's representative at this Public Consultation via email: smartfund@energy.gov.bb or telephone Ms. Jillian Willoughby at (246) 535:2561 on or before February 15, 2019.

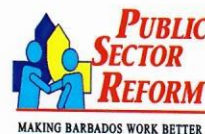
Yours faithfully

KEISHA REID (Ms.)
for Permanent Secretary

KR/jw



MEMORANDUM



FROM: PERMANENT SECRETARY,
MINISTRY OF ENERGY AND WATER RESOURCES

TO: Permanent Secretary
Ministry of Housing, Lands and Rural Development

DATE: February 12, 2019

OUR REF: MEE 36/2/1/7/3 Vol. I

SUBJECT: Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA)
Public Consultation for the Environmental Impact for the
Sustainable Investment Programme II

The Ministry of Energy and Water Resources is in the preparation stage of the Sustainable Energy Investment Programme II (Energy Smart Fund II). This Programme will be funded through a US\$30 million and US\$5 million in loan resources from the Inter-American Development Bank and the Caribbean Development Bank respectively, as well as \$13 million Euros in grant funds from the European Union.

2. In this regard, this Ministry invites your organization to attend an information session and stakeholder consultation on the proposed Energy Smart Fund II Programme on **Tuesday, February 19, 2019 at the Hilton Barbados Resort from 2:30 pm – 4:30 pm.**

3. The purpose of the meeting will be to present a description of the Programme as well as the results of the Environmental Assessment prepared by the independent international environmental consulting group Environmental Resources Management Inc. funded by the Inter-American Development Bank.

4. Accordingly, please indicate the name and position of your organization's representative at this Public Consultation via email: smartfund@energy.gov.bb or telephone Ms. Jillian Willoughby at (246) 535:2561 on or before February 15, 2019.

KEISHA REID (Ms.)
for Permanent Secretary



SMART Fund Barbados <smartfund@energy.gov.bb>

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA) Public Consultation for the Environmental Impact for the Sustainable Investment Programme II

4 messages

SMART Fund Barbados <smartfund@energy.gov.bb>
To: dnrhynd@sbrinc.com

Tue, Feb 12, 2019 at 5:56 PM

Good day Colleagues,

The attached is forwarded for your urgent attention.

Kind regards

Jillian Willoughby (Ms.)
for Project Manager

--

Sustainable Energy Investment Programme (Energy Smart Fund)

Project Execution Unit | Energy Division | Ministry of Energy and Water Resources
Trinity Business Centre | Country Road | St. Michael | Barbados
Email: smartfund@energy.gov.bb | www.energy.gov.bb
Telephone: (246)535-2500 Ext 52554 | Fax: (246)429-7489

 **SBRC.pdf**
416K

SMART Fund Barbados <smartfund@energy.gov.bb>
To: cjscantlebury@sbrinc.com

Fri, Feb 15, 2019 at 3:35 PM

Good Afternoon,

The Ministry of Energy and Water Resources would like to confirm your attendance at the upcoming Public Consultation. The attached documents should be reviewed in relation to the Public Consultation.

Kind regards

Jillian Willoughby (Ms.)
for Project Manager
[Quoted text hidden]

3 attachments

 **SBRC.pdf**
416K

 **Appendix_A_-_Draft_Barbados_Smart_Fund_II_ESMP_pdf (4).pdf**
529K

 **Draft_Barbados_Smart_Fund_II_EA_pdf (1).pdf**
1190K

Carol Scantlebury <cjscantlebury@sbrinc.com>

Mon, Feb 18, 2019 at 1:43 PM

To: SMART Fund Barbados <smartfund@energy.gov.bb>

Hello Ms Willoughby

I regret to inform you that SBRC will be unable to send a representative to tomorrow's consultation as both persons who would have been designated are unwell and therefore will not be available. We apologise for this but should there be future consultations please let us know.

Regards

Carol Scantlebury

[Quoted text hidden]

--

Carol Scantlebury

Administration Manager/Accountant

Sustainable Barbados Recycling Center Inc

Tel:(246) 425-2255 Fax:(246) 622-1861

SMART Fund Barbados <smartfund@energy.gov.bb>

Mon, Feb 18, 2019 at 2:05 PM

To: Carol Scantlebury <cjscantlebury@sbrinc.com>

Thank you Ms. Scantlebury.

