

# GEF-8 PROJECT IDENTIFICATION FORM (PIF)

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## General Project Information

### Project Title

Energy resilience and security for the residential and public sector in Antigua and Barbuda

### Region

Antigua and Barbuda

### GEF Project ID

11474

### Country(ies)

Antigua and Barbuda

### Type of Project

FSP

### GEF Agency(ies):

UNDP

### GEF Agency ID

9702

### Executing Partner

Department of Environment (DoE) Ministry of Health, Wellness, Social Transformation and the Environment Antigua & Barbuda

### Executing Partner Type

Government

### GEF Focal Area (s)

Climate Change

### Submission Date

10/18/2023

### Project Sector (CCM Only)

Renewable Energy

### Taxonomy

Focal Areas, Climate Change, Climate Change Adaptation, Climate resilience, Climate Change Mitigation, Technology Transfer, Renewable Energy, Financing, United Nations Framework Convention on Climate Change, Nationally Determined Contribution, Influencing models, Strengthen institutional capacity and decision-making, Transform policy and regulatory environments, Deploy innovative financial instruments, Demonstrate innovative approaches, Stakeholders, Beneficiaries, Civil Society, Academia, Type of Engagement, Consultation, Participation, Capital providers, Private Sector, Financial intermediaries and market facilitators, Individuals/Entrepreneurs, Gender Equality, Gender results areas, Participation and leadership, Access to benefits and services, Gender Mainstreaming, Sex-disaggregated indicators, Capacity, Knowledge and Research, Knowledge Generation, Capacity Development

### Type of Trust Fund

GET

### Project Duration (Months)

72

### GEF Project Grant: (a)

8,393,151.00

### GEF Project Non-Grant: (b)

0.00

### Agency Fee(s) Grant: (c)

797,349.00

### Agency Fee(s) Non-Grant (d)

0.00

### Total GEF Financing: (a+b+c+d)

9,190,500.00

### Total Co-financing

20,132,229.00

PPG Amount: (e) 200,000.00	PPG Agency Fee(s): (f) 19,000.00
PPG total amount: (e+f) 219,000.00	Total GEF Resources: (a+b+c+d+e+f) 9,409,500.00
Project Tags CBIT: No NGI: No SGP: No Innovation: No	

## Project Summary

Provide a brief summary description of the project, including: (i) what is the problem and issues to be addressed? (ii) what are the project objectives, and if the project is intended to be transformative, how will this be achieved? (iii), how will this be achieved (approach to deliver on objectives), and (iv) what are the GEBs and/or adaptation benefits, and other key expected results. The purpose of the summary is to provide a short, coherent summary for readers. The explanation and justification of the project should be in section B “project description”. (max. 250 words, approximately 1/2 page)

**Problem / issues to be addressed** includes ensuring a more sustainable energy sector (not based on fossil fuels) in a small island developing state – which is both climate change resilient and financially sustainable.

**The project objective** is the “Creation of a sustainable market mechanism for climate-resilient distributed renewable energy systems in Antigua and Barbuda, resulting in significant installation of such systems in the residential and commercial sectors – including amongst vulnerable populations and in storm shelters.”

**This will be achieved by** scaling up the adoption of renewable energy and reduction of GHG while mobilizing the market for building-level solar PV plus storage with the inclusion of low-income households – and increasing the power availability for storm shelters. The project focuses on policy and institutional interventions to reduce barriers and promote renewable energy, a bulk purchasing programme of PV and storage equipment, setting up of a revolving loan program to facilitate low-cost access to PV systems (via loans / delayed payment and through equipment distributor partnerships), the establishment of an end-of-life program for responsible disposal of renewable energy equipment, public awareness efforts, and Monitoring and Knowledge Management. By fostering renewable / efficient energy production, environmental sustainability, and inclusivity, the project directly addresses the broader goal of energy resilience and security in Antigua and Barbuda.

**GHG emissions reductions** are expected to be approximately 83,000 tCO<sub>2</sub>eq direct reductions over a 20-year investment lifetime of equipment (with the potential for indirect emissions reductions of an additional 415,000 tCO<sub>2</sub>eq reductions). Additionally, resilience will be improved for approximately 23,255 people directly – including over 15,000 women.

## Indicative Project Overview

### Project Objective

Creation of a sustainable market mechanism for climate-resilient distributed renewable energy systems in Antigua and Barbuda, resulting in significant installation of such systems in the residential and commercial sectors – including amongst vulnerable populations and in storm shelters.

## Project Components

### Component 1. Policy, capacities and institutional Interventions for energy transition

Component Type	Trust Fund
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Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
330,000.00	795,000.00

Outcome:

1: Acceleration of the adoption of GHG reduction technologies in Antigua and Barbuda via policy and training of the workforce

Output:

1.1: A market coordination structure to connect market participants to the project

1.2: Long term training and courses developed and carried out for new market stakeholders and distributed RE professionals

1.3: Enhancement of financial mechanism sustainability

## Component 2: Short term barrier removal through bulk procurement and a revolving loan program for low-carbon distributive energy in households, SMEs, and community centers / storm shelters

Component Type	Trust Fund
Investment	GET
GEF Project Financing (\$)	Co-financing (\$)
6,409,528.00	17,362,229.00

Outcome:

2: Finance mobilised for households (particularly low-income households) SMEs, and community centers resulting in an ongoing scalable financing mechanism

Output:

2.1: Bulk purchase of PV systems for distribution

2.2: Identify and set criteria for applicants for loans / grants and finalize term sheet with the **SIRF Fund**

## Component 2: Short term barrier removal through bulk procurement and a revolving loan program for low-carbon distributive energy in households, SMEs, and community centers / storm shelters

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
266,665.00	445,000.00

Outcome:

2: Finance mobilised for households (particularly low-income households) SMEs, and community centers resulting in an ongoing scalable financing mechanism

Output:

2.3: Develop investment manual and procedures for the loan applications for both the SIRF Fund as well as private equipment distributors and installers (set processes)

2.4: Calls for applications of loans and evaluation of potential investments

2.5: Installation and ongoing maintenance of PV + battery systems

### Component 3: End of life program for RE technology

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
673,284.00	300,000.00

Outcome:

3: End of life policy and practices for RE equipment and components are established

Output:

3.1: Waste companies are trained in reusing and disposing decommissioned Panels and batteries (lead acid, lithium), especially after an extreme weather event

3.2: Standards and a policy framework for regulating the disposal of RE equipment

3.3: Legal framework, policy and equipment for recycling panels and batteries for end of life

### Component 4: Public awareness and Knowledge Management

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
84,000.00	90,000.00

Outcome:

#### 4: Knowledge and information effectively tracked

Output:

4.1: Marketing / public awareness about the project

4.2: Lessons learned / knowledge sharing in the region and amongst stakeholders

#### M&E

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
230,000.00	190,000.00

Outcome:

5. Monitoring and Evaluation carried out

Output:

5.1: Safeguards, gender and knowledge monitoring

5.2: Mid-Term Review, Terminal Evaluation, Annual Reports

#### Component Balances

Project Components	GEF Project Financing (\$)	Co-financing (\$)
Component 1. Policy, capacities and institutional Interventions for energy transition	330,000.00	795,000.00
Component 2: Short term barrier removal through bulk procurement and a revolving loan program for low-carbon distributive energy in households, SMEs, and community centers / storm shelters	6,409,528.00	17,362,229.00
Component 2: Short term barrier removal through bulk procurement and a revolving loan program for low-carbon distributive energy in households, SMEs, and community centers / storm shelters	266,665.00	445,000.00
Component 3: End of life program for RE technology	673,284.00	300,000.00

Component 4: Public awareness and Knowledge Management	84,000.00	90,000.00
M&E	230,000.00	190,000.00
<b>Subtotal</b>	<b>7,993,477.00</b>	<b>19,182,229.00</b>
Project Management Cost	399,674.00	950,000.00
<b>Total Project Cost (\$)</b>	<b>8,393,151.00</b>	<b>20,132,229.00</b>

Please provide justification



## PROJECT OUTLINE

### A. PROJECT RATIONALE

Briefly describe the current situation: the global environmental problems and/or climate vulnerabilities that the project will address, the key elements of the system, and underlying drivers of environmental change in the project context, such as population growth, economic development, climate change, sociocultural and political factors, including conflicts, or technological changes. Describe the objective of the project, and the justification for it. (Approximately 3-5 pages) see guidance here

#### **Problem to be Addressed**

Antigua and Barbuda is a small island developing state (SIDS) in the Caribbean Sea consisting of two main inhabited islands and several smaller islands, with a total land area amounting to ~456 km. Antigua is the larger of the two islands at 280 km<sup>2</sup>, while Barbuda — which is 40 km north of Antigua — has a land area of 176 km<sup>2</sup>. Both islands are low-lying with 70% of the land in Antigua less than 30 m above mean sea level and most of Barbuda only 3 m above mean sea level. The country's economy is heavily dependent on natural resources, low-lying coastal zones, and favorable climate conditions to support the tourism sector, which accounts for about 80% of output gross domestic product (GDP), about 70% of direct and indirect employment and 85% of foreign exchange earnings. Despite a high-income ranking, approximately 18% of the total population (which is above 97,000) falls below the national poverty line<sup>15</sup>; 3.7% indigent (food poor); and 10% vulnerable to poverty in the event of a significant socio-economic shock or natural hazard.<sup>16</sup> When considering the proportion of the population that is at risk of falling into poverty if there is a shock to the economy, 17% rises to 28%.

