GEF-8 PROJECT IDENTIFICATION FORM (PIF)

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General Project Information

Project Title	
Global Program on Climate-Resilient Renewable Energy Systems in SIDS – National Project in the Republic of Palau	
Region	GEF Project ID
Asia	12296
Country(ies)	Type of Project
Palau	MSP
GEF Agency(ies):	GEF Agency ID
UNIDO	250432
Executing Partner	Executing Partner Type
Government decision on the national execution partners to be taken during PPG phase.	Others
GEF Focal Area (s)	Submission Date
Climate Change	3/3/2026
Project Sector (CCM Only)	
Climate Change Adaptation Sector	
Taxonomy	
Focal Areas, Climate Change, Climate Change Adaptation, Training, Knowledge Generation, Capacity, Knowledge and Research, Workshop, Course, Learning, Adaptive management, Theory of change, Indicators to measure change, Capacity Development, Knowledge Exchange, South-South, Peer-to-Peer, North-South, Conference, Twinning, Innovation, Gender Equality, Sex-disaggregated indicators, Gender Mainstreaming, Beneficiaries, Women groups, Gender-sensitive indicators, Knowledge Generation and Exchange, Gender results areas, Awareness Raising, Access to benefits and services, Stakeholders, Partnership, Type of Engagement, Consultation, Information Dissemination, Participation, Capital providers, Private Sector, SMEs, Individuals/Entrepreneurs, Civil Society, Academia, Non-Governmental Organization, Strengthen institutional capacity and decision-making, Influencing models, Convene multi-stakeholder alliances, Demonstrate innovative approache, Transform policy and regulatory environments, Climate Change Mitigation, Renewable Energy, United Nations Framework Convention on Climate Change, Nationally Determined Contribution, Paris Agreement, SIDS : Small Island Dev States, International Waters, Strategic Communications, Communications, Behavior change, Disaster risk management, Small Island Developing States, National Adaptation Plan, Livelihoods, Adaptation Tech Transfer, Climate finance, Community-based adaptation, Climate resilience, Climate information, Private sector, Mainstreaming adaptation	
Type of Trust Fund	Project Duration (Months)
SCCF	60
GEF Project Grant: (a)	GEF Project Non-Grant: (b)
2,639,726.00	0.00
Agency Fee(s) Grant: (c)	Agency Fee(s) Non-Grant (d)
250,774.00	0.00
Total GEF Financing: (a+b+c+d)	Total Co-financing

2,890,500.00	4,900,000.00
PPG Amount: (e) 100,000.00	PPG Agency Fee(s): (f) 9,500.00
PPG total amount: (e+f) 109,500.00	Total GEF Resources: (a+b+c+d+e+f) 3,000,000.00
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)

In alignment with the Global Program on Climate Resilient Renewable Energy Systems (G-RES), the Palau national project addresses the archipelago's acute climate vulnerabilities. This initiative transitions Palau's energy sector from reactive disaster management to proactive, long-term climate resilience:

Problem
Palau’s electricity sector faces a 'dual challenge' of aging infrastructure and a heavy reliance on volatile fossil fuels. This fragility serves as a primary multiplier of national economic risk, exacerbating climate impacts already felt across key value chains; historical outages have erased 2–5% of monthly GDP. Tourism, fisheries, and agriculture—already stressed by rising temperatures and sea-level rise—face a 'double blow' when power failures disrupt cold chains and essential services. The crisis is most acute on the sub-island Peleliu, where solar and battery assets remain 'stranded' due to technical failures. Consequently, the island is trapped in total dependence on a fragile diesel supply chain.

Approach
Therefore, the project aims to strengthen the adaptive capacity of Palau’s electricity system and dependent economic value chains by integrating climate-resilient renewable energy, grid, and storage solutions:

- Component 1: Strengthens institutional capacity through GIS-enabled vulnerability assessments to map national assets against climate hazards, informing a data-driven Climate Resilience Strategy.
- Component 2: Operationalizes the Peleliu mini-grid by installing grid-forming inverters and control systems. These synchronize renewables with legacy generators, enabling 'diesel-off' operation and climate-proofing the physical grid.

Benefits and Impact
The project will have major benefits for key households and MSMEs is key island value chains, such as fishery, agriculture and tourism. In line with the SCCF framework, key targeted benefits include:

- CI 1: 16,696 direct beneficiaries (50% women, 30% youth envisaged) with two tiers: (i) 570 residents and MSMEs of Peleliu gaining direct access to solar PV mini-grid energy services; and (ii) 16,126 residents nationwide benefiting from a more climate-resilient electricity system,
- CI 2: 15 hectares (10 ha land, 5 ha coastal) managed in a climate-resilient manner by benefiting from resilient renewable energy services.