Kind regards

Jillian Willoughby (Ms)

for Project Manager

[Quoted text hidden]



SMART Fund Barbados <smartfund@energy.gov.bb>

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA) Public Consultation for the Environmental Impact for the Sustainable Investment Programme II

11 messages

SMART Fund Barbados <smartfund@energy.gov.bb>

Tue, Feb 12, 2019 at 3:06 PM

To: Terrence Haynes <terrencehaynes@goldfieldsolar.com>, adam@renntekesl.com, julian@renntekesl.com, Omar Allahar <omar@allaharassociates.com>, vanrouse@caribsurf.com, "Erwin E. Edwards" <erwine@caribsurf.com>, greetecho@gmail.com, enermax@caribsurf.com

Cc: Keisha Reid <kreid@energy.gov.bb>, Sherry Waithe <swaithe@energy.gov.bb>

Dear Smart Fund Partner,

The Ministry of Energy and Water Resources is in the preparation stage of the Sustainable Energy Investment Programme II (Energy Smart Fund II). This Programme will be funded through a US\$30 million and US\$5 million in loan resources from the Inter-American Development Bank and the Caribbean Development Bank respectively, as well as \$13 million Euros in grant funds from the European Union.

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The purpose of the meeting will be to present a description of the Programme as well as the results of the Environmental Assessment prepared by the independent international environmental consulting group Environmental Resources Management Inc. funded by the Inter-American Development Bank.

Accordingly, please indicate the name and position of your organization's representative at this Public Consultation via email: smartfund@energy.gov.bb or telephone Ms. Jillian Willoughby at (246) 535:2561 on or before February 15, 2019.

Kind Regards

Jillian Willoughby (Ms.)
for Project Manager

--

Sustainable Energy Investment Programme II (Energy Smart Fund II)

Project Execution Unit | Energy Division | Ministry of Energy and Water Resources

Trinity Business Centre | Country Road | St. Michael | Barbados

Email: smartfund@energy.gov.bb | www.energy.gov.bb

Telephone: (246)535-2500 Ext 52554 | Fax: (246)429-7489

Mail Delivery Subsystem <mailer-daemon@googlemail.com>

Tue, Feb 12, 2019 at 3:09 PM

To: smartfund@energy.gov.bb



SMART Fund Barbados <smartfund@energy.gov.bb>

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA) Public Consultation for the Environmental Impact for the Sustainable Investment Programme II

1 message

SMART Fund Barbados <smartfund@energy.gov.bb>
To: cos@bdf.gov.bb

Tue, Feb 12, 2019 at 5:36 PM

Good day Colleagues,

The attached is forwarded for your urgent attention.

Kind regards

Jillian Willoughby (Ms.)
for Project Manager

--

Sustainable Energy Investment Programme (Energy Smart Fund)

Project Execution Unit | Energy Division | Ministry of Energy and Water Resources

Trinity Business Centre | Country Road | St. Michael | Barbados

Email: smartfund@energy.gov.bb | www.energy.gov.bb

Telephone: (246)535-2500 Ext 52554 | Fax: (246)429-7489



BDF.pdf
411K



SMART Fund Barbados <smartfund@energy.gov.bb>

Invitation: Sustainable Energy Investment Program (Smart Fund) (2485/... @ Tue 19 Feb 2019 14:30 - 16:30 (AST) (bhaynes@energy.gov.bb)

1 message

SMART Fund Barbados <smartfund@energy.gov.bb>

Tue, Feb 12, 2019 at 6:09 PM

Reply-To: SMART Fund Barbados <smartfund@energy.gov.bb>

To: bhaynes@energy.gov.bb, cbest@energy.gov.bb, lchandler@energy.gov.bb, rgriffith@energy.gov.bb, kdevonish@energy.gov.bb, rblades@energy.gov.bb, harcher@energy.gov.bb, Marvo Little <mlittle@energy.gov.bb>, kreid@energy.gov.bb, Marlon Moore <mmoore@energy.gov.bb>, sthompson@energy.gov.bb, swaithe@energy.gov.bb, dhaynes@energy.gov.bb, whinds@energy.gov.bb, jwiltshire@energy.gov.bb

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA) Public [more details »](#) Consultation for the Environmental Impact for the Sustainable Investment Programme II