Antigua and Barbuda's current power system is highly dominated by fossil fuel generation – specifically diesel power station generation - with only a 3.55% share of renewable energy. This results in a relatively high grid emissions factor of 0.62 tCO<sub>2</sub>eq/MWh in Antigua and 0.96 tCO<sub>2</sub>eq/MWh in Barbuda<sup>[1]<sup>1</sup></sup>. The total installed capacity of the electricity system is 126.7 MW (with approximately 9 MW of solar power) with peak demand of approximately 60 MW.<sup>[2]<sup>2</sup></sup> However, peak demand has been growing – especially as air conditioning has become more popular.<sup>[3]<sup>3</sup></sup> The Government of Antigua and Barbuda proposed a target to achieve a goal of 100% renewable energy generation by the year 2030, as part of their updated Nationally Determined Contributions (NDCs) under the Paris Agreement. To achieve this target, the energy sector of the country must therefore undergo a transition away from its current reliance on fossil fuels. This shift needs to reduce emissions by more than 90% and should also include steps to develop renewable energy sources and increase efficiency across major emitting sectors. Antigua and Barbuda does not possess any known indigenous sources of fossil fuel resources; hence it depends heavily on fossil fuel imports – heavy fuel oil in electricity generation, gasoline and diesel in transport, and liquid petroleum gas for cooking. As a result, the energy sector (including transport) is the major contributor of GHG emissions, emitting 650 Gg CO<sub>2</sub>e (kt CO<sub>2</sub>) and accounting for 76% of the total CO<sub>2</sub> emissions in 2015. Fossil fuel imports put an additional burden on the country's economy; in 2013, the fuel imports amounted to USD 165.4 million, equivalent to 13.7 % of

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its Gross Domestic Product (GDP).<sup>[4]</sup> Additionally, Antigua and Barbuda has one of the world's highest electricity costs, at USD 0.37/kWh for residences and USD 0.39/kWh for businesses<sup>[5]</sup>.

Antigua and Barbuda is exposed economically, environmentally and socially to projected climate change impacts which will result in a greater intensity of hurricanes, more frequent droughts, high temperatures and sea-level rise.<sup>[6]</sup> Antigua and Barbuda recognize that climate change disproportionately impacts the vulnerable groups of the country. Climate change impacts increase financial exclusion and is also a barrier to financial stability.

As part of the GoAB's Inclusive Renewable Energy Strategy, inclusive programmes are proposed that will facilitate the involvement of vulnerable communities in the energy transition and help them build resiliency and mitigate losses that are caused by climate change. An important risk related to climate change is that of power outages resulting from either storms or general grid instability – which is expected to increase with climate change impacts. Already, outages are common on the islands due to grid instability and storms.<sup>[7]</sup> Having power during the critical hours after a storm can be important for – for example – storage of medicines, keeping food from spoiling, ensuring light availability for safety reasons, etc.

Antigua and Barbuda has significant renewable energy resources such as solar and wind that have accelerated the energy transition. To achieve the targets from its first NDC, it has adopted several national and sectoral mitigation actions. Antigua and Barbuda has adopted a programmatic approach oriented towards installing renewable energy plants and innovative grid-interactive renewable energy systems designed to improve resilience during extreme weather events.

However, a large number of standby generators in Antigua and Barbuda exist - caused by a number of factors, including, but not limited to, an unreliable electric grid and the propensity of the country to hurricanes and resultant damage to the electric grid. The standby generation subsector is equivalent to at least 36.52 MW and likely equivalent to 70% (56 MW) of the grid's generating capacity.<sup>[8]</sup> Assuming a 'business as usual scenario', we can assume that residents and businesses of Antigua and Barbuda will continue their interest in having standby power, in preparation for a power outage for resilience purposes.

Given the high level of diesel-fueled back-up generation, grid instability, and high retail electricity costs, there is a great potential for market development of distributed energy systems – including energy storage. The

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main technology for this would be solar PV + batteries, and this technology is already starting to be implemented on the islands.<sup>[9]</sup> However, installation of small units (e.g. 3 kW or up to 10 kW) is expensive given the island's geographic position and economic size. Costs per installed kW are estimated by DOE at higher than 7000 USD / kW. At the same time, financing costs for such installations are high – typically with interest rates of 5 – 7% annually from commercial banks and over short tenors. These financial realities mean that lower-income (and even medium-income) consumers are not likely to purchase such systems. Furthermore, the repair of systems – while technically feasible locally – is reported as not an option locally since the PV installers do not have the appropriate level of partnership / training with the equipment providers, meaning that if an inverter needs to be fixed, it must be sent away for repair which could take a month or more.

The regulatory environment currently encourages distributed energy via net a billing system – allowing for electricity to be sold by PV systems to the grid at the wholesale price. There is a requirement for all buildings to be connected to the grid.

It is also important that there is no established protocol or regulatory framework for dealing with end-of-use for solar PV / battery equipment. This means that when equipment is either damaged by storms or simply reaches the end of its useful life, there is limited capacity on the island for dealing with it. This will increasingly become an issue with the emergence of electric vehicles with batteries.

Furthermore, there are specific barriers related to access to finance for poorer populations – including unsteady incomes (based around the tourist season) and overall relatively high financing prices (in terms of interest rates) and short tenors (under 7 years) for the requirement of payback of loans. Furthermore, there are barriers to the entrance into the professions related to renewable energy, and slightly higher unemployment rates for women than men (14.5% versus 12.9% in 2019).<sup>[10]</sup>

In order to address these issues, this project proposal has been developed with the objective of *“Creating a sustainable market mechanism for climate-resilient distributed renewable energy systems in Antigua and Barbuda, resulting in significant installation of such systems in the residential and commercial sector – including amongst vulnerable populations and in storm shelters.”*

The project will build on existing climate financial mechanisms– wherein a financial product is already offered by the GEF-supported Sustainable Island Resources Framework (SIRF) FUND – which is operated under the Antiguan Department of Environment and has a successful concessional lending programme for households to “climate-proof” their residences.<sup>[11]</sup> The SIRF Fund already has a financial product for

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lending to households and commercial entities for climate change adaptation. The project’s financial product would be similar – but geared towards mitigation (with adaptation co-benefits) and also having a special carve-out / criteria for storm shelters. The project is described in detail under Section B below.

## Key stakeholders

The following key stakeholders expected to be involved.

Stakeholder	Nature of involvement
Department of Environment, Ministry of Health, Wellness, Social Transformation and the Environment	Executing entity of the project
SIRF Fund	Revolving fund that will be the instrument of the financial product that will finance PV + storage systems, acquired through bulk procurement.
Ministry of Energy	Key stakeholder for energy planning and promotion of the project.
Ministry of Finance	Key stakeholder for potentially scaling up investments – e.g. via development of a scale-up project proposal for IFIs or other green financing market.
NODS – National Observatory Disaster Service	Key partner for choosing what storm shelters may be appropriate for installations.
Antigua Public Utilities Authority (APUA)	Responsible for granting permits to PV installations, and also to be involved in the planning of geographic areas which may be a priority for installation
International Financial Institutions	Potential partners for scaling up investments – especially in cooperation with commercial banks
NGOs (e.g. Intersect Antigua)	Key partners for establishing criteria for inclusion of gender issues and vulnerable households in the project
Ministry of Social Transformation Human Resource Development and the Blue Economy	Key partners for establishing criteria for inclusion of gender issues and vulnerable households in the project – including potential cofinancing through existing support programmes to vulnerable households.
Solar installers	Key partners for “selling” PV + battery systems, and involved in the process of bulk procurement to ensure the technical specifications are appropriate to the situation and can be serviced locally as much as possible.
Hardware stores	Key partners for “selling” PV + battery systems including having one unit available for people to see and liaising with installers and the SIRF Fund.
Local Financial Institutions (credit unions and commercial banks)	Involved in potentially implementing their own credit products around renewable energy and storage.
National Solid Waste Management Authority / Antigua and Barbuda Waste Recycling Corporation	Key partner for development of waste protocols / practices.