- CI 3: 3 policy documents/plans adopted, including the PPUC Climate Change Resilience Strategy, its Implementation Plan and energy resilience guidelines for MSMEs
- CI 4: 200 individuals (50% women, 30% youth) trained in resilient RE system operations.
- CI 5: 30 MSMEs (50% women and 30% youth led) in key value chains, like tourism and fisheries, benefit from climate-resilient renewable energy.

The project is expected to deliver substantial climate and economic co-benefits by reducing fossil fuel consumption and decreasing GHG emissions. In alignment with GEF-8 Core Indicator 6, these interventions are projected to achieve a total direct and indirect reduction of 75,134 tCO2e over a 20-year system perspective.

Indicative Project Overview

Project Objective

The overall project objective is to strengthen the adaptive capacity of Palau's electricity system and dependent economic value chains by integrating climate-resilient renewable energy, grid, and storage solutions.

Project Components

1. Enhanced vulnerability planning for the national electricity system

Component Type	Trust Fund
Technical Assistance	SCCF-A
GEF Project Financing ($)	Co-financing ($)
468,771.00	600,000.00

Outcome:

1.1 Enhanced adaptive capacity of the national electricity system through vulnerability assessments and adaptation planning

Output:

1.1.1 Gender-and youth-responsive GIS mapping and geolocated vulnerability assessment of PPUC assets

1.1.2 Data collection and software modelling scenarios & impacts for climate change vulnerability and operations availably of the Babeldaob and Koror electricity grid

1.1.3 Gender-and youth-responsive PPUC Climate Change Resilience Strategy and Implementation Plan, including energy resilience guidelines for MSMEs

1.1.4 Energy resilience training or PPUC and MSMEs in key value chains

2. Enhanced availability and resilience of PPUC's existing renewable energy mini-grid on Peleliu

Component Type	Trust Fund
Technical Assistance	SCCF-A

GEF Project Financing ($)	Co-financing ($)
1,925,539.00	3,700,000.00

Outcome:

2.1 Enhanced availability and resilience of existing renewable energy mini-grid on Peleliu

Output:

2.1.1 Feasibility assessments and EPC tender documentation for the enhanced availability and resilience measures of existing renewable energy mini-grid on Peleliu

2.1.2 Engineering supervision for the installation of enhanced availability and resilience measures of existing renewable energy mini-grid on Peleliu

2.1.3 Installed enhanced resilience measures for existing renewable energy mini-grid on Peleliu

2.1.4 Disseminated results and lessons learned through the G-RES and GN-SEC network, including on gender and youth aspects

M&E

Component Type	Trust Fund
Technical Assistance	SCCF-A
GEF Project Financing ($)	Co-financing ($)
119,715.00	300,000.00

Outcome:

3.1 Effective and adaptive implementation and evidence-based learning

Output:

3.1.1: M&E reports (e.g. PIRs, data tracking framework, incl. gender and youth action plan reporting)

3.1.2 Mid-term and Terminal evaluation report

3.1.3 Sharing of M&E data and analytics with the G-RES program

Component Balances

Project Components	GEF Project Financing ($)	Co-financing ($)

1. Enhanced vulnerability planning for the national electricity system	468,771.00	600,000.00
2. Enhanced availability and resilience of PPUC's existing renewable energy mini-grid on Peleliu	1,925,539.00	3,700,000.00
M&E	119,715.00	300,000.00
Subtotal	**2,514,025.00**	**4,600,000.00**
Project Management Cost	125,701.00	300,000.00
Total Project Cost ($)	**2,639,726.00**	**4,900,000.00**

Please provide justification

A higher PMC is required due to the very limited capacity of the local counterparts (Ministry).

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

1.1. Global Context and Environmental Imperative

Globally, Small Island Developing States (SIDS) are disproportionately exposed to the adverse impacts of climate change despite contributing less than 1% to global greenhouse gas emissions. The Intergovernmental Panel on Climate Change (IPCC) identifies SIDS as being at extreme risk from the impact of climate change due to their geographic isolation, limited economic diversification, and critical dependence on coastal infrastructure. The Pacific Island Countries (PICs) hold immense untapped renewable energy potential estimated by IRENA at over 10 GW, especially for solar power generation, yet remains heavily dependent on imported fossil fuels. This creates a double burden in PICs for urgently proofing energy infrastructure (and associated community services) against increasing immediate and long-term impacts of climate change, including intense tropical cyclones, storm surges, seal level rise and marine heatwaves, while simultaneously transitioning to much greater use of renewable energy. Compounding this vulnerability is the much higher cost for actions and limited economies inherent to SIDS and PICs, where the per-capita cost of resilient infrastructure and renewable energy installations are significantly higher than for continental nations.

