



PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Medium-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title:	Promoting Solar Photovoltaic Systems in Public Buildings for Clean Energy Access, Increased Climate Resilience and Disaster Risk Management		
Country(ies):	Barbados	GEF Project ID: ¹	5453
GEF Agency(ies):	UNDP (select) (select)	GEF Agency Project ID:	5186
Other Executing Partner(s):	Office of the Prime Minister - Energy and Telecommunications Division	Submission Date:	June 10, 2013
		1 st Resubmission Date:	October 28, 2013
		2 nd Resubmission Date:	November 21, 2013
GEF Focal Area (s):	Climate Change	Project Duration (Months)	48
Name of parent program (if applicable):		Agency Fee (\$):	164,016
• For SFM/REDD+ <input type="checkbox"/>			
• For SGP <input type="checkbox"/>			

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK²:

Focal Area Objectives	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-Financing (\$)
CCM-3	GEFTF	1,726,484	16,450,000
Total Project Cost		1,726,484	16,450,000

B. INDICATIVE PROJECT FRAMEWORK

Project Objective: To promote increased access to clean energy in Barbados through solar photovoltaic systems in public buildings (e.g. government facilities, community centers, health facilities, schools), thus strengthening its climate resilience and disaster risk management						
Project Component	Grant Type ³	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Cofinancing (\$)
1. Renewable energy policy framework	TA	1. Effective enforcement of approved licensing regime promoting broad-based renewable energy generation in Barbados	1.1. Approved framework for short /long-term integrated renewable energy resource planning with sustainable development targets and milestones (e.g. GHG reduction, fiscal balance, social inclusion) 1.2. Enforced procedures promoting decentralized renewable energy generation (e.g. licensing process, IPPs, PPAs, FiTs, installation standards, connectivity requirements, adequate tariff/billing)	GEFTF	100,000	800,000

¹ Project ID number will be assigned by GEFSEC.

² Refer to the reference attached on the [Focal Area Results Framework](#) when completing Table A.

³ TA includes capacity building, and research and development.

2. Clean energy capacity development	TA	2. Institutional and technical capacity and awareness strengthened in Barbados for clean energy developments	2.1. Disseminated best practices and lessons learned of social, economic and environmental benefits of solar PV fostering national multi-stakeholder dialogue (e.g. ECRE, BLPC, FTC, cabinet) 2.2. Completed solar technology educational, vocational and institutional peer-to-peer training and development programmes promoting sustainable plans (national content, youth employment)	GEFTF	100,000	400,000
3. Solar photovoltaic system installations	TA	3. Decentralized feasible and sustainable solar-powered electricity investments in Barbados demonstrated	3.1. Completed solar capacity assessments and feasibility studies for photovoltaic systems in Barbados 3.2. National solar PV business plans, financing options and pipelines in Barbados's public buildings	GEFTF	369,531	4,510,359
	Inv		3.3. Grid-connected Solar PV rooftop installations and market transformation completed (local entrepreneurship, inclusive growth, resilient development)		1,000,000	10,000,000
Subtotal					1,569,531	15,710,359
Project Management Cost (PMC) ⁴				GEFTF	156,953	739,641
Total Project Costs					1,726,484	16,450,000

⁴ To be calculated as a percent of subtotal.

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
Private Sector	Solar Photovoltaic Investors	Grant	14,850,000.00
Multilateral Agencies	SIDS DOCK Platform	In kind	200,000.00
GEF Agency	UNDP	Grant	200,000.00
National Government	Barbados Government	Grant	800,000.00
Multilateral Agencies	SIDS DOCK Platform	TBD	200,000.00
GEF Agency	UNDP	In kind	200,000.00
Total Co-financing			16,450,000.00

D. INDICATIVE TRUST FUND RESOURCES (\$) REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY¹

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount (\$ (a))	Agency Fee (\$ (b))	Total (\$) c=a+b
(select)	(select)	(select)				0
Total Grant Resources				0	0	0

¹ In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

² Indicate fees related to this project.

E. PROJECT PREPARATION GRANT (PPG)⁵

Please check on the appropriate box for PPG as needed for the project according to the GEF Project Grant:

	<u>Amount Requested (\$)</u>	<u>Agency Fee for PPG (\$)⁶</u>
• No PPG required.	--0--	--0--
• (upto) \$50k for projects up to & including \$1 million
• <i>(upto) \$100k for projects up to & including \$3 million</i>	<u>100,000</u>	<u>9,500</u>
• (upto) \$150k for projects up to & including \$6 million
• (upto) \$200k for projects up to & including \$10 million
• (upto) \$300k for projects above \$10 million

PPG AMOUNT REQUESTED BY AGENCY(IES), FOCAL AREA (S) AND COUNTRY(IES) FOR MFA AND/OR MTF PROJECT ONLY

Trust Fund	GEF Agency	Focal Area	Country Name/Global	(in \$)		
				PPG (a)	Agency Fee (b)	Total c=a+b
(select)	(select)	(select)				0
Total Grant Resources				0	0	0

MFA: Multi-focal area projects; MTF: Multi-Trust Fund projects.

⁵ On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

⁶ PPG fee percentage follows the percentage of the GEF Project Grant amount requested.

