

PUBLIC

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

**BARBADOS**

**PUBLIC SECTOR SMART ENERGY (PSSE) PROGRAM**

**(BA-L1025)**

**LOAN PROPOSAL**

AND

**SUPPORT FOR THE PSSE PROGRAM**

**(BA-X1003)**

**INVESTMENT GRANT**

**GRANT PROPOSAL**

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## Abbreviations

AC	Air Conditioning
BAU	Business As Usual
bbl/d	Barrels of oil per day
BE	Bioenergy
BL&P	Barbados Light and Power
CO <sub>2</sub>	Carbon Dioxide
CCB/CBA	IDB Country Office in Barbados
CFL	Compact Fluorescents Lamp(s)
CHENACT	Caribbean Hotel Energy Efficiency Action Program
COFAB	Co-financing Contributions Administered by the Bank
CLFGS	Local Counterpart Financing
EC	European Commission
EE	Energy Efficiency
ESMR	Environmental and Social Management Report
ETD	The Energy and Telecommunications Division, Prime Minister's Office
FCA	Fuel Clause Adjustment
FTC	Fair Trading Commission
GCI	General Capital Increase
GDP	Gross Domestic Product
GEED	Government Electrical Engineering Department
GEF	Global Environment Facility
GHG	Green House Gas
GOBA	Government of Barbados
IDB	Inter-American Development Bank
INE/ENE	Energy Division of the Infrastructure and Environment Department
kWh	Kilowatt hour
LAC	Latin America and the Caribbean
LED	Light Emitting Diode
MEPS	Minimum Energy Performance Standards
MTW	Ministry of Transport and Works
MW	Megawatts
MWh	Megawatt hour
MFIE	Ministry of Finance, Investment and Energy
PBP	Programmatic Policy Based Loan
PCR	Project Completion Report
PEU	Project Execution Unit
PMR	Project Monitoring Report
PR	Progress Report
PSG	Project-Specific Grant
PSSE	Public Sector Smart Energy (Program)

PV	Photovoltaic
OC	Ordinary Capital
RE	Renewable Energy
SEFB	Sustainable Energy Framework for Barbados
SME	Small and Medium Enterprise
SWH	Solar Water Heaters
tCO <sub>2</sub> e	Tons of Carbon Dioxide equivalent
UN ECLAC	United Nations Economic Commission for Latin America and the Caribbean
WAL	Weighted Average Life

**PROJECT SUMMARY**  
**BARBADOS**  
**PUBLIC SECTOR SMART ENERGY (PSSE) PROGRAM AND SUPPORT FOR THE PSSE**  
**(BA-L1025 AND BA-X1003)**

Financial Terms and Conditions				
<b>Borrower:</b> Government of Barbados (GOBA)  <b>Executing Agency:</b> Prime Minister's Office through its Energy and Telecommunications Division (ETD)			<b>Flexible Financing Facility (BA-L1025)*</b>	<b>PSG BA-X1003</b>
		<b>Amortization Period:</b>	25 Years	N/A
		<b>Original WAL</b>	15.25 Years	N/A
		<b>Grace Period:</b>	5 Years	N/A
<b>Source (US\$)</b>	<b>Amount</b>	<b>Disbursement Period:</b>	5 Years	5 Years
<b>IDB (OC)</b> <b>European Commission (EC) - Project-Specific Grant (PSG) BA-X1003***</b>	17,000,000	<b>Supervision and Inspection Fee:</b>  <b>Interest Rate:</b>  <b>Credit Fee:</b>  <b>Administrative Fee:</b>	**	N/A
	7,664,000		LIBOR-based	N/A
	--		**	N/A
<b>Local</b>	--		N/A	5%***
<b>Total</b>	24,664,000	<b>Currency:</b>	US Dollar of Single Currency Facility	Euros
Project at a Glance				
<b>Project Objective/Description:</b> The objective of this Program is to promote and implement the use of Renewable Energy (RE) and Energy Efficiency (EE) measures through the creation of the Public Sector Smart Energy (PSSE) Program. Ultimately, the project will help to reduce Barbados' fossil fuel dependency, promote sustainable energy and therefore contribute to the country's competitiveness. The specific objectives of the Program are to: (i) install RE systems in government buildings in the Program and retrofit these buildings and public lights with EE technologies; (ii) implement the RE pilot project and studies; and (iii) assist with capacity building, institutional strengthening and public awareness in the energy sector.				
<b>Special contractual clauses as a condition prior to first disbursement:</b> The selection of the Project Manager, Project Accountant, and Procurement Specialist for the PSSE Program by the ETD (see paragraph 3.2). Special contractual condition prior to first disbursement of Component I.(i): The Executing Agency shall have contracted the Barbados Light & Power (BL&P) for the procurement and installation of Energy Efficient Street Lights (see paragraph 2.7).				
<b>Exceptions to Bank policies:</b> Partial exceptions to the Policies for Procurement of Works and Goods and the Policies for the Selection and Contracting of Consultants Financed by the IDB (GN2349-9 and GN-2350-9) as of March 2011 are requested in order to allow goods and related services and consultancy services originating from non-Bank member countries may be eligible for procurement, provided that the country of origin of the goods and related services and consultancy services is recognized as eligible by the EC under its applicable regulations and as indicated in the Framework Agreement between the EC and the IDB (GN-2605) (see paragraph 2.4).				
<b>Project consistent with Country Strategy:</b>		Yes <input checked="" type="checkbox"/> [ X ]	No <input type="checkbox"/> [ ]	
<b>Project qualifies for:</b>		SEQ <input type="checkbox"/> [ ] PTI <input type="checkbox"/> [ ] Sector <input type="checkbox"/> [ ] Geographic <input type="checkbox"/> [ ] Headcount <input type="checkbox"/> [ ]		
<b>Procurement:</b> The Loan will finance contracts for procurement of works, goods and related services and consultancy services in accordance with the Bank's procurement policies (documents GN-2349-9 and GN-2350-9) with the exceptions stated in paragraph 2.4. Annex III outlines the agreements for managing procurement.				

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(\*) Under the Flexible Financing Facility (FN-655-1) the Borrower has the option to request modifications to the amortization schedule as well as currency and interest rate conversions, in all cases subject to the final amortization date and original Weighted Average Life (WAL). In considering such requests, the Bank will take into account market conditions and operational and risk management considerations.

(\*\*) The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable provision of the Bank's policy on lending rate methodology for ordinary capital loans. In no case will the credit fee exceed 0.75% or the inspection and supervision fee exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.

(\*\*\*) Grant resources to be provided to GOBA by the European Commission (EC), under the Framework Agreement with the European Commission (GN-2605), will be administered by the IDB through a Project-Specific Grant (PSG). The EC is expected to commit 5,810,000 in Euros, which is equivalent to 7,664,000 in U.S. Dollars, based on the exchange rate of April 13, 2012. A PSG is administered by the Bank according to Document SC-114. As contemplated in these procedures, and in the "Framework Agreement between the European Commission and the Inter-American Development Bank," dated July 19, 2011, the commitment from EC will be established through a separate "Standard Contribution Agreement" ("Contribution Agreement"). EC resources will be available once the Contribution Agreement is signed with EC and the funds from EC are received by the Bank. Contributions received from the EC shall be maintained and reported in Euros, and all commitments and disbursements shall also be administered and executed only in that currency, unless the IDB and EC agree otherwise in writing (see paragraph 1.21). Therefore, the amount in US Dollars associated with the EC contribution is provided for reference purposes only. In accordance with the Contribution Agreement to be entered into between EC and the Bank these resources will be administered by the IDB and the IDB will charge an administrative fee for this purpose equivalent to 5% of EC's contribution.

## I. DESCRIPTION AND RESULTS MONITORING

### A. Background, Problem Addressed, Justification

- 1.1. Barbados energy consumption relies mainly on imported oil. Although Barbados produces some oil, domestic demand (about 10,000-barrels per day (bbl/d)) greatly exceeds local supply (about 800-bbl/d), requiring 9,200-bbl/d of imported oil. This dependency impacts the Barbadian economy at the macroeconomic level and at the consumer level. The international oil price increased 42% during 2011, resulting in significant increase of the fuel import bill, which is estimated at US\$303 million<sup>1</sup>. The fuel imports represent a significant expenditure and drain on Barbados' foreign reserves, particularly considering the high degree of volatility in international oil markets. According to the Government of Barbados (GOBA), the fuel import bill (approximately 6% of Barbados' GDP) is equivalent to Barbados' expenditures on education.
- 1.2. Barbados Light and Power (BL&P) can directly pass through fuel costs to consumers by using a Fuel Clause Adjustment (FCA). The FCA reached an all-time high in August 2008 of US\$0.25 per kilowatt hour (kWh). This would have meant a monthly electricity bill of about US\$158 for a customer consuming 400kWh per month. This figure is striking when compared to other countries in Latin America and the Caribbean (LAC). In 2008, customers were cushioned from the full impact of the increase through a government subsidy on fuel oil used for electricity generation. This subsidy on the FCA cost the GOBA approximately US\$18 million.
- 1.3. Therefore, Barbados' high dependence on fossil fuels risks jeopardizing the sustainability of its economic and social development, as well as the competitiveness of the Barbadian economy. Power generation represents the main use of fuel in the country (50%), followed by transport (33%). According to the 2008 report of the Barbados Light & Power Company (BL&P), the sole electricity provider, the country's electricity is entirely fossil-fuel generated, with 82% from heavy fuel oil (of which 19 % is from steam plants, and 63% from low-speed diesel plants), and 18% from diesel fuel.
- 1.4. Given the aforementioned economic challenges, the GOBA is committed to promoting sustainable energy practices both on the supply side, mainly using RE sources, and on the demand side, by encouraging EE and energy conservation as means to reduce the country's dependency on fossil fuels, enhance security and stability in energy supply, improve the economy's competitiveness, and achieve greater environmental sustainability<sup>2</sup>.