When Tue 19 Feb 2019 14:30 – 16:30 Atlantic Standard Time - Barbados

Where Hilton Barbados Resort, Маяк Needhams Point Lighthouse, Bridgetown, Barbados ([map](#))

Joining info meet.google.com/udr-ceuy-zch

Or dial: +1 240-516-6294 PIN: 713496738#

Calendar [bhaynes@energy.gov.bb](#)

Who

- [smartfund@energy.gov.bb](#)- organiser
- [cbest@energy.gov.bb](#)
- [lchandler@energy.gov.bb](#)
- [rgriffith@energy.gov.bb](#)
- [kdevonish@energy.gov.bb](#)
- [rblades@energy.gov.bb](#)
- [bhaynes@energy.gov.bb](#)
- [harcher@energy.gov.bb](#)
- Marvo Little
- [kreid@energy.gov.bb](#)
- Marlon Moore
- [sthompson@energy.gov.bb](#)
- [swaithe@energy.gov.bb](#)
- [dhaynes@energy.gov.bb](#)
- [whinds@energy.gov.bb](#)
- [jwiltshire@energy.gov.bb](#)

Going ([bhaynes@energy.gov.bb](#))? **Yes** - **Maybe** - **No** [more options »](#)

Invitation from [Google Calendar](#)

You are receiving this email at the account [bhaynes@energy.gov.bb](#) because you are subscribed for invitations on calendar [bhaynes@energy.gov.bb](#).

To stop receiving these emails, please log in to <https://www.google.com/calendar/> and change your notification settings for this calendar.

Forwarding this invitation could allow any recipient to modify your RSVP response. [Learn More](#).

 **invite.ics**
4K



SMART Fund Barbados <smartfund@energy.gov.bb>

Sustainable Energy Investment Program (Smart Fund) (2485/OC-BA) Public Consultation for the Environmental Impact for the Sustainable Investment Programme II - Attachments for review

11 messages

SMART Fund Barbados <smartfund@energy.gov.bb>

Fri, Feb 15, 2019 at 2:06 PM

To: george.browne@townplanning.gov.bb, gina.patrick@townplanning.gov.bb, enermax@caribsurf.com, Dale Foster <dale.foster@barbados.gov.bb>, ps@agriculture.gov.bb, ps@mes.gov.bb, anthony.joseph@barbados.gov.bb, daphne.kellman@barbados.gov.bb, solidwastebarbados@gmail.com, pshealth@health.gov.bb, june.chandler@health.gov.bb, homeaffairs@mha.gov.bb, anthony.headley@epd.gov.bb, Timothy Simmons <finance@egfl.bb>, Ferdinand Straughn <fstraughn@egfl.bb>, glendene.bartlett@badmc.org, cos@bdf.gov.bb, info@bhta.org, bcci@barbadoschamber.com, roger.blackman@blpc.com.bb, strotman@bidc.org, Richard Goddard <goddardr@bnocl.com>, brownej@bnocl.com, aishmael@bnsi.com.bb, Fabian Scott <fscott@bnsi.com.bb>, meshia.clarke@brea.bb, labennm@caribank.org, Gerard Borely <gborely@caribbeanledlighting.com>, nter-American Development Bank <IDBBarbados@iadb.org>, Rochelle Franklin <ROCHELLEF@iadb.org>, vprado@iadb.org, dnrhynd@sbrinc.com, theoffice@sba.bb, "Rosalind Knight." <rosalind.knight@ssa.gov.bb>, ssealy@ftc.gov.bb, "HARRIS-NICHOLLS Karen (EEAS-BRIDGETOWN)" <Karen.HARRIS-NICHOLLS@eeas.europa.eu>, "DESRUELLE Cecile (EEAS-BRIDGETOWN)" <Cecile.DESRUELLE@eeas.europa.eu>, "STEFANESCU Bogdan (EEAS-BRIDGETOWN)" <Bogdan.STEFANESCU@eeas.europa.eu>, kyle-a-s.farnum@eeas.europa.eu, Kevin Devonish <kdevonish@energy.gov.bb>, William Hinds <whinds@energy.gov.bb>, Horace Archer <harcher@energy.gov.bb>, Lana Chandler <lchandler@energy.gov.bb>, Marlon Moore <mmoore@energy.gov.bb>, Jehu Wiltshire <jwiltshire@energy.gov.bb>, Sherry Waithe <swaithe@energy.gov.bb>, Ron Blades <rblades@energy.gov.bb>, Samantha Thompson <sthompson@energy.gov.bb>, Dara Haynes <dhaynes@energy.gov.bb>, Rosalind Griffith <rgriffith@energy.gov.bb>, Bryan Haynes <bhaynes@energy.gov.bb>, Marvo Little <mlittle@energy.gov.bb>, Keisha Reid <kreid@energy.gov.bb>, Claire Corbin <cbest@energy.gov.bb>, David Tindale <davidtindalebarbados@gmail.com>, Jerry Franklin <jerryfranklin@ensmartinc.com>, "arogers @caribsurf.com" <arogers@caribsurf.com>

