

GEF-8 PROJECT IDENTIFICATION FORM (PIF)

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General Project Information

Project Title

Global program on renewable energy systems in SIDS – global-regional project

Region

Global

GEF Project ID

12229

Country(ies)

Global

Type of Project

MSP

GEF Agency(ies):

UNIDO

GEF Agency ID

250231

Executing Partner

GN-SEC Centres (ECREEE, CCREEE, PCREEE, SACREEE, CEREEAC)

SIDS DOCK

Executing Partner Type

Others

Others

GEF Focal Area (s)

Climate Change

Submission Date

12/17/2025

Project Sector (CCM Only)

Technology Transfer/Innovative Low-Carbon Technologies

Taxonomy

Sustainable Development Goals, Focal Areas, Climate Change, Climate Change Mitigation, United Nations Framework Convention on Climate Change, Climate Change Adaptation, Community-based adaptation, Climate information, Private sector, Sea-level rise, Climate resilience, Innovation, Mainstreaming adaptation, National Adaptation Plan, Climate finance, Small Island Developing States, Influencing models, Demonstrate innovative approach, Strengthen institutional capacity and decision-making, Transform policy and regulatory environments, Deploy innovative financial instruments, Stakeholders, Consultation, Type of Engagement, Information Dissemination, Partnership, Participation, Communications, Behavior change, Strategic Communications, Awareness Raising, Public Campaigns, Private Sector, Individuals/Entrepreneurs, Capital providers, SMEs, Financial intermediaries and market facilitators, Beneficiaries, Local Communities, Civil Society, Academia, Non-Governmental Organization, Community Based Organization, Gender Mainstreaming, Gender Equality, Capacity Development, Gender results areas, Participation and leadership, Capacity, Knowledge and Research, Knowledge Exchange, South-South, Conference, Exhibit, North-South, Peer-to-Peer, Field Visit, Adaptive management, Learning, Theory of change, Workshop, Knowledge Generation, Professional Development, Training, Course

Type of Trust Fund

GET

Project Duration (Months)

60

GEF Project Grant: (a)

954,566.00

GEF Project Non-Grant: (b)

0.00

Agency Fee(s) Grant: (c)

90,684.00

Agency Fee(s) Non-Grant (d)

0.00

Total GEF Financing: (a+b+c+d)	Total Co-financing
1,045,250.00	6,749,000.00
PPG Amount: (e)	PPG Agency Fee(s): (f)
50,000.00	4,750.00
PPG total amount: (e+f)	Total GEF Resources: (a+b+c+d+e+f)
54,750.00	1,100,000.00

Project Tags

CBIT: No NGI: No SGP: No Innovation: No Competitive Window: 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)

The GEF- and bilateral donor-funded (e.g., Austria) Global Program on Climate-Resilient Renewable Energy Systems in SIDS (G-RES) is a multi-country initiative aimed at promoting the deployment of climate-resilient renewable energy (RE) solutions that reduce greenhouse gas (GHG) emissions and dependence on fossil fuels, strengthen energy security and the adaptive capacity of energy systems, and deliver productivity and climate adaptation co-benefits across key island value chains, including water, agri-food, tourism, and the blue economy. G-RES emphasizes empowering national energy utilities, regulators, and operators, alongside micro-, small-, and medium-sized enterprises (MSMEs), as primary drivers of this transition.

The programme is structured as a framework comprising the global-regional project and an expanding portfolio of national GEF-funded projects, implemented in parallel through allocations from STAR, SCCF, or LDCF. This global-regional project drives accelerated progress at the national level through regional and SIDS-to-SIDS cooperation, leveraging shared knowledge, harmonized policies, incentives, standards, training, and blended financing to reduce barriers to the adoption and supply of climate-resilient RE solutions. It is executed by UNIDO with active involvement of the UNIDO-led Global Network of Regional Sustainable Energy Centres (GN-SEC), which is closely linked to the regional economic communities covering SIDS and provides a mechanism for high-level buy-in and sustainability beyond project closure.

The G-RES framework is fully aligned with GEF-8 priorities, the Antigua and Barbuda Agenda for SIDS (ABAS), and regional commitments such as the Port Vila Call for Action and the C-SERMS initiative. It is projected to deliver significant climate change mitigation (514,800 tCO₂e direct and indirect reduction over 20 years) and critical climate adaptation co-benefits by protecting climate-resilient investments and economic sectors from disruptions, in line with SCCF/LDCF core indicators (1–5).

Indicative Project Overview

Project Objective

Promoting climate-resilient renewable energy (RE) systems that reduce GHG emissions and dependence on fossil fuels, strengthen energy security and the adaptive capacity of energy systems and deliver productivity gains and climate adaptation co-benefits in key island value chains (water, agri-food, tourism, blue economy).

Project Components

1. Policy and regulatory framework and institutional coordination

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
137,787.00	600,000.00

Outcome:

1.1 Enabling environment for the adoption and supply of climate-resilient RE&EE solutions in key island value chains

Output:

1.1.1 Regional gender and youth responsive market policies promoting the adoption and local supply of climate-resilient RE&EE solutions in productive sectors

1.1.2 Regional gender and youth responsive regulations, fiscal and non-fiscal incentives for the adoption and supply of RE&EE solutions

2. Capacity development and quality infrastructure

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
150,000.00	600,000.00

Outcome:

2.1 Strengthened private-sector capacities and quality infrastructure for the adoption and supply of climate-resilient RE&EE products and services

Output:

2.1.1 Replicable tools for energy climate risk assessments and resilience planning in RE&EE infrastructure and business operations

2.1.2 Regional technical guidelines and quality standards for RE&EE products and services, including for climate-resilient storage, smart grid and productive use appliances

2.1.3 Regional vocational qualification frameworks integrating certifications for climate-resilient RE&EE solutions

2.1.4 Regional training workshops and online courses or the planning and execution of climate-resilient

RE&EE solutions

3. Investment and business promotion

Component Type	Trust Fund
Investment	GET
GEF Project Financing (\$)	Co-financing (\$)
438,780.00	4,035,455.00

Outcome:

3.1 Enhanced regional framework to leverage financing and de-risk private investment in climate-resilient RE&EE projects and businesses

Output:

3.1.1 Regional project pipelines and de-risking mechanisms to leverage finance and private investment

3.1.2 BLOOM cluster platforms to support cleantech MSMEs, start-ups and scale-ups with makerspace, intelligence and matchmaking with corporate financing (e.g. venture capital, business angels, fintech)

4. G-RES information management system (IMS) for SIDS-SIDS exchange

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
100,000.00	600,000.00

Outcome:

4.1. Enhanced SIDS-SIDS knowledge exchange on climate-resilient RE&EE solutions

Output:

4.1.1 G-RES Information Management System (IMS) for SIDS-SIDS knowledge exchange

4.1.2 Regional webinars, forums and study tours on climate-resilient RE&EE solutions, considering gender and youth issues

M&E

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
41,220.00	300,000.00

Outcome:

5.1 Effective and adaptive implementation and evidence-based learning

Output:

5.1.1: M&E reports (e.g. PIRs, data tracking framework)

5.1.2 Terminal evaluation report

5.1.3 Sharing of M&E data and analytics

Component Balances

Project Components	GEF Project Financing (\$)	Co-financing (\$)
1. Policy and regulatory framework and institutional coordination	137,787.00	600,000.00
2. Capacity development and quality infrastructure	150,000.00	600,000.00
3. Investment and business promotion	438,780.00	4,035,455.00
4. G-RES information management system (IMS) for SIDS-SIDS exchange	100,000.00	600,000.00
M&E	41,220.00	300,000.00
Subtotal	867,787.00	6,135,455.00
Project Management Cost	86,779.00	613,545.00
Total Project Cost (\$)	954,566.00	6,749,000.00

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

• 1. The Current Situation: Global Context, Vulnerabilities, and Drivers

1.1. Global Context and Environmental Imperative

The Global Program on Climate-Resilient Renewable Energy Systems in Small Island Developing States (G-RES) is framed by intensifying global and local environmental pressures, underscoring the profound interdependence of planetary systems and island ecosystems. By targeting national utilities, regulators, Independent Power Producers (IPPs), and Micro-, Small-, and Medium-Sized Enterprises (MSMEs) as both adopters and providers of climate-resilient RE&EE solutions, the programme places the SIDS private sector at the centre of efforts to address global environmental degradation, strengthen climate resilience, and drive economic diversification. G-RES contributes directly to the implementation of major multilateral commitments, including the Paris Agreement and the Antigua and Barbuda Agenda for SIDS (ABAS).

The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6) confirms that climate change is widespread, rapid, and intensifying. Human activities—primarily the combustion of fossil fuels and unsustainable land-use change—have driven atmospheric concentrations of carbon dioxide (CO₂), methane, and nitrous oxide to levels unprecedented in at least 800,000 years, including a roughly 40% rise in CO₂ since the pre-industrial era. Without immediate, deep, and sustained mitigation efforts, global GHG emissions are projected to continue rising over the coming decades, pushing the world toward warming levels that risk triggering severe and irreversible climate impacts. IPCC AR6 stresses that limiting warming to 1.5°C requires urgent, systemic emission reductions across all sectors of the global economy, including a fundamental transformation of energy, industrial, and consumption systems.

For SIDS, climate change is already generating pervasive and escalating impacts across ecosystems and human systems. Globally, extreme weather events—including tropical cyclones, heatwaves, droughts, and heavy rainfall—have increased in frequency and intensity. Sea-level rise and coastal erosion threaten low-lying islands, while ocean warming and acidification are degrading coral reefs and marine ecosystems across all SIDS regions (Africa, Caribbean, Indian Ocean, and Pacific). Freshwater resources are becoming more variable and scarce, and climate-induced disruptions are undermining economic stability, social resilience, and environmental health across tropical regions.

These climate pressures interact with long-standing environmental stresses, including unsustainable production and consumption patterns, rapid biodiversity loss, and degradation of water and land resources. The combined effects are especially acute in developing countries and SIDS, which contribute least to global emissions yet face disproportionate climate risks and possess limited financial and institutional capacity to respond. This scenario presents a classic market failure, which necessitates catalytic investment to secure global environmental benefits. Climate change further exacerbates underlying systemic vulnerabilities, accelerating environmental degradation and significantly raising the cost of achieving the low-carbon transition across all sectors. In this context, the GEF seeks to catalyse transformative investments that address global environmental challenges by targeting key systems, enabling conditions, and fundamental drivers of change—objectives directly aligned with G-RES.

1.2. Local Context: SIDS Acute Vulnerabilities and Environmental Degradation

The G-RES directly addresses the acute local environmental and climate challenges facing SIDS. The global pressures described in Section 1.1 are magnified across SIDS regions, where small populations, fragile ecosystems, and narrow economic bases mean that external shocks rapidly escalate into national crises. SIDS face a dual structural vulnerability: high exposure to global market volatility and extreme physical sensitivity to climate hazards.

Energy Insecurity, Vulnerability and Fossil Fuel Dependence

A core challenge addressed by G-RES is the overwhelming reliance of SIDS on imported fossil fuels for electricity generation and transportation. In most SIDS, imported fuels exceed 90% of the primary energy mix (IRENA), leading to severe energy insecurity and exceptionally high and volatile energy prices. Electricity tariffs commonly range from USD 0.30 to upwards of USD 0.50 per kilowatt-hour—two to three times the average in OECD countries. Such high energy costs undermine the competitiveness of local industries and place heavy burdens on public finances.

Recent oil price escalations in the context of global conflicts demonstrate once again the energy security risks SIDS face. Fossil-fuel imports also impose significant macroeconomic stress, often consuming between 8% and 30% of GDP (UN-OHRLLS). Long and vulnerable fuel-supply chains expose islands to price shocks, geopolitical instability, and severe disruptions during natural disasters, frequently leaving communities without power for extended periods. Despite contributing negligibly to global emissions, SIDS energy sectors account for approximately 40% to 80% of national GHG emissions (UNDP/GEF), reinforcing local vulnerability while perpetuating global climate risks. These financial and energy insecurities constrain macroeconomic stability and disproportionately affect the productivity and resilience of MSMEs across critical value chains - including tourism, agri-food systems, water management, and the blue economy - hindering their ability to transition to low-carbon, climate-resilient growth. Mobilizing energy operators and MSMEs is therefore a prerequisite for achieving ambitious national decarbonization targets.

SIDS governments have recognised these risks and set ambitious RE&EE targets, demonstrating crucial political will. A number of SIDS have committed to 100% renewable energy in the power sector by 2030 and net-zero emissions by 2050. Specifically, countries including the Cook Islands, Niue, and Tuvalu have adopted such 100% renewable energy commitments, while Fiji, Vanuatu, and the Solomon Islands target the same goal by 2050. Furthermore, the Port Vila Call to Action adopted by Pacific energy and transport ministers calls for a complete phase-out of fossil fuels, including in the transport sector. Despite these ambitious commitments and notable progress in some countries, overall advancement remains limited, and fossil-fuel dependence continues to dominate the SIDS energy landscape.

Interplay of Energy, Climate Change, and Environmental Degradation

The energy transition to RE&EE needs to navigate through the rapidly increasing impacts of climate change on infrastructure. SIDS are on the frontline of the global climate crisis, facing both immediate and long-term impacts that threaten their economies, communities, and ecosystems. Intensifying climate hazards - including rising sea levels, warming oceans, and more frequent and powerful tropical cyclones - damage coastal infrastructure and assets essential for economic activity. Coastal erosion driven by sea-level rise and storm surges already undermines economic stability, with assets valued at up to 25% of GDP at risk in many highly exposed coastal zones (Source: World Bank).

Energy systems are major amplifiers of climate vulnerability and are themselves acutely threatened. Rising sea levels, intensifying tropical cyclones, and flooding directly threaten to disrupt critical fuel supply chains, damage power, transport, and storage infrastructure, and jeopardize overall energy security. The existing energy infrastructure constitutes a systemic weakness. Much of it is aging, non-resilient, and highly exposed, making it a liability that undermines the entire prospect of a sustained energy transition. Additionally, changing rainfall patterns and droughts put additional stress on the fragile water-food-energy nexus of low-lying islands, impacting hydropower outputs and freshwater cooling systems of thermal power stations. Higher temperatures and heat waves reduce the efficiency of power stations and transmission lines, enhancing cooling demands and increasing investment needs in peak power capacity.

Disruptions to energy systems can cripple entire economies, leading to cascading systemic failures. Recovery costs from a single major tropical cyclone have exceeded 200% of annual GDP in SIDS, such as Dominica after Hurricane Maria (2017) and The Bahamas following Hurricane Dorian (2019) (Source: ECLAC/IMF PDNAs). These disasters not only erase years of development gains but also destroy critical (and potentially

GEF-funded) mitigation assets. Without integrating resilience measures, RE&EE assets deployed today risk becoming stranded assets or being severely damaged, thereby permanently eliminating the expected GHG emissions reductions.

The climate risk is compounded by the interdependence of sectors. The critical economic sectors targeted by the programme - tourism, agri-food, water and wastewater services, fisheries, and the broader blue economy - are fundamentally dependent on reliable, affordable, and resilient energy. MSMEs are the dominant actors within these value chains and therefore face direct operational and financial exposure when energy systems fail. In this context, strengthening climate-resilient, clean, and efficient energy systems is essential not only for advancing Climate Change Mitigation (CCM) goals but also for safeguarding MSME competitiveness, protecting livelihoods, and sustaining the productive sectors that drive SIDS economies, with CCA serving as a vital co-benefit to secure these gains.

Integrated G-RES approach to climate change mitigation and adaptation

The transition to climate-resilient renewable energy systems is therefore not merely an environmental goal, but a fundamental requirement for the economic survival, competitiveness, and social resilience of SIDS. The G-RES core focus is Climate Change Mitigation (CCM), driven by the imperative to accelerate the decoupling from fossil fuels and achieve long-term, systemic GHG emissions reductions and minimize other environmental externalities, such as local air and water pollution. However, the CCM approach has strong adaptation co-benefits, particularly by promoting resilient RE&EE solutions that withstands extreme weather events and cope with the long term impacts of climate change (e.g. growing cooling demand). Crucially, there can be no successful CCM and just energy transition without fully integrating climate-resilience and adaptation.

This integrated approach is essential, as it delivers CCA co-benefits by protecting both the energy system and the vulnerable key value chains (tourism, agri-food, and water management) from climate shocks, thereby safeguarding low-carbon investments. Therefore, the G-RES program is fully aligned with the GEF's dual mandate to support both CCM through the STAR allocation and CCA through the Special Climate Change Fund (SCCF), recognizing that these goals are indivisible in the SIDS context. Therefore, three of the five currently supported national G-RES projects are requesting SCCF funding (e.g. Saint Lucia, PNG, Palau).

1.3. Underlying Systemic Barriers and Root Causes

There are several systemic barriers and root causes, which hinder the transition SIDS toward climate-resilient renewable energy systems:

1. Policy and regulatory gaps (Governance barrier): National and regional energy policies, while often setting high RE&EE targets, rarely integrate mandatory climate resilience standards or specific frameworks for distributed energy (e.g., microgrids) that could withstand extreme weather events. This lack of risk integration in policy documents, coupled with fragmented regulatory frameworks, inconsistent regulatory signals or incentives, and weak cross-sectoral coordination (e.g., between energy, climate, tourism, agri-food), means that new RE&EE deployment often does not adequately account for future climate risks, perpetuating reliance on less resilient, fossil-fuel-based infrastructure. Furthermore, the presence of market-distorting fossil fuel subsidies reduces the comparative competitiveness of clean energy solutions.
2. Institutional and capacity deficiencies (Technical barrier): There is a fundamental lack of expertise and technical capacity among local MSMEs, government regulatory bodies, and utilities to adopt or supply climate-resilient renewable energy solutions. Furthermore, a deficit of recognized regional quality infrastructure (QI), including standards, certifications, and testing facilities, specifically tailored for certified, climate-resilient RE&EE and storage technologies suitable for the SIDS environment, persists. This technical gap, alongside the limited availability, affordability, and awareness of suitable

cleantech for MSMEs, leads to poor project quality, unreliable system performance, and a low level of trust from investors and consumers, directly slowing the adoption of robust CCM technologies. The lack of climate adaptation/resilience considerations has repeatedly undermined the effectiveness and sustainability of CCM investments (e.g., damaged roof-top solar installations).

3. Lack of regional cooperation, markets and knowledge exchange (Systemic barrier): The markets for climate-resilient RE&EE products and services across SIDS are highly fragmented due to a profound lack of regional harmonization in policies, technical standards, and certification regimes. This fragmentation prevents the creation of sufficient economies of scale, resulting in small, unattractive domestic markets that cannot support the development of competitive local supply chains or attract foreign direct investment. This severely constrains the local availability of affordable, certified, and climate-resilient cleantech, thereby directly hindering the accelerated deployment of robust CCM technologies. Furthermore, knowledge management and technical assistance are fragmented, leading to duplicated efforts, repeated mistakes, and a critical failure to replicate proven low-carbon, climate-resilient best practices effectively across the regions. Crucially, this systemic fragmentation reduces the coherence, effectiveness, and cost-efficiency of individual national GEF projects, preventing the maximization of global environmental benefits across the program portfolio.