## Projects / initiatives to build on

The project will build on existing lessons – in particular related to:

- Activities by the SIRF Fund as part of several projects, the GEF project Building climate Resilience through Innovative Financing Mechanisms for Climate Change Adaptation (GEF ID 5523) in lending to households and businesses for climate change adaptation, the Adaptation fund project and the GCF EDA projects;
- The Adaptation Fund full project – “An integrated approach to physical adaptation and community resilience in Antigua and Barbuda's northwest McKinnon's watershed” – This project involves, amongst other things, disbursement of concessional loans through a revolving fund mechanism to vulnerable households and businesses to meet new adaptation guidelines and standards for built infrastructure to withstand extreme climate variability.
- Activities within the IRENA / ADFD RE & EE project which aims at energy efficiency and renewable energy implementation in the country – which will be providing cofinancing for the project. The project provides a number of grants for RE and EE in the public building sector in particular.
- GCF readiness activities – which include support to developing an appropriate regulatory and institutional framework for promoting RE in the country, recycling of EVs and RE technology, insurance as well as developing relevant projects - which will be providing cofinancing for the project.
- Antigua and Barbuda Sustainable Low-Emission Island Mobility (SLIM) Project (GEF ID 10281) – especially in dealing with waste and battery issues
- The Path to 2020 - Antigua and Barbuda (GEF ID 9402) which is reported to be dealing with storm-readiness - though it's main relevant outcome is “Protected Area (PA) management and financing framework in Antigua and Barbuda strengthened and coordinated to support biodiversity conservation and to enable a Public-Private Partnership agreement for future management of the PA system.

Some of the key lessons from related projects - including the installation of PV systems - that are incorporated already into the project include the following:

- **The need for bulk procurement to drive prices down:** Market sounding and some smaller levels of procurement have shown that the prices can be reduced significantly (perhaps up to 50%) through bulk procurement – especially through standardised equipment purchases.
- **The need for longer-term agreements for training / certification for service on the islands:** if a part requires repair, it is often possible to do so with local knowledge – but there need to be agreements and operating procedures in place with equipment providers to allow this to happen (which would save costs and time)
- **The need for “standardising” prices and practices of installation and maintenance:** There is a large variety of costs and quality for the installation/maintenance services of PV systems, so further public instruction and guidance are necessary.
- **The availability of financing in a concessional way that is “retail” is very welcome:** The SIRF Fund has been quite successful in conducting grass-roots outreach to end-use recipients for adaptation investments – which should be possible to replicate and scale up for the PV + storage sector mitigations actions.

It is noted that the Executing Entity for the project (Department of Environment) has been involved in all of these projects / activities – meaning that key lessons are already internalized within the project.

[1] <https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210419131026353/ASB0051-2021.pdf>

[2] <https://www.irena.org/publications/2021/March/Antigua-and-Barbuda-Renewable-Energy-Roadmap>

[3] Based on conversations with the Department of Environment

[4] [http://admin.theiguides.org/Media/Documents/Renewable%20RA\\_Antigua\\_and\\_Barbuda\\_2016.pdf](http://admin.theiguides.org/Media/Documents/Renewable%20RA_Antigua_and_Barbuda_2016.pdf)

[5] <https://www.nrel.gov/docs/fy15osti/64115.pdf>

[6] Further analysis is presented in the 3<sup>rd</sup> National Communication to the UNFCCC - <https://unfccc.int/documents/67473>

[7] Based on interviews with stakeholders carried out in 08/2023.

[8] Department of Environment (2022) The Antigua and Barbuda Back-Up Energy Sector

[9] Based on conversations with various stakeholders in development of this PIF.

[10] Based on analysis carried out by UNIDO

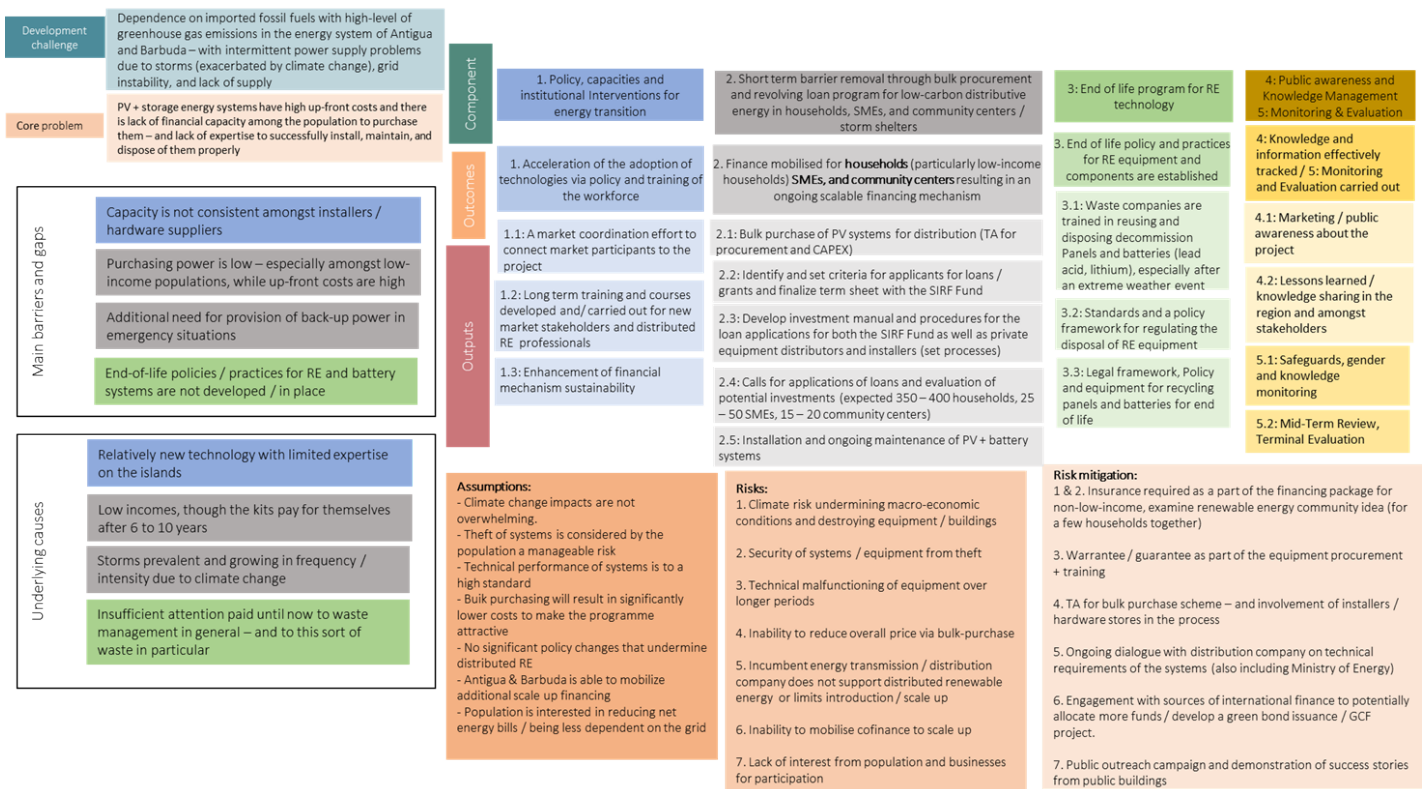
[11] <https://environment.gov.ag/sirf>

## B. PROJECT DESCRIPTION

### **Project description**

This section asks for a theory of change as part of a joined-up description of the project as a whole. The project description is expected to cover the key elements of good project design in an integrated way. It is also expected to meet the GEF's policy requirements on gender, stakeholders, private sector, and knowledge management and learning (see section D). This section should be a narrative that reads like a joined-up story and not independent elements that answer the guiding questions contained in the PIF guidance document. (Approximately 3-5 pages) see guidance here

The project's theory of change diagram is included in the figure below. The Development challenge is: *“Dependence on imported fossil fuels with high-level of greenhouse gas emissions in the energy system of Antigua and Barbuda – with intermittent power supply problems due to storms (exacerbated by climate change), grid instability, and lack of supply”* while the core problem the project seeks to address is *“PV + storage energy systems have high up-front costs and there is lack of financial capacity among the population to purchase them – and lack of expertise to successfully install, maintain, and dispose of them properly”*.



The planned project interventions are detailed below:

## Component 1. Policy, capacities and institutional Interventions for energy transition

*Outcome 1: Acceleration of the adoption of GHG reduction technologies in Antigua and Barbuda via policy and training of the workforce*

### Output 1.1: A market coordination effort to connect market participants to the project

This will involve a technical assistance engagement along with the project management team to sensitize potential market participants and stakeholders to the project. It will include various in-person events and meetings that will be identified in a stakeholder engagement plan to guarantee representativeness of diverse stakeholders groups, clarity of roles, gender mainstreaming and inclusion in project outputs and to ensure private sector buy-in. Stakeholders involved in the process will be tracked according to type (e.g. private company, government, NGO, etc.) as well as gender. As part of this activity, it is expected that a Technical Advisory Committee or Steering Committee will be formed with key stakeholders.

### Output 1.2: Long term training and courses developed / carried out for new stakeholders and RE professionals

This will involve the development of a programme for ongoing training and certification for new professionals and existing professionals in the distributed renewable energy / energy storage sector. This will include the development of the curriculum – likely in partnership with existing local professional schools – as well as the implementation of the first few rounds of training courses. A special focus will be put on

encouraging women in participating in the training courses – including outreach specifically geared towards women and via women’s groups. Additionally, partnerships with installers and other relevant businesses are envisaged to allow for easy job placement programmes and entrepreneurship (with priority to woman led business).