Good afternoon colleagues,

I have been directed to email the attached documents for your review regarding the upcoming Public Consultation.

Kind regards

Jillian Willoughby (Ms.)
for Project Manager

--

Sustainable Energy Investment Programme (Energy Smart Fund)

Project Execution Unit | Energy Division | Ministry of Energy and Water Resources

Trinity Business Centre | Country Road | St. Michael | Barbados

Email: smartfund@energy.gov.bb | www.energy.gov.bb

Telephone: (246)535-2500 Ext 52554 | Fax: (246)429-7489

2 attachments



Appendix_A_-_Draft_Barbados_Smart_Fund_II_ESMP_pdf (4).pdf
529K



Draft_Barbados_Smart_Fund_II_EA_pdf (1).pdf
1190K

MAILER-DAEMON@mymail.myregisteredsite.com <MAILER-

DAEMON@mymail.myregisteredsite.com>

To: smartfund@energy.gov.bb

Fri, Feb 15, 2019 at 2:09 PM

Hi. This is the gmail-send program at mymail.myregisteredsite.com.

<https://mail.google.com/mail/u/2/?ik=f179ae2bbb&view=pt&search=all&permthid=thread-a%3Ar1542595678826240228&simpl=msg-a%3Ar-5251732...> 1/485

Attachment 5 – Program Handouts

AGENDA

MASTER OF CEREMONIES

Mr. Marlon Moore
Project Coordinator
Sustainable Energy Framework
for Barbados
Ministry of Energy and Water Resources

PRESENTATION ON THE SUSTAINABLE ENERGY INVESTMENT PROGRAMME II

Ms. Sherry Waithe
Project Officer
Project Execution Unit
Ministry of Energy and Water Resources

PRESENTATION ON THE ENVIRONMENTAL IMPACT FOR THE PROGRAMME

Mr. Ricardo Calvo
Consultant
Inter-American Development Bank

QUESTION AND ANSWERS

SUSTAINABLE ENERGY INVESTMENT PROGRAMME II (ENERGY SMART FUND II)

PROGRAMME OBJECTIVE

The objective of the Sustainable Energy Investment Programme II (Energy Smart Fund II) is to reduce Barbados's dependency on imported fossil fuels through the increased use of renewable energy and energy efficiency technologies.

TOTAL BUDGET - USD\$50 million

- ◇ Inter-American Development Bank (USD \$30.0 million)
- ◇ European Commission (€13 million ~ USD \$15 million)
- ◇ Caribbean Development Bank (USD \$5 million)

DURATION - 6 YEAR PROGRAMME

PROJECT COMPONENTS

Component 1 – Technical Assistance and Loan facility for Small and Medium Enterprises (SMEs): comprises a package of financing instruments aimed at providing funding to energy users to design and develop renewable energy and efficiency projects, including electric mobility for SMEs and the Tourism Sector.

PROGRAMME COMPONENTS (CONT'D)

Component 2 – Promoting Energy Efficiency and Renewable Energy in the Public Sector: funding will be available for the Government of Barbados to promote renewable energy and energy efficiency and other related technologies such as smart grids and energy storage that are conducive to the increase of renewable energy penetration.

Component 3 – Capacity Building and Institutional Support: will provide funding for capacity building and institutional strengthening activities for the Project Execution Unit, the Fund Manager of the Smart Fund, and other government entities with responsibilities related to energy efficiency and renewable energy.

Energy Efficiency Residential Project (CDB)- this includes the 'Residential Efficient Product Installation' project designed to offer residents free installation of low-cost energy efficiency upgrades. The project would be available to homeowners and renters regardless of income, but would focus heavily on reaching low income residents. This project will be implemented through parallel financing by the CDB.