The latter mentioned systemic barriers will be addressed by G-RES also through the involvement of the UNIDO-led Global Network of Regional Sustainable Energy Centres (GN-SEC), which can provide such a SIDS-SIDS platform if GEF support is provided. Since 2010, UNIDO has supported ten regional economic communities (RECs) in the Global South (the first one in ECOWAS with GEF support) in the establishment of regional sustainable energy centres, covering today most LDCs and 35 of 39 SIDS. Centres, such as CCREEE, PCREEE, ECREEE, CEREEAC and SACREEE - are intergovernmental organisations, with the official mandate of the region to promote the uptake of integrated and inclusive regional RE&EE product and service markets by providing support “from the region, for the region”. The involvement of the GN-SECs in the global-regional G-RES component and national GEF projects will ensure coherence. In this context, CCREEE was already defined as an executing entity for the STAR funded projects in Barbados and St. Kitts and Nevis.

1.4. System Context: The MSME Sector, Cleantech Potential, and Market Failure

A defining feature of the G-RES program is its recognition that a sustainable energy transition in SIDS requires a shift beyond centralized, utility-scale interventions toward a whole-of-society approach. While national utilities, regulators, and Independent Power Producers (IPPs) remain the structural anchors of the energy system, Micro, Small, and Medium-Sized Enterprises (MSMEs) are positioned as central direct beneficiaries and proactive drivers of this transformation. By empowering MSMEs as both sophisticated adopters of climate-resilient solutions and as the emerging local providers of cleantech services, the project ensures that the shift toward low-carbon resilience is deeply rooted in the domestic economy. This dual focus ensures that the energy transition is not merely a technical upgrade of the grid, but an inclusive economic evolution that fosters decentralized energy security and local entrepreneurship.

The MSME sector is the backbone of SIDS economies and the key potential driver for distributed, resilient energy solutions. Representing over 98% of all formal enterprises and contributing substantially to national value added and employment, the aggregated resource consumption and carbon-intensity of MSMEs are critical to both the environmental challenge and the solution. For instance, tourism MSMEs (small hotels, restaurants, etc.) are significant consumers of grid electricity and fresh water, contributing substantially to overall national GHG emissions and water scarcity challenges due to inefficient legacy equipment. Transport MSMEs rely almost entirely on imported fossil fuels, representing a major portion of the transport sector’s emissions. However, despite their potential, the transition to climate-resilient renewable energy systems—which inherently require distributed and localized solutions perfect for MSME deployment—is

hampered by a pronounced market failure, which affects both technology adoption and the ability of local entrepreneurs to supply quality cleantech solutions.

- **Supply-side imbalance:** There is currently a disproportionate focus on promoting RE&EE adoption on the demand side (getting MSMEs to adopt/install) without adequate attention to supporting the local supply side (getting local MSMEs, cleantech start-ups and scale-ups to innovate, produce, and install quality cleantech). This results in a scarcity of local, certified, and climate-resilient cleantech providers, leading to reliance on costly imports, low project quality, and a failure to develop local green value chains and jobs.
- **Financial barriers:** Access to finance for cleantech remains insufficient. For adopters, conventional finance rarely targets climate-smart investments, and local banks perceive small-scale retrofits (e.g., solar, efficiency) as high-risk. For cleantech providers, there is a severe lack of early-stage private venture capital, seed funding, and equity instruments needed to commercialize innovations or scale operations.
- **Technological and skills barriers:** Many enterprises are locked into outdated, resource-inefficient technologies and business models, resulting in high operating costs. For cleantech providers, there is a pronounced shortage of technical, managerial, and R&D capacities, constraining their ability to innovate and limiting access to necessary infrastructure (e.g., prototyping, testing, and certification facilities) required to develop, implement, and maintain advanced cleantech solutions.
- **Ecosystem and market fragmentation:** The domestic cleantech ecosystem is highly fragmented, dominated by start-ups or micro-enterprises, with limited collaboration between firms or with academia. This acts as a profound obstacle for MSMEs seeking to become cleantech suppliers and entrepreneurs by limiting market access, making it difficult to find investors, secure supply chain inputs, and scale technologies for both local and regional markets.

The private sector faces significant financing hurdles due to these entrenched market barriers:

- **High perceived risk:** Small project sizes, currency risk, and the regulatory uncertainty increase the perceived risk by commercial banks and international financial institutions.
- **Lack of bankable projects:** Local cleantech MSMEs lack the technical and financial preparation (due diligence, bankability studies) to develop projects that meet stringent investor standards, limiting their access to commercial funding.
- **Absence of regional and national de-risking mechanisms:** There is an absence of dedicated regional financial tools (e.g., partial credit guarantees, risk insurance products) specifically structured to de-risk private investment in resilient energy projects, thus failing to bridge the crucial financing gap between private capital supply and local MSME demand.

2. Project Objective

The GEF- and bilateral donor-funded (e.g., Austria) Global Program on Climate-Resilient Renewable Energy Systems (G-RES) is a multi-country initiative focused on accelerating a sustainable, climate-resilient energy transition across SIDS. Its core objective is to promote climate-resilient renewable energy (RE) systems that reduce greenhouse gas (GHG) emissions and dependence on fossil fuels, strengthen energy security and the adaptive capacity of energy systems, and deliver productivity gains and climate adaptation co-benefits across key island value chains, including water, agri-food, tourism, and the blue economy.

By targeting national utilities, regulators, Independent Power Producers (IPPs), and Micro-, Small-, and Medium-Sized Enterprises (MSMEs) as both adopters and providers of climate-resilient RE&EE solutions, the programme positions SIDS public-private collaboration at the core of the transition. G-RES contributes directly to the implementation of major multilateral commitments, including the Paris Agreement and the Antigua and Barbuda Agenda for SIDS (ABAS).

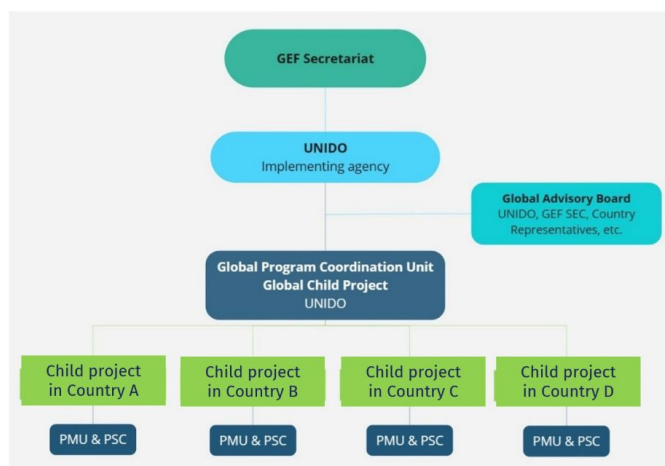
The program is structured as a framework comprising the global-regional project and an expanding portfolio of national GEF-funded projects, implemented in parallel through allocations from STAR, SCCF, or LDCF. This global-regional project drives accelerated progress at the national level through regional and SIDS-to-SIDS cooperation, leveraging shared knowledge, harmonized policies, incentives, standards, training, and blended financing to reduce barriers to the adoption and supply of climate-resilient RE solutions. Due to the exposure of SIDS, the use of climate-proven technologies and methodologies (also supported under CCA) are a prerequisite for the sustainability of GEF CCM and mitigation investments.

Figure 1: Global Program on Climate Resilient Renewable Energy Systems for SIDS

Global Program on Climate Resilient Renewable Energy Systems for SIDS

Global-regional component: provides a common umbrella and joint tools, builds coherence across policies and “child” projects, facilitates SIDS-SIDS knowledge transfer and replication (funded by GEF and donors - e.g. Austria)

National child projects: national implementation funded through GEF STAR, LDCF, SCCF, GCF and co-financing



National child projects to be executed by national entities in cooperation with regional partners



As GEF Agency, UNIDO coordinates the global-regional component and provides backstopping



Centres covering SIDS support the implementation of regional and SIDS-SIDS activities and partly act as co-executing partners

Other partners: SIDS DOCK, SIDS-SIDS Technology Transfer Hub at UWI

Figure 2: Objectives and scope of intervention of the G-RES Program for SIDS



Overall Objective

Promote climate-resilient renewable energy systems in SIDS that strengthen energy security, reduce GHG emissions and dependence on fossil fuels, and deliver productivity and climate adaptation co-benefits in key island value chains, including water, agri-food, tourism, and blue economy

Climate-proven renewable energy and efficiency solutions

Renewable integration and decentralisation, grid flexibilization and enforcement (hardening, disaster-resistant storage, heat resistant and water efficient generation), RE for productive uses, energy efficient solutions (e.g. MEPS, district cooling)

Resilient intelligent energy systems

Disaster-proven smart grid, storage and mobility systems, digital and AI applications for disaster, peak load and output projections (e.g. wind, solar),

Nature-based solutions

Heat protection, agrivoltaics and aquaponics, organic waste to energy (incl. sargassum), renewable ocean energy, restoring mangroves and wetlands for energy infrastructure protection

Low-carbon and resilient transportation

Integrated electric mobility and renewable power systems, low-carbon and climate-resilient shipping and ports, alternative transport technologies and fuels, incl. green hydrogen

The systemic barriers are addressed by G-RES through the involvement of the UNIDO-led Global Network of Regional Sustainable Energy Centers (GN-SEC), which provides a dedicated SIDS-to-SIDS exchange platform. Since 2010, UNIDO has assisted ten regional economic communities (RECs) in the Global South—starting with ECOWAS through GEF support—in establishing regional sustainable energy centres. Today, these centres cover most LDCs and 35 of 39 SIDS. Centres such as CCREEE, PCREEE, ECREEE, CEREEAC, and SACREEE are intergovernmental organizations officially mandated by their respective regions to promote integrated and inclusive regional RE&EE product and service markets, providing support “from the region, for the region.”

Regional cooperation and ownership are essential to jointly address barriers, achieve significant cost savings, and accelerate progress through shared learning. Harmonizing climate-resilient standards and strengthening supply chains create economies of scale for clean technology products and services, maximizing local added value in terms of green jobs and revenues. Furthermore, this inter-regional approach serves as a powerful catalyst for the systemic mainstreaming of climate resilience standards within national energy transitions. By elevating localized best practices into regional norms, the program ensures that renewable energy deployments are structurally protected, thereby safeguarding the long-term integrity and impact of Climate Change Mitigation (CCM) investments against an increasingly volatile environmental baseline.

Conversely, the lack of regional coherence hinders collective progress toward accelerated decarbonization and limits the ability to scale up green jobs and domestic economic benefits. The involvement of GN-SEC in the global-regional G-RES component and national GEF projects will ensure coherence. In this context, CCREEE has already been designated as an executing entity for STAR-funded projects in Barbados and St. Kitts and Nevis.

The global-regional project is structured around four mutually reinforcing elements, each addressing critical barriers while amplifying and accelerating national-level impact:

- **Component 1: Strategic Policy and Regulatory Coherence:** Strengthens regional policy and market rules to ensure coherence across SIDS. It mainstreams climate-resilient renewable energy systems into policies, regulations and incentives.

- **Component 2: Quality Infrastructure and Professionalization:** Enhances regional quality infrastructure and qualification frameworks (NVQ/CVQ). By establishing a 'Seal of Quality' for hardware and training an inclusive workforce (50% women/30% youth), it safeguards CCM investments in harsh maritime environments.
- **Component 3: Market Creation and Financial De-risking:** Facilitates investment through regional pipelines, de-risking mechanisms, and BLOOM innovation clusters. These tools bridge the 'collateral gap' for MSMEs, transforming local entrepreneurs into key providers within the regional cleantech supply chain.
- **Component 4: The Global SIDS Knowledge Commons (IMS):** Establishes the G-RES Information Management System (IMS) to drive SIDS-SIDS learning and replication. This 'Digital Commons' of performance data reduces the cost of scaling and positions SIDS as a recognizable asset class for international financiers.

Together, these interventions create a cohesive global-regional platform that amplifies national impacts, accelerates implementation timelines, and positions the G-RES portfolio for greater scale and strategic continuity under GEF-9. By addressing cross-cutting systemic barriers at the regional level, the MSP ensures that future national projects start from a stronger baseline of policy coherence, institutional capacity, investment readiness, and knowledge connectivity—enhancing both the effectiveness and efficiency of GEF support to SIDS.

3. Baseline Project Scenario

The Baseline Scenario outlines the likely trajectory of energy systems and MSME sectors in SIDS. Without the proposed GEF intervention, SIDS will remain on a business-as-usual (BAU) trajectory marked by systemic barriers and market failures, resulting in incremental, non-transformative outcomes and continued vulnerability to climate and economic shocks:

- **Persistent fossil fuel dependence and high GHG emissions:** Energy systems will rely on imported fossil fuels for over 90% of electricity and transport needs, keeping prices volatile and fiscal burdens high. MSME competitiveness will suffer and fragmented RE&EE efforts will fail to meet NDC targets.
- **Climate vulnerability and economic instability:** Infrastructure will lack climate-resilient standards, leaving MSMEs exposed to extreme weather disruptions and costly recovery needs, undermining economic stability. Without the coverage of the 'resilience premium,' mitigation assets remain at constant risk of failure.
- **Fragmented, import-dependent cleantech markets:** Domestic markets will remain small and reliant on imports, with limited certification, technical capacity, and innovation, restricting local job creation and green value chains.
- **Market Fragmentation and Lack of Harmonization:** Domestic markets for RE&EE will remain highly fragmented due to the lack of regional harmonization in policies and standards. This prevents the creation of sufficient economies of scale and slows the pace of the energy transition.
- **Weak policy and financial frameworks:** Regulatory gaps and high perceived risks will deter private investment. Regional and SIDS-SIDS coordination remains sporadic, preventing the pooling of resources required to lower the cost of capital.
- **Structural hurdles for Women and Youth Engagement:** Historically, the energy sector in SIDS has faced significant challenges in effectively engaging women and youth. These groups are often marginalized by structural hurdles, including limited access to specialized technical training and underrepresentation in utility leadership. Furthermore, energy insecurity and climate shocks are not gender-neutral; they often exacerbate unpaid care burdens and disrupt sectors where women form a

large share of the workforce. Persistent 'collateral gaps' in traditional financing continue to prevent young and female entrepreneurs from entering the clean energy market.

4. Alternative Transformational Project Scenario

G-RES will support SIDS to shift from fragmented efforts to a systemic, coordinated transition toward climate-resilient RE&EE systems, addressing market failures and institutional gaps that constrain the BAU pathway. Adopting an intersectional approach, the global-regional project will catalyze national progress while creating regional public goods for an inclusive transition:

- Accelerated RE adoption and GHG mitigation: Rapid deployment of climate-resilient RE&EE technologies will strengthen utilities, regulators, and other stakeholders in MSME-intensive sectors—such as tourism, agri-food, water, and the blue economy—while reducing dependence on fossil fuels and advancing NDC targets. Rapid deployment of climate-resilient RE&EE technologies and solutions strengthen utilities, regulators etc. in MSME-intensive sectors (tourism, agri-food, water, blue economy) will reduce fossil fuel dependence and advance NDC targets. This transition empowers also women and youth as active agents of change rather than mere beneficiaries, aiming for at least 50% participation of women-led and 30% participation of youth-led MSMEs in technology adoption and supply programs.
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- Enhanced resilience and economic stability: All investments will integrate climate-resilient standards, protecting MSME operations from extreme weather. By safeguarding the livelihoods of women and youth—and mitigating the disproportionate impact of energy outages on safety, health, and unpaid care burdens—reliable low-carbon energy strengthens community-level competitiveness and social stability.
- Stronger local cleantech ecosystem: Support for MSMEs and start-ups will foster domestic innovation. Through inclusive BLOOM cluster hubs, the project will specifically address the historical challenges of exclusion by promoting gender parity and youth-led ventures. Regional qualification frameworks (e.g., USP, UWI, TVET) will build high-level technical capacity and accredited STEM learning, aiming for a 50% women and 30% youth participation in all certification tracks.
- Effective policy and financing: Harmonized regional frameworks and de-risking instruments will attract private investment. Dedicated financial windows will bridge the 'collateral gap' and institutional biases that have historically hindered women and youth, with resource allocation strategies designed to support 50% female and 30% youth beneficiaries.
- Catalytic regional coordination and market creation: Leveraging the GN-SEC network and its dedicated Gender and Youth Network, as well as the SIDS DOCK Island Women Open Network (IWON), G-RES will enable structured SIDS-SIDS knowledge exchange. By utilizing these institutionalized platforms to share inclusive policy models and best practices, the program ensures a critical coherence that fosters a unified regional market. This approach follows a 'Do-No-Harm' principle and utilizes sex- and age-disaggregated data (<35) to ensure that the transition elevates the 'youth dividend' and female leadership as core drivers of the collective impact.

4.1. Integrated Mitigation-Adaptation Nexus: Resilience-by-Design Framework

To meet GEF/STAP adaptation standards and ensure full alignment with SCCF Window A (SIDS) priorities, G-RES is grounded in regional climate hazard profiles that distinguish between immediate shocks and chronic stressors on SIDS energy systems. This framework ensures that Climate Change Mitigation (CCM) investments are not only low-carbon but 'climate-proofed' to deliver durable adaptation benefits.

I. Regional Climate Hazard Profiles and Scenarios (IPCC AR6 Aligned):

SIDS Region	Immediate, Acute Hazards (Shocks)	Long-term, Slow-onset Hazards (Stressors)	Implications for Energy Systems & SCCF Adaptation Benefits
Caribbean	Cyclones & Landslides: 20% increase in Cat 4/5 frequency; extreme rain triggering slope instability.	SLR, Temp & Drought: 0.8m SLR; 2.5°C temp rise; increased frequency of seasonal droughts.	Impact: Physical asset loss and burial of lines. Benefit: Protection of tourism/agri hubs via hurricane-hardened decentralized RE and high-efficiency cooling (MEPS).
Pacific	Extreme Rainfall & Surges: 15% increase in flash flooding; higher tidal reach on atolls.	ENSO-driven Drought & Wind Shifts: More severe water scarcity; shifts in trade wind patterns affecting RE siting.	Impact: Hydro-power failure and grid inundation. Benefit: Safeguarding freshwater security through resilient RE-powered desalination and drought-proofed microgrids.
AIS	Storm Surges & Lightning: Increased height of surges; higher frequency of lightning strikes on electronics.	Heatwaves, Acidification & Bio-fouling: Sustained heat (>35°C); declining pH and Sargassum-driven intake blockage.	Impact: Inundation of coastal plants; surge-related electronic failure. Benefit: Enhanced durability of blue economy infrastructure through corrosion-resistant standards and self-healing smart grids.

II. Stakeholder Vulnerability Assessment:

Stakeholder Category	Vulnerability to Immediate Shocks	Vulnerability to Long-term Stressors	SCCF Alignment: Adaptation & Livelihood Co-benefits
Utilities & Regulators	Physical grid collapse and substation flooding during extreme storms.	Systemic instability from heat-driven demand; water scarcity for thermal/hydro cooling and desalination.	Resilient Infrastructure: Ensuring business continuity and grid stability, preventing 'emergency' fossil-fuel spikes.
IPPs & Developers	Total loss of assets in wind/flood events; landslide damage to T&D lines.	Accelerated hardware degradation from salt/acidification; loss of land-base due to chronic erosion.	De-risked Investment: Lowering insurance premiums and the cost of capital for climate-hardened clean energy assets.
Tourism & Agri MSMEs	Immediate loss of energy supply and cold chain; physical damage to facilities.	Chronic economic losses due to rising energy/water costs; reduced ROI on RE assets due to resource shifts.	Productive Sector Resilience: Protecting the livelihoods of women and youth by securing the energy-food-water nexus.