### **Output 1.3: Enhancement of financial mechanism sustainability**

This output will address needed assessments, stakeholder engagement and policy recommendations to guarantee the project can scale up. It will focus on the identification of new sources and mechanisms of financing for ongoing and future investments. This would include via private sources of finance (e.g. local financial institutions such as credit unions) and potentially via international sources (such as the GCF or other IFI sources, green bonds, etc). It could include, for example: the development of a green bond issuance and framework, the development of an application for other forms of concessional finance (such as GCF or other IFI funding), and / or the mobilisation of locally sourced funds. Part of the mechanism’s sustainable way forward should build on lessons learnt and gender criteria to increase woman access to credit and financing.

## **Component 2: Short term barrier removal through bulk procurement and a revolving loan program for low-carbon distributive energy in households, SMEs, and community centers / storm shelters**

*Outcome 2: Finance mobilised for households (particularly low-income households) SMEs, and community centers resulting in an ongoing scalable financing mechanism*

### **Output 2.1: Bulk purchase of PV systems for distribution**

PV + storage systems will be purchased and then made available for sale to end-users (average USD 5500 / kW expected). The procurement process will be run by the Department of Environment in collaboration with installers and procurement experts to be engaged to support a procurement framework. A key aspect will be ensuring the technology provider(s) are appropriate for the country context – including likely lithium ion batteries that would be delivered after the PV systems to prevent storage issues. Many specific aspects of the tender process will be established during the PPG process – including how many suppliers will be chosen (likely a maximum of 3) and the definition of a procurement framework with technology providers. The bulk purchase is expected to result in a decrease of costs per kW by at least 30% under the baseline price – and involve approximately 960 kW of systems (currently envisaged to be 3 kW, 5 kW and 10 kW). It is envisaged that part of the purchase agreements will include requirements on dealing with the end-of-life issues, as well as –training of local installers / technicians to provide authorised basic service to the system components.

### **Output 2.2: Identify and set criteria for applicants for loans / grants and finalize term sheet with the SIRF Fund**

This will involve the development of set criteria for applicants which will account for gender equity, encourage vulnerable / low-income households to apply, and set the conditions for lending. Already the SIRF Fund has a tool for identifying vulnerable households and criteria defined for other climate related programs which will be used as a starting point. Gender considerations will be included in these criteria – expected to include favouring women-led households and businesses. For example, already for the existing SIRF Fund criteria, the following are taken into account when assessing social vulnerability:



- Number of persons earning income in household
- Number of children
- Whether the household is caring for the elderly
- Whether the household is caring for special needs person / taking care of persons with physical disability
- # of females in the home
- # of males in home

For storm shelters, the NODS (National Observatory Disaster Service) will help to set criteria for participation. Further details on standard operating procedures, levels of concessionality for financing PV systems according to beneficiaries and final criteria to access SIRF will be based on market and financial assessments undertaken during PPG phase.

### **Output 2.3: Develop investment manual and procedures for the loan applications for both the SIRF Fund as well as private equipment distributors and installers (set processes)**

This investment manual and loan application / tracking procedures will be developed in cooperation with technical assistance. It will build on lessons learned within the implementation of the Adaptation Fund project being implemented by the SIRF Fund. The investment manual will be an instruction manual which will be used to guide SIRF Fund employees on the decisions related to disbursements and tracking. The tracking procedures and M&E will include information on gender and women-led households.

### **Output 2.4: Calls for applications of loans and evaluation of potential investments**

This output will involve the public announcement of the call for applications for the loans – facilitated through private sector partners like installers and hardware stores (likely via in-store advertising), as well as through public relations activities (e.g. social media, television programmes, news bulletins, etc.). The calls for applications will then be evaluated by the SIRF Fund in line with the criteria established as a part of Output 2.2. Additionally, as part of this output, it is expected that the scale-up and revolving nature of Fund activities will be carried out, mobilizing approximately an additional USD 9.9 million for installations – resulting in an additional 1.8 MW of systems being procured and installed.

### **Output 2.5: Installation and ongoing maintenance of PV + battery systems**

This output will involve the supervision of installation and ongoing maintenance of the systems. Most maintenance is to be covered by contracts with the installers, but additional ad-hoc technical assistance will be made available to end-users as needed.

## **Component 3: End of life program for RE technology**

*Outcome 3: End of life policy and practices for RE equipment and components*

### **Output 3.1: Waste companies are trained in reusing and disposing decommissioned Solar Panels and batteries (lead acid, lithium), especially after an extreme weather event**

This output will involve the training of the main waste company representatives in partnership with the National Solid Waste Management Authority. Mostly the company implementing this will be the Antigua and Barbuda Waste Recycling Corporation. International expertise will be engaged to achieve this output. **Mainly it will focus on processing of waste materials – potentially for re-use, but more likely for proper disposal.** It could also involve the re-using of batteries from the electric transport sector within the power sector. **Part of the outreach to obtain participants will be specifically geared towards women and participants in trainings will be tracked according to gender. During PPG specific opportunities to engage woman led business will be assessed and targeted in the gender action plan.**

### **Output 3.2: Standards and a policy framework for regulating the disposal of RE equipment**

In parallel with Output 3.2, the **policy framework will be drafted and put in consultation for further adoption** by the government of Antigua for waste management processes. These standards should be consistent with other island states in the region. **As noted, this will focus mostly on the processing of waste materials – potentially for re-use, but more likely for proper disposal.**

### **Output 3.3: Legal framework, policy, and equipment for recycling panels and batteries for end of life and develop legislation for the same**

Related Output 3.2, this policy output will be specifically partnering with the GEF7 Sustainable Low-Emission Island Mobility Project (SLIM) and the GCF Multiyear projects for recycling of relevant equipment. It is also related to efforts on e-mobility, wherein batteries from electric vehicles could be used for energy purposes. **As part of the output, the relevant policies will be drafted for consultation and adoption. It will also involve the setting up of a penalty system for owners of equipment who do not dispose of the equipment properly.**

## **Component 4: Public awareness, Monitoring and Knowledge Management**

*Outcome 4: Knowledge and information effectively tracked*

### **4.1: Marketing / public awareness about the project**

In addition to the stakeholder engagement outlined in Output 1.1, a public awareness campaign will be carried out – including social media, print media, television engagement, etc. The number of media “hits” will be tracked and examples shared within the Project Implementation Reports. **Part of the public awareness**

activities will be specifically geared towards women and women-led households including their specific needs for active participation in projects activities (such as childcare during trainings).

#### **4.2: Lessons learned / knowledge sharing in the region and amongst stakeholders**

The Implementation Team at the Department of Environment (and SIRF Fund) will continuously compile lessons learned and knowledge materials that will be shared (a) within the project-related websites at the SIRF Fund and Department of Environment, and (b) via bi-lateral and multi-lateral communications with other countries / operations within the region. This will include highlighting key aspects of gender considerations / mainstreaming (including results achieved, key gender-related barriers, and lessons learned), technical aspects of the procurement / installation process, lessons on financing, stakeholder engagement, etc.

The market coordination effort in Component 1 and the calls for applications of loans in component 2 will be done through a national communication campaign. SIRF fund new operations, stakeholder engagement activities and the final call for applications to diverse beneficiaries, will be disseminated according to a pre-defined plan for strategic communications. The participation of hardware stores in the program will be also an important aspect influencing the communication plan as these stores are used by the broad population. In parallel to the dissemination of SIRF fund operations, awareness of the environmental and economic benefits of PV systems will be undertaken. Based on lessons learnt from SIRF previous operations, the project will facilitate a repository of information that can be assessed by new staff (due to high staff turnover in A&B). This repository or platform will be key to easily access performance of the fund as well as to compile overall results for monitoring and evaluation and further capitalization by other donors.