PART II: PROJECT JUSTIFICATION⁷

A. PROJECT OVERVIEW

A.1. Project Description. Briefly describe the project, including ; 1) the global environmental problems, root causes and barriers that need to be addressed; 2) the baseline scenario and any associated baseline projects; 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project; 4) incremental cost reasoning and expected contributions from the baseline , the GEFTF, LDCF/SCCF and co-financing; 5) global environmental benefits (GEFTF, NPIF) and adaptation benefits (LDCF/SCCF); 6) innovativeness, sustainability and potential for scaling up

i. THE GLOBAL ENVIRONMENTAL PROBLEMS, ROOT CAUSES AND BARRIERS THAT NEED TO BE ADDRESSED

1. Barbados is still largely reliant on the use of fossil fuels (89%) –see Annex I. Under the Electric Light and Power Act (ELPA) there is no provision for licenses to independent power producers. A pilot project approved by the regulatory authority (FTC) expired in 2012, and capped renewable energy generation to a cumulative 2 MW. Government solar investments are limited due to the economic climate. It poses a risk to disaster response at hurricane shelters and health centers, given the typical power outages for several days after extreme events. There are few demonstration projects in public buildings or educational institutions to raise public awareness. And the solar water heating (SWH) boom of the past decades has not been replicated with other technologies (e.g. solar PV) –see Annex II. Several barriers constrain Barbados’ plans (presented in the following table). Their comprehensive analysis to confirm their nature (e.g. extent, root causes, inter-relationship) will be included in the final project document to be presented at the CEO endorsement stage:

Barrier type	Barrier Descriptions
<u>Regulatory Policy / Legal:</u> <i>Outdated national energy planning and policy frameworks do not integrate sustainable development goals</i>	<ul style="list-style-type: none"> • The national utility (Barbados Light & Power Co.) has no incentive to increase renewable energy generation in line with currently updated energy policy and nationally appropriate mitigation ambitions (NAMAs) • The existing energy policy (Barbados Electric Light & Power Act) does not provide for independent power generation production to support the upscale of renewable energy (particularly in grid-connected solar photovoltaic generation) – <u>see Annex III for further details on the national energy institutional framework</u> • The new government legislation being considered (Barbados Sustainable Energy Framework) lacks a concrete energy action plan of enforcement that considers broader development concerns (e.g. local content, youth employment, social entrepreneurship) – <u>see also Annex III and V on specific risks</u> • No clarity on most appropriate procurement and licensing processes for grid-connected electricity generation in Barbados to address inclusive growth needs (local value chain), environmental benefits (GHG emissions) and social concerns (health, education, disaster risks) – <u>idem Annex III and V</u>
<u>Institutional / Technical:</u> <i>Limited national awareness and capacity to reap the benefits of clean energy development</i>	<ul style="list-style-type: none"> • Obsolete knowledge and information on local renewable energy endowments (e.g. solar resource assessments) in Barbados • Limited sustainability of solar technology developments in Barbados (e.g. beyond SWH initiatives) • Lack of technical expertise in national government institutions (e.g. ECRE unit) tasked to oversee independent power processes (e.g. licensing criteria for grid-connected rooftop solar PV, RE targets) • Lack of capacity for the local market to absorb and benefit from RE developments (local firms versus foreign investors, no inclusion of solar technology topics in training equipment and related training modules)
<u>Market / Financial:</u> <i>Lack of economies of scale, and limited scope for solar energy technology investments</i>	<ul style="list-style-type: none"> • Despite high electricity costs in Barbados (US\$0.40/kWh), lower solar PV market prices globally and recent solar water heating market success in the country, the upfront cost of SETs is still regarded high (hence, their limited uptake and upscale) – <u>see Annex IV for comparison estimates and analysis per RE technology</u> • Lack of drive/financial incentives from (BL&P Co) to add renewable electricity in Barbados energy mix • Foreign investment entry normally crowds out local players in the solar market value chain (e.g. limited participation by smaller businesses, local suppliers and installers in the SWH industry) – <u>see also Annex II</u> • Market size traditionally led to monopolistic context with no incentive for generation, transmission, distribution efficiency (e.g. no feed-in-tariff to assess potential of feeding excess energy back into the grid).

2. This proposal is designed to address the above constraints. It is expected to contribute to the reduction of Barbados’ dependency on fossil fuels, through the incorporation to the baseline project the education of the public about the benefits of grid-connected solar photovoltaic technologies, demonstrate their uses and, through this intervention and expected replication, ultimately reduce GHG emissions, as detailed below. As a result, the country’s energy security will increase in a socially acceptable (e.g. employment potential, local content), economically feasible (e.g. investment scale-up) and environmentally sound manner (e.g. emissions reduced). The project would contribute to Barbados overall renewable energy target of 20% by 2026 (no cabinet approved targets exist per specific RE source –e.g. solar PV– at this point).

⁷ Part II should not be longer than 5 pages.

ii-iv. THE BASELINE SCENARIO AND ANY ASSOCIATED BASELINE PROJECTS; PROPOSED ALTERNATIVE SCENARIO, WITH A BRIEF DESCRIPTION OF EXPECTED OUTCOMES AND COMPONENTS OF THE PROJECT; AND, INCREMENTAL COST REASONING AND EXPECTED CONTRIBUTIONS FROM THE BASELINE, THE GEFTF, LDCF/SCCF AND CO-FINANCING