1.2 Local Context: Palau's Acute Vulnerabilities

The Republic of Palau is an archipelago of over 300 islands in the western Pacific, with a total land area of approximately 45,900 hectares (459 sq. km) and an Exclusive Economic Zone (EEZ) spanning over 600,000 sq. km. Nationally, Palau has a population of approximately 18,000 to 21,000 people, with the majority residing on the islands of Koror and Babeldaob. As a high-income Small Island Developing State (SIDS), Palau's economy is heavily concentrated, with tourism traditionally contributing roughly 40% of the GDP. This sector, alongside fisheries and agriculture, forms the lifeblood of the nation but leaves the economy

highly sensitive to external shocks, particularly global fuel price volatility and climate-induced disruptions.

At the heart of this economic structure is a vibrant ecosystem of MSMEs. These businesses - ranging from dive shops and family-run guest houses to local fish markets and small-scale farms - are the nation's primary employers. However, their survival and adaptive capacity are linked to energy security. Palau's geographic reality as a dispersed archipelago creates a fragmented energy landscape. Remote sub-islands operate as independent 'electrical islands' that are almost entirely dependent on fragile fossil fuel supply chains. This reliance makes local MSMEs uniquely vulnerable to climate shocks - such as intensifying storms and sea-level hazards - that sever physical supply lines and trigger cascading economic disruptions, from spoiled fish catches due to broken cold chains to the inability to pump and treat freshwater during droughts.

Geographically, Peleliu is a small, low-lying coral and limestone island covering approximately 1,300 hectares. Its isolation is a defining characteristic and a primary multiplier of climate risk. Located 55 kilometers south of the main hub in Koror, Peleliu relies entirely on its own electric generation capacity. For Peleliu's MSMEs, climate-induced fuel interruptions result in prolonged power outages, rendering critical equipment (like freezers and water pumps) as "stranded assets". Therefore, upgrading Peleliu's energy infrastructure with proactive, climate-hardened renewable technologies is not just an infrastructure upgrade; it is an urgent adaptation imperative to protect the livelihoods and economic resilience of the island's MSMEs.

Observed Climate Impacts and Systemic Failures

Palau is at risk of experiencing the damaging effects of climate change in several areas. While historically situated south of the active typhoon belt, the archipelago now confronts an increasing frequency of high-intensity tropical cyclones. This shift was underscored by four category 4 and higher typhoons hitting Palau within the past five years. Concurrently, sea-level rise is accelerating at up to three times the rate of the global average and storm surges are exacerbating coastal inundation and saltwater intrusion and compromising infrastructure and communities (homes/building, power, water and roads systems). Observed warming trends show an increase in annual maximum temperatures of 0.11°C per decade since 1953, driving higher cooling demands and thermal stress on infrastructure and increased sea temperatures are leading the destroyed reefs and other ocean biodiversity.

Projected Climate Trends and Adaptation Load

According to the PIRCA Report and Palau Climate Risk Country Profile, the archipelago faces a shifting baseline characterized by intensifying heat and marine hazards. Total annual mean temperatures are projected to rise by ~0.8°C by 2030 and up to 2.2°C by 2070. This shift includes a dramatic increase in the frequency of extreme heat days and sea levels are projected to rise by approximately 25 cm by 2050, amplifying the intensity of king tides and storm surges. While overall storm frequency may stabilize, the intensity of tropical cyclones is projected to increase, with a higher prevalence of Category 4 and 5 typhoons bringing destructive wind speeds and extreme precipitation.

The Palau Climate Change Policy (PCCP) identifies the compounding social and economic risk climate change at impacts all sectors. Already, critical infrastructure and utilities face acute vulnerability and damages; the destruction of infrastructure along coastal triggers prolonged service outages that paralyze the tourism-dependent economy and acutely overload emergency response systems at times. Food security confronts a 'ridge-to-reef' crisis, where saltwater intrusion decimates taro patches and other food crops and sedimentation degrades coastal fisheries. The water sector faces a dual threat of rising evapotranspiration and demand drive chronic scarcity, while saltwater intrusion and erosion actively degrade the quality of essential and limited freshwater reserves.