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<sup>1</sup> Barbados Article IV Consultation. IMF Country Report No. 12/7.

<sup>2</sup> Similar experiences in LAC support the adoption of EE and RE. For instance, with an operation of around US\$5 million (BH-X1001) Bahamas has achieved savings of 11,333, 295.5, and 113 MWh/year for the implementation of solar water heaters (SWH), efficient lights, and solar PVs, respectively. Other countries of the Caribbean have also recently shifted their energy interventions towards EE and RE (e.g., EE Loan in Jamaica in execution; JA-L1025). For RE, see more cases in: Gischler C. and Janson N. (2011), "*Perspectives and Trends in the Distributed Generation of Renewable Energy in Latin America and*



- 1.5. Since 2009, the Inter-American Development Bank (IDB) has supported the GOBA in the implementation of a Sustainable Energy Framework for Barbados (SEFB), through: (a) a package of policy-based lending (2410/OC-BA; 2609/OC-BA and BA-L1024 in preparation)<sup>3</sup>; (b) technical assistance in: assessing the potential for Renewable Energy (RE) and Energy Efficiency (EE) for the SEFB, ATN/OC-11473-BA; supporting GOBA in drafting policies and legislation in RE and EE; ATN/OC-12737-BA<sup>4</sup>; energy audits in Barbadian Hotels with the Caribbean Hotel Energy Efficiency Action Program CHENACT and the advanced program, CHENACT-AP<sup>5</sup>, ATN/OC-11465-RG and ATN/OC12926-RG; and support studies for the Upgrade and Expansion of the Natural Gas Network, ATC/OC-11995-BA, which contributed to the analysis of the efficient use of fossil fuels; and (c) an investment loan, Sustainable Energy Investment Program or Smart Fund, 2485/OC-BA; BA-L1020, that helps small businesses acquire state-of-the-art RE and EE equipment.
- 1.6. Within this framework, the IDB is also implementing, with funding from the Global Environmental Facility (GEF) (GRT/FM-12075-BA), the Sustainable Energy Framework (SEF) pilot program for the installation of solar photovoltaic (PV) panels and CFLs across the country<sup>6</sup>. Furthermore, the IDB technical assistance also supports institutional strengthening, capacity building and public awareness programs.
- 1.7. This holistic approach will allow Barbados to reduce its oil imports by 30%, and by extension it will result in a reduction of the cumulative cost over 20 years from

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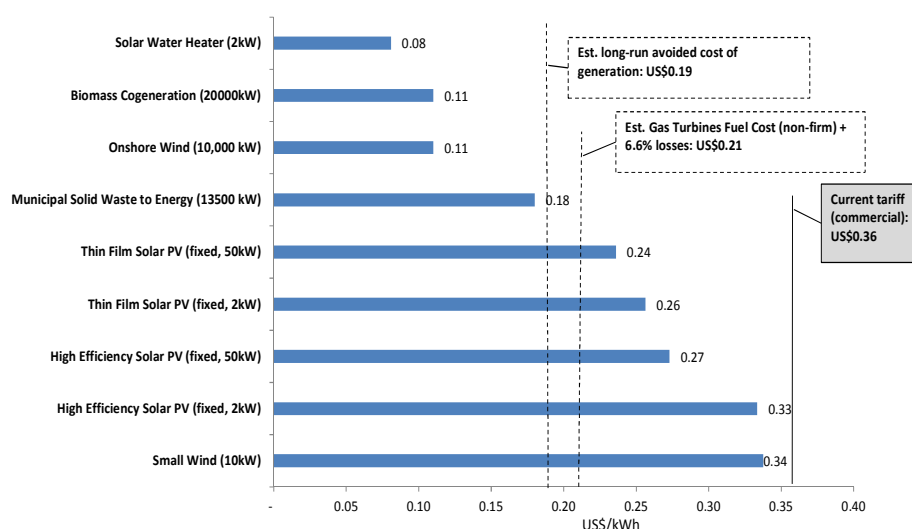
*the Caribbean: Analysis of Case Studies for Jamaica, Barbados, Mexico, and Chile*. Discussion Paper No. IDB-DP-208.

- <sup>3</sup> On September 15, 2010, the Board of Directors of the IDB approved the first operation in a series of two independent policy based loans under a programmatic approach (2410/OC-BA; BA-L1022) for US\$45 million, which was disbursed in a single tranche on November 23, 2010. The second operation in the series (2609/OC-BA; BA-L1021), for US\$70 million, was approved on November 2, 2011 and disbursed in a single tranche on December 12, 2011. The outcomes achieved as of 2011 include, among others: a) The facility for private individuals to feed excess power to the grid at an approved rate for a two year pilot period; b) The GOBA's awareness of the available measures to foster a reduction in GHG emissions and adaptation to CC; and b) The approval of a phase-out plan for incandescent lamps. In addition, a new Programmatic Energy Policy Based Loan called "Second Generation of Reforms to support the SEFB – I" (BA-L1024) of two phases is being prepared simultaneously with the PSSE. The new Energy PBP will continue to strengthen the regulatory and policy framework required to promote Energy efficiency (EE) and Renewable Energy (RE).
- <sup>4</sup> This Technical Cooperation supported the GOBA: by (i) assisting in the development of draft legislation in RE and EE; (ii) preparing cost-benefit analysis of the proposed measures; and (iii) study additional measures, such as replacement of street lighting with EE lamps and retrofitting of government buildings with EE equipment, structured as part of this operation.
- <sup>5</sup> Thanks to the success of the CHENACT, the IDB approved in September 2011, the CHENACT Advanced Program (CHENACT-AP, RG-T2015) to expand the CHENACT to Jamaica and the Bahamas as well as a follow-up of the first phase of the CHENACT in Barbados.
- <sup>6</sup> The SEFB Pilot Program has begun the tendering process and it is expected to begin the installation phase during the third quarter of 2012. This pilot program, executed in cooperation with BL&P and the GOBA, will install 3,000 power meters, 15,000 CFLs, 28 PV systems and 1 micro wind system, in selected households. The PSSE will take into consideration the lessons learned from the tendering process of this pilot. In particular, lessons regarding on how to expedite the bidding processes by involving the Special Tenders Committee and the Solicitor General Office, at a very early stage of the project.

US\$ 2.648 billion to US\$ 1.978 billion. If fully implemented, the SEFB will obtain the following long-term results, over the next 20 years: (i) generate a net benefit in present value of US\$283.5 million in electricity cost savings (5% of Barbados' GDP); and (ii) reduce monthly electricity bills by 15-20%<sup>7</sup>.

- 1.8. **RE Implementation Potential.** As shown in figure 1, the implementation of biomass cogeneration (20MW), waste to energy (13.5 MW) and SWH are economically and commercially viable (when compared to the long-run avoided cost of generation of US\$0.19 per kWh); therefore, these technologies are all recommended and may operate below the avoided cost of fossil fuel. Even today some of the PV technology and distributed scale wind technologies could be commercially viable in Barbados. The overall commercially and economically viable RE potential that could be deployed is estimated at 28.9% of the total installed capacity of electricity generation (in terms of MW).

**Figure 1: Analysis of technically and economically feasible renewable energy technologies available in Barbados.**

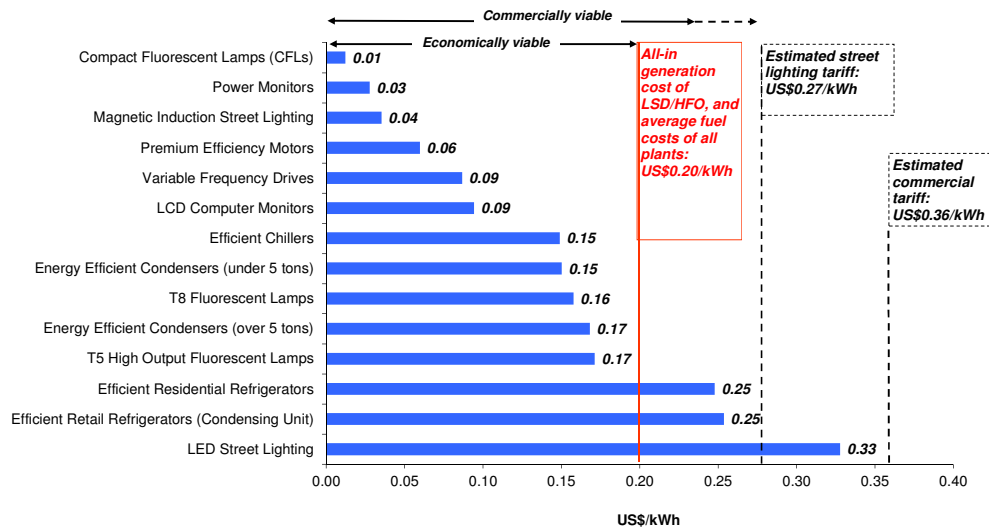


Source: Adapted from C. Gischler and N. Janson (2011). *Perspectives for Distributed Generation with Renewable Energy in Latin America and the Caribbean*. IDB DP No. 208 and from Castalia Consulting Firm

- 1.9. **EE Implementation Potential.** Figure 2 below compares the cost of energy efficient appliances and technologies with the current generation costs and the commercial tariff in Barbados. It shows that the most cost effective appliances for Barbados' market are CFLs, power monitors, premium efficiency motors, efficient Air Conditioning (AC) systems, variable frequency drives and efficient chillers (when these are compared to the avoided cost of diesel, indicated by the red line in figure 2). If the population of Barbados uses these technologies, the EE potential would be 19.4% (in terms of Megawatt hour (MWh) saved compared to the total electricity consumption).