3. Barbados aims at reducing its carbon footprint, while also increasing its climate resilience as tabled below:

Component	BAU/baseline scenario	GEF Alternative
1. <i>Renewable energy policy framework</i>	Government in-kind ongoing support (OPM's ECRE unit \$0.8m) to Barbados sustainable energy policy (SEP), regulatory and legislative developments (i.e. operationalizing the SEP) not integrated with local content and sustainable development efforts.	Integrated licensing environment with existing and new national energy and environmental sustainability policies (as captured by tender, licensing and procurement processes), are consistent with the reduction of electricity production costs and prices, dependency on fuel imports, and emissions of GHG, as well as in line with broader-based green, low emission, climate resilient development in Barbados.
\$900,000	\$800,000	\$100,000
2. <i>Clean energy capacity development</i>	Multilateral agency grant donor support (SIDS Dock CariCom Climate Change Centre \$0.2m / UNDP \$0.2m) to Barbados institutional strengthening processes not integrated with the national sustainable energy policy (SEP) and planned clean energy investments.	Developed national capabilities to ensure safety, energy security and disaster risk response is maintained; access to electricity in emergency situations is guaranteed, and; human and infrastructure resilience is strengthened consistent with local content, employment generation and sustainable development strategies so Barbadians reap the social, economic and environmental benefits of transformed RE markets.
\$500,000	\$400,000	\$100,000
3. <i>Solar photovoltaic system installations</i>	The Office of the Prime Minister's Energy Conservation and Renewable Energy (ECRE) unit is awarding contracts for grid-connected solar PV rooftop installations in government schools, promoting additional installations in health/community centers and launching calls for additional private sector investment (\$17m): a. Solar PV in schools (50kWp) b. Solar PV in health cc/shelters (150kWp) c. Solar PV in other public buildings (3MW)	De-risked policy and institutional environment is promoting the participation of the national utility and local engineering companies, in partnership with international firms, for the successful implementation of grid-connected solar PV technology projects in Barbados, demonstrate GHG emission reductions, increased energy access and resilience, and cost-effectiveness (e.g. US\$0.20/kWh) of scaled-up solar photovoltaic installations. The successful demonstration of public sector uptake of these technologies, triggers scaled-up private sector development (particularly, small and medium sized) for solar and other renewable energy technologies (e.g. FiT, IPP, PPAs, other).
\$18,526,484	\$17,000,000 (incl. PMC)	\$1,526,484 (incl. PMC)
\$19,926,484	\$18,200,000 (incl. PMC)	\$1,726,484 (incl. PMC)

4. The project will reduce Barbados' dependence on fossil fuel-generated electricity, particularly during extreme weather occurrences, with increased access to grid-connected solar photovoltaic technologies. The proposed approach (below) intends to address policy, market and institutional weaknesses, tackle its root causes and associated risks:
5. **Component 1: Renewable energy policy framework** – with the effective enforcement of the approved licensing regime promoting broad-based renewable energy generation in Barbados, as the proposed policy de-risking mechanism to unlock the investment potential of the solar photovoltaic private sector (see Annexes III and V on key entities and measures):
- (1.1) *Approved framework for short /long-term integrated renewable energy resource planning with sustainable development targets and milestones (e.g. GHG reduction, fiscal balance, social inclusion)* – An action plan is informed by updated solar resource assessments, and includes concrete goals, measures and timeframes to increase Barbados' RE electricity generation;
- (1.2) *Enforced procedures promoting decentralized renewable energy generation (e.g. licensing process, IPPs, PPAs, FiTs, installation standards, connectivity requirements, adequate tariff/billing)* – These procedures will streamline any required procurement, licensing and other policy de-risking instruments that would strengthen the enabling environment for renewable energy, considering needs for specific legislation that allows excess electricity supply to be fed back to the grid (i.e. assessing what the most suitable arrangement would be from different options, including net-metering and others mentioned above).
6. **Component 2: Clean energy capacity development** – contributing to the strengthening of the institutional and technical capacity and awareness in Barbados for clean energy developments (see Annexes III and V on entities and measures):
- (2.1) *Disseminated best practices and lessons learned of social, economic and environmental benefits of solar PV fostering*

national multi-stakeholder dialogue (e.g. ECRE, BLPC, FTC, cabinet) – the benefits of renewable energies for the sustainable development of Barbados, and its effective response to more regularly occurring extreme climate conditions are widely known;

(2.2) Completed solar technology educational, vocational and institutional peer-to-peer training and development programmes promoting sustainable plans (national content, youth employment) – the identified benefits are translated into educational and professional opportunities for Barbadians, particularly for the career development of women and young entrepreneurs;

7. **Component 3: Solar Photovoltaic System Installations** – promoting the demonstration of feasible and sustainable grid-connected solar PV investments in Barbados demonstrated (see Annexes III, IV and V on entities, costs and measures):
- (3.1) *Completed solar capacity assessments and feasibility studies for photovoltaic systems in Barbados* – these new assessments validate the solar potential previously identified during the solar water heating boom of recent years, to inform the expected investment upscale from the private sector in forthcoming years;
- (3.2) *National solar PV business plans, financing options and pipelines in Barbados’s public buildings* – the government confirms its interest in supporting this upscale by allocating budgetary resources, thereby, signaling its commitment with concrete plans to spearhead the transformation of the solar PV market (see Annex V for financing options to be considered);
- (3.3) *Grid-connected Solar PV rooftop installations and market transformation completed (local entrepreneurship, inclusive growth, resilient development)* – solar PV system design and installations take place in identified public buildings (see details below), unleashing the potential for additional investments in other public buildings and facilities.

v. GLOBAL ENVIRONMENTAL BENEFITS (GEFTF, NPIF) AND ADAPTATION BENEFITS (LDCE, SCCF)