PARTNERS...



**MINISTRY OF ENERGY
AND WATER RESOURCES**



FIND OUT MORE...

**MINISTRY OF ENERGY AND
WATER RESOURCES**

Trinity Business Centre,
Country Road, St. Michael
Tel: (246) 535-2509

www.energy.gov.bb
www.smartenergybarbados.com

PUBLIC CONSULTATION

**ENVIRONMENTAL IMPACT FOR THE
SUSTAINABLE ENERGY INVESTMENT
PROGRAMME II
(ENRGY SMART FUND II)**

**FEBRUARY 19, 2019
2:30 PM AT HILTON HOTEL
NEEDHAMS POINT
ST. MICHAEL**

Attachment 6 – Presentations

Sustainable Energy Investment Programme II (Energy Smart Fund II)



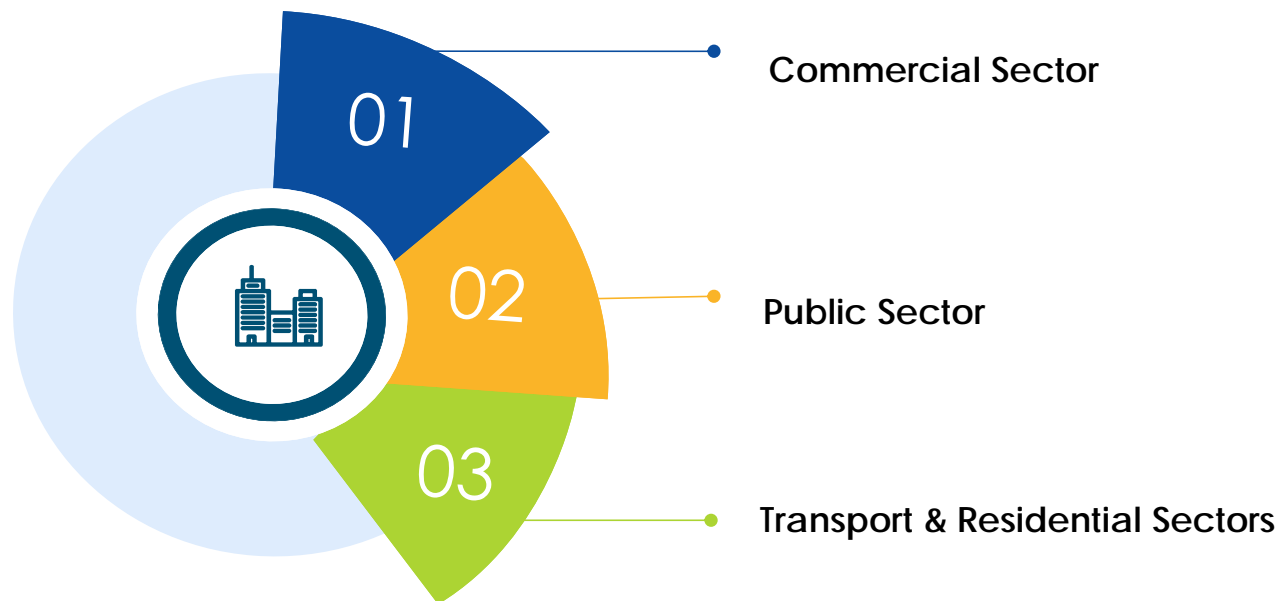
on

9

Project Framework



NET CARBON NEUTRAL ISLAND-STATE BY 2030



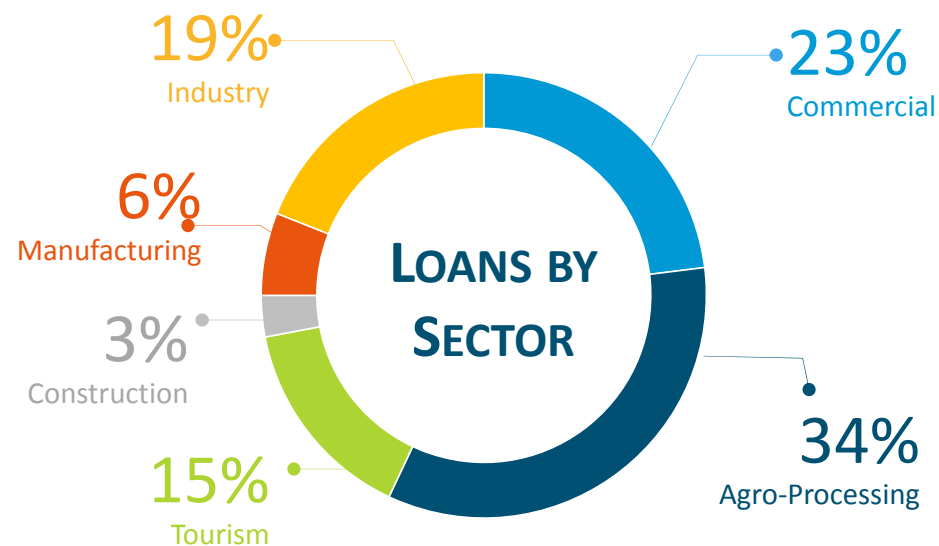
Project Context: Energy Smart Fund I Objective

- To promote the increased use of renewable energy (RE) and implementation of energy efficient (EE) technologies.
- To increase the country's energy security by reducing its dependency on imported fossil fuels.
- To increase local and global environmental sustainability by reducing emissions of polluting substances.
- To decrease energy costs.

Project Context: Energy Smart Fund I Successes

US\$
10M

US\$10 million loan to create a fund to promote EE and RE in the commercial sector



Project Context: Energy Smart Fund I (Lessons Learnt)

1

Develop mechanisms to raise client's awareness on the fund's financial attractiveness

2

Early identification and recruitment of key project personnel is critical

3

Capitalize on good governance structures

4

Continuous stakeholder engagement and dialogue

5

Leverage core competencies (Fund Manager)

6

Streamlining of technical processes

Energy Smart Fund II: Project Overview

- A package of financing instruments aimed at providing funding and technical assistance for energy users to design and develop renewable energy and energy efficiency projects;
- The promotion of renewable energy and related technologies that are conducive to increased renewable energy penetration (such as energy storage and smart grids); and
- Capacity building and institutional strengthening to enable the successful implementation of the programme.

Energy Smart Fund II: Project Objective

General Objective

To reduce Barbados's dependency on imported fossil fuels through the increased use of Renewable Energy (RE) and Energy Efficiency (EE) technologies.