<sup>7</sup> The long-term results have been assessed with the SEFB Cost-Benefit Analysis, financed with the ATN/OC-11473-BA.

**Figure 2: Analysis of the commercial and economic viability of energy efficient technologies in Barbados (Source: Castalia Consulting Firm).**



- 1.10. The RE and EE potential was calculated considering a limited penetration of RE and EE projects (with the exception of SWH) implemented as of May 2010 and extrapolated over a period of 20 years, comparing a business as usual (BAU) scenario with a limited<sup>8</sup> number of RE and EE projects in the energy matrix versus a Sustainable Energy scenario where technically and commercially viable RE and EE projects are incorporated in the energy mix<sup>9</sup>.
- 1.11. The RE and EE market barriers. Although many RE and EE technologies are commercially viable, their uptake in Barbados is low (with the exception of SWH), mainly due to the following barriers: (i) limited access to capital, as many consumers would have need to borrow to install RE or EE technologies and cannot find financing at reasonable rates; (ii) limited and uncompetitive RE and EE equipment supply (with the exception of SWH)<sup>10</sup>; and (iii) lack of information<sup>11</sup>. These barriers will be addressed through investments in RE and EE

<sup>8</sup> The BAU scenario would consider a minor portion of RE projects (10 MW of wind).

<sup>9</sup> Assumptions on annual growth in electricity customer numbers are the same for both the BAU and Sustainable Energy scenario. They are consistent with projections carried out by BL&P, taking into account historical data for the period between 1982 and 2008. On the other hand, the assumed growth in average electricity consumption under the Sustainable Energy scenario is lower than under the BAU scenario for all customer categories. Reduced growth in consumption under the Sustainable Energy scenario is assumed based on implementing the SEFB.

<sup>10</sup> There are relatively few providers of energy efficient equipment—which is virtually all imported. It is suggested that this situation creates two market barriers in Barbados: relatively high prices, and limited availability of EE equipment. This is likely to be a temporary barrier as the market for EE equipment develops and becomes more competitive, but in the shorter term it affects all EE technologies. For example, efficient light bulbs in stores cost about 50 percent more than in the United States—in spite of often not being of the best quality.

<sup>11</sup> A complete analysis of the barriers for RE and EE can be seen in the link to the Sustainable Energy Framework for Barbados (volumes 1 and 2).

retrofits for public buildings (see paragraph 1.18) and public awareness and education (see paragraph 1.20).

- 1.12. **Rationale.** The Public Sector Smart Energy (PSSE) Program (“The Program”) will focus on investments initiatives for RE and EE projects in the public sector. In parallel, the Energy Smart Fund (BA-L1020) is developing a package of economic instruments targeting SMEs (private sector only) to address the main market failures that prevent the country from adopting RE and EE. Consequently, both the private and public sectors of the country will be actively contributing to the achievement of the overall objective of reducing the country’s fossil fuel dependency. Besides power generation, and in order to further reduce Barbados’ fossil fuel dependency, the next possible sector in which energy savings could be made is transport. This Program will pilot the introduction of electric vehicles powered by renewable energy sources. In this way, additional energy savings could be harnessed.
- 1.13. Barbados is taking the lead on how both the private and public sector can reduce the usage of fossil fuel. By developing this Program, the GOBA is both setting an example for the region in this area, and also saving an average of yearly fiscal resources in the order of US\$ 2.4 million/year<sup>12</sup> that the GOBA could use for other purposes.
- 1.14. **Coordination with Country Strategy / Programming objectives.** The Program is fully consistent with the energy priority area of the IDB Country Strategy with Barbados (2009-2013) (GN-2539). In particular, the Program will contribute to the strategy’s objective of achieving “expansion of programs to support EE and RE,” and to the specific expected result associated with that objective of “expanded demand-driven funding for RE and EE initiatives.”
- 1.15. The operation also reflects the IDB’s institutional priorities as outlined in the report on the Ninth General Capital Increase in Resources for the Inter-American Development Bank (GCI-9) (AB-2764) as it contributes to the goals of (i) “supporting development in small and vulnerable countries” (such as Barbados) and (ii) “assisting borrowers in dealing with mitigation and adaptation to climate change, sustainable energy (including renewable energy and energy efficiency) and environmental sustainability.” As such, the program is in line with the Integrated Strategy for Climate Change Adaptation and Mitigation, and Sustainable and Renewable Energy (GN-2609-1).
- 1.16. **The Energy and Telecommunications Division (ETD) of the Office of the Prime Minister.** This Division, previously in the Ministry of Finance, Investment and Energy (MFIE) (see paragraph 2.5) is responsible for the management of the energy sector of Barbados, through the monitoring of activities of the Barbados National Oil Company and the National Petroleum Company; pricing of petroleum products; and setting goals and objectives of policy direction for the sector. The ETD is also responsible for the development of the current tax

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<sup>12</sup> Yearly financial savings represent savings compared to the ‘baseline technologies’—that is, technologies that are currently being used and that the GOBA would keep using under a BAU scenario.

incentives for the support of RE and EE. The Division has produced a draft National Energy Policy which was laid in Parliament in 2007. The current SEFB activities support the further development of a comprehensive National Energy Policy. The Public Sector Energy Conservation Program is the responsibility of the Division. The SEFB is an initiative of the Division to ensure an economically, socially and environmentally sustainable energy sector for the island.

**B. Objective, Components and Cost**

- 1.17. **Project Objective.** The objective of this Program is to promote and implement the use of Renewable Energy (RE) and Energy Efficiency (EE) measures through the creation of the Public Sector Smart Energy (PSSE) Program. Ultimately, the project will help to reduce Barbados' fossil fuel dependency, promote sustainable energy and therefore contribute to the country's competitiveness. The specific objectives of the Program are to: (i) install RE systems in government buildings in the Program and retrofit these buildings and public lights with EE technologies; (ii) implement the RE pilot project and studies; and (iii) assist with capacity building, institutional strengthening and public awareness in the energy sector.
- 1.18. **Component 1: Retrofit of government buildings with RE and EE technologies and public lights with EE technologies.** This component will finance: (i) the retrofit of public lights with EE technologies; (ii) the retrofit of at least twelve (12) government buildings with EE technologies; and (iii) the installation of solar PV systems on these government buildings<sup>13</sup> (see paragraph 1.12). The total capacity of Solar PV systems in the government buildings will amount to 1.14 MW of RE electricity capacity from RE sources (in particular solar PV systems). Regarding the public lighting, this component will retrofit approximately eighty five percent (85%) of Barbados' public lights, including approximately 25,460 street lights and 619 traffic lights. This component could save about 148 GWh of electricity; enable around US\$2.4 million in annual monetary savings and a total of US\$24.8 million of net financial savings for the GOBA; and avoid 130,617 tons of CO<sub>2</sub> emissions over a 20-year period.
- 1.19. **Component 2: A pilot project and studies for encouraging the use of RE.** This component will finance: (i) a fleet of government electric vehicles powered by RE sources. This fleet of electric vehicles will be used to promote low carbon transportation technologies in Barbados<sup>14</sup>; and (ii) studies culminating in a business prospectus to facilitate the construction and operation of an ocean power plant. The ocean power studies will serve as a platform for Barbados to assess the feasibility of this technology.

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<sup>13</sup> Based on an estimated 1040.8kW for twelve public buildings, prioritized by the GOBA and assessed under the SEFB are the following: 1.Government Headquarters, 2.Warrens Office Complex, 3.Geriatric Hospital, 4.Ministry of Agriculture, 5.Ministry of Education, 6.Ministry of Foreign Affairs, 7.Parliament Building, 8.National Housing Corporation, 9.Queen Elizabeth Hospital, 10.Frank Walcott Building, 11.Lloyd Erskine Sandiford (LES) Conference Centre, 12.Harrison College; as well as an additional 100kW on a separate public building.