8. The corresponding global environmental benefits associated to the above outcomes are estimated below. The expected MtCO₂e emission reductions will be confirmed during the project preparation stage of this proposal:

GHG emission reduction	Activity <i>* Emission Factor: 0.9 tCO₂e/MWh (avg.) ** Load Factor Range: 12-33% (2-5kWp systems)</i>	Annual energy output (MWh)**		Total energy saving / generation, MWh	GHG emission reduction, tCO ₂ e*		Unit Abated Cost (US\$ / tCO ₂ e)
		BAU	Project		Annual	Total	
Direct ***	Solar PV system design & installation in public schools and parks (20 x 2.5kWp) for disaster risk response (DRR)	-	146	584	131	524	
*** 4yr project lifetime	Solar PV in polyclinics (10 x 5kWp) and community/health centers (40 x 2.5kWp) for DRR	-	438	1,752	394	1,576	
	Solar PV in other public buildings (3MW) for DRR	-	8,760	35,040	7,884	31,536	
TOTAL Direct:						33,636	59.46
Indirect **** 20yr	Policy and financial de-risking for solar PV (10MW) investments (60% causality)	-	29,200	350,400	26,280	315,360	6.34
TOTAL Direct + Indirect:						348,996	5.73

vi. INNOVATIVENESS, SUSTAINABILITY AND POTENTIAL FOR SCALING UP

9. UNDP/GEF de-risking approach will continue to be proven in SIDS, which offer limited economies of scale. Barbados’ past success in the promotion of solar water heating did not benefit from this approach, as the technology development and its demand was directly linked to the maintenance of unsustainable fiscal incentives (e.g. Homeowners Tax Benefit deduction, Fiscal Incentive Tax exemption). The past SWH success in Barbados was highly concentrated in the residential sector, with limited impact in the public sector or private arena (e.g. tourism, food systems). Finally, these incentives only resulted in an SWH oligopoly, with few local manufacturers. In this intervention, limited budgetary resources and key licensing arrangements will be geared towards ensuring market transformation, such that the scale-up potential is realized with catalyzed private investment instead. The outlook is promising with at least 1 million sq. ft. of public building roof space earmarked to investment upscale, and private sector interest in tendering. Financial and institutional sustainability will be ensured by improved investment conditions and broadened market participation.

A.2. Stakeholders. Identify key stakeholders (including civil society organizations, indigenous people, gender groups, and others as relevant) and describe how they will be engaged in project preparation:

10. The project will be executed by the Office of the Prime Minister, in collaboration with a range of institutions (see below non-exhaustive list –expanded in Annex III and IV, all to be engaged during its preparatory and inception stages):

Type	Examples	Expected Roles
Government	OPM	The Office of the Prime Minister’s Energy and Telecommunications Division is the key project executing partner, including the proposed policy de-risking measures. Its ECRE unit will also lead the project formulation efforts during its preparatory stage.
	MF	The engagement of the Ministry of Finance will be crucial for the success of the proposed policy and financial de-risking measures (e.g. energy framework, budgetary provisions).

		Project preparation consultations will seek MF inputs to the final project documentation.
	MED	The Ministry of Environment and Drainage is Barbados' main operational interface with the GEF. Its oversight of enabling activities (e.g. SNC) will also serve as input during project preparation and implementation (e.g. greenhouse gas inventory reporting).
	DEM	The Department of Emergency Management leads the country's disaster risk response. Its advice will be critical to ensure the resilience of proposed solar PV installations, thus its inputs will also be sought after during proposal formulation and project execution.
<i>Donor partners</i>	UNDP	GEF agency that will provide implementation oversight, project assurance and support, in addition to co-financing. It will ensure project documentation is completed on schedule.
	SIDS DOCK	The platform hosted by the Caribbean Community Climate Change Centre (5Cs) and supported by UNDP and the World Bank will provide technical and financial assistance.
<i>Private sector</i>	BL&PC	The engagement of the Barbados Light & Power Company, as the national electricity utility, will prove critical for the success of the proposed policy de-risking recommendations (during project preparation) and measures (during implementation).
	PV Investors	Solar photovoltaic investors, developers and service providers will undertake the planned installations, and inform appropriate project design during the current preparatory stage. Some of these investors (e.g. Solar Dynamics) made significant strides in the Barbados SWH boom, but not all moved into solar PV (e.g. Sun Power), with other players promoting solar PV in Barbados (e.g. RES, Geo Green, Clarke Energy, Fuzion).
<i>Civil Society</i>	BANGO	As the national focal point for civil society organizations, the project will seek its engagement and members with climate-related focus (e.g. Future Centre Trust, Bawdens)

A.3. Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):

11. This project faces a number of inherent risks. Attention will be paid to the following key five (5) risks from the project preparation stage. Additional mitigation measures will be considered at CEO endorsement stage, as necessary.