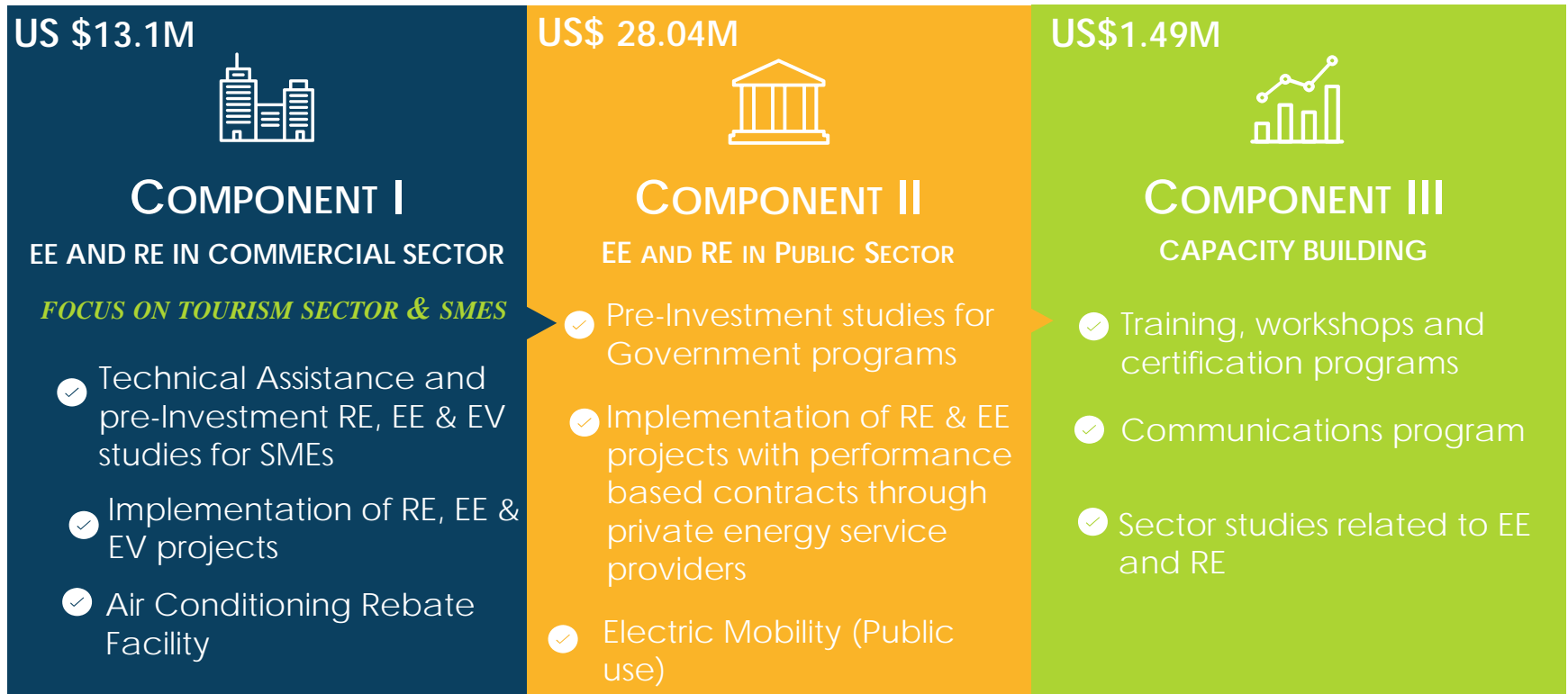
Specific Objective

- (i) reduce electricity consumption by implementing RE and EE measures;
- (ii) reduce Green House Gases (GHG) emissions from liquid fossil fuels used for power generation and transport; and
- (iii) increase institutional capacity for the management of RE and EE programs.

Energy Smart Fund II: Project Financing

- ▶ Project Cost: US\$ 50 million
- ▶ Funding: Inter-American Development Bank (US\$30M)
European Union (13 M Euros ~ US\$15 Grant)
Caribbean Development Bank (US\$5M)
- ▶ Instrument: Loan & Grant Financing
- ▶ Fund Manager: Enterprise Growth Fund Ltd

Energy Smart Fund II: Project Components



MANAGEMENT & ADMINISTRATIVE COSTS US\$ 2.1M

Energy Smart Fund II: Residential Component

- Provides incentives for households to access sustainable energy technologies including energy efficiency, renewable energy and solar water heaters.
 - ✓ Residential Efficient Product Installation Programme.
 - ✓ Designed to offer residents free installation of low-cost energy efficiency upgrades.

Energy Smart Fund II: Areas for Environmental and Social Concern

- ***Sub-component 1.3 - Air-Conditioning Trade-In Rebate Facility:*** will provide a 50 percent instant rebate for households and businesses to purchase energy efficient air conditioners.
- ***Sub-component 2.2 – Implementation of Energy Efficiency and Renewable Energy projects for the public sector:*** will finance the retrofitting of in excess of one-hundred (100) public buildings with renewable energy and energy efficiency technologies.

Energy Smart Fund II: Sub-component 2.2

Categories of Buildings

- Primary Schools



- Security Forces



- Fire Stations



- Day Nurseries



- Health Institutions



- Post Offices



- Children's Home



Energy Smart Fund II: Expected Outcomes

- 1) 1.4 million barrels of oil saved in imported fossil fuels for electricity generation;
- 2) 10.48 MW of Solar PV installed;
- 3) 90.7 GWh of annual electricity saved; and
- 4) 67,605 annual tons of CO₂e avoided.



PROJECT EXECUTION UNIT
MINISTRY OF ENERGY AND WATER RESOURCES

EMAIL:

SMARTFUND@ENERGY.GOV.BB

WEBSITES:

WWW.ENERGY.GOV.BB

WWW.SMARTENERGYBARBADOS.COM



Environmental Assessment

*Sustainable Energy Investment Program
SMART FUND II*

Presented by: Dr. Ricardo Calvo

February 19th, 2019

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written permission of ERM.