Cleantech Suppliers	Disruption of service capacity precisely when needed most post-disaster.	Inability to offer long-term warranties due to unforeseen bio-fouling and extreme corrosive environments.	Green Job Creation: Professionalizing a local supply chain capable of maintaining and repairing systems.
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4.2. Technological Scope and Eligibility

To achieve permanent and verifiable GHG reductions, G-RES supports a clearly defined menu of climate-resilient RE&EE technologies. The program prioritizes mature solutions that drive Productive Uses of Energy (PUE) across key island value chains—including agri-food, tourism, and water management—and places a strategic focus on the blue economy. These interventions require a 'resilience premium' to ensure that low-carbon infrastructure can withstand SIDS-specific hazards while powering the primary engines of local economic growth.

I. Priority Renewable Energy Pathways:

- **Solar Energy Solutions:** Decentralized Solar PV (grid-connected/off-grid, standalone systems) for lighting, water pumping, desalination, and agrivoltaics. This includes Solar Thermal Heating and Cooling (SHC) for industrial process heat, wood/fruit drying, and large-scale cooling in the tourism and agri-food sectors.
- **Wind Power:** Inclusive of both small-scale and larger utility-scale distributed wind turbines (on-shore and off-shore) engineered with high-wind survival modes to maintain operations and prevent asset loss in hurricane-prone regions.
- **Small and Micro-Hydroelectric Power:** These systems are favored for decentralized resilience, particularly in mountainous SIDS. To ensure environmental integrity and minimize the ecological footprint, the program focuses exclusively on run-of-river configurations (no-dam approach) that preserve natural water cycles. All interventions will adhere to international sustainability standards, specifically applying the UNIDO Technical Guidelines for Small Hydropower (SHP).
- **Renewable Ocean Energy:** As a cornerstone of programmatic innovation, G-RES supports emerging solutions including wave, tidal, Ocean Thermal Energy Conversion (OTEC), and Sea Water Air Conditioning (SWAC). Supported through the Global Ocean Energy Alliance (GOEA), these technologies offer a unique, resilient baseload for coastal MSME clusters and the wider blue economy. This includes pioneering the use of renewables for blue productive uses—such as solar and ocean-powered cooling for fisheries, marine energy storage, and the electrification of small-scale shipping vessels—to decouple the maritime sector from fossil fuel dependency. This will be particularly addressed by the Global Ocean Energy Alliance (GLOEA), coordinated by SIDS DOCK and UNIDO.
- **Small-scale Geothermal Systems:** Prioritizing modular and small-scale geothermal applications that provide a reliable, low-carbon baseload. These interventions will adhere to international sustainability criteria to ensure minimal environmental impact and respect for local geological contexts. The program draws on successful regional models, such as the pioneering small-scale geothermal development in Dominica, to demonstrate how volcanic SIDS can achieve energy independence through resilient, locally-sourced baseload power.
- **Sustainable Bioenergy and Resource Recovery:** Prioritizing integrated bioenergy solutions that utilize non-food competing feedstocks and invasive species, specifically sargassum seaweed, as a strategic asset for energy security. The technical scope encompasses anaerobic digestion for biogas, as well as thermochemical pathways such as gasification and the production of biochar for soil enhancement and carbon sequestration. Waste-to-Energy (WtE) is strictly limited to segregated organic waste streams—including sargassum—for methane avoidance. Furthermore, the program supports small-scale biofuels for domestic uses, provided they adhere to strict international sustainability criteria to safeguard local

food systems and ecosystems.

II. RE-Coupled Energy Efficiency and Smart Systems:

G-RES provides support for energy efficiency (EE) exclusively where such interventions are intrinsically linked to the deployment, optimization, and viability of renewable energy (RE) systems. EE is treated as a strategic facilitator to reduce base-loads, thereby allowing for higher RE penetration and more cost-effective system sizing:

- **Building and Productive Sector Efficiency for RE Integration:** Modern light building materials and low-energy construction methods designed to minimize cooling loads in RE-powered buildings; high-efficiency motors and Minimum Energy Performance Standards (MEPS) for appliances and productive-use equipment that enable smaller, more affordable decentralized RE systems.
- **Grid and Infrastructure Optimization:** Smart grid technologies, demand-response systems, and automated load-shedding protocols that maximize the absorption of variable RE and stabilize distributed microgrids.
- **Resilient Transportation and Blue Corridors:** Electric mobility solutions integrated with decentralized RE charging infrastructure to ensure a low-carbon transport-energy nexus. This includes the development of resilient and renewable ports and the establishment of 'blue corridors' for sustainable maritime transport, in alignment with the Clean Energy Ministerial (CEM) Initiative on Clean Energy Marine Hubs (CEM-Hubs) .

III. Strategic Cross-Cutting Technologies:

- **Storage and Flexibility:** Utility-scale and commercial Battery Energy Storage Systems (BESS) and green hydrogen pilot applications for the deep decarbonization of hard-to-abate sectors.
- **Digitalization and Artificial Intelligence (AI):** Utilizing AI-driven Energy Management Systems (EMS) and machine-learning based predictive modeling to create 'self-healing' resilient networks. This includes the use of AI for real-time grid balancing, automated load-shedding, and early-warning systems that anticipate

Approaches to improve climate resilience of energy systems in SIDS

Measure Category	Technical/Operational Approach	Resilience/Adaptation Impact
Physical Hardening	Hurricane-rated PV mounting, elevated/submersible substations, corrosion-resistant materials	Reduces damage from storms/floods; increases system durability
Decentralized Networks	Distributed solar, wind, microgrids, run-of-river hydro, and hybrid systems	Maintains local power during main grid outages; reduces fossil fuel dependence
Advanced Storage (BESS)	Utility-scale and distributed batteries with resilience-focused design	Smooths RE output; provides backup power during extended outages
Grid-Forming Inverters	Inverters that regulate frequency/voltage for islanded systems	Stabilizes microgrids; enables autonomous operation under grid failure
Smart EMS	Predictive modelling, automated load shedding, real-time monitoring	Enables self-healing networks and optimized grid response to stress
T&D Upgrades	Undergrounding lines, reinforced poles, flood-resistant routing	Protects network components from extreme weather and storm surge
Responsive Planning	Integrated Resource & Resilience Plans, climate risk assessments	Informs investment decisions; ensures adaptation mainstreaming
Efficiency & Demand	Building efficiency improvements; demand response systems	Reduces peak loads; improves energy use efficiency under stress

Monitoring & Warning	Weather monitoring linked to grid operations; automated alerts	Improves preparedness and response to climate events
Risk Assessments	Detailed studies of generation, T&D, and demand shifts	Identifies climatic impacts; prioritizes adaptation investments
Financial Mitigation	Climate risk insurance, blended finance facilitation	Reduces financial losses and supports investment readiness
Capacity & Skills	Training for utilities, MSMEs, regulators	Builds local capacity to maintain resilient systems
Value Chain Integration	Agrivoltaics; Blue Corridors; resilient electrification for Tourism	Strengthens adaptation across interlinked economic sectors
Policy Enablers	Resilience-oriented grid codes and standards	Ensures new infrastructure incorporates climate adaptation
Ecosystem-Based (EbA)	Coastal protection (mangroves, reefs) protecting grid/port assets	Reduces exposure to storm surge and coastal erosion

5. Justification for and Value Proposition of the Project

The G-RES programme offers a unique value proposition for the GEF and SIDS by addressing the integrated nexus of climate change mitigation and adaptation as a singular, synergetic objective. This is achieved through a cascading global-regional-national approach that serves as a powerful engine for SIDS-SIDS cooperation. The global-regional 'umbrella' provides the methodologies and de-risking frameworks that no single SIDS could develop in isolation, while national child projects provide the real-world testing ground for implementation.

This multi-level integration ensures that national utilities and regulators stabilize the energy landscape, creating a predictable and de-risked environment for MSMEs to flourish. In this ecosystem, MSMEs occupy a central role as both adopters and suppliers of resilient energy solutions; as adopters, they gain operational continuity and productivity, and as suppliers, they provide the specialized local expertise required for a durable transition. This sequential logic ensures high additionality and catalytic value, fostering a systemic transformation that is equitable, scalable, and resilient across the three oceans.

5.1. Global Environmental Benefits and GEF Alignment

The primary justification for GEF support lies in the generation of Global Environmental Benefits (GEB) through measurable reductions in greenhouse gas (GHG) emissions, resource efficiency gains, and enhanced climate resilience.

- **Climate Change Mitigation (CCM):** The program supports the transition away from high-carbon fossil fuels, reducing energy-related GHG and local emissions in critical island value chains such as tourism, agri-food, water, and the blue economy. By targeting MSMEs, G-RES ensures that both the demand and supply sides of the cleantech market are mobilized, increasing the adoption of certified technologies while contributing to SIDS' NDC commitments.
- **Adaptation Co-Benefits (CCA):** Integrating climate resilience into all RE&EE installations ensures that mitigation investments are protected against intensifying climate hazards, such as tropical cyclones, flooding, and sea-level rise. This guarantees that GEB delivery is durable and sustainable in highly vulnerable SIDS.
- **International and Regional Conventions:** The project strengthens alignment with global frameworks (UNFCCC, Paris Agreement), regional strategies (C-SERMS), and SIDS-specific agendas such as the Antigua and Barbuda Agenda for SIDS (ABAS).

5.2. Incremental Cost Reasoning and Value Added

The primary objective of the G-RES program is to accelerate the transition toward low-carbon SIDS economies through significant and sustained greenhouse gas (GHG) emission reductions. GEF resources provide the critical incremental support required to unlock these mitigation results by overcoming the persistent financial, technical, and institutional barriers that the baseline scenario cannot resolve.

By financing the “resilience premium”—the additional costs associated with disaster-proofing low-carbon infrastructure and professionalizing local cleantech ecosystems—GEF resources unlock a transition that national budgets and standard commercial financing cannot currently support. GEF also covers part of the incremental costs faced by start-ups and scale-ups launching cleantech businesses without external support. Without this targeted intervention, SIDS remain locked in a cycle of technology importation and stranded assets, which keeps local value addition low and prevents the emergence of a self-sustaining green economy. This targeted GEF investment ensures that mitigation efforts are permanent, effective, and synergistic with bilateral co-financing, securing long-term GHG reductions across the productive sectors of the SIDS.

GEF resources are uniquely positioned to manage the complexity of multi-regional SIDS coordination. By providing the 'connective tissue' through a unified global-regional framework, the project creates unprecedented synergies between national child projects and regional centers. This ensures that every GEF dollar invested at the national level is leveraged by regional public goods—such as harmonized grid codes and de-risking templates—that would be too costly for any single island nation to develop on its own.

A defining feature of the G-RES program is its ability to address a critical global gap: at present, there are virtually no integrated programs addressing the supply side of the energy transition for productive uses in SIDS. While most interventions remain demand-side oriented—focusing on policy targets and consumer subsidies—G-RES is uniquely designed to strengthen MSMEs as local suppliers and service providers of climate-resilient solutions.

5.3 Innovation

The G-RES program introduces a transformative 'Resilience-by-Design' approach centered on Climate Change Mitigation (CCM). The program distinguishes between the scaling of proven institutional models and the introduction of novel programmatic innovations to ensure high-impact results.

Replication and Scaling of Proven Models (The Foundation):

Global-Regional-National Programmatic Nexus Approach: A fundamental innovation of G-RES is its multi-tiered implementation architecture. This 'umbrella' approach is built on the proven model of the GEF Strategic Program for West Africa (SPWA), which demonstrated the power of regional anchoring through the establishment of ECREEE. G-RES evolves this success by utilizing the GN-SEC platform to provide the specialized 'software'—harmonized policies, climate-resilient standards, and regional de-risking tools—that national 'child' projects cannot efficiently develop in isolation. This creates a symbiotic feedback loop where regional public goods accelerate national execution, while national results provide the data to refine global standards.

Genuine Programmatic Innovation (The Novelty):

Beyond institutional scaling, G-RES introduces genuine innovation through the following pillars:

- **The GN-SEC as an Engine for SIDS-SIDS Cooperation:** The project utilizes the GN-SEC institutional architecture as a unique global platform for South-South and Triangular Cooperation (SSTC). By connecting regional centers across the Caribbean (CCREEE), Pacific (PCREEE), and AIS regions (ECREEE, SACREEE, CEREEAC), G-RES facilitates the inter-regional transfer of

innovation. For the first time, a policy or technical standard validated in the Caribbean can be systematically adapted and 'exported' to the Pacific or African SIDS through a shared institutional memory, effectively overcoming the geographic isolation that traditionally hinders SIDS-SIDS exchange.

- **Integrated Mitigation-Adaptation Nexus (Resilience-by-Design Standards):** G-RES innovates by making climate resilience a mandatory technical standard. It specifically targets the industrial and productive-use energy nexus to replace carbon-intensive fossil fuel use with resilient RE systems. The project is developing first-of-their-kind regional technical standards that account for SIDS-specific hazards, such as Category 5 cyclone-resilient mounting systems and salt-mist corrosion standards. This elevates RE installations from standard hardware to climate-proofed industrial assets, ensuring that mitigation investments are protected against local climate realities.
- **MSME Cleantech Ecosystem Innovation:** A core novelty of G-RES is addressing the market failure of supply-side imbalance. While previous mitigation efforts are often focused on demand-side support, G-RES empowers MSMEs as active suppliers and innovators of climate-resilient renewable energy solutions. The program introduces an integrated ecosystem approach to overcome the scarcity of local, certified cleantech providers:
 - BLOOM Cleantech Clusters: These clusters provide the necessary infrastructure—prototyping, testing, and certification facilities—to bridge the R&D and managerial capacity gaps and overcome domestic ecosystem fragmentation.
 - Professionalization & Quality Infrastructure: Aligning cleantech qualifications with regional frameworks (NVQ/CVQ) and introducing a Voluntary Green Business Recognition Labelling Programme reduces performance risk and professionalizes the local green value chain.
- **Targeting the 'Resilience Premium':** The project innovates by facilitating de-risking mechanisms specifically for the higher upfront costs of resilient infrastructure, valuing long-term avoided losses as a bankable metric for local financial institutions. This will be done in partnership with existing financial institutions and based on existing instruments.
- **Technology Innovation:** G-RES will proactively advance frontier renewable energy technologies, including ocean energy solutions. Building on UNIDO's prior submission to the GEF Innovation Fund and in coordination with the Global Ocean Energy Alliance (GLOEA), the programme is strategically positioned to drive innovation at the forefront of renewable energy. A central objective is to address the "valley of death" in technology commercialization by facilitating the transfer and deployment of climate-resilient solutions in the Global South. This includes exploring a range of Renewable Ocean Energy (ROE) technologies—such as Ocean Thermal Energy Conversion (OTEC), wave energy, tidal stream energy, tidal range energy, salinity gradient (osmotic) energy, and floating offshore wind—which are uniquely suited to the blue geographies of Small Island Developing States (SIDS). Despite its strategic relevance, ROE remains largely overlooked by mainstream climate finance, often described as the "forgotten" renewable energy source. In this context, the GEF plays a catalytic role by covering a substantial portion of the incremental costs associated with early-stage and capital-intensive technologies. Specifically, it helps bridge the "resilience premium"—the cost gap between standard energy infrastructure and the specialized, climate-hardened systems required in SIDS maritime environments. Through this support, G-RES creates a global knowledge base, de-risks industrial roll-out, and positions SIDS as real-world innovation hubs, enabling ocean energy technologies to scale globally.
- **SIDS-SIDS Digital Commons & Asset Class Creation:** The cross-regional Information Management System (IMS) utilizes standardized climate-risk templates to aggregate data across three oceans, creating a 'global SIDS investment asset class' that allows international financiers to view fragmented island markets as a unified, de-risked portfolio.
- **Inclusive Social Innovation:** G-RES treats gender-responsiveness and youth leadership as a core innovation, utilizing an intersectional lens to design financial instruments and vocational tracks that tap into previously excluded talent pools to accelerate technology deployment.

Testing, Adaptation, and Risk Calibration Strategy: Technical innovations are first developed as global-regional templates by UNIDO and then stress-tested via the BLOOM platforms in national child projects. Risk calibration occurs through a feedback loop: regional hazard data is used to calibrate the technical standards, ensuring that 'global' tools are accurately.

5.4 Potential for Scaling Up & Replication

The G-RES strategy uses a 'global umbrella' framework designed to act as a Strategic Accelerator for all SIDS, leveraging a structured South-South and Triangular Cooperation (SSTC) approach:

- **Cross-Regional Scaling and Solution Transfer:** The program is designed to standardize the key components of the energy transition—including climate-resilient grid codes, policy templates, training curricula, and de-risking models. This standardization serves as the primary vehicle for the transfer of proven solutions between SIDS regions, enabling an innovation validated in the Caribbean (CCREEE) to be seamlessly adapted and deployed in the Pacific (PCREEE) or the AIS regions via the shared Digital Commons (IMS).
- **Programmatic Scaling via the GEF-9 Cycle:** The programmatic framework, comprising global, regional, and national interventions, is specifically engineered for rapid expansion. The scale-up potential will be further enhanced through the anticipated GEF-9 funding cycle, which aims to expand the G-RES portfolio from the initial five national projects to ten or more. This expansion will consolidate G-RES as a strategic programmatic platform that accelerates cross-regional learning and replication. This could be undertaken in partnership with other GEF Implementing Agencies under a global programmatic approach.
- **Emergence of a Unified Market:** By harmonizing technical and financial standards across disparate island groups, the G-RES platform overcomes market fragmentation. This encourages the emergence of a unified market for climate-resilient energy solutions, attracting international independent power producers (IPPs) and financiers who previously viewed small island markets as too small or high-risk for entry.
- **Global Advocacy and Political Scaling:** Leveraging its partnership with SIDS DOCK and the outcomes of the Antigua and Barbuda Agenda for SIDS (ABAS), G-RES uses the GN-SEC platform to advocate for resilience standards as a global requirement for SIDS climate financing, elevating regional successes to global political forums (e.g., UNGA, COP).

5.5 Sustainability

The programmatic approach of G-RES applies a multi-dimensional sustainability framework to ensure that results endure beyond project closure. By simultaneously addressing climate change adaptation and mitigation, the programme enhances the long-term sustainability of renewable energy investments and reduces the risk that decarbonised infrastructure becomes stranded as climate hazards intensify. The sustainability strategy is built on four core pillars:

- **Institutional & Generational Sustainability:** G-RES builds on UNIDO's longstanding engagement in SIDS through the Global Network of Regional Sustainable Energy Centres (GN-SEC). By engaging established regional institutions (CCREEE, PCREEE, etc.) as executing partners, the program embeds institutional knowledge and implementation capacity within the SIDS regions. The institutionalization of the GN-SEC Gender and Youth Network provides a permanent platform for inclusive advocacy and ensures that the transition is resilient to demographic shifts and leadership changes.