<sup>14</sup> The Program will purchase at least eight electric vehicles and charging dock installations. The Program will also purchase a 50kW solar PV system to charge the vehicles' batteries. The pilot will promote low carbon transportation as way to further reduce the country's dependency on fossil fuels.

- 1.20. **Component 3: Capacity building, institutional strengthening and public awareness.** In order to achieve the objectives of the SEFB and generate the transformational effect in Barbados to promote and harness the country's RE and EE potential, capacity building and institutional strengthening will be required at all levels within the energy sector. This component will finance the following subcomponents: (i) capacity building and training<sup>15</sup> to upgrade professional and technical skills; (ii) upgrade of capacity within the GOBA in all sectors related to sustainable energy; (iii) public awareness campaigns at all levels to promote sustainable energy, such as schools, government, media, conventions, conference and workshops. This subcomponent will allow the GOBA to implement an awareness and education program to promote RE and EE throughout the country, including schools, universities, labor unions, and broader civil society; (iv) a Project Execution Unit (PEU) for the PSSE Program in the ETD (see paragraph 3.2) as well as software for data collection; and (v) the monitoring and evaluation of the PSSE Program, including the data collection and analysis of the impact, outcomes and output indicators of the results matrix (see Annex II) using the methodologies explained in the Monitoring and Evaluation arrangements (see link 2). The PSSE Program will be committed to gender equality and it will encourage women to participate in any training and to apply for any job opportunities.
- 1.21. **Cost and additional financing:** The total estimated budget is US\$24,664,000. The Bank will finance up to US\$17 million from the Ordinary Capital (OC) resources under the Flexible Financing Facility. The EC is expected to contribute Euros with a Project-Specific Grant (PSG) of Euros 5,810,000 which is equivalent to 7,664,000 in U.S. Dollars, based on the exchange rate of April 13, 2012. The PSG will be administered by the IDB according to the "Report on COFABs, Ad-Hocs and CLFGS and a Proposal to unify them as Project-Specific Grants" (Document SC-114). In accordance with the Contribution Agreement to be entered between EC and the Bank the IDB will charge an administrative fee of 5% to cover administrative and indirect costs deriving from the project. The 5% fee, duly identified in the budget table (see table 1 below), will be charged and converted into US\$ when the first installment is received by the IDB. Resources of the EC shall be maintained and reported in Euros, and all commitments and disbursements shall also be administered and executed only in Euros, unless the

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<sup>15</sup> Women will be encouraged to participate in training for upgrading of skills for electricians and installers of PV systems and EE equipment, an area usually dominated by male participation. The training will target government officials, such as: the Government Electrical Engineering Department (GEED), the ETD, the Ministry of Transport and Works (MTW) as well as the utility (the BL&P), suppliers of electric equipment, solar equipment installers, electricians among other technicians and professionals in the sector.

IDB and the EC agree otherwise in writing as part of the Contribution Agreement or elsewhere<sup>16</sup>.

- 1.22. In accordance with the Contribution Agreement to be entered into between EC and the IDB these resources will be administered by the IDB and the IDB will charge an administrative fee for this purpose equivalent to 5% of EC contribution.

**Table 1. Program Costs**

Components	IDB	EC*		Total
	(US\$)	(Euros)	(US\$)	
<b>1. Retrofit of government buildings with RE and EE technologies and public lights with EE technologies</b>				
1.1. EE Retrofits for Public Lights	3,850,000	4,645,300	6,127,638	9,977,638
1.2. EE Retrofits for Public Buildings	4,150,000	-	-	4,150,000
1.3. Solar PV for Public Buildings	5,500,000	-	-	5,500,000
<b>2. A pilot project and studies for encouraging the use of RE</b>				
2.1. Public Electric Vehicles with solar PV	300,000	-	-	300,000
2.2. Ocean Power Studies	-	758,000	999,882	999,882
<b>3. Capacity building, institutional strengthening, public awareness and Project management</b>				
3.1. Capacity Building, Institutional Strengthening, and Public Awareness	1,700,000	-	-	1,700,000
3.2. Monitoring & Evaluation and Project Management	1,500,000	116,200	153,280	1,653,280
<b>4. Administrative Fee (5%)</b>	-	290,500	383,200	383,200
<b>Total</b>	<b>17,000,000</b>	<b>5,810,000</b>	<b>7,664,000</b>	<b>24,664,000</b>

Notes: \* Resources of the EC shall be maintained and reported in Euros, unless the IDB and EC agree otherwise in writing (see paragraph 1.21). The amount in US Dollars associated to the EC contribution is provided for reference purposes only.

## C. Key Results Indicators

- 1.23. **Expected Results.** According to the Program's Cost-Benefit Analysis, the PSSE Program may generate positive net benefits<sup>17</sup> both with a 12% social discount rate

<sup>16</sup> Therefore, the total amount indicated in U.S. dollars in this budget related to the EC contribution is for reference purposes only and may vary due to exchange rate fluctuations, depending on the applicable exchange rate at the time when the EC payments of the contribution are received and converted into U.S. dollars by the IDB, as may be provided in the Contribution Agreement. If necessary, the budget will be adjusted accordingly by the team leader to reflect such fluctuations (see table 1 Program Costs). This Loan Proposal, may be included as an annex to the Contribution Agreement, although a consolidated budget (i.e., without detailing the allocation of each of the parties' resources per component) may be used to reflect the fungible nature of the EC contribution and comply with EC requirements.

<sup>17</sup> The Internal Rate of Return of the Project is 12.2%.

- and with a 6% social discount rate<sup>18</sup>. For the latter, the net present value is estimated at US\$7.27 million over a twenty-year period, compared to a business-as-usual (BAU) scenario that involves no additional investments in sustainable energy for public lighting, public buildings, and RE pilot projects. The benefits of the Program will stem from savings on electricity bills, revenues from the sale of excess electricity to the grid, financial revenues from sale of emissions reductions, and savings on fuel consumption. In addition the PSSE Program could abate more than 132,000 tCO<sub>2</sub>e over a twenty-year period.
- 1.24. The GOBA has available roof space on public buildings to install solar PV systems to generate electricity both for self-consumption and to sell the excess to the grid. With a capacity of about 1.14 MW of installed PV systems, the energy and financial savings could amount to about 1.7 GWh/year<sup>19</sup> and US\$0.59 million per year<sup>20</sup> respectively. Through the financing of RE equipment, the project will promote the generation of at least 1 MW of RE distributed generation and energy savings of at least 30 GWh, as well as financial savings from the reduction in electricity bills.
- 1.25. The baseline, results and target for the PSSE Program can be found in the Project Results Framework (see annex II). The financing of RE projects will increase self-generation and distributed generation with the possibility of selling excess electricity to the grid, thereby lowering the energy bill of end users and contributing to reduce fossil fuel electricity generation that would have been necessary without this project. The PSSE Program, sponsored by GOBA, EC and IDB can benefit from the Fair Trading Commission's (FTC) approval of a rider allowing private individuals, companies and/or public entities to feed excess power from RE technologies into the grid for a pilot period of two years. The RE rider<sup>21</sup> introduces tariffs and terms for a feed-in tariff for PV and micro wind applications. It is expected that after the two year trial, FTC may approve the same policy for a longer period of time.
- 1.26. Overall, the PSSE Program, as part of the Sustainable Energy Framework for Barbados, will contribute to reduced GHG emissions and mitigate climate change. The project team estimates that, the PSSE Program would generate US\$45 million in electricity costs savings over the next 20 years and would avoid the production of more than 132,000 tCO<sub>2</sub>e emissions, which are concrete environmental benefits, over the same period.

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<sup>18</sup> The CBA also uses the 6% as an approximation to a referential social discount rate for climate change mitigation and adaptation in Barbados. See: United Nations Economic Commission for Latin America and the Caribbean (UN ECLAC), 2011: Review of the Economics of Climate Change in the Caribbean.

<sup>19</sup> Assuming a 19% capacity factor (1,700kWh/kW/year) for solar PV panels.

<sup>20</sup> Assuming a General Service Tariff of US\$0.36/kWh of avoided retail electricity cost; and a Renewable Energy Rider of US\$0.26/kWh obtained for selling the excess power to the grid..

<sup>21</sup> The Rider approved by FTC will allow at least 200 RE connections, of which 28 connections will be financed by SEF Pilot Program, mainly PV systems, with a value of 1.8 times the Fuel Clause Adjustment (FCA) (US\$0.16 per kWh) for a period of 2 years. This policy commitment was included in the first phase of the Energy PBP.