Electricity Sector Vulnerability and the Need for Resilient Renewable Energy Systems

The electricity sector faces acute physical risks, and without adaptation and resilience measures, the fragility of the electricity sector becomes a primary multiplier of national economic risk. Currently, energy infrastructure and assets are ageing and lack the physical capacity to withstand projected climate hazards. Many generation assets as in coastal areas, such as the Malakal, Peleliu, Kayangel, and Angaur power plants, and are at risk of future water inundation. Intense cyclones and frequent storms physically damage transmission and distribution infrastructure, especially those strung along coastal areas. Rising sea levels and storms amplify salinity and sea spray, accelerating the corrosion of critical equipment, shortening lifespans of various electrical equipment. Additionally, due to ambient temperatures rise, diesel engines suffer from slight thermal efficiency losses, increasing fuel consumption exactly when cooling demand peaks.

The Palau Public Utilities Corporation (PPUC) is the state-owned enterprise that operates the backbone of the nation's electricity system. The PPUC main grid relies on the 34.5 kV overhead and undersea cables to connect major generation assets to load centers in Koror, Malakal, Meyuns and Babeldaob islands. Where electricity on this main grid is generated at the Malakal diesel power plant, Babeldaob solar power plant (IPP1), and roof top solar systems. Mini-grids are operating on the Peleliu, Kayangel, and Angaur islands that were designed as hybrid solar and diesel systems. Unfortunately, due to improper design and damage, the mini-grids on Peleliu and Angaur islands currently only generate electricity from diesel fuel (e.g. the solar and battery systems are not delivering power to the grid). Main grid and mini-grid elements are at risk of extreme weather events that drive seabed scouring that threatens under sea links and heavy wind and rain impacts overhead/above-ground systems. Intermittent blackouts are very common in Palau, often occurring on a daily basis, as different elements fail and trip the systems.

Failures here would sever the main islands' power backbone, causing prolonged blackouts. The fuel supply chain is also fragile and susceptible to acute sever weather and long-term onsite climate events. Severe sea storms frequently disrupt international fuel imports to Palau and sever the barge supply lines to outer islands like Peleliu. A typhoon-induced closure of the Malakal Port or outer island fuel deposits can halt fuel deliveries to outer islands entirely, which have only 5–7 days of fuel stock available. Such events can result in total power failure for these communities within one week of a major storm, and such power failures also mean the water systems cannot operate and forces closure of schools, health centers, and government services.

These climate risks translate into severe economic penalties for Palau in the form of increased costs of electricity and loss of economic productivity. Historical data (e.g., the 2009 shock) indicates that major power outages can erase 2–5% of monthly GDP due to halted tourism and commercial activity. However, the true economic impact is more systemic: a lack of climate-adaptive capacity within the electricity sector creates a 'fragility trap' that reverberates across the entire economy and its most vital value chains. The primary engine of Palau's economy—the tourism value chain—is particularly exposed. Without resilient power, hotels, dive operators, and restaurants face immediate service interruptions, leading to reputational damage and lost revenue. Furthermore, the fisheries value chain, critical for food security and local livelihoods, is compromised when power failures disrupt the cold chain, causing the spoilage of catch and destroying the profit margins of local fishers.

This systemic energy vulnerability falls most heavily on MSMEs, which lack the fiscal buffers to invest in expensive private backup generators or absorb the costs of prolonged service outages. For these businesses, the absence of a resilient national grid is not merely an inconvenience; it is a structural barrier to growth. By failing to 'climate-proof' the electricity sector, the economy remains decoupled from stability, leaving local entrepreneurs and essential service providers highly vulnerable to the volatile costs and physical disruptions of a climate-stressed energy system.

Particular Vulnerabilities and Resilience needs in Peleliu

Located 55 kilometers south of the main hub in Koror and covering just 13 square kilometers, Peleliu is not connected to the national central grid. This isolation forces it to operate as an independent 'electrical island,' creating significant logistical hurdles as all fuel must be transported via barge across open ocean—a process frequently disrupted by rough seas and storms. The energy sector is the cornerstone of Peleliu's socio-economic survival. MSMEs in the fishery sector rely on a stable cold chain to preserve their catch, while tourism operators depend on reliable power to maintain services for international visitors. Without stable electricity, these primary livelihoods collapse. Furthermore, the public sector, including the health clinic, schools, and government offices, is entirely contingent on the grid. This creates a critical energy-water nexus where power failures immediately halt the electrically powered pumps that deliver water to nearly every household on the island, turning a technical fault into a humanitarian crisis.