- **Policy and Regulatory Sustainability:** The program promotes the adoption of regionally harmonized climate-resilient renewable energy standards and grid codes. Once endorsed at the regional level (e.g., CARICOM, SPC), these frameworks are transposed into legally binding regulations for national governments, embedding climate resilience into long-term utility operations.
- **Technical Sustainability and Capacity Development:** Capacity building is institutionalized within regional academic and training institutions. This creates a continuous pipeline of locally trained experts—with strict participation targets for women (50%) and youth (30%)—capable of operating and maintaining resilient low-carbon systems.
- **Financial Sustainability:** In alignment with the UN Multidimensional Vulnerability Index (MVI), G-RES promotes innovative de-risking and blended finance mechanisms. By leveraging partnerships with development partners and private investors, the program addresses the 'climate resilience premium' and helps create bankable investment pipelines for MSMEs in key value chains.

Adherence to SSTC Quality Principles: All South-South and Triangular Cooperation (SSTC) activities facilitated by the G-RES platform follow the Voluntary Quality Guidelines of the Global Partnership Initiative on Effective Triangular Co-operation (OECD). These principles ensure that interventions are effective, inclusive, and sustainable by adhering to the following criteria:

- **Country ownership and demand-driven cooperation:** Activities are implemented with the full ownership of partner countries and aligned with national priorities and the 2030 Agenda for Sustainable Development.
- **Shared commitment:** Partners collaborate and assume shared responsibility in identifying, designing, implementing, monitoring, and evaluating cooperation initiatives.
- **Results-oriented approaches:** Partners commit to achieving clearly defined results and to documenting these results to facilitate learning, replication, and scale-up.
- **Inclusive partnerships and multi-stakeholder dialogue:** Cooperation initiatives engage governments, regional organizations, the private sector, academia, and civil society to promote knowledge exchange and sustainable solutions.
- **Transparency and mutual accountability:** Partners share relevant information to support effective monitoring, evaluation, and collective accountability.
- **Innovation and co-creation:** Activities promote intelligent risk-taking, evidence-based policies, technological innovation, and flexible approaches that support locally driven solutions.
- **Joint learning and knowledge sharing:** Horizontal exchanges allow partners to benefit mutually from shared experience, capabilities, and strengths.
- **Advancing gender equality and empowerment:** SSTC initiatives contribute to gender equality and the empowerment of women and girls, promoting inclusive and sustainable development outcomes.
- **Leaving no one behind:** Cooperation efforts support vulnerable groups and communities and ensure equitable access to opportunities and benefits from sustainable energy transitions.

6. Stakeholder Engagement

The program employs a multi-stakeholder, systems-oriented approach, recognizing that transformative change in SIDS energy systems requires coordinated action across governments, the private sector, financial institutions, and civil society. By engaging these actors in complementary roles, the program ensures that policy, finance, technology, and knowledge interventions are mutually reinforcing, contributing to a self-sustaining cleantech ecosystem.

- Government Ministries and Regulators develop and enforce climate-resilient energy policies and quality infrastructure standards (Component 1) through steering committees, inter-ministerial working groups, and targeted policy consultations.
- Utilities, independent power producers (IPPs), MSMEs (both adopters and suppliers of cleantech), are central to implementation. They benefit from capacity-building (Component 2), access to de-risked finance (Component 3), and participation in innovation challenges.
- Local financial institutions provide commercial capital, supported by technical assistance and co-financing mechanisms aligned with GEF de-risking instruments (Component 3).
- Regional and SIDS-SIDS institutions - including GN-SEC centers, SIDS DOCK and the SIDS-SIDS Hub at UWI - support replication and knowledge-sharing, harmonize standards, and deliver technical training (Component 4).
- Civil society organizations ensure accountability, gender and youth inclusion, and public awareness through consultations, gender action plans and outreach.

The systems approach is embedded across all four components: governance and policy (1), capacity and quality standards (2), financial de-risking (3), and regional replication and knowledge exchange (4). Together, these interventions foster a cohesive, climate-resilient cleantech ecosystem that delivers long-term environmental, economic, and social benefits.

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

1. Overall Objective and Rationale

The GEF and bilateral donor (e.g., Austria) funded Global Program on Climate-Resilient Renewable Energy Systems (G-RES) is a multi-country program focused on accelerating a sustainable, climate-resilient energy transition across SIDS. The core objective of the overall program is to promote resilient RE systems that reduce GHG emissions and dependence on fossil fuels, strengthen energy security and deliver productivity gains and climate adaptation co-benefits in key island value chains (water, agri-food, tourism, blue economy).

By targeting national utilities, regulators, Independent Power Producers (IPPs), and Micro-, Small-, and Medium-Sized Enterprises (MSMEs) as both adopters and providers of climate-resilient RE&EE solutions, the programme positions SIDS public-private collaboration at the core of the transition. G-RES contributes directly to the implementation of major multilateral commitments, including the Paris Agreement and the Antigua and Barbuda Agenda for SIDS (ABAS).

The G-RES is structured as a framework comprising this global-regional project, which provides an umbrella for the national GEF-funded projects implemented in parallel with allocations from STAR, SCCF, or LDCF (in some cases). The global-regional project aims to accelerate national progress through regional and SIDS-SIDS cooperation, leveraging shared knowledge, harmonized standards, and blended financing to reduce barriers that prevent private sector, particularly MSMEs, to adopt or become suppliers of climate-resilient R&EE solutions.

2. The Theory of Change (ToC) Causal Pathways

Problem Statement

The energy landscape of Small Island Developing States (SIDS) is currently defined by a precarious and costly reliance on imported petroleum products, which serves as a primary driver of high greenhouse gas (GHG) emissions and chronic economic instability. This fossil-fuel dependency leaves island nations exceptionally vulnerable to the dual-front threat of climate change: the immediate, catastrophic shocks of extreme weather events and the slow-onset impacts of sea-level rise and rising temperatures. These climate hazards frequently trigger debilitating power outages that paralyze critical social services and jeopardize the continuity of vital economic sectors such as tourism, agri-food, and the emerging blue economy. The resulting fiscal burden is disproportionately borne by households and micro-, small, and medium-sized enterprises (MSMEs), which lack the resources to recover from recurrent infrastructure failures, thereby trapping them in a cycle of vulnerability and low productivity.

Impact / Ultimate Goal

Through the strategic deployment of climate-resilient renewable energy systems, the G-RES programme seeks to catalyze a systemic transformation across SIDS. The ultimate goal is to achieve a decisive reduction in GHG emissions and a decoupling from fossil fuel dependence, thereby strengthening national energy security and the adaptive capacity of domestic energy systems. By integrating 'Resilience-by-Design' into the core of the energy transition, the programme delivers measurable productivity gains and climate adaptation co-benefits across the most sensitive island value chains, ensuring that water, agri-food, tourism, and blue economy sectors are future-proofed against the escalating realities of a warming planet.

Causal Progression of Outcomes

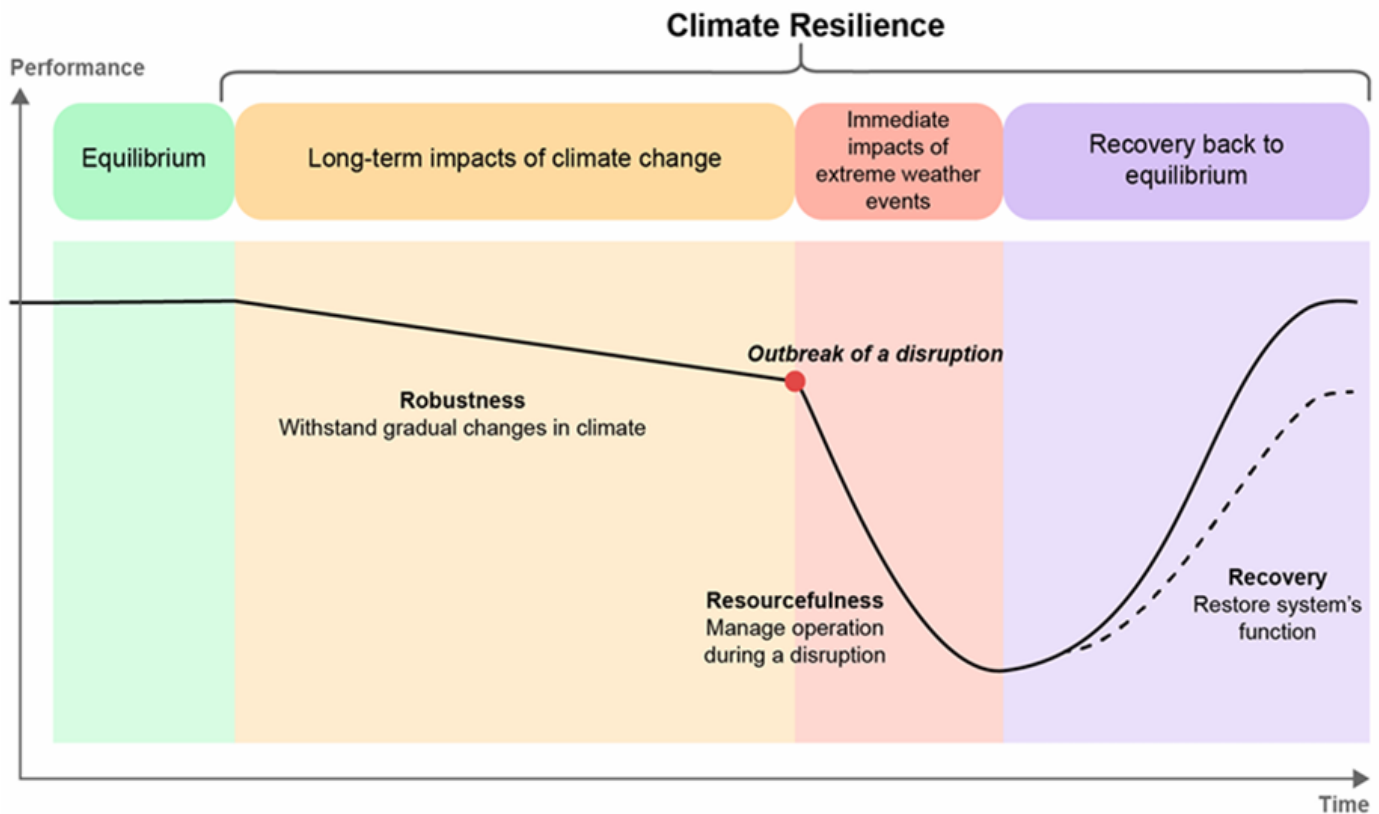
Immediate Outcomes: Establishing the Normative Foundation

In the short term, the programme focuses on dismantling the primary barriers to entry for resilient renewable technology. This is achieved by establishing the normative and technical foundations required for a professionalized market. By creating enhanced qualification and certification frameworks, G-RES ensures that local products and services meet rigorous international resilience standards. Simultaneously, national utilities and energy regulators are supported in adopting forward-looking strategies and roadmaps that prioritize long-term stability over short-term cost-cutting. Central to this phase is the empowerment of the workforce; through targeted capacity-building programs, a new generation of experts—including a mandatory 50% representation of women and 30% of youth—is equipped to lead the technical implementation of resilient solutions. Furthermore, the expansion of the G-RES portfolio to at least 10 national projects serves to demonstrate the viability of these models, leveraging initial blended finance to attract private IPPs and mini-grid operators.

Medium-Term Outcomes: Catalyzing Market Transformation

As these foundational tools take hold, the programme facilitates a shift in market behavior and institutional planning. Strengthened institutional capacity allows governments and utilities to identify and plan for decarbonized energy systems that are demonstrably 'stress-tested' against climate impacts. On the financial front, the program enhances the access of utilities and MSMEs to innovative risk-mitigation instruments, effectively lowering the perceived risk for local lenders. This leads to a measurable increase in the volume of high-quality, resilient RE products available in the SIDS market. Underpinning this market growth is an accelerated culture of innovation and joint learning; through sustained SIDS-SIDS cooperation via the GN-SEC network, successful models are replicated across ocean clusters, ensuring that no single island has to bear the full cost of innovation alone.

Figure 3: Climate resilience of energy systems to climate change (IAEA)



• Long-Term Outcomes: Achieving National Transformation

In the long term, these systemic shifts culminate in a state of enhanced national resilience and global environmental benefits. The environmental impact is realized through significant lifetime GHG reductions in direct and in consequential mitigation. Beyond carbon, the adaptation benefits are profound: at least 75 hectares of land and coastal zones are managed in a climate-resilient manner, and 10 regional or national policies are fully operationalized to safeguard future investments. Socio-economically, over 83,480 individuals and 150 MSMEs—with a good emphasis on female and young entrepreneurs—benefit from energy security that is no longer tethered to global oil market volatility. The resulting reduction in fossil fuel spending at the household and national levels unlocks capital for further sustainable development, securing a trajectory of inclusive and stable green growth.

Project Outputs: The Operational Building Blocks

The program's theory is operationalized through six primary categories of outputs:

- **Policy & Regulation:** Providing the governance 'software' through climate-proven regulations and fiscal incentives that make resilient investments bankable.
- **Investment & Business Support:** Mobilizing capital through regional pipelines and the BLOOM Cleantech innovation clusters, which serve as incubators for local startups.
- **Quality & Skills:** Developing the 'human infrastructure' through regional vocational frameworks and certified training modules that professionalize the local green value chain.
- **Knowledge & Risk Assessment:** Deploying integrated climate risk assessment toolkits that allow operators to quantify the 'resilience premium' of their assets.
- **Technical Standards:** Establishing clear, climate-resilient quality standards for all RE/EE hardware to prevent the dumping of sub-standard technology in SIDS.

- SIDS-SIDS Exchange: Maintaining the G-RES support desk and a digital knowledge platform to facilitate the rapid transfer of best practices across the Global South.

Key Assumptions and Risk Mitigation

The success of this theory relies on the maintained political commitment of SIDS governments to prioritize resilience over conventional, non-resilient alternatives. It assumes that the local financial sector will respond positively to de-risking instruments and that the technical appetite for innovation remains high among MSMEs. While risks such as political instability or extreme weather events during implementation are acknowledged, they are mitigated by anchoring reforms in international NDC commitments and by the strict application of resilient design standards for all project-supported infrastructure.

Key Risks

- Political Instability: Changes in government priorities could delay policy adoption.
- Financial Conservatism: Banks may remain risk-averse despite de-risking mechanisms.
- Extreme Weather Events: Severe climate shocks during implementation could disrupt activities.
- Supply Chain Disruptions: Global market volatility may affect access to resilient technologies.
- Capacity Constraints: Limited technical expertise could slow uptake of standards and training.
- Social Barriers: Gender norms or cultural factors may limit participation of women and youth.

Figure 4: Theory of Change of the G-RES Program

1 Problem Statement

SIDS with fossil-fuel-dependent energy systems cause high GHG emissions and are highly vulnerable to climate hazards and long-term impacts of climate change. Power outages from extreme weather and sea-level rise disrupt critical services, threaten key value chains like tourism, agri-food and blue economy, and increase fiscal burden for households and MSMEs.

2 Impact / Ultimate Goal

Through the deployment of climate-resilient renewable energy systems in SIDS, the G-RES program reduces GHG emissions and dependence on fossil fuels, strengthens energy security and the adaptive capacity of energy systems, and delivers productivity and climate adaptation co-benefits across key island value chains, including water, agri-food, tourism, and the blue economy.

3 Long-Term Outcomes

Environmental Direct GHG reduction of 171,600 tCO ₂ e and indirect reduction of 343,200 tCO ₂ e over 20 years (CI6 Core Indicator)	Adaptation Benefit 75 hectares (50 ha land / 25 ha coastal) managed in a climate-resilient manner with RE systems (CI2)	Adaptation Benefit 10 resilient RE/EE policies and plans adopted at regional/national level (CI3)
Adaptation Benefit 83,480 individuals (CI1) and 150 MSMEs (CI5) (50% women / 30% youth) benefiting from RE solutions	Economic and Security Improved energy security and reduced fossil fuel spending on national, household and MSME level	Adaptation Benefit 1,000 individuals (50% women / 30% youth) trained in resilient RE system (CI4)

4 Medium-Term Outcomes

Knowledge, Quality & Skills Strengthened institutional capacity to identify and plan decarbonised and climate-adaptive energy systems	Investment Enhanced access of utilities, IPPs and MSMEs to blended finance and risk mitigation instruments	Policy Enhanced institutional support and policy framework for the integration of climate-resilient RE solutions across SIDS;
Knowledge, Quality & Skills Increased number of resilient quality RE products and services in the SIDS market	Investment Decarbonised and resilient energy system protected from climate impacts	Knowledge Accelerated replication, innovation and joint learning through SIDS-SIDS cooperation

5 Immediate Outcomes

Knowledge, Quality & Skills Enhanced qualification and certification framework for climate-resilient RE products and services.	Policy RE strategies or roadmaps adopted by utilities and energy regulators; quality standards adopted;	Quality & Skills Experts and policy makers (50% women, 30% youth) on climate-resilient RE trained
Investment leveraged in blended finance; G-RES project portfolio expanded to at least 10 national projects.	Investment Start-ups, IPPs, and mini-grid operators supported; 5 SIDS utilities adopt improved resilience practices.	Knowledge SIDS energy institutions gain knowledge on resilient RE systems; stakeholders trained and engaged in networks.

6 Outputs

Policy Climate-proven renewable energy policies, regulations, and incentives;	Investment Regional investment pipelines and finance network; BLOOM Cleantech innovation cluster support platform	Quality / Skills Regional vocational frameworks integrating resilient RE certifications; training workshops, online courses, and study tours
Knowledge Integrated climate risk assessments and strategies	Quality & Skills Climate-resilient quality standards for renewable energy product and services	Knowledge G-RES support desk and SIDS-SIDS knowledge and exchange platform

* Assumptions

Governance Political commitment by SIDS governments and utilities to prioritize climate-resilient RE	Financial Availability of concessional climate financing; private sector appetite; high fossil fuel prices;	Technical Sufficient staff capacities within institutions and MSMEs
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3. Project Components, Interventions, and Activities

The G-RES program is structured around five comprehensive components, designed to function as a systemic SIDS-SIDS accelerator that addresses the multi-dimensional barriers to a resilient energy transition.

Component 1: Policy and regulatory framework and institutional coordination

This component establishes the governance 'software' required to de-risk the market for national utilities, regulators, Independent Power Producers (IPPs), and community-led energy systems.

Outcome 1.1: Enabling environment for the adoption and supply of climate-resilient RE&EE solutions in key island value chains

This outcome targets the structural and regulatory hurdles that currently prevent national utilities, regulators, ministries, and IPPs from effectively integrating climate-resilience into energy planning and implementation. Simultaneously, it fosters the conditions for MSMEs in productive sectors to adopt decentralized solutions and for local cleantech start-ups to supply the necessary services.