### **Component 5: Monitoring and Evaluation**

*Outcome 5: Monitoring and Evaluation carried out*

#### **5.1: Safeguards, gender and knowledge monitoring**

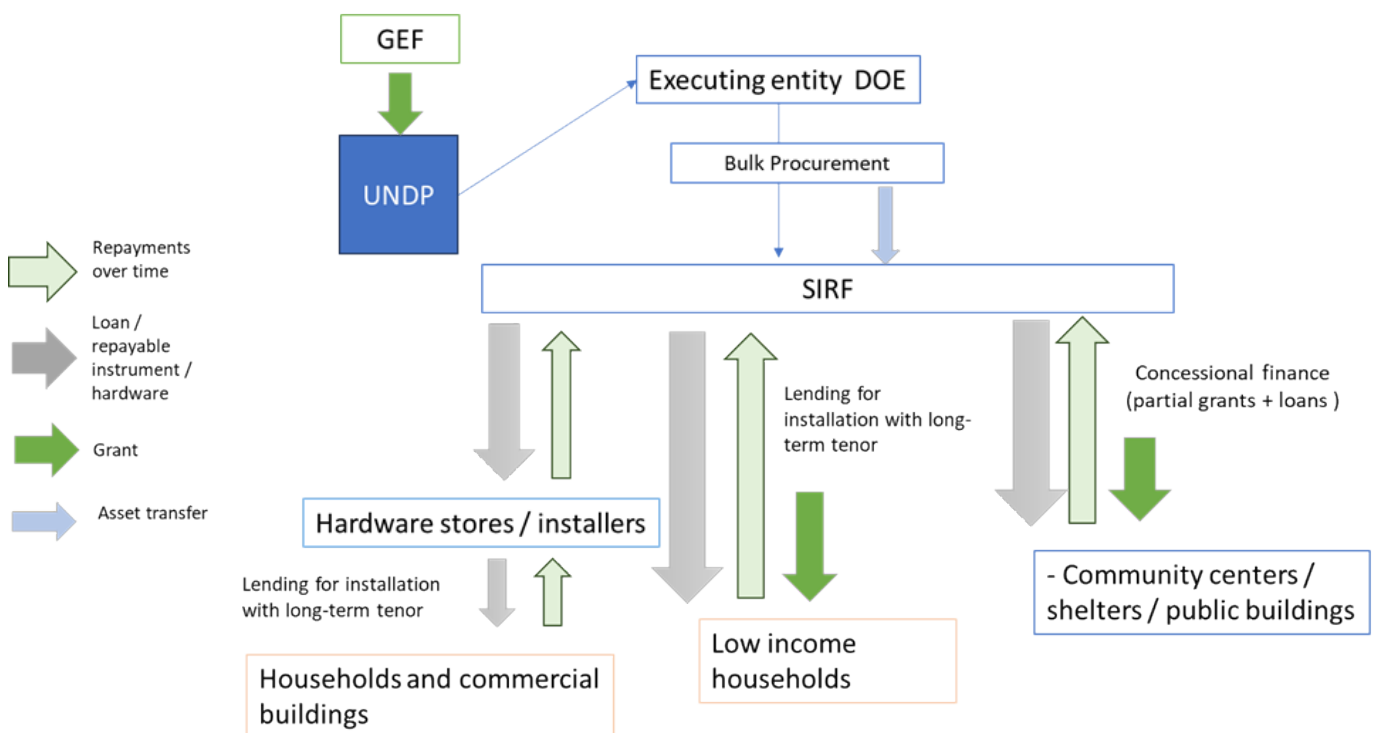
This output will involve making sure there is an appropriate budget for safeguards in the project and incorporation of gender mainstreaming activities and knowledge management. This is a standard practice of UNDP. It will include having a Redress Mechanism for any complaints regarding the project which can be dealt with appropriately. The monitoring of participants / beneficiaries disaggregated according to gender will be included throughout the project, and a specific focus will be put on enhancing women's participation in the sector as professionals and direct beneficiaries.

#### **5.2: Mid-Term Review, Terminal Evaluation, Annual Reports**

This activity involves the development of Project Implementation Reports (PIRs), the Mid-Term Review, and the Terminal Evaluation of the project.

A diagram indicating the interaction of the various components and stakeholder engaged with the SIRF mechanism for the project is included below. Note that that the GEF funding / UNDP funding will not

capitalize the SIRF Fund, but rather support the bulk procurement of Solar PV+battery systems by DOE which ownership will be transferred to the SIRF Fund and then deployed to installers, hardware companies, etc. The SIRF Fund will include a revolving mechanism for repayment of those systems by the beneficiaries. Different modalities will be considered whereas households or commercial entities could directly purchase the systems or alternatively the SIRF could finance systems purchase. Technical assistance will be provided to ensure proper installation and ongoing monitoring of systems. For certain categories of purchasers of the systems (vulnerable households and hurricane shelters) some level of grant / reduction in the costs for the systems will be developed.



The project's multifaceted approach allows for scalability, with the potential to expand the loan program including to more low-income households. The proposed technical solution is financially advantageous for households and could potentially become the “norm” within the entire population. Additionally, 20 more SMEs will be engaged in subsequent phases and with other stakeholders as investors in their own PV and storage systems.

The innovative blend of strategies offers a replicable model for the entirety of Antigua and Barbuda, and potentially for other Caribbean countries / SIDS. The lessons learned could inform similar initiatives, promoting renewable energy adoption with adaptation and resilience approaches on a wider scale.

The project's innovation lies in its approach to blend technological advancements with financial accessibility and responsible governance related to climate-resilient sustainable energy production. Its scale is reflective of a broad and inclusive vision, aiming to create a lasting impact on energy resilience and security in the region.

The project represents a multifaceted innovation that combines technological, financial, and policy-driven approaches. Technologically, it promotes the integration of distributed solar and energy storage (likely battery), a cutting-edge solution to enhance distributed renewable energy in the national grid while providing back-up power in the case of climate events. Financially, the revolving loan program, bulk purchase programme, and partial grant / concessional finance scheme are innovative financial mechanisms to facilitate access to renewable energy solutions for building owners – with a focus on low-income households and community centers / storm shelter buildings.

Policy-wise, the project's focus is on developing (a) regulatory framework and capacity development for renewable energy equipment service providers (including Maintenance), as well as (b) recycling policies and standards for end-of-life disposal of renewable energy equipment.

The scale of the innovation encompasses the escalation of energy resilience to various sectors of society, including residential, public, and commercial domains. By having a specific focus on low-income families, SMEs, and buildings used for storm shelters, the project reaches a wide demographic, ensuring inclusivity. The financing mechanisms will be managed within the existent SIRF Fund (which is itself managed by the Ministry) which is mandated to implement the Environmental Protection and Management Act (2019) in a coordinated, systematic and cost-effective manner. Within its mandate, the SIRF fund provides concessional finance for a number of initiatives, including to the most vulnerable in emergency situations. The bulk purchase of equipment and partnership with equipment distributors represents an innovative approach to make the relevant technologies more available for businesses, households, and community centres / buildings used as storm shelters – with differentiated levels of concessionality (grants and / or lending conditions). This approach is intended to create a revolving fund which can be upscaled by the local financial sector when the GEF initiative ends. The combination of short-term barrier removal through loans and partial grants and long-term policy interventions will potentially transform this market for Antigua and Barbuda.

### **Coordination and Cooperation with Ongoing Initiatives and Project.**

Does the GEF Agency expect to play an execution role on this project?

If so, please describe that role here. Also, please add a short explanation to describe cooperation with ongoing initiatives and projects, including potential for co-location and/or sharing of expertise/staffing

As noted, the project will build on existing activities within Antigua and Barbuda, specifically:

- Activities by the SIRF Fund as part of several projects, the GEF project Building climate Resilience through Innovative Financing Mechanisms for Climate Change Adaptation (GEF ID 5523) in lending to households and businesses for climate change adaptation, the Adaptation fund project and the GCF EDA projects;
- The Adaptation Fund full project – “An integrated approach to physical adaptation and community resilience in Antigua and Barbuda's northwest McKinnon's watershed”
- Activities within the IRENA / ADFD RE & EE project which aims at energy efficiency and renewable energy implementation in the country – which will be providing cofinancing for the project
- GCF readiness activities – which include support to developing an appropriate regulatory and institutional framework for promoting RE in the country, recycling of EVs and RE technology, insurance as well as developing relevant projects - which will be providing cofinancing for the project.
- Antigua and Barbuda Sustainable Low-Emission Island Mobility (SLIM) Project (GEF ID 10281) – especially in dealing with waste and battery issues
- The Path to 2020 - Antigua and Barbuda (GEF ID 9402) which is reported to be dealing with storm-readiness

The activities of these projects are coordinated by the DoE (the anticipated Executing Entity for this project) meaning that there would be significant sharing of expertise and colocation of key activities.

## Core Indicators

### Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
<b>Expected metric tons of CO<sub>2</sub>e (direct)</b>	83000	0	0	0
<b>Expected metric tons of CO<sub>2</sub>e (indirect)</b>	415000	0	0	0

### Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
<b>Expected metric tons of CO<sub>2</sub>e (direct)</b>				
<b>Expected metric tons of CO<sub>2</sub>e (indirect)</b>				
<b>Anticipated start year of accounting</b>				
<b>Duration of accounting</b>				

### Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
<b>Expected metric tons of CO<sub>2</sub>e (direct)</b>	83,000			
<b>Expected metric tons of CO<sub>2</sub>e (indirect)</b>	415,000			
<b>Anticipated start year of accounting</b>	2025			
<b>Duration of accounting</b>	20			

### Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
<b>Target Energy Saved (MJ)</b>				

**Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)**

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)
Solar Photovoltaic	3.00			

**Indicator 11 People benefiting from GEF-financed investments**

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
<b>Female</b>	12,093			
<b>Male</b>	11,162			
<b>Total</b>	<b>23,255</b>	<b>0</b>	<b>0</b>	<b>0</b>

Explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators (max. 250 words, approximately 1/2 page)

- The GHG calculations are estimated based on the likely level of installation of PV systems over the course of the project period including the bulk procurement of approximately 1.2 MW and
- The scale up by 1.5 x involving either new finance or the revolving of funds (an additional 1.8 MW)
- An indirect multiplier effect resulting from significant scaling up of the project (the focus of Output 1.3).
- Lifetime of investments of 20 years

A standard capacity factor for Antigua and Barbuda of 20% was used (meaning that 20% of the time the PV systems will produce energy) and with a grid emissions factor per MWh based on the average of Antigua (0.62 tCO<sub>2</sub>eq/MWh) and Barbuda (0.96 tCO<sub>2</sub>eq/MWh).