- 1.27. **Sustainability of the PSSE Program.** The PSSE Program as part of the Sustainable Energy Framework for Barbados (SEFB) will trigger higher levels of energy efficiency and clean generation that is highly unlikely to be reverted. The savings-based structure for the Program's flow of funds can use savings accrued throughout the execution of RE and EE projects to pay for the Program's maintenance and replication. Furthermore, the Program is structured in accordance with the principles of the EE and RE Policies designed by the SEFB and currently approved by Cabinet. Through these Policies, the GOBA provides an environment that contributes to the sustainability of the PSSE Program. For instance, the GOBA will be able to replace the light bulbs at the end of lifetime or after a failure with similar or better technologies, given that the Minimum Energy Performance Standards (MEPS), stated in the EE policy, will allow the gradual phase out of inefficient light bulbs, as well as other inefficient lighting, by restricting import and sales of the inefficient technologies. Furthermore, by extrapolation of the current trend, by the time that a replacement is needed, efficient air conditioners, efficient lights, and efficient screens will be considered as international best practices, and it is likely that even more efficient equipment may be installed at even lower costs. In particular, there are consistent signals suggesting that Light Emitting Diodes (LEDs), an efficient lighting technology, will stay on the track of further decreases in costs. The same can be said of solar PV systems, which are likely to experience an increased penetration in Caribbean countries as costs continue to drop. Finally, supporting innovative technologies with a conservative part of the Program's budget may give Barbados a competitive edge in technologies that are being piloted elsewhere in the world.

## **II. FINANCING STRUCTURE AND MAIN RISKS**

### **A. Financial Instruments and Contractual Conditions**

- 2.1 The project will be financed through an investment loan and an investment grant as mentioned in paragraph 1.26. The loan will be financed with resources from the Ordinary Capital of the Bank under the framework of the Flexible Financial Facility. The amortization period will be 25 years, a Weighted Average Life (WAL) of 15,25, an original disbursement period of 5 years and a grace period of 5 years.

### **B. Environmental and Social Safeguard Risks**

- 2.2 Overall, the project classified as B, will have net positive environmental effects due to the potential impacts in GHG emission reductions, substitution of fossil fuel based electricity generation and climate change mitigation brought by the implementation of EE and RE measures. The type of operations currently envisioned for support by the Program (EE appliances and measures, distributed power generation using RE technologies, such as solar PV systems, for government buildings) are likely to have minimal to moderate adverse environmental impact (see the ESMR in link 3).

## C. Risks and Special Considerations<sup>22</sup>

- 2.3 **Fiduciary Risk.** Based on the Institutional Capabilities Assessment (SECI, acronym in Spanish) and the IDB project team's assessment, the ETD has a solid knowledge of the energy sector, and is the most qualified entity to execute the Program. However, its institutional and fiduciary capacity is limited and needs to be strengthened through the assignment of additional staff to support the execution of the PSSE Program. In order to facilitate the procurement of goods, works and related services, and consultancy services, a Procurement Specialist, funded by the Program will provide support to the ETD.
- 2.4 Procurement for this Program financed in whole or part by the IDB will be carried out in accordance with the Policies for Procurement of Works and Goods Financed by the IDB (GN2349-9) of March 2011 and the Policies for the selection and Contracting of Consultants (GN2350-9) of March 2011; and the provisions established in the Loan Contract, Non-reimbursable Financing Agreement and the procurement plan. **A partial waiver to the IDB's Policies for Procurement of Works and Goods and the IDB's Policies for the selection and Contracting of Consultants Financed by the IDB (GN2349-9 and GN-2350-9) of March 2011 is requested by the Project Team in order that goods, related services, and consultancy services from non-Bank member countries may be eligible for procurement provided that the country of origin of the goods, related services, and consultants is recognized as eligible by the EC under its applicable regulations, and as indicated in the Framework Agreement between the EC and the IDB.** The waiver will facilitate a seamless integration of the funds from both sources, allow for a more efficient administration process and allow procurement opportunities to be open to eligible countries under the EC's applicable regulations for origin of goods, related services and consultancy services.
- 2.5 **Procurement Plan.** The procurement plan for the PSSE Program covering the first 18 months of the program (from January 2013 to August 2014) is summarized in Annex III. It indicates the procedure to be used for the procurement of goods, the contracting of works or services, and the method of selecting consultants, for each contract or group of contracts. It also indicates cases requiring prequalification; the estimated cost of each contract or group of contracts; the requirement for ex ante or ex post review by the Bank; and estimated dates for the publication of specific procurement notices and completion of the contracts included in this project. The procurement plan will be updated annually or whenever necessary or as required by the Bank.
- 2.6 Procurement for the PSSE Program includes: (i) goods: (a) provision and installation of EE lights for public lights, (b) provision, installation, operation and maintenance of solar PV panels and EE equipment for government buildings, (c) provision of at least eight electric vehicles, and (d) public relations materials such as brochures; and (ii) consulting services to: (a) conduct assessments of EE retrofits of public lights and EE retrofits and solar PV systems for public

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<sup>22</sup> The overall risk of the program is rated low.

- buildings, (b) ocean power studies, (c) prepare public education materials, (d) support the execution of the Program through technical expertise and consultants to support the work of the ETD and (e) develop public awareness campaigns, implement and execute public education and awareness activities and media relations.
- 2.7 For the procurement of section (i).(a)., in accordance with paragraph 2.4, the Executing Agency will contract the BL&P to carry out the tendering process for the EE street lights and to install the EE street lights, within the execution period of the Program. The fee for and the execution of the contract for the operation and maintenance (O&M) of the EE street lights will be negotiated between the GOBA and the BL&P. The sole source is justified by the considerable experience of the BL&P in this field, given that this company owns the majority of street lights in the country. In addition, the BL&P follows strict safety procedures which might be difficult for other possible installers to adopt in a short period of time. **The Executing Agency shall have contracted the BL&P for the procurement and installation of EE street lights as a special contractual condition prior to first disbursement of Component I.(i).**
- 2.8 The contract for EE retrofits and solar PV for public buildings may be structured with performance-based payments. Under this type of contract, the performance of EE retrofits may be measured in terms of savings in electricity consumption compared to the 'baseline' consumption specified in the approved Baseline and Optimization Study, and the performance of PV systems will be measured in terms of energy output compared to the projected output specified in the Configuration and Roof Study. The O&M of the retrofits in Public Buildings will be carried out by the contractor for the execution period of the Program. The contractor will provide O&M manuals and training for each building's maintenance staff on how to do O&M before the end of the contract period.
- 2.9 For further information regarding the fiduciary and procurement arrangements, see Annex III - Fiduciary Arrangements and requirements.
- 2.10 **Execution Risk.** The PSSE Program presents some execution risks, given the limited institutional capacity of the ETD in the management and execution of RE and EE projects. This risk will be mitigated with the implementation of a PEU, including a Project Manager, Project Accountant, Procurement Specialist and a Project Assistant as well as software for data collection, funded through Component 3 of this Loan. The IDB, through INE/ENE and CCB/CBA, will also provide technical assistance to assist in the execution upon request of the GOBA.

### **III. IMPLEMENTATION AND MANAGEMENT PLAN**

#### **A. Summary Implementation Arrangements**

- 3.1. **Borrower and Executing Agency.** The GOBA will be the Borrower and the ETD will be the Executing Agency. The ETD will be responsible for the execution of the PSSE Program.
- 3.2. The ETD will establish a Project Executing Unit (PEU) to be financed from Component 3 (see paragraph 1.20) throughout the five-year execution period of

the PSSE Program including: (i) a Project Manager who will have overall responsibility for the PEU as well as for the coordination and execution of all the components and activities under the Program; (ii) a Procurement Specialist who will be in charge of designing and implementing the procurement plan; (iii) a Project Accountant who will be in charge of the fiduciary arrangements; and (iv) one Project Assistant. **The selection and appointment of the Project Manager, Project Accountant, and the Procurement Specialist for the PSSE by the ETD, will be a condition prior to first disbursement.**

- 3.3. **Co-financing with EC funds:** Grant resources to be provided by the EC will be administered by the IDB through a PSG, BA-X1003, pursuant to the terms of the Contribution Agreement to be entered into between EC and the IDB (see paragraph 1.21).
- 3.4. **Supervision and reporting:** The IDB Project Team will report to the EC on the EC-funded activities. The IDB will provide annual and final reporting to the EC, in compliance with the provisions of art. 2 of Annex II of the EC-IDB Framework Agreement (GN-2605). Reporting will be prepared on the basis of detailed input provided by the ETD (see paragraph 3.6).

**Table 2. Disbursement Schedule**

US\$ Millions	2013	2014	2015	2016	2017	Total
IDB Loan	1	11	3	1	1	17
EC Grant	0.64	3.2	2.7	1.03	0.1	7.664
Percentage (%)	6.64	57.57	23.11	8.22	4.46	100.00

- 3.5. **Execution period.** The execution period will start on signature of the Loan Contract, for a period of 5 years. The PSSE Program should be totally disbursed in that period.

## **B. Summary of Arrangements for Monitoring Results**

- 3.6. The IDB project team located both in Washington and in the Barbados Country Office will be in charge of monitoring the Program. The Borrower and the IDB have agreed to carry out follow-up meetings, initially on a quarterly basis. The ETD, through the PEU, will prepare semi-annual Progress Reports (PR) for the IDB's non-objection. These reports will include technical information in terms of (i) number of government buildings retrofitted; (ii) cumulative MW of RE introduced and MWh saved with EE measures or equipment; (iii) number of street lights retrofitted and MWh saved; (iv) the MW of RE introduced and MWh saved with EE measures; (v) fossil fuels saved (i.e., barrels of oil equivalent of electricity saved and generated by RE and EE measures); (vi) Program's Financial savings; (vii) CO<sub>2</sub> emissions avoided by the PSSE Program; and (viii) jobs created by the PSSE Program. The PEU will also monitor and evaluate the progress of the Program in relation to the Results Framework (see Annex II), and include such information in the semi-annual PRs. The ETD will also submit to the IDB annual audited reports as well as final audited financial statements of the Program. The Results Framework and the PRs are the principal elements for

monitoring the Program. The IDB and the ETD, through the PEU, will convene on specific reporting arrangements needed for reporting to the EC. Those arrangements will be included in the semi-annual PRs prepared by the PEU for the IDB's non-objection.