- Output 1.1.1 (Regional gender and youth responsive market policies promoting the adoption and local supply of climate-resilient RE&EE solutions in productive sectors): Development of specific regulations and models for integrating climate resilient RE&EE solutions, such as technical standards for grid-forming inverters and model power purchase agreements (PPAs) that incentivize black-start capabilities. These frameworks provide IPPs and community mini-grid operators with the bankability required for projects utilizing hurricane-rated hardware, and utilities with the operational predictability needed to manage distributed loads during extreme weather events. These policies will include mechanisms for periodic technical review (every 5 years) to integrate updated climate science and ensure that fiscal incentives remain aligned with the evolving risk landscape.
- Output 1.1.2 (Regional gender and youth responsive regulations, fiscal and non-fiscal incentives for the adoption and supply of RE&EE solutions): Drafting regional templates for fiscal signals and market-based instruments, including Minimum Energy Performance Standards (MEPS) for appliances. MEPS act as a critical shield against long-term climate impacts, such as rising ambient temperatures and the resulting surge in cooling demand that threatens utility grid stability and increases energy costs for MSMEs. Activities also include drafting duty exemptions on climate-hardened components (e.g., salt-corrosion resistant inverters and reinforced solar racking).

Component 2: Capacity development and quality infrastructure

Professionalization of the supply side and technical strengthening of energy system players to ensure asset longevity:

Outcome 2.1: Strengthened private-sector capacities and quality infrastructure for the adoption and supply of climate-resilient RE&EE products and services.

This outcome addresses the 'technical deficit' in SIDS. By building a robust Quality Infrastructure (QI) ecosystem, the program ensures that utility engineers, IPP technical teams, and MSME practitioners possess the skills needed to maintain systems—including smart energy management systems and grid-forming storage—capable of surviving extreme environmental stresses.

- Output 2.1.1: Replicable tools for energy climate risk assessments and resilience planning in RE&EE infrastructure and business operations. This activity provides utility grid operators, regulators, and private IPP developers with digital risk-modeling toolkits to 'stress-test' their assets. Simultaneously, it

helps MSMEs in productive sectors identify vulnerabilities in their supply, encouraging the deployment of on-site resilient battery storage to maintain operations during climate-induced grid outages. All climate-resilient guidelines and tools will use forward-looking projections (minimum 2050 timeframe).

- Output 2.1.2: Regional technical guidelines and quality standards for RE&EE products and services, including for climate-resilient storage, smart grid and productive use appliances. This output establishes a regional 'Seal of Quality' for island-specific equipment, focusing on salt-mist resistant Battery Energy Storage Systems (BESS), cyclone-rated mounting structures, and high-efficiency, surge-protected productive use appliances compliant with MEPS. These standards ensure utilities and IPPs procure hardware verified for harsh maritime conditions, while preventing the 'dumping' of inefficient technology into SIDS markets. Crucially, all technical guidelines and quality standards will be anchored in forward-looking design parameters. Potential example are: (i) wind speed requirements for Category 5+ (>250 km/h) cyclone resistance for solar arrays; (ii) coastal elevation/setback requirements based on 2050/2100 SLR + surge projections; (iii) IP67+ flood resilience standards or platform elevation for BESS; and (iv) heat tolerance specifications for electronics maintaining efficiency at ambient temperatures up to 45°C.
- Output 2.1.3: Regional vocational qualification frameworks integrating certifications for climate-resilient RE&EE solutions. G-RES will work with regional accreditation bodies to professionalize the workforce, ensuring technicians are certified to install and maintain advanced inverters with frequency control and reinforced energy storage enclosures, supporting both utility-scale RE assets and decentralized MSME systems.
- Output 2.1.4: Regional training workshops and online courses on the planning and execution of climate-resilient RE&EE solutions. Delivering specialized technical modules to at least 50% women and 30% youth professionals, empowering young utility engineers and women cleantech entrepreneurs to lead the commissioning and operation of resilient microgrids and smart-metering infrastructure.

Component 3: Investment and business promotion

The financial engine of the program, leveraging co-financing to bridge the 'valley of death' and foster utility-scale resilient infrastructure and businesses:

Outcome 3.1: Enhanced regional framework to leverage financing and de-risk private investment in climate-resilient RE&EE projects and businesses

This outcome targets the 'resilience premium'—the higher upfront cost of hurricane-hardened inverters, reinforced storage systems, and MEPS-compliant high-efficiency hardware. It provides national utilities and IPPs with new financial options for utility-scale investments while helping MSMEs and cleantech start-ups become bankable. G-RES applies a strategic partnership model which strengthens existing regional financial architecture rather than creating new entities. The program operates through a partnership framework with IFIs, National Development Banks (NDBs), and Local Financial Institutions (LFIs). UNIDO and the GN-SEC centres provide technical de-risking methodologies and pipeline vetting, ensuring local ownership and alignment with national priorities. G-RES engages in structured partnerships with philanthropy, international financial institutions (IFIs), and climate funds to mobilize co-financing and advocate for an inclusive and fair financial system, aligned with the principles of the UN Multidimensional Vulnerability Index (MVI) framework.

- Output 3.1.1 (Regional project pipelines and de-risking mechanisms to leverage finance and private investment): G-RES facilitates the bundling of regional project pipelines together with the GN-SEC centres, convenes financial partners, and provides analytics for the development of innovative financing schemes. Recognizing that the majority of energy transition investments must originate from

the private sector, public support is utilized strategically to leverage private capital. Potential modalities and instruments include:

1. Guarantees (e.g., Partial Credit Guarantees – PCGs): Advising on mechanisms to lower collateral barriers for women- and youth-led MSMEs.
2. Performance-Based Grants (PBGs): Supporting the design of grants to offset the 'Resilience Premium' for climate-hardened investments.
3. Blended Finance Structures: Providing technical guidance to combine concessional finance, grants, and private capital to crowd in investors.
4. Crowdfunded Fintech Platforms: Utilizing digital financial technology to enable community-based investment and peer-to-peer (P2P) funding models for localized renewable energy projects.
5. Climate Risk Insurance & Catastrophe Bonds: Providing advisory support and capacity-building to help financial partners and project developers structure insurance-based risk mitigation for climate-resilient infrastructure.
6. Green, Blue, and Transition Bonds: Preparing governments and private actors to develop climate-resilient projects suitable for bond financing. Through these activities, G-RES enables financial partners and investors to make climate-resilient investments bankable, mitigating both technology and climate risks, and leveraging GEF resources to attract additional capital.

Output 3.1.2 (BLOOM cluster platforms to support cleantech MSMEs, start-ups and scale-ups with makerspace, intelligence and matchmaking with corporate financing):

Building on the lessons learned from the first Barbados BLOOM Cleantech Cluster, G-RES provides technical support for the establishment and operation of cleantech innovation cluster platforms at the national level, creating a makerspace for entrepreneurs, corporates, public institutions, applied science, and financiers to work jointly on climate-resilient RE systems and other cleantech solutions. These platforms serve as public-private hubs that professionalize the local cleantech ecosystem and provide makerspace and shared services to their members. For cleantech providers (start-ups and scale-ups), the platforms offer 'makerspace' facilities for prototyping innovative resilient solutions (e.g., modular salt-resistant solar systems) and provide the market intelligence required to scale. Simultaneously, the platforms assist technology adopters (MSMEs in key value chains such as tourism and agri-food) in developing bankable business cases for the adoption of renewable energy and high-efficiency hardware. The operation of these clusters will be guided policies and MSME selection criteria and inclusion strategies specifically designed to prioritize women and youth-led enterprises. This includes the development of tailored “on-boarding” tracks that address the structural collateral and capacity gaps often faced by marginalized entrepreneurs. By integrating these strategies into the core cluster governance, G-RES ensures the cleantech transition effectively captures the “youth dividend” and promotes gender parity. Crucially, BLOOM clusters facilitate matchmaking with corporate financing, including venture capital, business angels, and fintech providers, while also supporting access to carbon market sponsorships and results-based financing to ensure ventures are investment-ready for both local and international capital markets.

Note: The BLOOM component of the G-RES program builds on the foundational lessons learned from the GEF-UNIDO pilot that established the Barbados BLOOM Cleantech Cluster—the first of its kind in the Caribbean and a pioneering model for all SIDS. This initiative demonstrated how a cluster-based approach can dismantle entrenched market and institutional barriers, fostering a vibrant local ecosystem for clean technology. Operating under a robust public-private-project financial model, these clusters function as collaborative platforms—or 'makerspaces'—that unite entrepreneurs, government, academia, and financiers to jointly advance resilient solutions. The success of the Barbados pilot was showcased during a high-level side event at the 4th International Conference on SIDS (SIDS4) in Antigua and Barbuda in May 2024, where it garnered significant interest from regional leaders as a blueprint for replication. By scaling these clusters across the SIDS regions, G-RES will institutionalize this model as a critical regional accelerator, generating

bankable pipelines and professionalizing local supply chains to ensure the energy transition is both inclusive and domestically driven. The 2nd phase of the BLOOM cluster is also part of the national G-RES project in Barbados.

Component 4: G-RES information management system (IMS) for SIDS-SIDS exchange

This component addresses knowledge fragmentation and the 'learning tax' that often delays the energy transition in SIDS.

Outcome 4.1: Enhanced SIDS-SIDS knowledge exchange on climate-resilient RE&EE solutions

This outcome institutionalizes inter-regional solidarity by establishing a 'Global SIDS Knowledge Commons.' By turning isolated national successes into regional and global public goods, the program reduces the time and cost required for utility managers, ministries, and Independent Power Producers (IPPs) to replicate successful resilient models. This streamlined exchange ensures that a validated policy or technical solution in one ocean region can be rapidly adapted in another, fostering a unified front against climate-related energy disruptions.

- Output 4.1.1 (G-RES Information Management System (IMS) for SIDS-SIDS knowledge exchange): Coding and launching the G-RES IMS digital architecture as a centralized, inter-oceanic platform for market intelligence. UNIDO will lead the technical development of this 'Digital Commons,' which will aggregate performance data on hardened RE systems, technology costs, and climate-resilience metrics across the Caribbean, Pacific, and AIS regions. By utilizing standardized climate-risk templates, the IMS effectively creates a 'global SIDS investment asset class,' providing international financiers and IFIs with the transparent, comparable data needed to de-risk large-scale investments in island energy systems.
- Output 4.1.2 (Regional webinars, forums and study tours on climate-resilient RE&EE solutions, considering gender and youth issues): Institutionalizing structured, high-level exchanges that elevate technical successes to the global political stage. SIDS DOCK, in tandem with the GN-SEC centres, will facilitate sovereign and technical dialogues between utility managers, IPPs, and community operators. These peer-to-peer (P2P) exchanges will focus on replicating successful 'Blue Corridor' blueprints, self-healing microgrid configurations, and load-management strategies via MEPS. By centering gender and youth leadership in these forums, the program ensures that the most successful and inclusive resilience models are replicated across the entire SIDS community, utilizing major inter-governmental arenas (e.g., UN General Assembly, COPs) as platforms for advocacy and learning.

Component 5: Project monitoring and evaluation

This component ensures the program remains agile, transparent, and anchored in evidence-based learning. Given the geographic complexity of the G-RES program, a robust Monitoring and Evaluation (M&E) framework is vital to track progress across three oceans and ensure that lesson-learning is systematically captured and fed back into the regional hubs.

Outcome 5.1: Effective and adaptive implementation and evidence-based learning.

This outcome targets the establishment of a rigorous tracking system that moves beyond mere compliance toward 'Adaptive Management.' By continuously monitoring the program's technical and socio-economic performance, G-RES can recalibrate its interventions in real-time to respond to evolving climate risks or shifting market conditions in the child project countries. This commitment to evidence-based learning ensures that every dollar of GEF financing is optimized for maximum impact and that successes are documented for future global scaling.

- Output 5.1.1 (Systematic Project Reporting): Managing the production of annual Project Implementation Reports (PIRs) and tracking GEF Core Indicators (GHG emissions avoided, number of beneficiaries). This ensures that UNIDO and the GEF Secretariat maintain full transparency on the program's contributions to global environmental benefits.
- Output 5.1.2 (Independent Terminal Evaluation): Executing an impartial, high-level assessment at the end of the project cycle to verify results, analyze the efficiency of the 'Strategic Partnership Model,' and provide concrete recommendations for the GEF-9 cycle.
- Output 5.1.3 (Integrated Data Analytics and Lessons Learned Sharing): In coordination with the IMS (Component 4), this activity involves the regular synthesis of monitoring data into 'Impact Briefs.' These briefs will be shared across the GN-SEC network to provide utility managers and policy makers with a clear understanding of which de-risking mechanisms or technical standards are delivering the highest resilience dividends, thereby fostering a culture of continuous improvement and inter-island solidarity.

4. Transformational Impact and Global Benefits

The G-RES program is engineered to catalyze a systemic transformation within SIDS energy markets. It shifts the paradigm from a fragmented, vulnerable model dependent on imported fossil fuels to one that is integrated, resilient, and driven by the private sector. This represents a systemic shift where climate resilience is no longer an optional consideration but a mandatory standard for all energy investments, enforced by new governance frameworks and technical standards. The program also drives economic diversification by fundamentally changing the role of local MSMEs. Through support structures like the BLOOM cluster platforms, local enterprises transition from being passive energy consumers to becoming active providers of resilient cleantech services. This evolution creates new, high-quality green jobs and revenue streams, reducing the economy's dangerous reliance on vulnerable sectors like traditional tourism. Most significantly, the program delivers climate security. By ensuring that essential services such as water supply, healthcare facilities, and food processing plants have reliable, independent power sources, the program guarantees their continued operation even during extreme weather events. This capability fundamentally increases the adaptive capacity of SIDS communities and significantly reduces the economic and social devastation typically caused by major climate shocks.

5. Global Environmental Benefits (GEBs) and Additionality

Global Environmental Benefits (GEBs)

The GHG emission reductions will be calculated in detail during the PPG phase. Since the MSP is mainly focusing on regional activities which are facilitating replication and spill-over effects on a national level, the impact of the project is more indirect. It highly depends on the readiness of countries to adopt and enforce regional policies or standards. The G-RES program delivers benefits primarily in the Climate Change Mitigation (CCM) focal area, while simultaneously generating co-benefits in Climate Change Adaptation (CCA) and pollutant reduction. Therefore, a very moderate target will be included.

Initial calculations, utilizing an average SIDS grid emission factor of 650 g/kWh, target a lifetime mitigation of 514,800 tCO₂e over 20 years. This includes Direct Emissions Reductions of 171,600 tCO₂e and 343,200 tCO₂e consequential (indirect) reductions, coming from improved policies, regulations, standards, qualification frameworks, enhanced financing modalities. This is based on the assumption that the project will co-facilitate the installation of 10 MWp of solar PV capacity, including climate-proven battery storage, during the project life-time (mainly through Outcome 3).

Adaptation co-benefits

Similarly, the estimated adaptation co-benefits in line with the SCCF Core Indicators are kept conservative since the project is mainly facilitating global and regional activities, which require a longer time-horizon to demonstrate impacts on national level. However, by considering also the adaptation benefits of the national “child projects”, the following positive climate adaptation effects are estimated:

- Direct Beneficiaries (SCCF Indicator 1): 83,480 individuals (50% women / 30% youth). This includes residents and MSMEs gaining direct access to climate-resilient energy services and those benefiting from a functionally hardened national electricity system.
- Area under Resilient Management (SCCF Indicator 2): 75 hectares (50 ha land / 25 ha coastal) managed in a climate-resilient manner by benefiting from resilient RE services.
- Policies and Plans (SCCF Indicator 3): 10 policy documents and plans adopted on regional and national level.
- Training and Capacity (SCCF Indicator 4): 1,000 individuals (50% women / 30% youth) trained in resilient RE system operations and maintenance on regional and national level.
- MSME Resilience (SCCF Indicator 5): 150 MSMEs (50% women and 30% youth-led) in key value chains (tourism, fisheries, agri-food) benefiting from hardened RE solutions to secure their cold chains and operational continuity.

Additionality

The GEF funding is strictly additional because it addresses critical gaps that neither the private sector nor local governments can fill in isolation. Primarily, it finances the 'resilience premium'—the incremental cost of switching to climate-resilient RE&EE technologies with higher up-front costs. This price difference between standard renewable energy equipment and the specialized, hardened systems required to withstand Category 5 hurricanes and corrosive maritime environments is eligible for CCM funding as it is essential to protect the underlying mitigation assets from climate risks, thereby ensuring the longevity and sustainability of the Global Environmental Benefits (GEB).

Furthermore, GEF funds enable market creation by collaborating with global, regional and national financial partners to improve, adapt, and leverage existing finance and risk mitigation instruments that are currently underutilized in the SIDS context. By providing the technical assistance necessary to make these established financial tools accessible to MSMEs and utilities, and by operationalizing the BLOOM cluster platforms, the programme provides the patient, catalytic capital needed to prove commercial viability and unlock private investment that is currently frozen due to risk aversion. Finally, the GEF grant, matched with initial grant funding from the Government of Austria, covers the incremental costs of regional cooperation—the missing link in international climate cooperation—by formalizing SIDS-SIDS knowledge exchange through the GN-SEC network. This centralized platform addresses the fundamental coordination barrier, serving as a powerful accelerator for inter-regional SIDS-SIDS cooperation and maximizing the return on investment for the entire global community.

6. Private Sector

The G-RES program views the private sector, and specifically energy operators and Micro, Small, and Medium-Sized Enterprises (MSMEs), as the primary engine of a climate-resilient just energy transition. The strategy engages the private sector in three distinct and complementary roles. First, as demand generators (adopters), MSMEs in critical economic sectors like tourism and agriculture act as the end-users of the clean energy solutions. The program makes their transition financially rational by de-risking their investments and ensuring the resilience of their energy supply. Second, the program focuses on supply chain development (providers) by supporting local cleantech MSMEs, start-ups, and scale-ups. These businesses receive technical training, certification, and business coaching through the

BLOOM cluster platforms. This support professionalizes the local industry, enabling them to deliver high-quality, bankable projects. Finally, private entities are essential for capital mobilization (financiers). By working closely with local commercial banks and international financial institutions through the de-risking mechanism, the program unlocks private balance sheets for green lending, thereby ensuring the long-term financial sustainability of the market transformation.

7. Gender Equality and Women's Empowerment

The G-RES programme reflects a commitment to transforming energy systems into inclusive engines of prosperity and resilience. Recognizing that women and youth in SIDS are disproportionately affected by energy poverty and climate-induced disruptions to the energy-water-food nexus, the programme implements a comprehensive Gender Action Plan (GAP). This plan is fully harmonized with the requirements of the parallel bilateral co-financed component, ensuring a unified and accountable approach to social inclusion.

7.1 GESI Approach: Gender-Responsive and Inclusive Design

Recommendations from the preliminary gender and social inclusion analysis are integrated across all project components. G-RES adopts an 'Agents of Change' philosophy, moving beyond the traditional view of marginalized groups as 'vulnerable beneficiaries.' Instead, the programme positions women and youth as active architects and leaders of the cleantech value chain.