Risks	Likely	Remedial actions
1. Climate variability in Barbados exacerbating extreme weather events, such as hurricanes, severe storms and other patterns leading to infrastructure disruption	High	The climate resilience of the proposed solar photovoltaic installations will be addressed by ensuring that the design and installation of the systems places emphasis on their ability to withstand extreme conditions. Project implementation will primarily target public buildings and infrastructure expected to be used as shelter during extreme weather events (e.g. hurricanes, cyclones, storms). The proposed solar PV installations will be an integral part of the disaster risk management activities led by the Office of the Prime Minister. It is expected that their backup support and emergency function will help spread the use of solar photovoltaic as another means of climate change adaptation for the population of Barbados, particularly as the occurrence of extreme events increases.
2. Lack of coordination amongst various stakeholders and partners with various energy, climate change and disaster risk management roles and responsibilities in Barbados	Low	The project will ensure the coordination and integration of support to energy, climate change and disaster risk management activities by hosting the project at the Office of the Prime Minister. Its Energy and Telecommunications Division –through the Energy Conservation and Renewable Energy (ECRE) unit– will liaise with key stakeholders. These included the Ministry of Environment and Drainage (overseeing GEF-financed climate change mitigation enabling activities), with the ECRE unit being a member of the national climate change and GEF committees; the Ministry of Finance (as executing partner of the IADB-supported sustainable energy framework project); and, the Department of Emergency Management of Barbados).
3. Limited private sector uptake of Barbados' request for proposals for solar photovoltaic installations on government buildings	Medium	The costs and risks associated with the proposed solar PV infrastructure will be shared between the project, the Government and the private developers who are expected to engage with, and invest in, this project. The project's market transformation approach will primarily focus on addressing the policy de-risking concerns the private sector may have before committing to invest. The government's contribution of budgetary

		resources will address financial de-risking issues that may arise.
4. Non approval of the new Light and Power Act by Parliament, or government budgets for some solar photovoltaic installations	Low	Access to cleaner energy sources has been placed high enough in the government agenda. With the direct involvement of the Office of the Prime Minister, the solar installations are no longer considered an environmental issue, but a sustainable development concern for the future of Barbados. Therefore, budgetary allocations will be closely monitored to ensure provision is made to support planned solar investments, with the engagement of the Ministry of Finance.
5. Low capacity and awareness to support project formulation, preparation and start-up implementation (e.g. proposal development, tendering, oversight)	Low	The requested project preparation resources will address this concern. Actions will be proposed to ensure the Office of the Prime Minister provides the required technical and policy oversight of the project; the local private sector is directly engaged in project implementation; and, the project communication strategy helps all other stakeholders visualize the benefits of the proposed solar PV installations.

A.4. Coordination. Outline the coordination with other relevant GEF financed and other initiatives

12. The project will coordinate with activities leading to the completion of Barbados' Second National Communication (SNC) to the UNFCCC. This task is overseen by the Ministry of Environment and Drainage (MED), with assistance from the GEF-financed National Communications Support Programme. The emphasis of the MED on accurate greenhouse gas inventory will be supported by the project (e.g. demonstration of emission reductions). The project will also promote some of the initiatives identified by the GEF-financed IADB-supported Sustainable Energy Framework project, and support institutional strengthening in those specific activities (e.g. solar PV licensing and procurement). UNDP's implementation support will also ensure scientific, technical and financial coordination with the Caribbean Community Climate Change Centre and the World Bank, as partners in the SIDS DOCK initiative, with bilateral donor support from Denmark and Japan. This project is at the moment not part of the current SIDS DOCK pipeline. But since Barbados is eligible to grants as a SIDS DOCK member, the project will engage the partners in its implementation.

B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

B.1. National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSAs, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.:

13. The project is linked to the government 2006 National Energy Policy (NEP) that has been approved by Parliament in 2007. This policy has a target for renewable energy electricity of 30% of total use in 20 years, which this project will help contribute to (10MW worth of solar PV installations estimated in the next 20 years). The project is also consistent with the fiscal incentives announced in Financial Statement and Budgetary proposals announced by the Ministry of Finance in 2008, 2011, 2012 which supports greater use of renewable energy through reduced import duties and taxes. This project also supports the effort of the Barbados Government to facilitate greater use of electricity from renewable energy by revising the 100 year old Electric Light and Power Act (ELPA). This revision is expected in early 2013. The project is consistent with the First National Communication to the UNFCCC (as it addresses the policy and capacity barriers to renewable energy identified there), and Green Economy Scoping Study of Barbados (as it promotes the adoption of green standards and renewable energy sources for the sustainability of electricity consumption in buildings).

B.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities:

14. The project is in line with the clean energy ambitions of Barbados and consistent with GEF-5's Climate Change Mitigation Objective no. 3 (Promote investment in renewable energy technologies). It will result in an effective policy framework, institutional capacity and operational installations for renewable energy-based electricity generation.

B.3. The GEF Agency's comparative advantage for implementing this project:

15. The project is consistent with UNDP's implementing mandate, capacity and presence, as captured in the 2007 GEF Council document on comparative advantages (GEF/C.31/5). Its emphasis of environmental finance for market transformation is in line with UNDP's Strategic Plan 2008-2011/13 followed in over 150 countries worldwide. The project GEF focal area falls under UNDP's Energy and Environment priority area on "Access to sustainable energy services". UNDP's capacity in this area has been recently codified in the UNDP-GEF Profile document and the UNDP-GEF publication on "Transforming On-Grid Renewable Energy Markets". This project is in line with the Signature Programme no. 1 on clean energy (solar), with the proposed policy and financial de-risking interventions targeting the island of Barbados. It is also central to the 2012-2016 UNDAF for Barbados and the Organization of Eastern Caribbean States (OECS), contributing to a key priority of UNDP's work in the region (UNDAF Outcome 1 "Environment, Energy, Climate Change and Disaster Risk Reduction") with a direct impact on Millennium Development Goal (MDG) no. 7 to "ensure environmental sustainability".