Two tables showing GHG emissions reduction calculations as well as number of beneficiaries are attached to this submission in an excel file "GHG emissions calculations"

**Risks to Project Preparation and Implementation**

Summarize risks that might affect the project preparation and implementation phases and what are the mitigation strategies the project preparation process will undertake to address these (e.g. what alternatives may be considered during project preparation—such as in terms of consultations, role and choice of counterparts, delivery mechanisms, locations in country, flexible design elements, etc.). Identify any of the risks listed below that would call in question the viability of the project during its implementation. Please describe any possible mitigation measures needed. (The risks associated with project design and Theory of Change should be described in the “Project description” section above). The risk rating should reflect the overall risk to project outcomes considering the country setting and ambition of the project. The rating scale is: High, Substantial, Moderate, Low.

Risk Categories	Rating	Comments
Climate	High	<p>This is a macro-risk due to island vulnerability to climate change. At an investment level, there is also the risk of destruction of equipment. To mitigate against this risk, insurance should be required as a part of the financing package for non-low-income, and a renewable energy community idea will be examined (to bundle a few households together). Installation of PV systems will require CAT 5 resistant structures.</p>
Environment and Social	Moderate	<p>There is limited environmental risk related to the proper disposal of equipment. To mitigate against this risk the project will ensure the proper waste protocols are developed. Antigua is a fairly stable political environment, so overall risks to the political and governance paradigm are low. Mitigation action: Project board will include main political actor involved in resilience and energy policies.</p>
Political and Governance	Low	<p>Antigua is a fairly stable political environment, so overall risks to the political and governance paradigm are low. Mitigation action: Project board will include main political actor involved in resilience and energy policies.</p>
Macro-economic	Moderate	<p>There is a risk of macro-economic impacts due to dependency on tourism and vulnerability of the economy to climate change impacts such as hurricanes, droughts and heat. This risk will be monitored and will be mitigated against by ensuring that there is a financial (business) case for the installations to address power demand by specific consumers.</p>



Strategies and Policies	Substantial	There is a low risk that the government will change policies in terms of supporting distributed energy – as the current support is not overly generous. The main risk here is related to APUA policies for approving installations. Various stakeholders flagged that there is a risk that the incumbent energy company (APUA) may wish to change policies / not authorize the implementation of PV + storage projects if the market uptake is large. This will be mitigated against by including relevant political and operational stakeholders in project implementation and planning.
Technical design of project or program	Low	This is a low risk due to the experience of the Department of Environment and the plans to engage solar installers and other procurement experts (potentially from UNDP) in the project.
Institutional capacity for implementation and sustainability	Moderate	There is good capacity within the SIRF Fund and the Department of Environment, but turnover of staff could prove to be a risk. This will be mitigated against by having proper documentation of processes and a hand-over process in the event of staff turnover.
Fiduciary: Financial Management and Procurement	Low	The SIRF Fund and Department of Environment are experienced in carrying out projects funded by the GEF, GCF, and Adaptation Fund and have shown a good track record, including an Outstanding Evaluation of the Year award from UNDP. This potential risk will be mitigated against by having tools for tracking of the financial management and assistance in the procurement process as needed.
Stakeholder Engagement	Low	Stakeholders have already been engaged in the process of developing

		the PIF and will continue to be engaged throughout project preparation and during implementation as a key activity.
Other		N/A
Financial Risks for NGI projects		N/A
Overall Risk Rating	Moderate	The overall risk rating can be considered moderate given: 1. The existing institutional framework for the project (including a lending facility in place) 2. The financial advantages for the systems assuming bulk procurement can drive the prices down (estimated 5 – 7 year payback periods) 3. The relatively stable regulatory and policy environment. The key risks lie in the potential for climate impacts – linked with macro-economic risks, successful engagement of the incumbent utility (APUA) and institutional capacity to carry out the project.

#### C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES

Describe how the proposed interventions are aligned with GEF- 8 programming strategies and country and regional priorities, including how these country strategies and plans relate to the multilateral environmental agreements.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this.

For projects aiming to generate biodiversity benefits (regardless of what the source of the resources is - i.e., BD, CC or LD), please identify which of the 23 targets of the Kunming-Montreal Global Biodiversity Framework the project contributes to and explain how. (max. 500 words, approximately 1 page)

The project is directly aligned with the GEF-8 Programming Strategy *Pillar I: Promote innovation, technology development and transfer, and enabling policies for mitigation options with systemic impacts* – in particular *Objective 1.2 - Enable the transition to decarbonized power systems*. It contributes directly to the transition to decarbonized power systems in Antigua. It is also noteworthy that it does so via a sustainable revolving financing mechanism developed within the SIRF Fund.

The project is directly aligned with the countries priorities including as follows:

**Alignment with the Antigua National Energy Policy (NEP) 2011 and Sustainable Energy Action Plan (SEAP updated in 2013):** The SEAP serves as a roadmap for the energy future in Antigua and Barbuda from 2010 until 2030, and identify four kind of barriers to overcome: 1) institutional and regulatory barriers, 2) barriers harming energy conservation and energy efficiency targets, 3) barriers harming renewable energy development, and 4) countering low levels of awareness from the people and technical education.

**Antigua's Nationally Determined Contributions (NDC):** The project's emphasis on reducing greenhouse gas emissions, promoting renewable energy, and enhancing climate resilience aligns with Antigua's commitments under its NDC. By targeting community centers, schools, low-income families, and SMEs, the project supports the country's broader climate change mitigation and adaptation goals.

**Vulnerability Risk Assessments (VRAs) and Adaptation Plans:** The project's focus on distributive solar, energy and storage align with the 2022 NAP's Communication to the UNFCCC goal to develop adaptation baselines through comprehensive climate change risk mapping. By promoting renewable energy, the project contributes to reducing the country's vulnerability to climate change impacts. The NAP seeks to conduct VRAs and develop adaptation plans for various sectors. The project's emphasis on energy resilience and security supports this goal by addressing vulnerabilities in the energy sector and creating plans to enhance renewable energy adoption.

**Strategic Impact Assessments (SIAs) and Sustainable Financing:** The project's investment in renewable energy aligns, through the SIRF Fund, with the NAP's goal to develop a sustainable financing strategy. By fostering innovation and investment in renewable energy solutions, the project contributes to a sustainable financing strategy within the country for climate change mitigation.

#### D. POLICY REQUIREMENTS

##### **Gender Equality and Women's Empowerment:**

We confirm that gender dimensions relevant to the project have been addressed as per GEF Policy and are clearly articulated in the Project Description (Section B).

Yes

##### **Stakeholder Engagement**

We confirm that key stakeholders were consulted during PIF development as required per GEF policy, their relevant roles to project outcomes and plan to develop a Stakeholder Engagement Plan before CEO endorsement has been clearly articulated in the Project Description (Section B).

Yes

##### **Were the following stakeholders consulted during project identification phase:**

Indigenous Peoples and Local Communities: Yes

Civil Society Organizations: Yes

Private Sector: Yes

##### **Provide a brief summary and list of names and dates of consultations**

The following stakeholders were consulted in the period of 15/8/2023 through 1/9/2023 regarding the project.

Name / Last Name	Institution / role	Email address	Gender
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Diann Black Layne	GEF Focal Point	<a href="mailto:Diann.Black-Layne@ab.gov.ag">Diann.Black-Layne@ab.gov.ag</a>	F
Melissa LeBlanc	Technical Officer, Department of Environment	<a href="mailto:Melissa.LeBlanc@ab.gov.ag">Melissa.LeBlanc@ab.gov.ag</a>	F
Vekash Khan	Technical Officer, Renewable Energy Department of Environment	<a href="mailto:Vekash.Khan@ab.gov.ag">Vekash.Khan@ab.gov.ag</a>	M
Gita Gardner	MRV Officer, Department of Environment	<a href="mailto:Gita.Gardner@ab.gov.ag">Gita.Gardner@ab.gov.ag</a>	F
Garth Simon	Department of Environment / SIRF Fund	<a href="mailto:garth.simon@ab.gov.ag">garth.simon@ab.gov.ag</a>	M
Sherwyn Greenidge	Planning Consultant, Department of Environment	<a href="mailto:Sherwyn.greenidge@ab.gov.ag">Sherwyn.greenidge@ab.gov.ag</a> , <a href="mailto:roatroctclubantigua@gmail.com">roatroctclubantigua@gmail.com</a>	M
Pierre Briemel	Technical Officer for Renewable Energy Projects, Department of Environment	<a href="mailto:Pierre.Briemel@ab.gov.ag">Pierre.Briemel@ab.gov.ag</a>	M
ChristaJoy Burton	Regional Project Coordinator, Department of Environment	<a href="mailto:christajoy.burton@ab.gov.ag">christajoy.burton@ab.gov.ag</a>	F
Lakeea Allen	Apprentice, Department of Environment	<a href="mailto:Lakeea.allen@ab.gov.ag">Lakeea.allen@ab.gov.ag</a>	F
Nadia Spencer-Henry	Debt Manager, SIRF Fund	<a href="mailto:nadia.spencer-henry@ab.gov.ag">nadia.spencer-henry@ab.gov.ag</a>	F
Dwight Laviscount	Engineer, Ministry of Energy		M
Itajah Simmons	Energy Officer, Ministry of Energy		M
Christopher Straughn	Sustainable Energy Specialist, Caribbean Development Bank	<a href="mailto:straugc@caribank.org">straugc@caribank.org</a>	M
Sherrod James	Director, NODS – National Observatory Disaster Service		M
Julia Schramm	Green Energy Specialist, UNDP Global Procurement Services Division	<a href="mailto:julia.schramm@undp.org">julia.schramm@undp.org</a>	F
Alfonso Buxens	Procurement Specialist, UNDP Global Procurement Services Division	<a href="mailto:alfonso.buxens@undp.org">alfonso.buxens@undp.org</a>	M
Annetta Jackson	Director / Storyteller, Intersect Antigua	<a href="mailto:annettajackson@icloud.com">annettajackson@icloud.com</a>	F
Robyn Browne	Research Assistant, Department of Blue Economy, Ministry of Social Transformation Human Resource Development and the Blue Economy	<a href="mailto:robyn.browne@ab.gov.ag">robyn.browne@ab.gov.ag</a>	F
Dale O'Brien	Director Community Development and Citizens' Engagement Division · Ministry of Social Transformation Human Resource Development and the Blue Economy	<a href="mailto:dale.obrien@ab.gov.ag">dale.obrien@ab.gov.ag</a>	F
Raisa Charles	Directorate of Gender Affairs, Ministry of Social Transformation Human Resource Development and the Blue Economy	<a href="mailto:raisa.charles@ab.gov.ag">raisa.charles@ab.gov.ag</a>	F
Gloria Brewer	Social Protection Officer, Department of Social Policy, Research and Planning,	<a href="mailto:gloria.brewer@ab.gov.ag">gloria.brewer@ab.gov.ag</a>	F