7.2 Data, Indicators, and Monitoring (Sex- and Age-Disaggregated)

The programme utilizes the G-RES Information Management System (IMS) to track gender and youth indicators annually. In compliance with Criterion 3 of the Gender Marker (sex-disaggregated indicators), the project systematically collects and analyses:

- **Disaggregated Quantitative Data:** Systematic collection of sex-disaggregated data for all trainings, events, and capacity-building activities, complemented by age-disaggregated data (<35\$) to track the 'youth dividend' in the energy transition.
- **Leadership and Enterprise Metrics:** Specific indicators to track women's and youth's leadership in policy engagement, enterprise creation within the BLOOM clusters, certification uptake, and improved access to finance.
- **Qualitative Resilience Impact:** Capturing gender-specific qualitative data, including perceived community benefits, identified barriers to entry, safety concerns, time savings, and enhanced business resilience post-climate shocks.

7.3 Do-No-Harm Approach and Safeguards

Following UNIDO and GEF guidance on applying a Do-No-Harm approach, G-RES ensures that energy interventions do not inadvertently reinforce existing inequalities or harmful stereotypes. Key safeguards include:

- **Normative Integrity:** Ensuring no project output or communication material reinforces restrictive gender norms or occupational segregation.
- **Inclusive Policy Design:** Auditing policy and planning tools to ensure they do not systematically exclude women, youth, or marginalized communities from decision-making or resource allocation.
- **Safeguard Alignment:** All activities are fully aligned with the UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), with additional internal safeguards developed specifically for the G-RES platform to monitor risks of discrimination.

7.4 Dismantling Structural Barriers: Gender-Lens Investing

A core innovation of G-RES is the application of Gender-Lens Investing within the BLOOM Cleantech Clusters (Component 3). These clusters provide tailored business incubation and 'on-boarding' tracks specifically designed for women-led and youth-led MSMEs. By addressing the 'collateral gap'—a primary barrier for female entrepreneurs in the Global South—the programme utilizes specialized de-risking mechanisms to unlock private capital for innovations in resilient cooling, agri-food processing, and blue economy technologies, ensuring that the energy transition serves as a catalyst for a more equitable society.

8. Knowledge Management and Learning

Knowledge management is not an afterthought but a central pillar of the program, housed within Component 4 and executed through the robust infrastructure of the GN-SEC network. The strategy revolves around the G-RES Information Management System (IMS), which serves as the operational nerve center for the program. This system collects and curates all program outputs, including standardized Climate Risk and Vulnerability Assessment methodologies, detailed case studies of resilient deployments, and model regulatory documents. To ensure this knowledge is actively used, the program fosters systematic exchange through formalized annual events, virtual forums, and study tours (Output 4.1.2). These activities ensure that certified experts, policy lessons, and technical guidelines flow freely between the Caribbean, Pacific, and other SIDS regions. The ultimate knowledge product is the G-RES Toolkit, a comprehensive, published set of guidelines that will serve as the standard reference for all future resilient energy projects in SIDS, ensuring that the lessons of G-RES define the future of island energy.

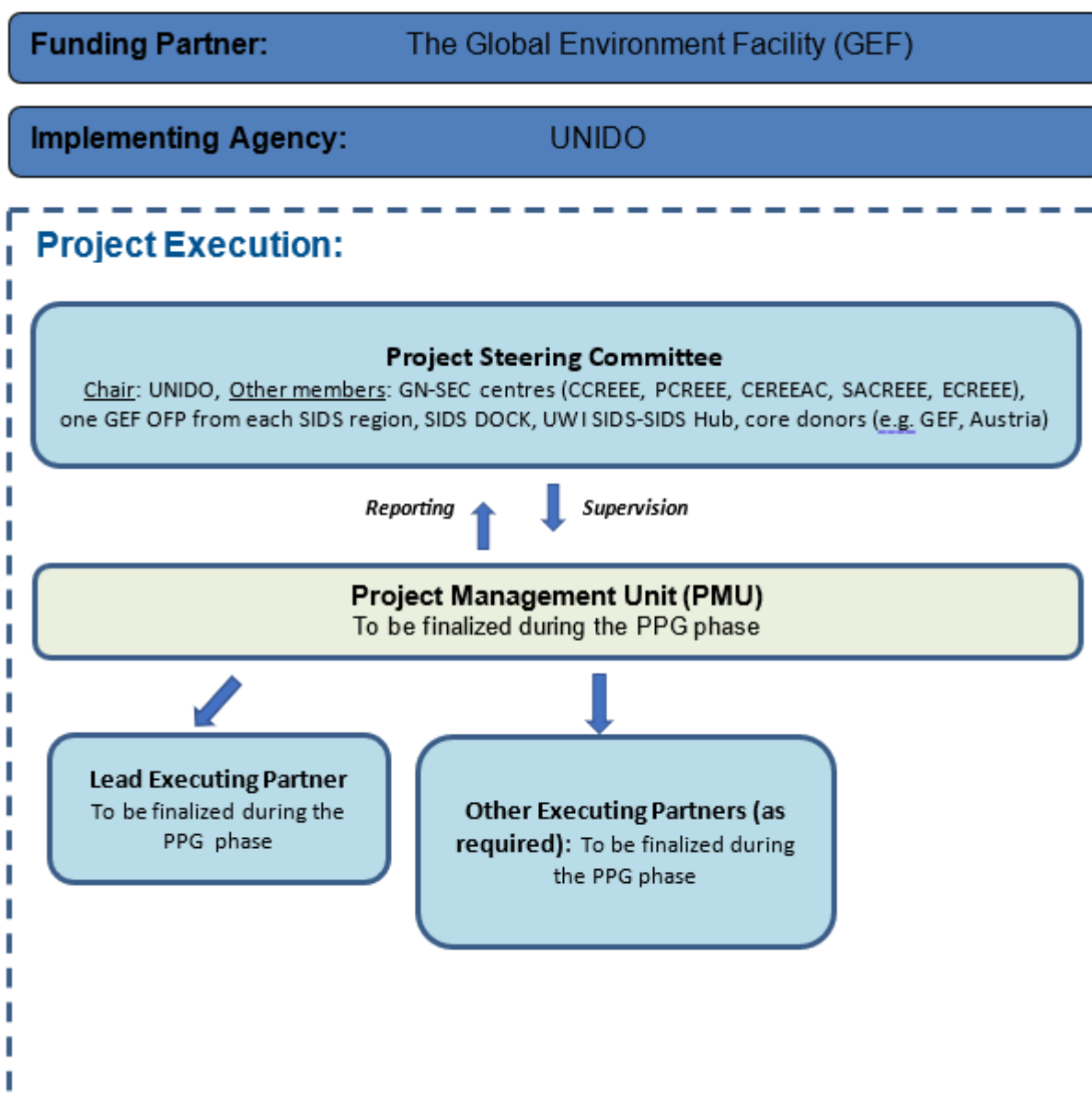
9. Stakeholder Engagement

The program employs a multi-stakeholder, systems-oriented approach, recognizing that transformative change in SIDS energy systems requires coordinated action across governments, the private sector, financial institutions, and civil society. By engaging these actors in complementary roles, the program ensures that policy, finance, technology, and knowledge interventions are mutually reinforcing, contributing to a self-sustaining cleantech ecosystem for the adoption of climate-resilient renewable energy systems in SIDS. The regional-national component has the following implementation and execution structure as indicated below. It will be further detailed during the PPG phase.

Implementation strategy:

The UNIDO Sustainable Energy and Just Energy Transition Unit (ECA/JET), hosting the GN-SEC platform, will have the overall global implementation responsibility in close cooperation with the newly established UNIDO-Barbados SIDS Hub in Bridgetown.

- **Figure 5: Implementation and execution structure of the GEF project**



The global-regional component of the G-RES program operates as a highly integrated, joint effort among UNIDO, the GN-SEC Regional Centres, and SIDS DOCK. Designing a global program across highly diverse SIDS regions requires a sophisticated division of labour where agencies work collaboratively across all components. To detail this operational structure, the revised PIF clarifies the specific technical roles of each agency down to the Output level. The project utilizes a “Complementary Consortium” model where agencies collaborate on the same Outcomes while leading distinctly different aspects of the execution on different levels (global, regional, national):

UNIDO (Global Technical Coordination and Quality Assurance) - Leads the global technical and financial framework: UNIDO acts as the overarching guarantor of global coherence, quality assurance, and innovation across the SIDS regions. Drawing on extensive experience from the GN-SEC program and in all SIDS regions, UNIDO's role is vital as a neutral broker connecting these highly diverse regions, as this level of complex inter-regional South-South cooperation does not occur organically. In this capacity, and to ensure harmonization, UNIDO procures the highly specialized international services required to develop the various global-regional outputs and tools (e.g., regional policies and regulations [Outputs 1.1.1, 1.1.2], climate risk assessment templates [Output 2.1.1], technical guidelines [Output 2.1.2], qualification frameworks [Output 2.1.3], and the global-regional framework for project pipelines and BLOOM activities [Outputs 3.1 & 3.3]). Under Component 3, UNIDO

provides the overarching technical assistance and methodology for private sector engagement and the financial structuring of the global de-risking mechanisms. Technically, UNIDO will directly execute Output 4.1.1 by developing and coding the central G-RES Information Management System (IMS) digital architecture. In parallel, the bilateral donor funding provided to UNIDO will be channeled to the GN-SEC centres to ensure regional buy-in, integration, and coherence.

The GN-SEC Regional Centres - e.g., CCREEE, PCREEE (Regional and National Execution and Direct Deployment) - Lead the grassroots regional implementation: Working jointly with UNIDO, they adapt global frameworks to regional realities and secure official statutory buy-in from regional decision-making bodies (e.g., CARICOM, SPC) under Components 1 and 2. Moreover, they will lead the day-to-day support for countries to implement the regional policies, regulations, quality, and training frameworks on the national level (e.g., Outputs 1.1.1, 1.1.2, 2.1.1, 2.1.2, and 2.1.3). Some of these outputs are already incorporated into the national “child” projects (e.g., climate risk assessments in Palau and PNG, vocational training frameworks in Barbados, and climate-resilient RE policies across all of them). They will also support grassroots activities by delivering hands-on green skills and business training directly to local MSMEs (Output 2.1.4). Furthermore, they act as the project 'originators' by maintaining the regional investment pipelines and assisting SIDS in setting up BLOOM cleantech innovation clusters (Output 3.3) based on the developed global documents to support SIDS start-ups and scale-ups. National “child” projects already include such BLOOM elements (e.g., in Barbados and Saint Lucia), ensuring a highly coherent global-regional-national approach.

SIDS DOCK (Global Policy Advocacy and High-Level Convening) - Leads the global diplomatic and technical intra-regional advocacy: SIDS DOCK operates in tandem with UNIDO and GN-SEC, taking their technical outputs and elevating them to the global political stage. They will support the organization of inter-regional SIDS-SIDS meetings and global convening events. Moreover, under Component 3, they utilize the Global Ocean Energy Alliance (GOEA) network to help mobilize private sector partnerships and programmatic investments into the regional pipelines. Under Component 4, they hold operational responsibility for the formalized inter-governmental SIDS-SIDS knowledge exchanges (Output 4.1.2) at global forums such as the UN General Assembly and UNFCCC COPs. This will involve also the SIDS DOCK Island Women Open Network (IWON) when it comes to gender and youth issues.

The UWI SIDS-SIDS Technology Transfer Hub (hosted by the University of the West Indies) is a technical partner. It plays a role in Component 2 (Capacity) by developing and delivering the regional vocational qualification frameworks, providing academic rigor for training and certification, and facilitating the transfer of appropriate resilient technologies across the SIDS regions.

The “Consortium Model” is based on lessons learned: The global-regional approach is well tested, also in the context of GEF funded interventions. The UNIDO-led Global Network of Regional Sustainable Energy Centers (GN-SEC), recognized internationally as a 'best practice' model for South-South and triangular cooperation, is another regional execution vehicle. UNIDO's work on the GN-SEC began 2010 with the establishment of the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) in Praia, Cape Verde, which was supported by the GEF's Strategic Program for West Africa (SPWA) and the Government of Austria, demonstrating a proven model on how regional institutional capacity can become an accelerator for the uptake of RE&EE markets. The creation of ECREEE was part of the GEF-UNIDO efforts to build coherence between the national “child” projects and facilitated the establishment of the ECOWAS Observatory for Renewable Energy and Energy Efficiency (ECOWREX). The undertaken external terminal evaluation of a similar regional MSP has proven the effectiveness of the regional approach. Today, the network comprises ten regional centers covering 35 of 39 SIDS (via CCREEE, PCREEE, etc.).

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The engagement and roles of the specific stakeholders are detailed in the table below:

Stakeholder Type	Specific Stakeholder/Entity	Level of Engagement & Primary Interest	Specific Contribution to Project Success	Key Component/Output Linkage
I. Governance & Policy				
GEF National Focal Points (NFPs)	National Ministries of Environment / Finance	High: Strategic Oversight & Alignment. Interest in maximizing GEF investments (STAR/SCCF).	Program Oversight: Ensures country alignment, chairs national steering committees, and validates national priority setting.	Components 1 & 5 (Policy, M&E)
National Energy/Business Ministries	Ministries of Energy, Commerce, Economic Development	High: Strategic Alignment. Interest in aligning the project with national energy and MSME strategies.	Strategic Guidance: Directs the technology roadmap and incentive proposals to maximize energy security and economic diversification.	Component 1 (Policy, regulatory framework - Output 1.1.2)
National Environment/Planning Ministries	Ministries of Environment, Climate Change, Planning	High: Policy Oversight. Interest in environmental compliance and climate-resilient economy.	Policy Implementation: Ensures environmental compliance and provides policy oversight for all project activities.	Component 1 (Policy, regulatory framework)
Regulatory Bodies	Utility Regulators, Standard Bureaus	High: Policy Enforcement. Interest in consistent market rules and tariff structures.	Regulatory Reform: Adopts and enforces new climate-resilient energy policies and quality standards.	Component 1 (Policy, regulatory framework - Output 1.1.1)
II. Global, national and regional execution				
Implementing and Global Executing Agency	UNIDO	High: Global Coherence, Quality Assurance, & Technical Coordination. <i>Interest:</i> Operating a unified, cross-regional global program rather than fractured regional interventions.	Global Methodological Framework: Acts as a neutral broker to connect diverse SIDS regions. Procures international expertise to develop baseline global-regional policies, standards, and frameworks. Develops overarching methodologies for de-risking	C1 & C2: Methodologies & Standards (Outputs 1.1.1, 1.1.2, 2.1.1, 2.1.2, 2.1.3) C3: De-risking Frameworks (Outputs 3.1, 3.3) C4: Digital Infrastructure (Output 4.1.1)

			mechanisms. Directly develops and codes the central G-RES IMS digital architecture.	
Regional Executing Partners	GN-SEC Regional Centres (e.g., CCREEE, PCREEE)	High: Regional Embedment, Grassroots Deployment, & Pipeline Generation. <i>Interest:</i> Bridging UNIDO's global frameworks with the specific national realities of the child project countries.	Regional & National Deployment: Secures official statutory buy-in from regional bodies (CARICOM, SPC). Adapts global standards to local contexts. Delivers hands-on cleantech and business skills training directly to local MSMEs. Facilitates BLOOM innovation clusters and regional pipelines. Collects regional data for the IMS.	C1: Policy Embedment C2: Local Capacity (Output 2.1.4) C3: Innovation Pipeline (Output 3.3) C4: Regional Data Management
Global Policy & Advocacy Partner	SIDS DOCK and its Island Women Open Network (IWON)	High: Global execution SIDS-SIDS Cooperation, Diplomatic Convening, & Niche Pipeline Mobilization. <i>Interest:</i> Championing the project's technical successes to SIDS Prime Ministers and Ministers of Finance.	Diplomatic Convening: Leverages the Global Ocean Energy Alliance (GOEA) to mobilize private sector partnerships and programmatic donor investments. Organizes and facilitates high-level policy dialogues and advocacy events at major inter-governmental arenas (e.g., UN General Assembly, UNFCCC COPs).	C3: Investment Mobilization C4: High-Level Knowledge Exchange (Output 4.1.2)
III. Technical Partnerships				
Technical & Academic Partners	Regional Academic Institutions (e.g., UWI SIDS-SIDS Hub)	High: Training Delivery & R&D. <i>Interest:</i> Integrating cleantech into vocational curricula.	Curriculum Integration: Delivers certified vocational training programs and contributes to regional cleantech certification integration.	C2: Capacity (Output 2.1.3) C4: Knowledge Exchange
Technical Partners	Regional Utility Associations (e.g.,	Medium/High: Regional Standardization and	Policy Input & Technical Harmonization:	Components 1, 2, 3

	CARILEC, PPA, WAPP, SAPP)	Best Practice Exchange. <i>Interest:</i> Grid stability, quality standards, and harmonized PPA models.	Provides utility-side input on regional technical standards and supports the development of harmonized PPA/grid integration rules.	
IV. Financial & Investment				
Co-financiers	Bilateral Donors (e.g., ADA/BMEIA)	High: Co-financing and Strategic Alignment. <i>Interest:</i> Leveraging GEF funds to maximize development impact and thematic focus (e.g., green recovery).	Committed Co-financing: Provides critical resources for technical assistance, adaptation standards, and initial investment de-risking.	Components 1, 2, 3
Financial Intermediaries	Local Financial Institutions (Commercial Banks, Credit Unions)	High: Co-delivery/Investment Role. <i>Interest:</i> De-risking financial products and scaling up green lending.	Green Lending: Utilizes GEF de-risking mechanisms to substantially increase lending portfolios toward climate-resilient RE&EE projects.	Component 3 (Investment & finance - Output 3.1.1)
Project Partners	National Development/Trust Funds	High: Executing Partner & Blended Finance. <i>Interest:</i> Providing blended finance and direct partnership capital.	Financing Mechanism: Implements the innovative blended finance mechanisms and provides counterpart funding for national projects.	Component 3 (Investment & finance)
Leverage Partners	International Financial Institutions (e.g., IADB, World Bank)	Medium: Leverage/Co-financing. <i>Interest:</i> Maximizing regional program impact and resource mobilization.	Resource Mobilization: Ensures project activities are leveraged with existing regional programs and massive co-financing resources.	Project Co-financing / C3
V. Private Sector, PPPs & MSMEs				
Energy Off-takers / Grid Operators	Utility Companies (Electricity and Water) & IPPs	Medium/High: Technical Partner. <i>Interest:</i> Grid integration, PPAs, and quality of distributed energy resources.	Technical Integration: Provides input on national grid interconnection standards and ensures the smooth integration of resilient RE into	Components 2, 3, 4

			the national grid; supports PPP structuring.	
Beneficiaries	MSMEs (Technology Adopters: Tourism, Agri-food, Water)	High: Primary Beneficiaries/Partners . <i>Interest:</i> Cleantech adoption, business growth, and energy cost reduction.	Adoption & Supply: Directly adopt/supply cleantech, develop bankable business plans, and provide market feedback to financial mechanisms.	Component 3 (Output 3.1.2)
Beneficiaries	Local Cleantech Entrepreneurs/Start-ups	High: Primary Supply Partners. <i>Interest:</i> Incubation, technical support, and market access.	Supply Chain Development: Receive support via BLOOM platforms, professionalize local industry, and increase local cleantech supply/maintenance capacity.	Component 3 (BLOOM / Output 3.3)
Industry Advocates	National Private Sector Associations (Chambers of Commerce, etc.)	High: Key Executing Support. <i>Interest:</i> Advocating for the private sector and facilitating training/standards uptake.	Institutional Home/Advocacy: Facilitates MSME engagement and ensures smaller enterprises are adequately supported in policy dialogue and training access.	Components 1, 3
VI. Civil Society & Social Inclusion				
Accountability Partners	Civil Society Organizations (CSOs) & NGOs	High: Accountability, Gender/Youth Engagement. <i>Interest:</i> Driving social inclusion, environmental safeguards, and public awareness.	Outreach & Inclusion: Drives youth- and gender-sensitive awareness events, verifies local adaptation needs, and ensures equitable participation (Gender Action Plan execution).	Component 4 (Knowledge Exchange & Awareness)

UNIDO Legal context

It is expected that each set of activities to be implemented in the target countries will be governed by the provisions of the Standard Basic Cooperation Agreement concluded between the Government of the recipient country concerned and UNIDO or – in the absence of such an agreement – by one of the following: (i) the Standard Basic Assistance Agreement concluded between the recipient country and UNDP, (ii) the Technical Assistance Agreements concluded between the recipient country and the United Nations and specialized agencies, or (iii) the Basic Terms and Conditions Governing UNIDO Projects.