- 3.7. The ETD, through the PEU, will monitor installed RE equipment, and estimate excess energy sold to the grid from Government Buildings and energy savings, using the RE Rider or a similar mechanism (see paragraph 1.25). With the information gathered through the monitoring process, the ETD will prepare a mid-term and final evaluation of the PSSE Program (see link 2). The mid-term evaluation will be prepared after half of the execution period has elapsed or once 50% of the resources have been disbursed, whichever comes first. The final evaluation will be prepared when 90% of the resources have been disbursed.
- 3.8. The mid-term and final evaluation will measure, through a comparison between a BAU scenario vs. PSSE Program scenario and an expost Cost-Benefit Analysis, the following indicators: (i) savings in Government energy consumption and spending; (ii) avoided CO<sub>2</sub> emissions; (iii) jobs created by the PSSE Program; (iv) reduced fossil fuel use in Barbados's energy matrix; (v) emerging energy technologies demonstrated by wider uptake; and (vi) institutional capacity for sustainable energy programming.
- 3.9. In addition, a Project Completion Report (PCR) will be prepared within six months after the last disbursement of the Program. The PCR will evaluate the impact and results obtained by the program. The Borrower, through the PEU, is responsible for gathering information and data required for monitoring and evaluation.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives	Aligned		
Lending Program	This operation contributes to the lending program for (i) small and vulnerable countries, and (ii) support climate chance initiatives, renewable energy and environmental sustainability.		
Regional Development Goals	Protecting the environment, responding to climate change, promoting renewable energy, and enhancing food security (Stabilization of CO2 equivalent emissions (metric tons per habitant)).		
Bank Output Contribution (as defined in Results Framework of IDB-9)	The operation contributes to the following Bank outputs: (i) Infrastructure for competitiveness and social welfare (Km of electricity transmission and distribution lines installed or upgraded), (ii) Protecting the environment, responding to climate change, promoting renewable energy, and enhancing food security (Percentage of power generation capacity from low-carbon sources over total generation capacity funded by IDB, Number of people given access to improved public low-carbon transportation systems, and Climate change pilot projects in agriculture, energy, health, water and sanitation, transport, and housing).		
2. Country Strategy Development Objectives	Aligned		
Country Strategy Results Matrix	GN-2539	The operation is aligned with the country strategy objective related to strengthening institutional and policy framework for promoting EE and RE.	
Country Program Results Matrix	GN-2661-4	The operation is included in the 2012 Country Program Document.	
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability	Highly Evaluable	Weight	Maximum Score
	9.1		10
3. Evidence-based Assessment & Solution	9.8	25%	10
4. Ex ante Economic Analysis	10.0	25%	10
5. Monitoring and Evaluation	6.6	25%	10
6. Risks & Mitigation Monitoring Matrix	10.0	25%	10
Overall risks rate = magnitude of risks*likelihood		Low	
Environmental & social risk classification		B	
III. IDB's Role - Additionality			
The project relies on the use of country systems (VPC/PDP criteria)			
The project uses another country system different from the ones above for implementing the program	Yes	The program will use the national system for supervision, evaluation and monitoring of RE and EE projects.	
The IDB's involvement promotes improvements of the intended beneficiaries and/or public sector entity in the following dimensions:			
Gender Equality	Yes	The PSSE Program will be committed to gender equality and it will encourage women to participate in any training event and to apply to any job related to the Program.	
Labor			
Environment	Yes	The project will provide benefits in terms of CO2 emission reductions.	
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	Yes	BA-T1007 and BA-T1016.	
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan.			

The objective of this project is to promote the use of Renewable Energy (RE) and the implementation of Energy Efficiency (EE) measures through the creation of the Public Sector Smart Energy (PSSE) Program, which will fund investments in: (i) retrofitting of government buildings and public lights; (ii) RE pilot projects; and (iii) capacity building. Ultimately, the project will help reduce Barbados' fossil fuel dependency, promote sustainable energy and therefore contribute to the country's competitiveness.

The first section of the POD presents very clearly and persuasively the case for the implementation of an energy policy in Barbados that tackles both supply and demand side challenges associated with the very high dependence on fossil fuels, particularly imported oil. The diagnosis states very clearly that the introduction of RE and EE is strategically important for Barbados and represents a long term economically/commercially feasible alternative. The market barriers/failures that impede/block their uptake are also presented: access to capital, limited supply and lack of information.

The proposed intervention is clearly connected to the diagnosis. The results matrix has a clear logic connecting impact to outcomes to outputs. All indicators are SMART. The proposed project includes a complete Cost Benefit analysis. Monitoring arrangements are adequate. The evaluation plan includes a retrospective evaluation of the project's outcomes and an ex-post Cost Benefit estimation.

The project has a low overall risk and a "B" environmental classification.

### RESULTS FRAMEWORK

<b>Program objective</b>	The objective of this Program is to promote and implement the use of Renewable Energy (RE) and Energy Efficiency (EE) measures through the creation of the Public Sector Smart Energy (PSSE) Program. Ultimately, the project will help to reduce Barbados' fossil fuel dependency, promote sustainable energy and therefore contribute to the country's competitiveness. The specific objectives of the Program are to: (i) install RE systems in government buildings in the Program and retrofit these buildings and public lights with EE technologies; (ii) implement the RE pilot project and studies; and (iii) assist with capacity building, institutional strengthening and public awareness in the energy sector.			
<b>Impact indicators</b>	<b>Baseline 2012</b>	<b>Midterm Target 2015</b>	<b>Final Target 2017</b>	<b>Comments</b>
PSSE Financial savings cumulative to date (real 2012 US\$).	0	US\$3,264,174 to date	US\$11,284,963 to date	Financial savings from the reduction in electricity purchased from BL&P by the GOBA, as well as the sale of electricity produced by the solar PV systems to BL&P, and reduction in fuel purchased for the GOBA vehicle fleet.
Avoided CO <sub>2</sub> emissions by the PSSE Program (cumulative to date).	0	8,637 tCO <sub>2</sub> e to date	32,528 tCO <sub>2</sub> e to date	Given an emissions factor for grid power generation of 0.88tCO <sub>2</sub> e/MWh, and 0.00064tCO <sub>2</sub> e/mile for cars.

<b>Component 1.</b> Install RE systems in government buildings in the Program and retrofit these buildings and public lights with EE technologies	<b>Baseline 2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>Comments</b>
<b>Outcome</b>							
Electricity Generated from Solar PV Systems (MWh/year, MWh to date generated).	0	0	0	2,024/yr, 2,024 to date	2,024/yr, 4,049 to date	2,024/yr, 6,073 to date	Assuming an output of 1,700/kW/year for solar PV. Note: this includes the 50kW PV system installed for charging the Electric Vehicles in Component 2.
Electricity Saved through retrofits (energy efficient public lights and energy efficient equipment in public buildings) (MWh/year, MWh to date saved).	-	-	-	7,752/yr	10,430/yr, 18,180 to date	10,430/yr, 28,608 to date	All 12 public buildings in the program retrofitted by 2015; all public lights in the program retrofitted by 2016.
<b>Outputs</b>							
Share of national public lighting (EE street lights and traffic lights) with efficient technology (current number of EE street and traffic lights / total number of street and traffic lights).	0%	0%	25%	65%	85%	85%	Light Emitting Diode (LED) and/or other efficient technologies could be used in the retrofit for public lights.



Number of retrofitted public buildings (aggregated).	0	0	0	3	6	12	Retrofits for the 12 public buildings include efficient lights, computer monitors, and A/C.
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Solar PV installed capacity in public buildings (aggregated, in kW).	0	0	0	300	590	1,190	Total capacity to be installed on least 12 selected buildings, as well as for charging the Electric Vehicles with electricity from renewable energy sources in Component 2
<b>Component 2. A pilot project and studies for encouraging the use of RE.</b>	<b>Baseline 2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>Comments</b>
<b>Outcomes</b>							
Fossil Fuels Saved from the implementation of the pilot projects (barrels of oil equivalent).	-	-	-	240	240	240	Estimated fuel savings from fuel consumption resulting from the electric vehicles pilot project implemented by 2015
<b>Outputs</b>							
Number of Electric Vehicles combined with Solar PV Generation being used by GOBA (to date).	0	0	0	3	6	8	The Program will purchase eight electric vehicles and charging dock installations that, as well as a 50kW thin film solar PV system to charge the vehicles' battery.