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Mr. Rickardo WARD	GEF Operational Focal Point	MINISTRY OF ENVIRONMENT AND DRAINAGE	07/12/2013

B. GEF AGENCY(IES) CERTIFICATION

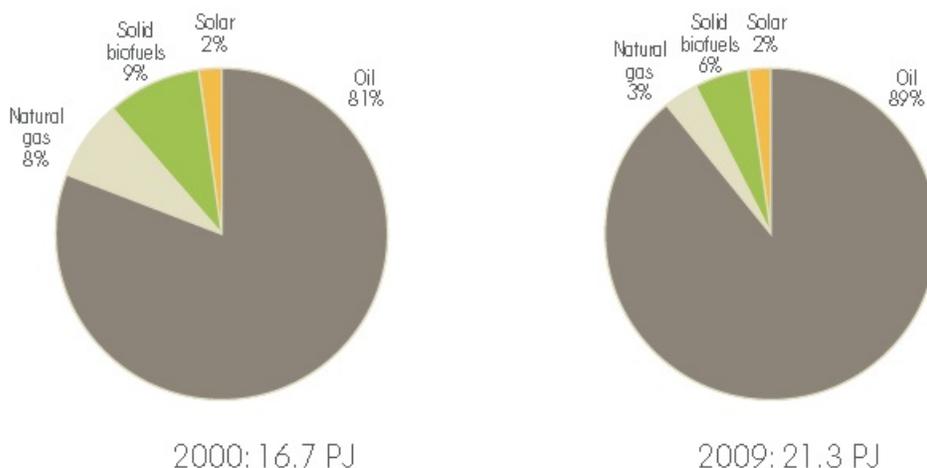
This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for project identification and preparation.					
Agency Coordinator, Agency name	Signature	DATE (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
UNDP/GEF Officer-in-Charge and Deputy Executive Coordinator		11/20/2013	Raul Alfaro-Pelico, Regional Technical Advisor, EITT	+5073024500	raul.alfaro@undp.org

ANNEXES

I. BARBADOS ENERGY PROFILE:

16. The energy matrix of Barbados is heavily fossil-fuel dependent (see Figure 1, below). The share of solar in the mix is a marginal 2%, and has remained so for the past decade despite the reinstatement of tax deductions for SWHs in 1996:

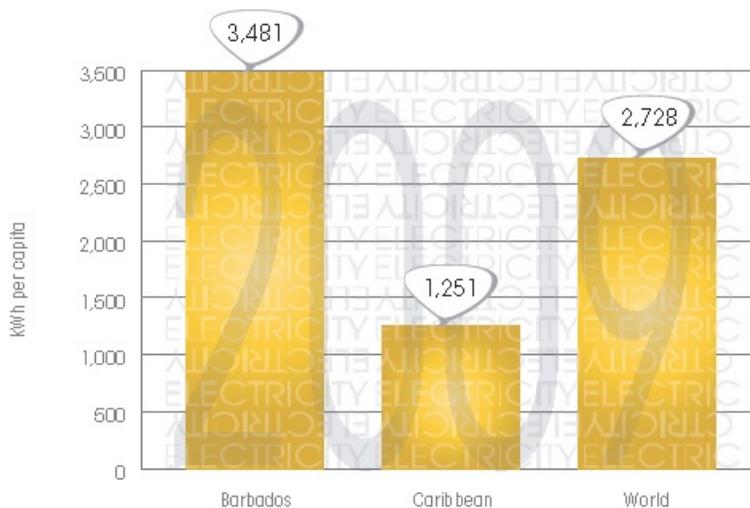
Figure 1. Barbados Primary Energy Supply in 2000 and 2009



Source: IRENA

17. The intensity of fossil-fuel generated electricity use in Barbados is above both regional and global averages (see comparisons in Figure 2, below), confirming the potential for growth of renewable energy technologies, namely considering the high cost and weight of oil imports on the national budget:

Figure 2. Electricity Use Per Capita (2009)



Source: IRENA

II. BARBADOS SOLAR PHOTOVOLTAIC MARKET:

18. The Barbados solar PV supply chain has few industry players (particularly installers/maintenance)—see below, providing market growth potential for entrants and SMEs (i.e. entrepreneurs, engineers, technicians). The initial focus on public buildings provides a customer base that can be expanded to other commercial and residential sectors (e.g. hotels, other industries, residential customers) as capacity develops and awareness grows.

Type	Name	Details
<i>Key Suppliers</i> (to be confirmed during the PPG phase)	Solar Dynamics	SWH pioneer, leading Barbados-based manufacturer in the Caribbean. The company has been in existence since 1972 having installed over 30,000 solar systems across the region
	Solaris Energy	Aqua Sol (founded in Barbados in 1981 to tap the booming SWH market) was acquired in by Solaris Energy in 2010 to expand in the Caribbean (e.g. Trinidad & Tobago, OECS)
	Clarke Energy	Barbados entrepreneur and reseller of solar PV panels amongst other (e.g. wind turbines, inverters, and system components) with North American trading links (US, Canada)
	Geo Green Power	UK-owned with Barbados base solar PV firm with investment interests in the Caribbean and technology transfer potential to develop local content
	Ren. Energy Solutions	Barbados importer and reseller of solar PV systems and components, also with interests in consulting, installing and training services for the local market
	Solar Watt Systems	Company operating since 1985, subsidiary of US-based Platinum Systems Inc since 2006 to focus both on solar PV panels, and components (e.g. inverters, monitors, meters)
	Fuzion Sun Power	UK firm with a Barbados base specialized in solar photovoltaic systems and other equipment (e.g. EE lighting, solar mounting systems)
<i>Main Installers</i> (to be confirmed)	Solar Watt Systems	Platinum Systems Inc, which specialized in commercial and residential installations in the US, not only supplies but also (via Solar Watt Systems) maintains/repairs solar PV systems
	CJ Elect	UK firm with a Barbados base specialized in solar PV and other electrical installations, as subsidiary of Fuzion Sun Power
<i>Potential Customers</i>	Commercial	These include both the public sector (e.g. national government departments, other public entities) and private commercial sectors (e.g. tourism operators, industrial customers)
	Residential	These would initially be high/middle-income homeowners, once a commercial base and critical mass achieved in the solar PV market, and lower-income houses as market grows