Coordination and Cooperation with Ongoing Initiatives and Project.

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

No

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

This will be determined during the PPG phase. The UNIDO Sustainable Energy and Just Energy Transition Unit (ECA/JET), hosting the GN-SEC platform, will have the overall global implementation responsibility in close cooperation with the newly established UNIDO-Barbados SIDS Hub in Bridgetown. Important partners for the regional activities will be also the GN-SEC centres covering SIDS in African, Caribbean, Indian Ocean and Pacific (CCREEE, PCREEE (SPC), ECREEE, SACREEE and CEREEAC). SIDS DOCK will be an important partner for SIDS-SIDS knowledge and ocean energy activities. There will be also cooperation with the SIDS-SIDS Hub at UWI on vocational training framework.

Core Indicators

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO₂e (direct)	171600	0	0	0
Expected metric tons of CO₂e (indirect)	343200	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)
Expected metric tons of CO₂e (direct)	0			
Expected metric tons of CO₂e (indirect)	0			
Anticipated start year of accounting				
Duration of accounting				

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)
Expected metric tons of CO₂e (direct)	171,600			
Expected metric tons of CO₂e (indirect)	343,200			
Anticipated start year of accounting	2026			
Duration of accounting	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)
Target Energy Saved (MJ)				

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	11.00			

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)
Female	500			
Male	500			
Total	1000	0	0	0

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 emission reductions and contributions to other indicators will be calculated in detail during the PPG phase. Since the MSP is mainly focusing on regional activities which are facilitating replication and spill-over effects on a national level, the impact of the project is more indirect. It highly depends on the readiness of countries to adopt and enforce regional policies or standards on national level. The G-RES program delivers benefits primarily in the Climate Change Mitigation (CCM) focal area, while simultaneously generating co-benefits in Climate Change Adaptation (CCA) and pollutant reduction. Initial calculations, utilizing an average SIDS grid emission factor of 650 g/kWh, target a lifetime mitigation of 514,800 tCO₂e over 20 years. This includes Direct Emissions Reductions of 171,600 tCO₂e and 343,200 tCO₂e consequential (indirect) reductions, coming from improved policies, regulations, standards, qualification frameworks, enhanced financing modalities. This is based on the assumption that the project will co-facilitate the installation of 10 MWp of solar PV capacity, including climate-proven battery storage, during the project life-time (mainly through Outcome 3). It is understood that these GHG emission reductions are additional to those indicated in the national projects. It will be proven that these reduction are the result of the envisaged regional blended finance and risk mitigation activities of the global-regional component. During the PPG phase this calculation will be more detailed by considering also other RE technologies. Regarding the core indicator 11 - People will benefit directly (high intensity) through the facilitated investments in climate-resilient RE installations. Moreover, they will benefit through provided trainings, improved policies, standards and regulations, as well as indirectly through the benefits of a more resilient electricity system demonstrating business continuity during extreme climate events.

Key Risks

	Rating	Explanation of risk and mitigation measures
CONTEXT		
Climate	Moderate	The risk of intensified extreme weather events (Category 5 hurricanes, cyclones, flooding) is significant and unavoidable in the SIDS context – but varies from SIDS to SIDS region. These hazards directly threaten RE/EE assets and critical infrastructure, undermining the longevity of the GEB (GHG reduction). Mitigation: The G-RES program is designed to be climate-resilient by definition. Component 2 supports the use of climate risk assessments, regional technical standards for climate-resilient RE&EE design, ensuring that all projects and subsequent leveraged investments incorporate climate-proven technologies (Output 2.1.1). Component 1 promotes policies that incentivize resilient RE&EE adoption.

Environmental and Social	Low	The risk can be considered as low as project will support soft activities. Under the investment/acceleration component the focus will be on support for feasibility studies and young entrepreneurs through incubation/acceleration, as well as matchmaking with financiers and investors. Due to the regional nature and limited budget of the G-RES, there will be no significant support for hardware project installations. Mitigation: The Project Preparation Grant (PPG) phase will study the potential risks further and come up with Stakeholder Engagement Plan (SEP). All national interventions will require site-specific environmental and social screening, in line with UNIDO and GEF safeguard policies.
Political and Governance	Low	Political instability, policy reversals, or slow adoption of harmonized policies in partner SIDS could delay the regional market transformation objective (ToC Intermediate Outcome). Changes in ministerial leadership or government priorities may undermine commitments to regional technical standards and incentive reforms (Component 1). Mitigation: Risk is managed by anchoring project objectives in National Energy Policies and NDCs (which provide consistent, cross-party direction) and leveraging the GN-SEC network for institutional memory and continuity. The Project Steering Committee (PSC) will be high-level to ensure sustained political ownership.

INNOVATION

Institutional and Policy	Moderate	The risk stems from the complexity of coordinating and harmonizing policies (e.g., grid integration rules, PPA standards) across multiple SIDS with distinct national legal frameworks (Component 1). Failure to coordinate could undermine the economies of scale benefit. Mitigation: The program leverages the GN-SEC's proven regional convening power (established with GEF and Austrian support) and Regional Utility Associations (like CARILEC) to facilitate the adoption of model policies and standards. This focuses efforts on high-impact, politically feasible harmonization points, rather than broad legislative overhaul.
Technological	Low	The program relies on proven climate-resilient technologies (solar PV, battery storage, energy efficiency). The key technological risk relates to supply chain disruptions, equipment quality assurance, and lack of local skills for specialized resilient installations. Mitigation: Component 2 directly addresses this through regional Vocational Qualification Frameworks and Quality Infrastructure standards, professionalizing the local supply chain. The program will prioritize technologies that meet GEF/UNIDO/GN-SEC quality benchmarks and utilize regional procurement mechanisms where feasible.
Financial and Business Model	Moderate	The market failure risk remains that private finance is unwilling to scale green lending, viewing SIDS cleantech (especially MSME-level) as too small and risky, even with national policies in place. Mitigation: Component 3 directly addresses this by creating a structured pipeline of bankable MSME projects through the BLOOM Cluster platforms and strengthening regional de-risking mechanisms (e.g., credit guarantees), thereby reducing the actual and perceived risk for local commercial banks. Bilateral co-financing (like the Austria

		committed USD 2.5 million) provides critical patient capital to seed these mechanisms.
EXECUTION		
Capacity	Moderate	The complexity of simultaneously coordinating regional knowledge management (IMS), financial de-risking (BLOOM replication), and technical training (Component 2) across 35 SIDS nations presents an inherent implementation capacity risk, compounded by staff turnover within UNIDO and GN-SEC centers. Mitigation: UNIDO's PMU will closely coordinate with the existing, robust GN-SEC Secretariat and Centers, which have a decade of regional experience. The program invests significantly in training and embedding technical competencies within permanent regional institutions (CCREEE, PCREEE, SIDS DOCK, UWI Hub) to ensure sustainability and institutional memory beyond the project cycle.
Fiduciary	Moderate	The risk of mismanagement or fraud is considered low. Mitigation: UNIDO, as the GEF Implementing Agency, provides rigorous fiduciary oversight and disbursement controls aligned with international standards. Execution will be mainly done by UNIDO ECA/JET and through the GN-SEC network benefits from established financial management systems and regular auditing of the regional centers, ensuring accountability and compliance.
Stakeholder	Moderate	Risk of stakeholder consultation fatigue and competing interests among diverse sectors (utilities, private IPPs, MSMEs, government regulators) could slow down the adoption of new standards and reforms. Mitigation: The comprehensive Stakeholder Engagement Plan (SEP) will ensure continuous, inclusive engagement. The project design explicitly creates value for all key players—MSMEs get technical/financial support (C3), Utilities/IPP get technical standards/harmonized PPAs (C2), and Regulators get policy models (C1). This alignment of self-interest ensures broad-based cooperation.
Other		
Overall Risk Rating	Moderate	The Overall Risk Rating for the G-RES program is categorized as Moderate. This rating reflects the inherent complexity of managing a multi-oceanic global program across diverse political and economic landscapes. While the program faces significant external risks—such as the potential for financial market conservatism—these are balanced by the robust institutional architecture of the GN-SEC network and UNIDO's extensive experience in SIDS. The risk is further mitigated by the 'Resilience-by-Design' approach, which proactively addresses technical uncertainties through standardized quality infrastructure. Therefore, the program's strategic design ensures that individual risks are effectively buffered, resulting in a manageable and stable overall risk profile.

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 G-RES is fully aligned with the strategic direction of the GEF-8 programming cycle, specifically targeting the core objectives of the Climate Change Mitigation (CCM) Focal Area and directly supporting the foundational priorities of Small Island Developing States (SIDS), particularly their need for integrated mitigation and adaptation solutions. Due to its focus it also generates significant climate adaptation co-benefits for the energy system and MSMEs in key island value chains.

1. ALIGNMENT WITH GEF-8 CLIMATE CHANGE MITIGATION (CCM) OBJECTIVES

The G-RES program directly contributes to two core GEF-8 CCM objectives, focusing on systemic, market-based transformation rather than incremental installation:

- **CCM Objective 1: Promote De-risking and Scaling-up Investment in Clean Energy:** Several Components but particularly Component 3 is dedicated to overcoming financial barriers by strengthening regional de-risking mechanisms and creating a structured pipeline of climate-resilient renewable energy projects. This de-risking and market-making intervention is essential for unlocking the committed co-financing and ensuring that the market for climate-resilient RE/EE solutions becomes self-sustaining after the GEF intervention ends. This addresses the GEF's focus on leveraging private capital for mitigation at scale. Through the BLOOM component the project also aims at facilitating corporate finance into businesses and MSMEs providing innovative cleantech solutions. Also Components 1 and 2 generate important policies, regulations, incentives and quality frameworks, which are conducive for private investment in climate resilient renewable energy projects and businesses.
- **CCM Objective 2: Promote Industrial Decarbonization, Low-Carbon Materials, and Circularity:** By focusing on Energy Efficiency (EE) and resource-efficient technologies (e.g., cooling) within key island value chains (tourism, agri-food, water), the program explicitly targets GEF Core Indicator 6 (Material consumption avoided) and promotes the decarbonization of the small-scale industrial and commercial sector (MSMEs). This linkage to EE and resource efficiency supports the broader circular economy and pollutant reduction co-benefits desired under GEF-8.

2. Strategic Alignment with GEF-8 SCCF Mandates (Priority Area A and B)

While requesting funding from the CCM focal area, G-RES is fully aligned with the GEF-8 Programming Strategy on Adaptation to Climate Change for the Special Climate Change Fund (SCCF). It prioritizes transformational adaptation and a 'whole-of-society' approach to build resilience in highly vulnerable SIDS, directly operationalizing the SCCF's mandate to reduce vulnerability and strengthen adaptive capacity in the infrastructure sector.

Alignment with SCCF Intervention Windows:

- **SCCF Priority Area A (Supporting the Adaptation Needs of SIDS):** G-RES is a focused inter-regional intervention dedicated to strengthening the resilience of SIDS utility assets to both chronic and acute

climate hazards. It specifically targets the adaptation deficit of the 'essential service nexus' across the Caribbean, Pacific, and AIS regions.

- SCCF Priority Area B (Technology Transfer, Innovation, and Private Sector Engagement): The program acts as a technical incubator. By funding the 'Resilience Premium'—the incremental cost of climate-resilient technologies—the program facilitates the transfer of innovative cleantech that was previously non-functional in harsh SIDS environments.

Pillar I – Building Climate Resilient Systems and Climate-Smart Policy:

- Infrastructure & Operational Resilience: Component 2 serves as the primary adaptation measure. By funding physical hardening and shifting utilities from reactive repairs to predictive asset management via geospatial risk tools, the program lowers long-term operational vulnerability to storm surges and flooding.
- Resource Resilience: Maximizing local RE generation reduces national reliance on climate-vulnerable international fossil fuel supply chains, directly enhancing energy security.

Pillar II – Integrating Adaptation into Planning and Policy:

- NAP Operationalization: The program ensures outcomes are formally integrated into National Adaptation Plans (NAPs), providing the empirical data required to translate high-level adaptation targets into actionable infrastructure investment plans.
- Policy and Standards: The development of Climate Change Resilience Strategies embeds risk considerations into procurement protocols, ensuring infrastructure is designed for 2050 climate scenarios rather than historical baselines.

3. ALIGNMENT WITH GEF-8 REGIONAL AND INTEGRATED PROGRAMMING

The program's regional structure is fundamentally aligned with the GEF-8 emphasis on integrated and multi-country approaches:

- Regional Cooperation as an Accelerator: The program utilizes the existing, UNIDO-supported Global Network of Regional Sustainable Energy Centers (GN-SEC) as the primary execution vehicle. This approach leverages the GEF grant to overcome the high incremental costs of regional cooperation, knowledge transfer, and institutional coordination across 35 SIDS. This ensures that the policy and technical successes achieved in one region (e.g., the Caribbean BLOOM model) are systematically replicated across the Pacific and other SIDS, maximizing the GEF's catalytic impact and ensuring that the entire SIDS portfolio acts as a cohesive unit.
- Integrated Programming Co-benefits: The program's integrated focus on resilience in the energy systems that serve critical sectors (tourism, water, agri-food) naturally aligns with the GEF-8 Integrated Programs related to Sustainable Cities/Urbanization and Resource Efficiency, strengthening the climate adaptive capacities of MSMEs and ensuring multi-focal co-benefits beyond pure climate mitigation

4. ALIGNMENT WITH COUNTRY AND REGIONAL PRIORITIES (SIDS)

- The G-RES program is directly aligned with SIDS's highest priorities and international commitments, operationalizing national ambitions across the regional scale:

- **Foundational National Ambitions:** The program is a core driver for realizing the high-level vision of SIDS to become '100% sustainable island states,' a commitment enshrined in declarations like Mission Barbados. It operationalizes national policies, such as the National Energy Policy's 100% renewable energy goal and the Climate Change Policy's mandate for private-sector resilience, serving as a replicable model for regional implementation.
- **SIDS Development Frameworks:** This national focus is amplified by a strong alignment with the entire continuum of SIDS development frameworks, from the foundational Barbados Programme of Action (BPoA, 1994) and the priorities of the SAMOA Pathway (2014) to the forward-looking Antigua and Barbuda Agenda for SIDS (ABAS, 2024) (Caribbean) and the Port Vila Call for Action on a Resilient Pacific (2023) (Pacific). The project directly supports the energy security and climate resilience pillars of these agendas by promoting a transition away from vulnerable, high-cost fossil fuels.
- **CARICOM Integration:** The project aligns with key CARICOM decisions and frameworks, including
 - COTED (Council for Trade and Economic Development) – Environment and Energy: Which emphasizes sustainable energy, circular economy, and environmental innovation for economic growth.
 - CARICOM Energy Policy and C-SERMS (Caribbean Sustainable Energy Roadmap and Strategy): Which aim to achieve 47% renewable energy penetration by 2027 and promote energy efficiency across all sectors.
- **Economic and Climate Resilience:** By focusing on value chain resilience and circular economy interventions, the program advances national economic roadmaps (e.g., the Blue Economy Roadmap) while simultaneously strengthening the adaptive capacities of MSMEs and productive sectors against climate shocks, ensuring mitigation efforts are durable.
- **Nationally Determined Contributions (NDCs):** By fostering an enabling environment for private sector investment and building technical capacity for renewable energy and energy efficiency deployment, G-RES provides the crucial enabling platform required for SIDS to meet and potentially raise their ambitious Paris Agreement commitments (NDCs) for GHG emission reduction. The financial eligibility argument for the incremental cost of resilience (Section 5) ensures that the program supports the SIDS imperative to ensure that mitigation efforts are not undone by climate impacts, fundamentally strengthening the adaptive capacity of key national sector.

5. ALIGNMENT WITH THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

The G-RES program delivers broad and integrated impacts across the Sustainable Development Goals (SDGs), demonstrating its commitment to the 2030 Agenda. Its key contributions include:

1. **SDG 7 (Affordable and Clean Energy):** Promotes access to resilient, reliable, and modern energy services, framing energy transition as a critical measure for national resilience and security.
2. **SDG 8 (Decent Work and Economic Growth):** Stabilizes economic growth by ensuring business continuity during climate shocks and fosters green job creation and entrepreneurship, particularly for women and youth.
3. **SDG 9 (Industry, Innovation, and Infrastructure):** Builds resilient energy infrastructure, promotes inclusive and sustainable industrialization through the BLOOM cluster model, and supports technological innovation.
4. **SDG 12 (Responsible Consumption and Production):** Advances resource efficiency, cleaner production, and circular economy interventions, directly reducing material consumption and waste.
5. **SDG 13 (Climate Action):** Provides both Climate Change Mitigation (GHG reduction) and strengthens Climate Change Adaptation (systemic resilience of key economic sectors) across SIDS.
6. **SDG 17 (Partnerships for the Goals):** Amplifies global partnership through the UNIDO-led GN-SEC network, driving SIDS-SIDS and triangular cooperation to achieve sustainable energy goals.

6. CONTRIBUTION TO KUNMING-MONTREAL GLOBAL BIODIVERSITY FRAMEWORK (GBF)

While focused on climate change mitigation, the project's success in reducing land- and sea-based pollution generates significant biodiversity co-benefits, advancing the GBF targets:

- Target 7 (Pollution Reduction): The focus on Energy Efficiency and Resource Efficiency (GEF Core Indicator 6), particularly through circularity and waste reduction in key economic sectors, directly mitigates pollution risks and the negative impacts of pollution from fossil fuel combustion and industrial processes on marine and terrestrial biodiversity
- Target 15 (Private Sector Action): The program supports private sector (MSME) capacity to assess, disclose, and reduce their risks and impacts on the environment and biodiversity by integrating resilient and cleaner production standards into their business operations.

7. ALIGNMENT WITH AND COMPARATIVE ADVANTAGE OF UNIDO

The G-RES approach is central to the mission of the United Nations Industrial Development Organization (UNIDO), which leads the international debate on addressing global challenges through Inclusive and Sustainable Industrial Development (ISID). UNIDO drives industrial policies, technical cooperation, and investment promotion activities that foster economic diversification and create decent jobs. Within the SIDS context, UNIDO recognizes that transitioning toward climate-resilient and fossil-fuel-independent energy systems is a fundamental prerequisite for promoting higher value-added manufacturing and services, thereby securing the long-term industrial competitiveness of island nations.