Climate change acts as a severe threat multiplier for this fragile infrastructure. Most of Peleliu's critical assets, including the existing diesel powerhouse, are located at low elevations near the coast, making them highly vulnerable to storm surges and sea-level rise. Rising ambient temperatures also force diesel generators to work harder and less efficiently, increasing fuel costs at the exact moment cooling demand peaks. Additionally, while the island has 164 kW of solar capacity physically in place, it currently sits 'stranded' and non-operational because it lacks the grid-forming technology required to synchronize variable renewable energy with legacy diesel units.

The importance of operationalizing this solar capacity cannot be overstated for the resilience of Peleliu's MSMEs and residents. Successfully 'un-stranding' these assets would provide the island with a degree of energy autonomy, reducing the volume of diesel that must be barged over stormy seas and insulating local businesses from volatile global fuel prices. In a post-storm scenario where the port might be closed, a functional, climate-proofed solar mini-grid with energy storage can provide life-saving emergency power to maintain water systems and medical services when they are needed most.

1.3 Underlying Drivers of Environmental Change and Systemic Constraints

Palau's urgent need for climate-resilient development is constrained by interlinked systemic barriers that exacerbate climate vulnerabilities. These represent the 'soft limits to adaptation' the project aims to overcome using SCCF resources:

- Economic drivers: Palau's economy is structurally fragile, characterized by a tourism monoculture and extreme dependence on imports. Tourism contributes over 40% of GDP and is highly climate-sensitive, while more than 76% of GDP is spent on imports, including fossil fuels. This dual dependence generates acute volatility, leaving government institutions and business of all sizes without fiscal buffers to invest in resilience. The absence of diversified revenue streams constrains adaptive capacity and heightens exposure to external shocks
- Climate & adaptation drivers: The primary drivers are severe weather events, sea level rise, and slow-onset temperature rise. The severe weather events and sea level rise not only damage the electricity system infrastructure but also cause power outages. Whereas temperature rise stresses the electricity system with periodic increase in demand that impact system stability.
- Technological drivers: There is a resilience deficit in the built environment, with critical infrastructure designed for historical climates rather than projected Category 4/5 typhoons and increased rainfall. A lack of affordable, island-appropriate adaptation technologies forces reliance on standard solutions that frequently fail during extreme weather events.
- Justice and inclusion drivers: Vulnerability is geographically stratified, with outer island communities (e.g. Peleliu) and subsistence farmers disproportionately exposed. These groups face an 'essential services gap,' where fragile transport and utility links leave them isolated and unable to access financing for adaptation.

- Sociocultural and institutional drivers: The speed of climate change is outpacing traditional resource stewardship in Palau. Institutionally, a lack of granular, localized data and capacity to interpret this information creates an 'information void,' preventing agencies from implementing precise, science-based adaptation interventions and take on resilience measures.
- Political and governance drivers: A persistent implementation gap exists between high-level policies (NDC) and on-the-ground execution. Lack of finance and fragmented coordination between National and State governments hinders implementation required for systemic resilience

1.4 System Context: Electricity Sector

Overview of the sector

Palau has achieved 100% electrification, with a total installed capacity of approximately 40 MW, primarily dominated by aging diesel infrastructure. While recent reforms have lowered electricity tariffs, the rate remains very high by global standards and volatile due to fossil fuel price shocks. The main PPUC grid seen recent progress in transitioning to a more stable system, evidenced by the successful commissioning of 15 MWp Babeldaob Solar photovoltaic (PV) + Battery Energy Storage System (BESS) project in 2023. Though a large portion of the generation capacity is currently curtailed due to grid stability issues. However, there is no policy and planning for climate change adaption and resilience of the electricity system nor future allocated funding for this topic by government or development partners.

- In stark contrast to the main grid, rural outer islands like Peleliu remain fragile, relying on barge-supplied diesel and ageing diesel generators. The South Korean-funded Peleliu solar mini-grid infrastructure (around 164 KWp) is currently in place, though it is undersized for the power demand of the island (between 180 to 2020 kw peak demand). It is also not currently operational due to significant technical barriers, specifically the inability to synchronize variable solar PV with legacy diesel generators without calibrated grid-forming inverters and energy storage. This failure is compounded by an unsuccessful attempt at 'remote commissioning,' which left the complex control logic unresolved. Local technicians lack the specialized training to determine the new equipment needs and resolve the system wide errors. The issue with controls and that the current battery system remains offline, since it is grid-following instead of grid-forming, renders the solar capacity 'stranded' and forcing the island to rely entirely on aging diesel units for stability.

  Role of electricity sector in Palau’s development

  The electricity sector is identified as a 'macro-critical' asset in the Palau Development Plan 2023-2026 as its reliability is a prerequisite for all other economic pillars. Tourism, which contributes approximately 40% of GDP, depends entirely on stable power for hotels and services. Emerging growth sectors such as digital residency and fintech are equally contingent on grid stability.