III. BARBADOS ENERGY SECTOR INSTITUTIONAL ARRANGEMENTS:

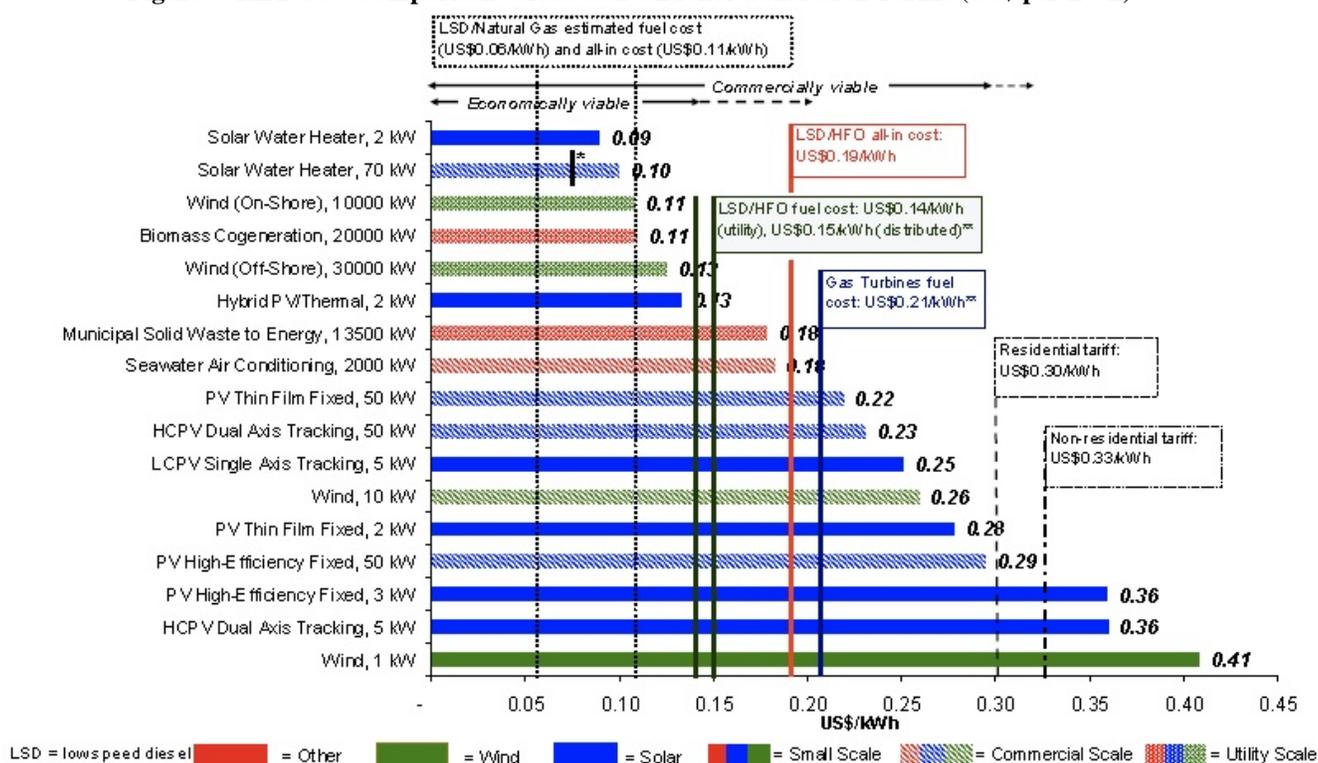
19. The project is executed by the Energy unit of the Office of the Prime Minister, with a mandate over licensing, and standing a better chance of mainstreaming energy issues across government, and facilitate buy-in from:

Type	Name	Details
National Government	Ministry of Fin., Inv. & Energy	Responsible for energy policy advice and oversight, will be engaged by the project, particularly for the consideration of tax deductions or other government financial incentives to reduce the risk of small scale solar PV investments
Electricity Utility	BL&PC	As the power market opens up, the utility will still control the grid (e.g. transmission, maintenance). So its project engagement is necessary to ensure solar PV safety, reliability.
Electricity Regulator	FTC	The independence and autonomy of the Fair Trade Commission will be critical to project success as it is engaged to oversee changes promoted by OPM and implemented by BL&PC (e.g. licensing and procurement terms and conditions)
Other Energy Stakeholders	Barbados NSI	The National Standards Institute will be engaged to ensure solar PV equipment imported meet quality requirements for Barbados, and may qualify for any proposed incentives
	GEED	The Government Electrical Engineering Department has a mandate over standards with electrical installations in Barbados and will be engaged in coordination with BNSI
	Smart Fund	Government plan to promote capital access for RE/EE via grants and subsidized loans
	UWI Cave Hill Campus	The project will coordinate with the University of West Indies plan to transform its Cave Hill campus into a RE demonstration site, to support capacity development activities