UNIDO's vision to "unlock a new era of industrialization powered by clean energy" provides a clear comparative advantage. While many agencies focus primarily on basic energy access, UNIDO emphasizes the industrial dimensions of the energy transition, mainstreaming sustainable energy into productive sectors and promoting the participation of local entrepreneurs in global and regional clean energy value chains. This 'Energy-Industry Nexus' ensures that renewable energy deployment directly translates into economic productivity.

The programme aligns fully with UNIDO's new SIDS Strategy and the Blue Industry Framework. It builds on the Joint Declaration signed by UNIDO, SIDS DOCK, and the Government of Austria at the SIDS4 Conference (2024) and will benefit from the newly established UNIDO-Barbados SIDS Hub on Sustainable Development in Bridgetown (2025). UNIDO possesses a robust operational track record in SIDS—including flagship initiatives in Guinea-Bissau, Cape Verde, São Tomé and Príncipe, the Dominican Republic, Barbados, Cuba, and Fiji—covering utility-scale and decentralized renewable energy deployment, grid resilience, and capacity building.

UNIDO's comparative strength is further anchored in its long-term experience with South-South and Triangular Cooperation (SSTC). As the architect and coordinator of the Global Network of Regional Sustainable Energy Centres (GN-SEC), UNIDO has operationalized ten centers covering 35 of the 39 SIDS worldwide. This network facilitates structured SSTC among regional centers (such as CCREEE and PCREEE) and international partners, a model highlighted as best practice by the UNOSSC, OECD, and EU. UNIDO's strategic partnership with SIDS DOCK and the Global Ocean Energy Alliance (GLOEA) further ensures that G-RES is linked with broader regional energy transformation agendas and high-level diplomatic advocacy.

Synergies will be deepened with the following UNIDO programs which showcase the UNIDO experience:

- Global Cleantech Innovation Program (GCIP): Supporting the acceleration of cleantech MSMEs and local entrepreneurs across the SIDS regions.
- Accelerate-to-Demonstrate (A2D) Facility: Piloting and demonstrating innovative climate-resilient energy technologies.
- The Global Ocean Energy Alliance (GLOEA): Promoting ocean energy solutions within the Blue Industry Framework to harness maritime potential.
- International Vienna Energy and Climate Forum (IVECF): Utilizing Regional Dialogues as a high-level platform for policy advocacy and knowledge exchange.
- Specialized Technical Training (STAR-C & EELA): Leveraging the STAR-C network for solar technology certification and the EELA Program for harmonizing energy efficiency standards.
- Institutional Support to SIDS DOCK: Ensuring alignment with the 'Island Energy for Life' strategy and intergovernmental climate resilience goals.
- Aligning with the Gender and Energy Compact to accelerate gender equality and the Partnership for Action on Green Economy (PAGE) to support the transition toward green industrialization.

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:

Civil Society Organizations: Yes

Private Sector: Yes

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

To ensure the highest levels of regional ownership, political legitimacy, and technical relevance, the G-RES programme was developed through a comprehensive, multi-tiered consultation process involving key diplomatic, technical, and community-level actors across SIDS regions.

Political Mandate (February 2025):

The programme's foundational mandate was established during the GN-SEC Steering Committee meeting in February 2025 in Botswana. During this session, GN-SEC centres serving SIDS called on UNIDO, as host of the GN-SEC platform, to prioritize South-South and Triangular Cooperation (SSTC) in advancing climate-resilient renewable energy systems. The meeting also reviewed progress under the Global Ocean Energy

Alliance (GLOEA), promoted in partnership with SIDS DOCK, ensuring that the G-RES framework is aligned with emerging global ocean energy ambitions.

Regional Technical Harmonization (2025):

Throughout 2025, a series of technical working sessions were convened with GN-SEC regional centres, notably the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE) and the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE). Additional consultations with the University of the West Indies (UWI) SIDS-SIDS Hub were held.

UN Ocean Conference (June 2025):

The programme's strategic vision was further refined through high-level engagements with SIDS DOCK. A key milestone was a dedicated side event on renewable ocean energy for SIDS at the United Nations Ocean Conference in Nice (June 2025), co-hosted with SIDS DOCK. This event underscored the critical role of climate-resilient energy in the blue economy and enabled direct engagement with the GLOEA. These discussions positioned the programme as a bridge between climate mitigation and sustainable ocean resource management, while mobilizing support from international marine energy stakeholders. Consultations included also the SIDS DOCK Island Women Open Network (IWON).

Broad Stakeholder Engagement (Late 2025):

Extensive consultations in late 2025 brought together a wide range of stakeholders, including National GEF Focal Points and regional organizations such as PCREEE, CCREEE, ECREEE, SACREEE, and CEREEAC.

National Child Project Integration:

In parallel, intensive national consultations were conducted in the five countries hosting the programme's child projects: Papua New Guinea (PNG), Palau, Barbados, St. Kitts and Nevis, and Saint Lucia. These dialogues served as critical feedback loops, ensuring that regional standards and de-risking mechanisms are aligned with the operational realities of national energy utilities and local MSME ecosystems. Engagements also included Civil Society Organizations (CSOs) and Indigenous Peoples' groups to ensure that project interventions are culturally appropriate and socially inclusive. Moreover, consultations with the Austrian Government resulted into a funding commitment.

Global Launch at IVECF:

The programme's formal global launch represents a key milestone at the International Vienna Energy and Climate Forum (IVECF) on Prosperity, Security, and Stability, scheduled to take place from 9 to 10 April. As a premier global platform, IVECF provides an opportunity to present the GEF-funded G-RES programme to international partners and donors, highlighting its role in advancing a stable and prosperous energy transition across the Global South.

Strategic Validation (2026):

To sustain momentum, the programme will be presented at the upcoming Pacific Energy and Transport Ministers Meeting in Papua New Guinea, scheduled to take place in May 2026. This engagement is expected to secure final ministerial endorsement in the Pacific region and ensure that the programme's technical outcomes are embedded within regional policy frameworks.

Throughout 2025, strategic engagements were held with regional CSOs such as the Caribbean Youth Environment Network (CYEN), the University of West Indies and the University of South Pacific. Gender-responsive design were specifically discussed with the SIDS DOCK Island Women Open Network (IWON) and its network of focal points, as well as the gender focal points of PCREEE and CCREEE. At the national level, the program secured feedback by consulting with CSOs and associations, such as the Barbados Chamber of Commerce and Industry (BCCI), the Small Business Association (SBA) of Barbados, Export Barbados (BIDC), the Saint Lucia Hospitality and Tourism Association (SLHTA), the Saint Lucia Chamber of Commerce, Industry and Agriculture (SLCCIA), and the St. Kitts & Nevis Chamber of Industry &

Commerce. Furthermore, consultations with indigenous groups, including the PNG Tribal Foundation and the Palau Conservation Society.

During the PPG phase, consultations will be further deepened and expanded, including targeted engagement with Civil Society Organizations (CSOs), Indigenous Peoples' groups, and vulnerable coastal communities. This matrix summarizes the multi-tiered consultation process undertaken throughout 2025 and planned for the PPG phase, ensuring that the programme is firmly grounded in regional ownership and a "whole-of-society" approach to inclusivity.

Stakeholder Group	Specific Entity / Mechanism	Primary Consultation Focus	Contribution to Project Design & Implementation
I. Regional & Global Bodies	GN-SEC Centres; SIDS DOCK/IWON; SPREP; Pacific Community (SPC); CCCCC; GLOEA.	Programmatic alignment with regional environment, climate, and energy agendas.	Ensures the project moves beyond a technocratic energy focus to an integrated 'Ocean-Climate-Energy' nexus.
II. Governance & Policy	GEF NFPs; Indigenous Governing Councils; Ministries of Energy and Finance.	Alignment with NDCs and NAPs; integration of Traditional and Local Knowledge (TLK) into policy frameworks.	Ensures national-level buy-in and the formal adoption of resilience standards that respect indigenous land and sea tenure.
III. Technical & Academic	UWI SIDS-SIDS Hub; Regional Training Bodies.	Integration of academic research and local vocational qualification frameworks.	Anchors technical standards in regional science and local craftsmanship.
IV. Private Sector & Finance	Utilities & Regulators; MSME Associations; Development Banks.	De-risking mechanisms; financial product development for cleantech; private sector co-financing.	Informs the design of de-risking tools and ensures the bankability of project pipelines for local entrepreneurs.
V. Indigenous Peoples & Vulnerable Groups	Indigenous Community Leaders; Women's Cooperatives; Youth Councils.	Identifying localized energy security needs; establishing protocols; validating traditional resilient building techniques.	Key partners in co-designing the 'Resilience Premium' interventions to ensure they benefit the most marginalized communities.
VI. Civil Society & Inclusion	CSOs; NGOs.	Social and environmental safeguards; Accountability Forums; public awareness and benefit-sharing monitoring.	Acts as 'Accountability Partners' to ensure the 'Resilience Dividend' reaches the grassroots level.

(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
Low			

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 (\$)
UNIDO	GET	Global	Climate Change	CC Global/Regional Set-Aside	Grant	954,566.00	90,684.00	1,045,250.00
Total GEF Resources (\$)						954,566.00	90,684.00	1,045,250.00

Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount (\$)

50000

PPG Agency Fee (\$)

4750

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG(\$)	Agency Fee(\$)	Total PPG Funding(\$)
UNIDO	GET	Global	Climate Change	CC Global/Regional Set-Aside	Grant	50,000.00	4,750.00	54,750.00
Total PPG Amount (\$)						50,000.00	4,750.00	54,750.00

Please provide justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total(\$)
Total GEF Resources					0.00

Indicative Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing(\$)	Co-financing(\$)
CCM-1-2	GET	954,566.00	6749000
Total Project Cost		954,566.00	6,749,000.00

Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Donor Agency	International Partnerships Austria	Grant	Investment mobilized	2500000
GEF Agency	UNIDO	Grant	Investment mobilized	40300
Others	GN-SEC centres (e.g. CCREEE, PCREEE, ECREEE, SACREEE, CEREEAC)	In-kind	Investment mobilized	500000

Private Sector	Utilities, MSMEs, start-ups and scale-u	Equity	Investment mobilized	1499700
Others	Regional Development Banks	Loans	Investment mobilized	1700000
Others	Regional Economic Communities (RECs) , utility organisations and power pools	In-kind	Investment mobilized	509000
Total Co-financing				6,749,000.00

Describe how any "Investment Mobilized" was identified

The indicated "investment mobilized" comes from various partners: The Austrian Government has committed funding for the implementation of the global-regional G-RES component with the involvement of the GN-SEC centers. Investment from private sector and regional development banks will be mobilized as co-funding for bundled project pipelines and BLOOM support for cleantech start-ups and scale-ups.

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	UNIDO	12/8/2025	Ganna Onysko	+431260263647	G.ONYSKO@unido.org
Project Coordinator	UNIDO	12/8/2025	Martin Lugmayr	+431260263595	m.lugmayr@unido.org

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

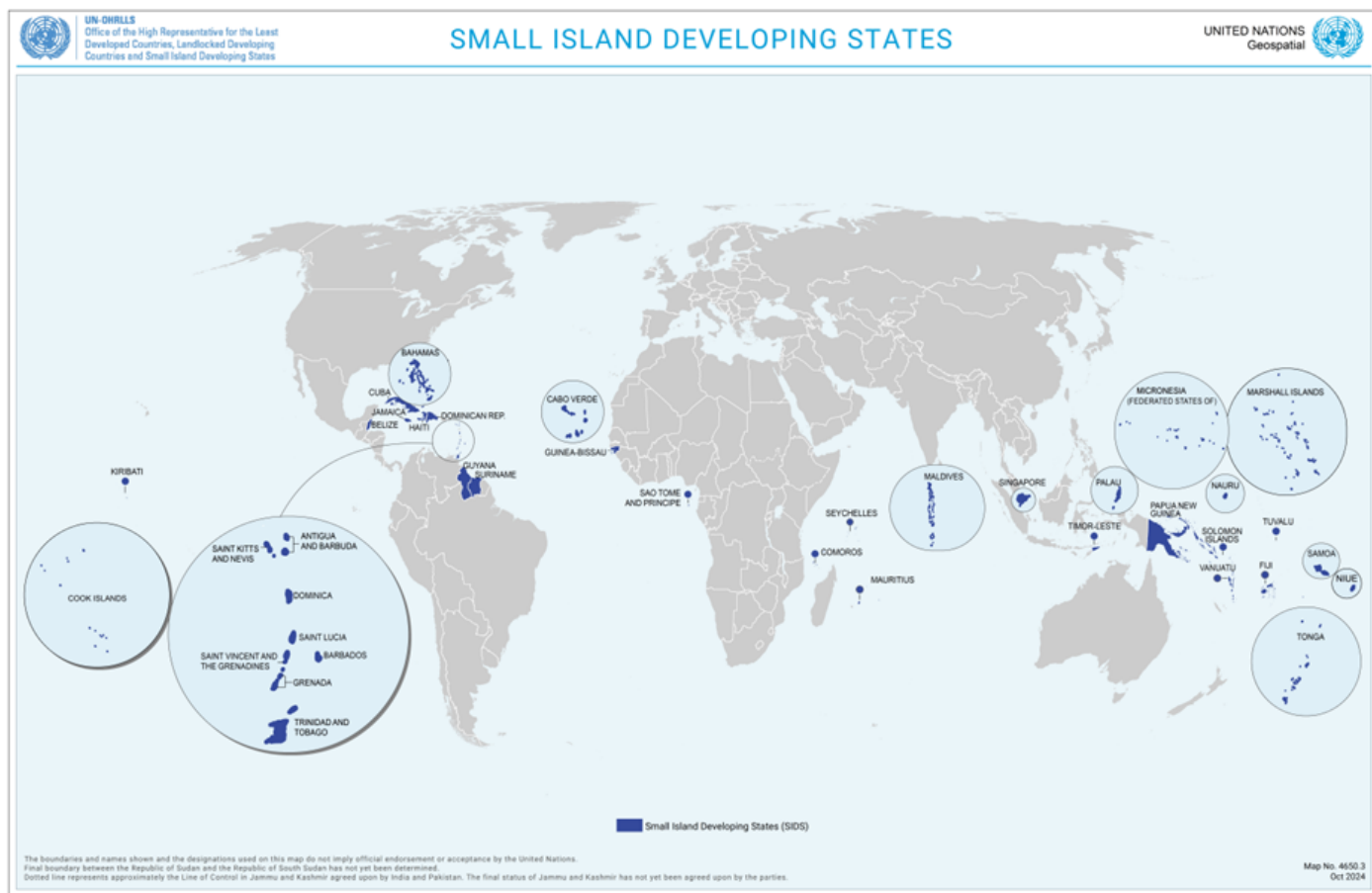
Name	Position	Ministry	Date (MM/DD/YYYY)
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ANNEX C: PROJECT LOCATION

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

Geographic Scope

The global-regional component of the G-RES program generates deliverables relevant for 39 SIDS (all members of the GEF), distributed across three geographic regions: 16 in the Caribbean, 15 in the Pacific, and 8 in the Atlantic, Indian Ocean, and South China Sea (AIS) region. For now, the program includes five national 'child' projects in Barbados, Saint Lucia, St. Kitts and Nevis, Palau and Papua New Guinea. It is intended to increase the portfolio during GEF-9 in partnership with other GEF Implementing Agencies.



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

ES_Screening_250231_G-RES_global-regional_component_signed

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
Influencing Models	Transform Policy and Regulatory Environments	Regional policy harmonization and regulatory support for climate-resilient RE&EE.	Development of gender- and youth-responsive regional policies and fiscal/non-fiscal incentives (Component 1).

Influencing Models	Deploy Innovative Financial Instruments	Establish innovative and regional de-risking mechanisms for MSME cleantech adoption.	Deployment of guarantee funds and blended finance to mobilize private capital for resilient projects (Component 3).
Influencing Models	Strengthen Institutional Capacity	Enhance regional quality infrastructure (QI) and green skills for cleantech service providers and MSMEs.	Development of regional vocational qualification frameworks (RVQF) and technical guidelines for resilience (Component 2).
Influencing Models	Convene Multi-Stakeholder Alliances	Establish an integrated regional knowledge and technology transfer platform.	Operationalization of the G-RES Information Management System (IMS) and GN-SEC coordination mechanisms (Component 4).
Stakeholders	Private Sector	Micro-, Small-, and Medium-Sized Enterprises (MSMEs).	Direct beneficiaries for technology adoption and active providers of cleantech solutions (BLOOM cluster platforms).
Stakeholders	Academia / Executing Partner	GN-SEC Network (e.g., CCREEE, PCREEE) and SIDS-SIDS Knowledge Hubs (e.g., UWI).	Execution support, capacity building, technical assistance, and hosting of regional knowledge exchange mechanisms.
Stakeholders	Financial Intermediaries	Local commercial banks and international financial institutions.	Deploy the regional de-risking mechanism and provide commercial lending for resilient cleantech investments (Component 3).
Stakeholders	Civil Society & Community	Women, youth groups, and non-governmental organizations.	Inclusive participation in capacity building, policy dialogue, and monitoring project benefits (Section B.7).
Capacity, Knowledge & Research	Knowledge Generation & Data Systems	Standardized Climate Risk Assessment (CRVA) tools and data collection for evidence-based decision-making.	Development and dissemination of replicable tools for energy climate risk assessments (Output 2.1.1).
Capacity, Knowledge & Research	Knowledge Dissemination & Innovation	South-South Knowledge Exchange and replication of successful models across SIDS.	Sharing results and lessons through the G-RES IMS and formalized regional/SIDS-SIDS exchanges (Output 4.1.1/4.1.2).
Capacity, Knowledge & Research	Capacity Building & Training	Green skills training for MSMEs and technical staff on climate-resilient solutions.	Cleantech-specific training to enhance technical, business, and entrepreneurial capabilities (Output 2.1.4).
Gender Equality	Gender-Responsive Design	Mainstreaming gender and youth considerations across all project components.	Implementation of a Gender Action Plan (GAP) and use of sex-disaggregated indicators in M&E (Section B.7).
Gender Equality	Women's Economic Empowerment	Promote women and youth in cleantech entrepreneurship and employment.	Inclusive access to finance, technical training, and leadership

			opportunities within the new cleantech market.
Focal Area / Theme	Climate Change Mitigation (CCM)	Renewable Energy, Energy Efficiency, and Decarbonization.	Achieving substantial Direct and Indirect GHG Emission Reductions through RE/EE deployment (Section B.5).
Focal Area / Theme	Climate Change Adaptation (CCA)	System-wide Climate Resilience of energy infrastructure and MSME operations.	Promoting the adoption of climate-resilient cleantech products and strengthening adaptive capacity against climate shocks (Section B.5).
Focal Area / Theme	Chemicals and Waste (CW)	Resource Efficiency (RE) and Circular Economy.	Adoption of Best Available Techniques (BAT) and Best Environmental Practices (BEP) for resource efficiency within MSME value chains.