	Ministry of Social Transformation Human Resource Development and the Blue Economy		
Kimbalie Constant	Project Implementation Manager, Department of Social Policy, Research and Planning, Ministry of Social Transformation Human Resource Development and the Blue Economy	<a href="mailto:Kimbalie.constant@ab.gov.ag">Kimbalie.constant@ab.gov.ag</a>	F
Stanley Barreto	Director, Solar Solutions Ltd	<a href="mailto:megapowerantigua@yahoo.com">megapowerantigua@yahoo.com</a>	M
Daryl Jackson	Director, Owia Energy Solutions	<a href="mailto:daryl.jackson@owiaenergy.com">daryl.jackson@owiaenergy.com</a>	M
Natasha Watts	PFM Officer, Ministry of Finance	<a href="mailto:Natasha.watts@ab.gov.ag">Natasha.watts@ab.gov.ag</a>	F
Shiron Burton	Deputy Debt Manager, Ministry of Finance	<a href="mailto:Shiron.burton@ab.gov.ag">Shiron.burton@ab.gov.ag</a>	F
Ian Ireland	Business Advisory Officer, Entrepreneurial Development Programme (government programme)	ian.ireland3@gmail.com	M
Collin Willock	Maintenance Contractor, ACB Caribbean (private bank)	<a href="mailto:cwillock@acbonline.com">cwillock@acbonline.com</a>	M
Urica Mannix- Charles	Admin & Facilities, ACB Caribbean (private bank)	umannix-charles@acbonline.com	F
Lyndon Ryan	Manager, Antigua Plumbing and Hardware		M

A Summary of the roles of the types of stakeholders can be found in the table below:

Simplified stakeholder engagement plan				
Stakeholder Group	Why included (interests)	Participation methods		Timeline
		Method	Responsibility	
Government ministries / agencies	Important for adopting any relevant policies / legislative framework	Engaged in various outputs according to their competencies for all components - likely as part of a Technical Advisory Committee or Steering Committee. Some members will serve on the Investment Committee for the SIRF Fund activities.  Authorities responsible for finance will be particularly engaged in scaling up discussions / activities for the project.	DoE is responsible for project implementation and will engage other stakeholders with technical assistance as appropriate.	Ongoing
Private Sector: PV Installers / maintenance organisations, and Hardware stores	Engage in public selling of systems, installation and ongoing maintenance of systems.	Part of market engagement efforts and provision of advice for Component 1 – likely via a Technical Advisory Committee.	To be further refined during PPG	Ongoing

		Responsible for engaging of the public for selling of systems, installation and maintenance.  May also advise on appropriate technologies for bulk procurement  Beneficiaries of training.		
Private sector / NGO sector: Businesses and shelters	Potential purchasers / users of PV plus storage systems	Actively engaged via bilateral and marketing activities by private sector installers / hardware stores and other project consultants (Component 1 and 2).  Further engaged to track results / pay back loans.	To be further refined during PPG	Ongoing
Waste management companies	Key beneficiaries of Component 3 activities.	Actively engaged as a beneficiary of the project. In particular for purchase of hardware necessary for waste processing, as well as further planning of capacity building activities.	To be further refined during PPG	Ongoing with a focus on the 2 <sup>nd</sup> half of the project.
Local Civil Society Organizations (CSOs) / women's groups	Engaged in public outreach and advisory on how to address vulnerable groups and gender issues.	Certain organizations will likely be invited as part of a Technical Advisory Committee or Steering Committee to provide perspective on the project implementation.  Additionally, they could potentially be engaged in technical assistance activities in dealing with outreach.	To be further refined during PPG	Ongoing
Financial institutions (including International Financial Institutions and Local Financial Institutions)	Potentially engaged in financing of additional installations / scaling up of the project	Actively engaged throughout the project for potentially scaling up investment.	To be further refined during PPG	On a quarterly basis.

(Please upload to the portal documents tab any stakeholder engagement plan or assessments that have been done during the PIF development phase.)

### Private Sector

Will there be private sector engagement in the project?

Yes

And if so, has its role been described and justified in the section B project description?

Yes

### Environmental and Social Safeguard (ESS) Risks

We confirm that we have provided indicative information regarding Environmental and Social risks associated with the proposed project or program and any measures to address such risks and impacts (this information should be presented in Annex D).

Yes

#### Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

## E. OTHER REQUIREMENTS

### Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described in the Project Description (Section B)

Yes

## ANNEX A: FINANCING TABLES

### GEF Financing Table

#### Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant(\$)	Agency Fee(\$)	Total GEF Financing (\$)
UNDP	GET	Antigua and Barbuda	Climate Change	CC STAR Allocation: CCM-1-2	Grant	8,393,151.00	797,349.00	9,190,500.00
<b>Total GEF Resources (\$)</b>						<b>8,393,151.00</b>	<b>797,349.00</b>	<b>9,190,500.00</b>

### Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount (\$)

200000

PPG Agency Fee (\$)

19000

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG(\$)	Agency Fee(\$)	Total PPG Funding(\$)
UNDP	GET	Antigua and Barbuda	Climate Change	CC STAR Allocation: CCM-1-2	Grant	200,000.00	19,000.00	219,000.00
<b>Total PPG Amount (\$)</b>						<b>200,000.00</b>	<b>19,000.00</b>	<b>219,000.00</b>

Please provide justification

### Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total(\$)
UNDP	GET	Antigua and Barbuda	Climate Change	CC STAR Allocation	1,900,000.00
UNDP	GET	Antigua and Barbuda	Biodiversity	BD STAR Allocation	3,709,500.00
UNDP	GET	Antigua and Barbuda	Land Degradation	LD STAR Allocation	3,800,000.00
<b>Total GEF Resources</b>					<b>9,409,500.00</b>

### Indicative Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing(\$)	Co-financing(\$)
CCM-1-2	GET	8,393,151.00	20132229
<b>Total Project Cost</b>		<b>8,393,151.00</b>	<b>20,132,229.00</b>

### Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Department of Environment	In-kind	Recurrent expenditures	1730000
Recipient Country Government	Ministry of Health, Wellness, Social Transformation and the Environment Antigua & Barbuda – ADFD project	Grant	Investment mobilized	7462229



Recipient Country Government	Ministry of Health, Wellness, Social Transformation and the Environment Antigua & Barbuda – via SIRF Fund revolving fund	Loans	Investment mobilized	9900000
GEF Agency	UNDP	In-kind	Recurrent expenditures	150000
Donor Agency	GCF – via Ministry of Health, Wellness, Social Transformation and the Environment Antigua & Barbuda	Grant	Investment mobilized	890000
<b>Total Co-financing</b>				<b>20,132,229.00</b>

Describe how any "Investment Mobilized" was identified

Note: The investment mobilized represents the approximate scaling up of the funds / revolving of the funds after repayment by a factor of 1.5 during the lifetime of the project (6 years) i.e. a significant portion of the initial funds outlaid for bulk purchasing will be paid back to the SIRF Fund which will allow for revolving those funds, as well as injection of new capital.