  The Water-Energy nexus:

  Water security in Palau is inextricably linked to energy security. The water distribution network relies entirely on electrically powered pumps to treat and deliver water to 97% of households connected to the public supply. This include the major islands and outer islands where all water pumping is powered by the PPUC electricity systems. This means that water services have a single point of failure when the main grid and mini-grids trigger cascading disasters: during past outages, electric lift stations failed, causing water stoppages and raw sewage overflows that threatened both public health and coastal ecosystems.

Sector challenges

The broader national electricity sector is constrained by systemic planning & data deficits and chronic lack of financing. PPUC operates with limited and stretched technical and institutional capacities and lacks comprehensive geospatial asset mapping or climate vulnerability studies, forcing the utility into a costly 'reactive maintenance' model where assets are repaired only after disaster strikes, rather than proactively climate-proofing assets based on risk data. Historically, investments have prioritized immediate generation and fuel savings (e.g. solar IPPs) but excluded measures for grid stability that allow for larger portions of solar power generation; thus the system currently reaches less than 25% renewable energy penetration on the main grid. Though currently financed (but not implemented) grid system upgrades supported by AIFFP and ADB are expected to address power system planning and grid communication systems to allow for more renewable energy penetration.

2. Overall Objective and Rationale

The primary objective of this intervention is to systematically strengthen the adaptive capacity of Palau's isolated electricity systems and the economic value chains that depend on them. By integrating climate-resilient renewable energy, advanced grid control, and storage solutions, the project seeks to move beyond the current 'reactive' energy model. This will be achieved through two parallel workstreams: high-resolution, risk-informed vulnerability assessments to guide national adaptation planning, and the immediate physical hardening of critical infrastructure.

A centerpiece of this approach is the operationalization of the currently 'stranded' 164 kWp solar PV system on Peleliu. This asset has remained non-functional due to complex technical synchronization failures between legacy diesel units and modern renewable components, exacerbated by a total lack of energy storage. By installing advanced inverters and a typhoon-resistant Battery Energy Storage System (BESS), the project will transform this idle infrastructure into a resilient powerhouse capable of autonomous 'diesel-off' operation.

This technical upgrade provides a vital safety net: even when extreme weather events sever international maritime fuel supply chains, the island's MSMEs, health clinics, and water-pumping stations will maintain a reliable, life-saving power source. Ultimately, by enhancing the reliability of electricity services, the project aims to reduce the national fiscal burden—specifically post-disaster repair costs and fuel import bills—while shielding the economy from the escalating Loss and Damage associated with climate change.

The proposed project is fully aligned with the GEF-8 Programming Strategy on Adaptation to Climate Change, specifically targeting the Special Climate Change Fund (SCCF) Window A. It prioritizes transformational adaptation, private-sector engagement, and a 'whole-of-society' approach to build resilience in Palau—a highly vulnerable Small Island Developing State (SIDS).

3. Baseline Project Scenario

In the absence of targeted intervention, Palau's power system remains trapped in a high-risk trajectory. The baseline scenario is characterized by a significant adaptation deficit, where the electricity sector lacks the technical and institutional tools required to withstand a changing climate.

- **Climate Vulnerability and Reactive Management:** Currently, the utility operates without the benefit of comprehensive geospatial asset mapping or site-specific climate risk studies. Under this baseline, infrastructure is repaired or replaced only after sustaining damage from extreme events—a 'climate disaster recovery' model that is both expensive and unsustainable. Furthermore, a total reliance on imported fossil fuels for the outer islands perpetuates a precarious supply chain. Frequent disruptions to fuel barges during storms lead to immediate power outages, while global price volatility limits the utility's fiscal space to self-finance the necessary resilience upgrades.
- **Diesel Dominance and Stranded Assets:** The Peleliu grid is currently a diesel-dominated system that is technically incapable of accommodating high shares of variable renewable energy. Without the SCCF intervention, these technical barriers will persist, leaving the island 100% dependent on aging diesel generators despite the physical presence of renewable hardware. This constitutes a major drain on Palau's hard-currency reserves, diverting funds that could otherwise be invested in productive sector development.
- **Cascading Service Failures:** The baseline results in a dangerous 'domino effect' across the Energy-Water-Food nexus. Because the current system lacks autonomy, power outages immediately disable electric pumps, halting water supply and sewerage systems. Simultaneously, the disruption of the fisheries cold chain leads to the rapid spoilage of catch, directly threatening food security and the primary livelihoods of the local community.