<b>Component 3. Capacity building, institutional strengthening, and public awareness</b>	<b>Baseline 2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>Comments</b>
<b>Outcome</b>							
Public Awareness of sustainable energy : Percentage of survey respondents participating at events that report high awareness and support of sustainable energy practices (Number of respondents that answered “high awareness and support of sustainable energy”/ Total number of survey respondents )	0	20%	40%	60%	70%	80%	Measuring public awareness of will rely on information obtained from surveys of participants of with respect to their awareness and support of sustainable energy practices. The surveys will be carried out at the end of each activity. .
<b>Outputs</b>							
Number of jobs created in ETD, for implementing the PSSE Program.	4 new (1 / Project Manager + 1 Procurement Specialist+ 1 Project Accountant+1 Project Assistant)	4 to date	4 to date +	4 to date	4 to date	4 to date	To be documented with organizational charts for the Energy Unit within the ETD , showing breakdown in various departments, positions created, to be created, filled, and to be filled; filing documents by the Ministry of the Environment, and the Town and Country Development Planning Office.

Number of events in public awareness or programs (and of participants), cumulative	0	1 (20 people)	2 (50 people)	3 (70 people)	4 (100 people)	5	To be documented with event's minutes.
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## FIDUCIARY ARRANGEMENTS

**Country:** Barbados

**Project:** BA-L1025 – Public Sector Smart Energy (PSSE) Program; and  
BA-X1003 - Support to the PSSE Program (funded by the European Commission (EC))

**Executing Agency:** Energy and telecommunications Division (ETD),  
Office of the Prime Minister

**Prepared by:** Denise Salabie – Financial Management Snr. Specialist  
Shirley Gayle-Sinclair – Procurement Specialist

### I. EXECUTIVE SUMMARY

- 1.1 BA-L1025 will be executed by the Energy and Telecommunications Division (ETD), Office of the Prime Minister. The ETD will have responsibility for the technical administration and financial management of the project.
- 1.2 The SECI methodology was used to perform the fiduciary assessment of the project. It indicated a low fiduciary risk. In light of this, we believe that ETD will have the fiduciary capacity to adequately implement and execute the program given its previous experience with executing IDB financed operations, ATN/OC-11473-BA and TT-L1020.
- 1.3 The Public Financial Management (PFM) systems were assessed by the European Commission in May 2010 using the PEFA performance measurement framework. The assessment concluded that Barbados' overall budget planning, accounting and reporting systems work well, Smart Stream (PFM system used by the Government) now operates consistently and reliably, providing updated information about all elements of budget execution. Budget planning and reporting is being done in accordance with accrual accounting since 2007. It is recommended that the project use the country PFM system, Smart Stream, to facilitate the financial administration of the project and the Auditor General of Barbados for external control (depending on availability) and if unavailable, a firm of independent public accountants acceptable to the Bank.
- 1.4 The project will be co-financed with a grant of approximately US\$7.66 million provided by the European Community (EC)<sup>1</sup>. The grant contribution will be administered by the IDB through a project specific grant, BA-X1003. The resources of the EC will be maintained and reported in Euros, and all commitments and disbursements will be administered and executed only in Euros, as per the Framework Agreement between the IDB and the EC (GN-2605). The EC grant contribution will be maintained, administered, disbursed and accounted for only in Euros. A fee equivalent of 5% of the EC grant will be used to cover IDB's overhead related to the project, whilst a 2% fee equivalent will be used to cover execution and monitoring expenses by the Bank.

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<sup>1</sup> The EC grant contribution, which is indicated in US dollars, may vary due to exchange rate fluctuations.

## II. EXECUTING AGENCY'S FIDUCIARY CONTEXT

- 2.1 The ETD uses Smart Stream for its financial administration and is audited by the Auditor General of Barbados.
- 2.2 It is recommended that the ETD use the country PFM system, Smart Stream, for the financial administration of the project and that where necessary, supplemented with the use of another software for financial reporting. The Smart Stream system is capable of facilitating the management of the budget and accounting of the project. It is however unable to generate financial statements as per the Bank's requirement.

## III. FIDUCIARY RISK ASSESSMENT AND MITIGATING ACTIONS

- 3.1 The ETD has adequate institutional capacity to execute the project. The fiduciary risk was assessed using the SECI methodology and was found to be low. The fiduciary capacity however needs to be strengthened by the assignment of an experienced and qualified Procurement Specialist and Project Accountant to the Project.

## IV. ASPECTS TO BE CONSIDERED IN SPECIAL CONDITIONS OF THE CONTRACT

- 4.1 To facilitate the execution of the operation, outlined below are agreements and requirements which should be incorporated into the special conditions:

### *Special Conditions: Precedent to First Disbursement*

- i. The submission of an Operations Manual for the project, which includes details of the procurement, financial management, internal and external control systems for the project.
- ii. Assignment of a Procurement Specialist and Project Accountant to the Project.
- iii. Special contractual condition prior to first disbursement of Component I.(i) – EE retrofits for public lights: **The Executing Agency shall have contracted the Barbados Light & Power (BL&P) for the procurement and installation of Energy Efficient Street Lights.** The Executing Agency will contract the BL&P to carry out the tendering process for the EE street lights and to install the EE street lights, within the execution period of the Program. The fee for and the execution of the contract for the operation and maintenance (O&M) of the EE street lights will be negotiated between the GOBA and the BL&P. The sole source is justified by the considerable experience of the BL&P in this field, given that this company owns the majority of street lights in the country. In addition, the BL&P follows strict safety procedures which might be difficult for other possible installers to adopt in a short period of time.
- iv.

### *Rate of Exchange Agreed with the Executing Agency*

For purposes of justification of expenses to the Bank (including reimbursements), if the project expenses have been incurred in local currency, the equivalent amount to be reported in the project currency, shall be determined using:

- i. the effective exchange rate used to convert the funds denominated in the project's

currency to the local currency, or

- ii. the effective exchange rate of the payment date, without regard to the source of the financing used.

***Financial Statements and Reports, audited or unaudited***

*Annual Audited Financial Statements (AFS)* of the project are to be submitted to the Bank within 120 days after the close of each fiscal period, in addition to Final Audited Financial Statements, which are due for submission to the Bank within 120 days of the close (last disbursement date) of the Project. The AFS should report on the overall project, in the expressed currency of the Loan and should also include financial statements on the EC Grant contribution, expressed in euros.

*Semi Annual Progress Reports*, should include a financial progress report on the project indicating amount disbursed broken down according to source of funding and category of investments.

**V. FIDUCIARY ARRANGEMENTS FOR FINANCIAL MANAGEMENT**

**5.1 Programming and Budget**

Each year, the Ministry of Finance publishes a Budget Circular requesting the submission of estimates of income and expenditure from ministries and other agencies for inclusion in the National Budget for the following fiscal year, April to March. The Budget Circular provides the structure and format in which the estimates are to be submitted, and the required submission deadlines.

The ETD will prepare annual estimates in the required format for the review and approval by the Financial Comptroller of the Office of the Prime Minister, which will be included in the Office's overall budget estimates. The estimates will consider the total cost of financing required for execution of the program. The budget (Appropriation Bill) is presented to Parliament before the close of the fiscal year. Once the budget is approved, amendments are made through the submission of Supplementary Appropriation Bills by the Minister of Finance.

It is anticipated that the Borrower will commit to allocate, for each fiscal year of project execution, adequate fiscal space to guarantee the unfettered execution of the project.

**5.2 Accounting and Information Systems**

Project accounting will be performed using the Government's financial management system – Smart Stream, in accordance with International Financial and Reporting Standards and International Public Sector Accounting Standards when applicable. It is expected that the financial management system of the project will facilitate the recording and classification of all financial transactions, provide information related to: planned versus actual financial execution of the project; the financial execution plan for the next 6 months that will be attached to each request for Advance of Funds, annual Financial Statements, performance reports, and any other reports, financial or otherwise, audited or unaudited, that may be required from the Bank from time to time. As the Smart Stream System is not yet able to report in accordance with the Bank's requirements, it will be supplemented with another financial reporting software.

The ETD will have responsibility for financial administration of the IDB loan funds and EC contribution. Each source of funding will be accounted for separately. The IDB funds should be maintained and accounted for in US\$, whilst the EC funds will be maintained and accounted for in Euros.

### 5.3 Disbursements and Cash Flow

The ETD will have responsibility for the preparation and submission of disbursement requests to the Bank. Treasury authorized bank accounts with the Central Bank of Barbados will be used for the management of loan resources. One account should be used to manage and maintain the IDB loan resources, in US dollars. The other account will be used to manage and maintain the EC grant contribution, in Euros.

Disbursement methods that may be used to disburse funds from the loan financing are as follows: Advance of Funds; Reimbursement of Payments Made; or Direct Payment to Supplier.

Disbursements will be ex-post, except for Requests for Direct Payment to Suppliers. The Executing Agency will be responsible for the maintenance of adequate and original documentation to support disbursement requests. Such documentation will include, accounting receipts, canceled invoices, payment receipts, legible canceled cheques, customs duties certificates, certificates of works, employment contracts, shipping, unloading, and storage documents, receipt reports, and any other payment support document acceptable to the Bank.

It is expected that the Bank's *eDisbursements* system, which will facilitate the electronic submission of disbursement requests to the Bank, will be used for the Project. Final determination of its use will be determined based on the readiness of the PEU and a cost-benefit analysis to be conducted.