## ANNEX B: ENDORSEMENTS

### GEF Agency(ies) Certification

GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	Pradeep Kurukulasuriya	10/18/2023	Ludmilla Diniz		ludmilla.diniz@undp.org

### Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s):

Name	Position	Ministry	Date (MM/DD/YYYY)
Mrs. Diann Black Layne	Director	Department of Environment Ministry of Health, Wellness, Social Transformation and the Environment	10/16/2023

## ANNEX C: PROJECT LOCATION

Please provide geo-referenced information and map where the project interventions will take place

Source: Worldometer

Coordinates: 17.0608° N, 61.7964° W



## ANNEX D: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

(PIF level) Attach agency safeguard screen form including rating of risk types and overall risk rating.

Title

GEF-8 PIF 9702-Antigua Barbuda RE-UNDP-SESP-v4\_cleared for PIMS (1)

## ANNEX E: RIO MARKERS

Climate Change Mitigation	Climate Change Adaptation	Biodiversity	Land Degradation
Principal Objective 2	Significant Objective 1	No Contribution 0	No Contribution 0

## ANNEX F: TAXONOMY WORKSHEET

Level 1	Level 2	Level 3	Level 4
<b>Influencing models</b>			
	<b>Transform policy and regulatory environments</b>		
	<b>Strengthen institutional capacity and decision-making</b>		
	<b>Convene multi-stakeholder alliances</b>		
	<b>Demonstrate innovative approaches</b>		
	<b>Deploy innovative financial instruments</b>		
<b>Stakeholders</b>			
	<b>Indigenous Peoples</b>		
	<b>Private Sector</b>		
		Capital providers	
		Financial intermediaries and market facilitators	
		Large corporations	
		SMEs	
		Individuals/Entrepreneurs	
		Non-Grant Pilot	
		Project Reflow	
	<b>Beneficiaries</b>		
	<b>Local Communities</b>		
	<b>Civil Society</b>		
		Community Based Organization	
		Non-Governmental Organization	
		Academia	
		Trade Unions and Workers Unions	
	<b>Type of Engagement</b>		
		Information Dissemination	
		Partnership	
		Consultation	
		Participation	
	<b>Communications</b>		
		Awareness Raising	
		Education	
		Public Campaigns	
		Behavior Change	
<b>Capacity, Knowledge and Research</b>			
	<b>Enabling Activities</b>		
	<b>Capacity Development</b>		
	<b>Knowledge Generation and Exchange</b>		
	<b>Targeted Research</b>		

	<b>Learning</b>		
		Theory of Change	
		Adaptive Management	
		Indicators to Measure Change	
	<b>Innovation</b>		
	<b>Knowledge and Learning</b>		
		Knowledge Management	
		Innovation	
		Capacity Development	
		Learning	
	<b>Stakeholder Engagement Plan</b>		
<b>Gender Equality</b>			
	<b>Gender Mainstreaming</b>		
		Beneficiaries	
		Women groups	
		Sex-disaggregated indicators	
		Gender-sensitive indicators	
	<b>Gender results areas</b>		
		Access and control over natural resources	
		Participation and leadership	
		Access to benefits and services	
		Capacity development	
		Awareness raising	
		Knowledge generation	
<b>Focal Areas/Theme</b>			
	<b>Integrated Programs</b>		
		Commodity Supply Chains ([1] <sup>12</sup> Good Growth Partnership)	
			Sustainable Commodities Production
			Deforestation-free Sourcing
			Financial Screening Tools
			High Conservation Value Forests
			High Carbon Stocks Forests
			Soybean Supply Chain
			Oil Palm Supply Chain
			Beef Supply Chain
			Smallholder Farmers
			Adaptive Management
		Food Security in Sub-Sahara Africa	
			Resilience (climate and shocks)
			Sustainable Production Systems
			Agroecosystems
			Land and Soil Health
			Diversified Farming
			Integrated Land and Water Management
			Smallholder Farming
			Small and Medium Enterprises
			Crop Genetic Diversity
			Food Value Chains
			Gender Dimensions
			Multi-stakeholder Platforms
		Food Systems, Land Use and Restoration	
			Sustainable Food Systems
			Landscape Restoration
			Sustainable Commodity Production
			Comprehensive Land Use Planning
			Integrated Landscapes
			Food Value Chains
			Deforestation-free Sourcing
			Smallholder Farmers
		Sustainable Cities	
			Integrated urban planning

			Urban sustainability framework
			Transport and Mobility
			Buildings
			Municipal waste management
			Green space
			Urban Biodiversity
			Urban Food Systems
			Energy efficiency
			Municipal Financing
			Global Platform for Sustainable Cities
			Urban Resilience
	<b>Biodiversity</b>		
		Protected Areas and Landscapes	
			Terrestrial Protected Areas
			Coastal and Marine Protected Areas
			Productive Landscapes
			Productive Seascapes
			Community Based Natural Resource Management
		Mainstreaming	
			Extractive Industries (oil, gas, mining)
			Forestry (Including HCVF and REDD+)
			Tourism
			Agriculture & agrobiodiversity
			Fisheries
			Infrastructure
			Certification (National Standards)
			Certification (International Standards)
		Species	
			Illegal Wildlife Trade
			Threatened Species
			Wildlife for Sustainable Development
			Crop Wild Relatives
			Plant Genetic Resources
			Animal Genetic Resources
			Livestock Wild Relatives
			Invasive Alien Species (IAS)
		Biomes	
			Mangroves
			Coral Reefs
			Sea Grasses
			Wetlands
			Rivers
			Lakes
			Tropical Rain Forests
			Tropical Dry Forests
			Temperate Forests
			Grasslands
			Paramo
			Desert
		Financial and Accounting	
			Payment for Ecosystem Services
			Natural Capital Assessment and Accounting
			Conservation Trust Funds
			Conservation Finance
		Supplementary Protocol to the CBD	
			Biosafety
			Access to Genetic Resources Benefit Sharing
	<b>Forests</b>		
		Forest and Landscape Restoration	
			REDD/REDD+
		Forest	

			Amazon
			Congo
			Drylands
	<b>Land Degradation</b>		
		Sustainable Land Management	
			Restoration and Rehabilitation of Degraded Lands
			Ecosystem Approach
			Integrated and Cross-sectoral approach
			Community-Based NRM
			Sustainable Livelihoods
			Income Generating Activities
			Sustainable Agriculture
			Sustainable Pasture Management
			Sustainable Forest/Woodland Management
			Improved Soil and Water Management Techniques
			Sustainable Fire Management
			Drought Mitigation/Early Warning
		Land Degradation Neutrality	
			Land Productivity
			Land Cover and Land cover change
			Carbon stocks above or below ground
		Food Security	
	<b>International Waters</b>		
		Ship	
		Coastal	
		Freshwater	
			Aquifer
			River Basin
			Lake Basin
		Learning	
		Fisheries	
		Persistent toxic substances	
		SIDS : Small Island Dev States	
		Targeted Research	
		Pollution	
			Persistent toxic substances
			Plastics
			Nutrient pollution from all sectors except wastewater
			Nutrient pollution from Wastewater
		Transboundary Diagnostic Analysis and Strategic Action Plan preparation	
		Strategic Action Plan Implementation	
		Areas Beyond National Jurisdiction	
		Large Marine Ecosystems	
		Private Sector	
		Aquaculture	
		Marine Protected Area	
		Biomes	
			Mangrove
			Coral Reefs
			Seagrasses
			Polar Ecosystems
			Constructed Wetlands
	<b>Chemicals and Waste</b>		
		Mercury	
		Artisanal and Scale Gold Mining	
		Coal Fired Power Plants	
		Coal Fired Industrial Boilers	
		Cement	
		Non-Ferrous Metals Production	
		Ozone	
		Persistent Organic Pollutants	
		Unintentional Persistent Organic Pollutants	

		Sound Management of chemicals and Waste	
		xWaste Management	
			xHazardous Waste Management
			Industrial Waste
			e-Waste
		Emissions	
		Disposal	
		New Persistent Organic Pollutants	
		Polychlorinated Biphenyls	
		Plastics	
		Eco-Efficiency	
		Pesticides	
		DDT - Vector Management	
		DDT - Other	
		Industrial Emissions	
		Open Burning	
		Best Available Technology / Best Environmental Practices	
		Green Chemistry	
	<b>Climate Change</b>		
		<b>Climate Change Adaptation</b>	
			Climate Finance
			Least Developed Countries
			Small Island Developing States
			Disaster Risk Management
			Sea-level rise
			Climate Resilience
			Climate information
			Ecosystem-based Adaptation
			Adaptation Tech Transfer
			National Adaptation Programme of Action
			National Adaptation Plan
			Mainstreaming Adaptation
			Private Sector
			Innovation
			Complementarity
			Community-based Adaptation
			Livelihoods
		<b>Climate Change Mitigation</b>	
			Agriculture, Forestry, and other Land Use
			Energy Efficiency
			Sustainable Urban Systems and Transport
			Technology Transfer
			Renewable Energy
			Financing
			Enabling Activities
		<b>Technology Transfer</b>	
			Poznan Strategic Programme on Technology Transfer
			Climate Technology Centre & Network (CTCN)
			Endogenous technology
			Technology Needs Assessment
			Adaptation Tech Transfer
		<b>United Nations Framework on Climate Change</b>	
			Nationally Determined Contribution

[1]