In the absence of targeted interventions to enhance resilience and climate-proof the electricity sector, Palau’s power system remains trapped in a high-risk trajectory for damages due to climate change. The baseline scenario is characterized by structural vulnerability to climate hazards, high fossil fuel dependence, and technical capacity constraints that prevent the effective integration of climate-resilient renewable energy solutions.

4. Alternative Transformational Project Scenario

The alternative scenario establishes a climate-resilient electricity system that enables Palau’s outer islands to transition from fragile diesel dependence toward resilient, renewable-based autonomy.

GEF support will finance the incremental costs required to achieve this transformation. Two interrelated transitions are addressed. First, the shift from low-capital-cost diesel generation to renewable energy systems with higher upfront costs. Second—and specifically targeted by this SCCF intervention—the transition from standard renewable installations to climate-hardened, resilience-oriented systems capable of operating under extreme weather conditions. While development partners such as the ADB and AIFFP finance core generation and transmission infrastructure on the main Babeldaob–Koror grid, these investments do not extend to geographically isolated communities nor do they cover the additional engineering requirements for climate resilience. This creates a critical gap at the “last mile,” where communities remain highly exposed to climate risks.

The project addresses this gap in Peleliu, where the existing mini-grid remains functionally fragile despite prior investments in solar and battery systems. At present, the island depends on diesel fuel transported by barge over increasingly unpredictable sea conditions. This reliance creates systemic vulnerability: disruptions in fuel supply directly lead to cascading failures across essential services, including water supply, food storage, and emergency communications. **GEF resources will cover the incremental “resilience premium”**, defined as the additional costs required to ensure that renewable energy systems can withstand and operate during climate extremes. These include:

- Grid-forming (GFM) inverters enabling stable, diesel-free operation
- Saltwater- and corrosion-resistant components

- Typhoon-rated PV mounting structures and system configurations
- Advanced control systems to ensure reliable integration of solar and storage assets

By financing these incremental elements, the project ensures that existing and planned renewable energy investments become fully operational, climate-resilient assets, rather than remaining underutilized or vulnerable to failure.

In parallel, the project strengthens institutional capacity within the PPUC by introducing geospatial asset management and climate risk mapping. This enables the utility to move from reactive maintenance toward proactive, risk-informed planning, ensuring that future investments across the archipelago are aligned with site-specific climate risks and national adaptation priorities.

The operationalization of the Peleliu mini-grid will demonstrate the technical and economic viability of diesel-independent operation based on high shares of renewable energy. The resulting "Peleliu Model"—combining grid-forming inverters, battery energy storage systems (BESS), and climate-hardened infrastructure—serves as a national blueprint for replication across other outer islands, including Angaur and Kayangel, which face similar structural vulnerabilities. Lessons learned will be shared through regional platforms, including the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE), enabling replication across other Small Island Developing States (SIDS).

- **6. Stakeholder and Systems Approach:**

Effective project implementation requires deep engagement and buy-in from key public, private, and civil society stakeholders throughout the project lifecycle. Consultation during the Project Preparation Grant (PPG) phase will formalize roles and secure co-financing. The project adopts a multi-stakeholder, co-creation model designed to ensure national ownership, technical complementarity, and long-term sustainability. The project's partnership architecture ensures vertical integration - from policy formulation to on-the ground adoption - and horizontal collaboration, maximizing impact and replication potential.

Oversight is provided by a Project Steering Committee (PSC) composed of key government entities. The inclusion of Finance Ministries would be important for mainstreaming climate resilience into national planning and budgetary frameworks (CI 13). Ministry of Public Infrastructure and Industries (MPII) - Capitol Improvement Program (CIP) and Palau Energy & Water Administration (PEWA) serve as the main executing agencies, supported by PPUC as technical partner and UNIDO as the Implementing Agency, as well as coordinator of the G-RES and GN-SEC. In the moment, there is no final decision on the national execution partners by the Government. Therefore, this will be defined during the PPG phase.

7. Part of the Global Program on Climate Resilient Renewable Energy Systems (GRES):

The national project is part of the GEF and bilateral donor (e.g., Austria) funded Global Program on Climate-Resilient Renewable Energy Systems (G-RES), which 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 renewable energy (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). The G-RES is underpinned by the principle that

mitigation investments in SIDS are highly vulnerable and require adaptation financing (SCCF/LDCF) to be secure and sustainable. The program places a strong emphasis on empowering energy operators and MSMEs as the primary drivers of this transition.