### 5.4 Internal Control and Internal Audit

The internal control system of the ETD is considered acceptable and as such, will be incorporated into the internal control system which is to be established for the project. The system to be established should provide reasonable assurance that 1) the project funds are used for their intended purpose and project development objectives, with special attention given to the principles of economy and efficiency; 2) project assets are properly safeguarded; 3) project transactions, decisions, and activities are properly authorized and documented; and 4) project transactions are executed in accordance with the established policies and procedures delineated in the legal agreements. In order to enhance the internal control system of the project, a recommendation should be made to the Executing Agency for the Internal Audit Department of the Ministry to periodically audit the project.

### 5.5 External Control and Reports

The Executing Agency will be required to submit to the Bank, Annual Audited Financial Statements of the Project to be submitted within 120 days after the close of the fiscal period and Final Audited Financial Statements due within 120 days of the close (last disbursement date) of the Project. Financial Statement will be prepared as per the

guidelines outlined in the Guide for Financial Reports and External Audits for Operations Financed by the IDB and audits audit will be done in accordance with International Auditing Standards. The Terms of Reference will be agreed on between the Executing Agency and the Bank, and will include at a minimum, the requirement to audit basic the financial statements of the project, review internal controls and carry out ex-post disbursement and procurement reviews. The Financial Statements will be audited either by the Auditor General of Barbados or by a firm of independent public accountants acceptable to the Bank. The firm for the auditing of the Programme, if the Auditor General is not used, will be selected according to the Bank's procurement procedures for audit (Document AF-200).

#### 5.6 **Financial Supervision Plan**

The initial Financial Supervision Plan of the project will focus on 1) activities related to the implementation and follow-up of arrangements and systems being implemented for the financial management and procurement of the project.; and, 2) capacity building of PEU personnel in the Bank's procedures and requirements.

#### 5.7 **Execution Mechanism**

The project will be executed by the Energy and Telecommunications Division (ETD), Office of the Prime Minister. The ETD will have responsibility for the technical and financial management of the project, including the EC funded portion of the project.

### **VI. FIDUCIARY ARRANGEMENTS FOR PROCUREMENT EXECUTION**

#### 6.1 **Procurement Execution**

Procurements for the project will be carried out in accordance with the Policies for the Procurement of Works and Goods Financed by the Inter-American Development Bank (GN-2349-9), of March 2011; and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (GN-2350-9), of March 2011, and with the provisions established in the loan contract and the procurement plan in Appendix 1. In addition, prior to any procurement being initiated for this project, the Borrower is required to prepare and submit to the Bank a draft General Procurement Notice.

**A partial waiver to the IDB's Policies for Procurement of Works and Goods and the IDB's Policies for the selection and Contracting of Consultants Financed by the IDB (GN2349-9 and GN-2350-9) of March 2011 is requested by the Project Team in order that goods, related services, and consultancy services from non-Bank member countries may be eligible for procurement provided that the country of origin of the goods, related services, and consultants is recognized as eligible by the EC under its applicable regulations, and as indicated in the Framework Agreement between the EC and the IDB.** The waiver will facilitate a seamless integration of the funds from both sources, allow for a more efficient administration process and allow procurement opportunities to be open to eligible countries under the EC's applicable regulations for origin of goods, related services and consultancy services.

- A. Procurement of Goods, Works, and Non-Consulting Services:** The procurement plan for the Program, covering the first 18 months of project execution, is summarized at Appendix 1, and indicates the procedure to be used for the procurement of goods, the



contracting of works or non-consulting services. The review of technical specifications in all cases, during the process of selection is the responsibility of the sector specialist of the Project.

**B. Procurement of IT systems:** None

**C. Procurement of Consulting Services:** The procurement plan for the Program, covering the first 18 months of project execution is summarized in Appendix 1, and indicates the procedure to be used for the procurement of consultancy services, and the method of selecting consultants. The Borrower is responsible for preparing and implementing the project, and therefore for preparing the TORs, short lists, selecting the consultants, and awarding and subsequently administering the contract.

- **Selection of Individual Consultants:** Individual consultants are employed on assignments for which: (i) teams of personnel are not required; (ii) no additional outside (home office) professional support is required; and (iii) the experience and qualifications of the individual are the paramount requirement. Individual consultants are selected on the basis of their qualifications for the assignment. Advertisement is not required<sup>2</sup> and consultants do not need to submit proposals. Consultants shall be selected through comparison of qualifications of at least three candidates among those who have expressed interest in the assignment or have been approached directly by the Borrower. Individual consultants may be selected on a sole-source basis with due justification in exceptional cases. This is to be carried out in accordance with Section V (Selection of Individual Consultants) of GN-2350-9 paragraphs 5.1-5.4.
- **Single Source Selection:** None.
- **Training:** As per GN-2350-9 if the assignment includes an important component for training or transfer of knowledge to Borrower staff or national consultants, the TOR shall indicate the objectives, nature, scope, and goals of the training program, including details on trainers and trainees, skills to be transferred, time frame, and monitoring and evaluation arrangements. The cost for the training program shall be included in the consultant's contract and in the budget for the assignment.

**D. Recurring Expenses:** None.

1. **Advance Contracting/Retroactive Financing:** Section 1.9 of the procurement policies allows for retroactive financing and advance contracting where the procurement procedures, including advertising, are in accordance with the procurement policies in order for the eventual contracts to be eligible for Bank financing. The Bank shall review the process used by the Borrower. A Borrower undertakes such advance contracting at its own risk, and any concurrence by the Bank with the procedures, documentation, or proposal for award does not commit the Bank to make a loan for the project in question. If the contract is signed, reimbursement by the Bank of any payments made by the Borrower under the contract prior to loan signing is referred to as retroactive financing and is only permitted within the limits specified in the Loan Contract.

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<sup>2</sup> However, in some cases Borrowers may consider the advantage of advertising at their option.

- A. Domestic Preference:** Determining whether it is appropriate and necessary to use domestic preference in the evaluation of bids should be guided by Appendix 2 of GN-2349-9 paragraphs 1-6.
- B. Other Requirements:** The on-line Electronic Procurement Execution System (known by its Spanish acronym as SEPA) may be introduced in Barbados in 2012. In such case the executing agency will be guided in the use of the SEPA program for management of its procurement activities. Otherwise Procurement Plans will continue to be prepared in the current manner. As part of the Modernization of National Procurement Regime, financed by the IDB, the Government of Barbados is also planning to develop an on-line procurement notice publication portal. Procurement processes falling below the national competitive bid thresholds may also be advertised on this site.
- C. Use of national procurement systems:** The Government of Barbados, together with the IADB, has agreed on actions that can be taken to help bring their procurement systems to an internationally recognized standard of performance and increase competitiveness in their procurements. The Program for the Modernization of the Barbados National Procurement System, BA-L1004, created with the objective of improving the country's national public procurement framework and operations, is currently in implementation. To the extent that the Modernization of National Procurement program enhances the national procurement framework, eventually creating standard national bidding documents, modernizing the national procurement policies, and creating a modernized regulatory framework, the Bank is expected to be able to rely more frequently on national procurement systems for acquiring goods, general services, works, and consulting services.
- 2. Country Threshold Table (US\$ Thousands):** The following table indicates the thresholds that determine the procurement method to be used for each type of contract see Country Threshold Table

Works			Goods			Consulting Services		Limit for Ex-Post Revision
International Competitive Bidding	National Competitive Bidding	Shopping/Price Comparison	International Competitive Bidding	National Competitive Bidding	Shopping/Price Comparison	International Competitive Bid	Short Lists Solely by Nationals	
+3,000	150 -3,000	-150	+ 150	50-150	-50	N/A	-200	12 months
Ex Ante Review	Ex Post Review	Ex Post	Ex Ante Review	Ex Post Review	Ex Post Review	Ex ante	Ex Post Review	
Individual Consultants: will be reviewed ex ante for services at or above US\$50,000. For amounts below US\$50,000, such procurements will be reviewed ex post.								

Note: Amounts for ex post and ex ante review are applicable based on the capacity of the executing agency and complexity of procurements. These amounts may be adjusted by the Bank, as capacity is improved, and as agreed with the executing agency.

- 3. Procurement Plan (PP)** The procurement plan for the Program covering the first 18 months of project execution is summarized in Appendix 1. It indicates the procedures to be used for the procurement of goods, the contracting of works or services, and the method of selecting consultants, for each contract or group of contracts. It also indicates cases requiring prequalification; the estimated cost of each contract or group of contracts;

the requirement for prior or post review by the Bank. The procurement plan will be updated annually or whenever necessary, or as required by the Bank. The detailed procurement plan is available at **[www.iadb.org/procurement](http://www.iadb.org/procurement)**.

- 4. Procurement Supervision** Procurements will be reviewed ex post for NCB levels and below (except for individual consultant procurements, which must be reviewed in accordance with the threshold established in the Country Threshold Table above) and ex ante for ICB levels, as per the procurement plan, unless otherwise agreed. Ex post procurement supervision should take place at least once every 12 months, in accordance with the supervision plan of the Project.