IV. BARBADOS RENEWABLE ENERGY TECHNOLOGY COST COMPARISONS:

20. Solar PV technologies may be commercially viable globally, but are not economically viable in Barbados according to expert estimates (see Figure 3 below) –the benchmark proposed for comparison is set at US\$0.14/kWh (fuel cost of most efficient conventional plant), versus the US\$0.28/kWh cost of solar PV (which is marginally commercial but not economically viable) that can still compete with current non-residential tariffs (set at US\$0.33/kWh) applicable to public buildings, where most initial solar PV investments will take place:

Figure 3. RET Cost Comparison versus Conventional Generation Tariffs (US\$ per kWh)



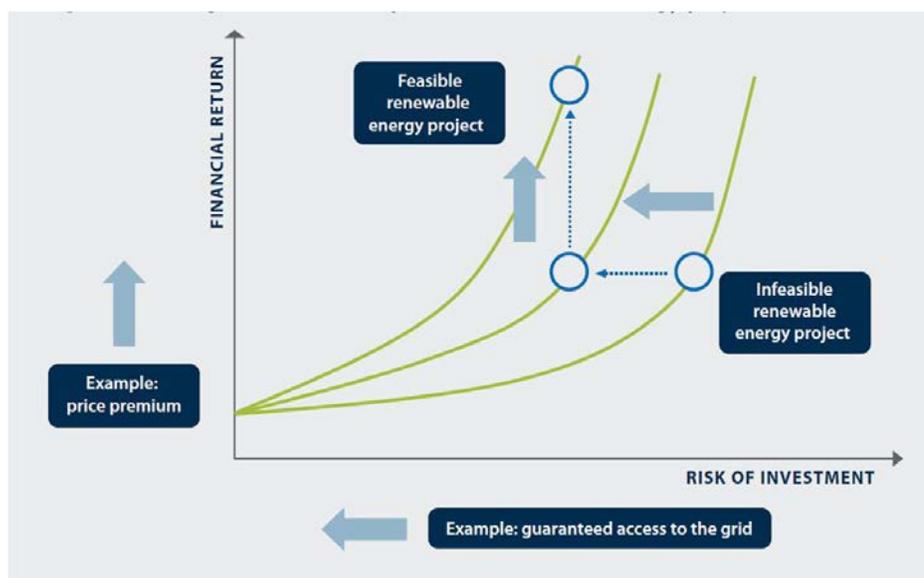
Source: Castalia Ltd. (2010); Castalia and Stantec estimates for the IADB report on the Sustainable Energy Framework for Barbados

V. BARBADOS UNDP-GEF PROJECT SUGGESTED DE-RISKING MEASURES:

21. The project will mainly focus on policy de-risking measures (see box and Figure 4 below) to address previously noted barriers affecting the viability of solar PV in Barbados (thereby, shifting the risk profile of investments “to the left” so that financial de-risking is effective in shifting financial returns “upwards”):

Types	Risks	De-risking Measures
<i>Policy Derisking Instruments</i>	Permits risk (eg. licensing)	<i>Establishing streamlined licensing procurement processes:</i> The project will support the OPM, in liaison with the energy ministry, utility and the regulator, the setup of tender and procurement procedures for self-supply, IPP and PPA to open up the electricity market
	Transmission / grid risk (eg. standards)	<i>Developing grid connection strategies and capabilities:</i> The project will help setting standards to ensure the safety and quality of equipment installations and grid integrity are not compromised, as it would negatively impact the credibility of solar PV technologies
	Counterparty risk (utility payments)	<i>Applying utility best practices on cost recovery arrangements:</i> The project will propose adequate billing arrangements to be developed for the utility and self-suppliers (e.g. net metering, others) to ensure there are no counterpart credit or payments defaults
	Technology / resource risk (O&M skills)	<i>Developing local content capacity for solar PV supply and installations:</i> The project will focus more on developing the local skill base of installers, repairers and maintenance of PV panels and components than suppliers to promote employment and entrepreneurship
	Social acceptance (awareness)	<i>Developing public campaigns and establishing solar PV demo project sites:</i> The PV installations in public buildings and education institutions (e.g. schools, UWI) will be supported by communication strategies to ensure technology knowledge dissemination
<i>Financial Derisking Instruments</i>	Macro-economic risk (eg oil prices)	<i>Monitoring oil price and currency rate movements to consider hedging mechanisms:</i> The project will monitor any decrease in oil prices or US dollar appreciation that would negatively impact solar PV imports and unit costs versus conventional fossil-based sources
	Financial sector risk (eg capital access)	<i>Promoting innovative finance mechanisms for solar PV and other RE technologies:</i> The Smart Fund may provide the financial access and guarantees needed for the solar PV market to grow in other commercial and residential sectors once established. These mechanisms may include grants directly to private sector developers, performance grants, revolving loans, amongst other grant and non-grant instruments to be considered during the PPG phase, and confirmed by the CEO Endorsement stage.
<i>Direct Financial Incentives</i>	Political risk (eg taxes)	<i>Establishing fiscal benefits for solar PV market growth learning from the pitfalls of the SWH boom:</i> the PV market may need but cannot depend solely on tax deductions (e.g. import duty or other wavers) so the project will support developing fiscal alternatives

Figure 4. UNDP-GEF Derisking Instruments: Risk-Reward Profile Shifts



Source: UNDP