The business of sustainability



Objectives of this Presentation

- Present and discuss program related risks and impacts
- Provide proposed mitigation and management measures
- Allow for feedback

Beneficial Environmental and Social Objectives



The objective of the Smart Fund II Program is to promote Renewable Energy and Energy Efficiency Projects

The specific Project activities include:

- Installing energy efficient lighting
- Replacing existing AC units with higher efficiency units
- Seal and tint windows to improve building energy efficiency
- Replace government vehicles with energy efficiency vehicles



Project Description



Project Activities will

- Be conducted at government owned buildings
 - Located in urbanized/developed city areas
 - Be carried out inside existing facilities or on the sides/roofs (for AC unit replacements)
- Not include purchase or development of additional land
- Not lead to operational changes once the individual Projects have been implemented



Project Impacts



- The Objective of the Project is to lead to POSITIVE impacts
- Potential negative impacts associated with the Project can occur from:
 - The generation of fumes from sealants/adhesives used
 - The generation of waste:
 - Ozone Depleting Substances (refrigerants)
 - Heavy metals and acids (used oil, used car batteries)
 - Hazardous waste (discarded fluorescent light bulbs that contain mercury)

Potential Project Impacts – Climate and Air Quality



Potential Impact	Impact Significance (post mitigation measures)
Accidental release of refrigerants into the environment during air conditioning unit removal.	NEGLIGIBLE
Inappropriate disposal of refrigerants	NEGLIGIBLE
Reduction of the use of ODS.	POSITIVE
Reduction of the emission of greenhouse gases	POSITIVE

Potential Project Impacts – Hydrology, Geology, Topography, and Soils



Potential Impact	Impact Significance (post mitigation measures)
Accidental release of hazardous materials into the environment during transportation and/or storage.	NEGLIGIBLE
Inappropriate disposal of hazardous materials.	NEGLIGIBLE

Potential Project Impacts – Natural Disasters



Potential Impact	Impact Significance (post mitigation measures)
Hurricanes and natural fires.	NEGLIGIBLE

Potential Project Impacts – Flora and Fauna



Potential Impact	Impact Significance (post mitigation measures)
Accidental release of hazardous materials	NEGLIGIBLE
Inappropriate disposal of hazardous materials	NEGLIGIBLE

Potential Project Impacts – Human Resources



Potential Impact	Impact Significance (post mitigation measures)
Hazardous materials related effects on the public due to inappropriate handling of hazardous materials.	NEGLIGIBLE
Fire hazard risks due to accident release of refrigerants or used oils.	NEGLIGIBLE

Potential Project Impacts – Human Resources - Socio-Economic



Potential Impact	Impact Significance (post mitigation measures)
Project induced economic activity will result from contracting of materials and services during the construction	POSITIVE
Decrease in fossil fuel dependency.	POSITIVE
Increase use of renewable energy in Barbados.	POSITIVE
Reduction of the emission of greenhouse gases.	POSITIVE

Environmental and Social Management Plan



The Energy and Telecommunications Division's Program Manager will lead the Project Execution Unit (PEU) which is responsible for:

- Ensuring that all contractors comply with regulations regarding the handling and disposal of hazardous materials and hazardous wastes.
- Data collection and monitoring.



Summary of Management Measures per Waste Type



Activity	Waste Type	Waste Material	Management Measure
Treating and sealing windows	Non-haz waste	Silicone sealants and adhesives waste	Disposal at the mangrove pond landfill
Replacing air conditioning units	Haz waste / controlled substance	Used refrigerants containing ODS	The refrigerant should be collected in gas cylinders and shipped off the island to a facility that will ensure appropriate disposal.
Replacing vehicles	Haz solid waste	Used batteries Used oil	Used batteries can be recycled by local companies Used oil can also be recycled by local companies
Replacing fluorescent light bulbs	Hazardous	Light bulbs containing mercury gas	Collect and package the bulbs carefully to prevent them from breaking during transport to the facilities where they will be appropriately crushed and where the mercury gas will be collected for later transport off the island. If bulbs do break, personnel handling them should have “mercury spill kits” and the necessary ppe readily available in order to contain the spill and safely transport it to its final destination.

Specific Plan Requirements



The PEU will verify that activities are conducted in compliance with the ESMP and applicable regulatory requirements.

Specifically, 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

Conclusion



By applying industry-standard best practices standards, the overall impact of the Program on the environment physical, biotic, and socioeconomic will be **POSITIVE.**





Thank you

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The business of sustainability