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 (GEF ID:12229) 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 renewable energy and energy efficiency (R&EE) solutions. Due to the exposure of SIDS, the use of climate-proven technologies and methodologies (i.e., those features representing the incremental cost of adaptation) are a prerequisite for the sustainability of GEF CMM and mitigation investments. The SCCF component of G-RES (and this Saint Lucia project) specifically finances this resilience premium, ensuring that the overall program's goal is climate-secure. G-RES contributes directly to the implementation of major multilateral commitments, including the Paris Agreement and the Antigua and Barbuda Agenda for SIDS (ABAS).

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

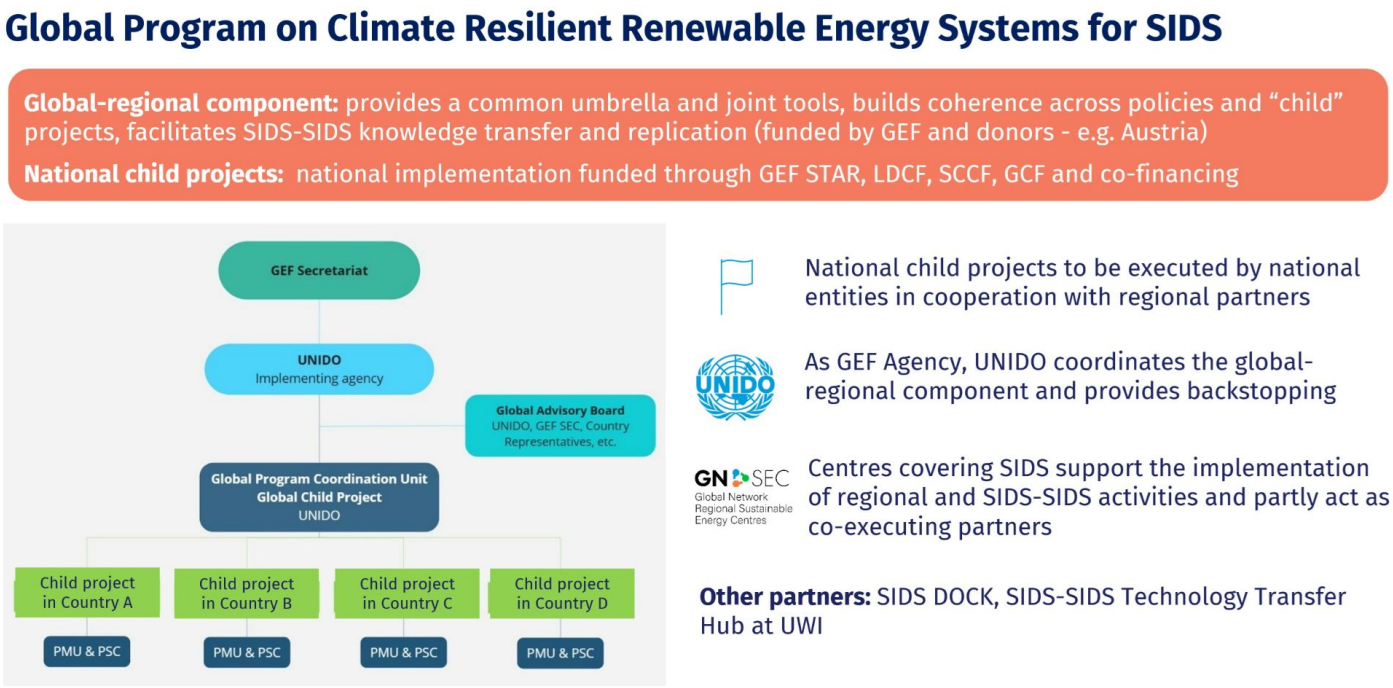


Figure 2: Objectives and scope of intervention of the G-RES Program for SIDS

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

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 project aims to strengthen the adaptive capacity of Palau's electricity system and dependent economic value chains by integrating climate-resilient renewable energy, grid, and storage solutions. The primary objective is to transition Palau's electricity sector from a reactive posture—characterized by recovery from climate shocks—to a proactive adaptation framework that anticipates and withstands intensifying climate hazards. Current infrastructure remains vulnerable to frequency instabilities and system failures during extreme weather events. On the island of Peleliu, this has resulted in 164 kW of 'stranded' solar PV assets that cannot operate independently of legacy diesel generators. Without intervention, these assets remain a liability rather than a resilient lifeline.

The project addresses these systemic 'soft limits' and technical barriers through two integrated components:

- Component 1: National Resilience Planning: Focuses on addressing knowledge and capacity gaps within the Palau Public Utilities Corporation (PPUC). This involves the development of a National Climate Resilience Strategy and GIS-enabled vulnerability mapping to mainstream adaptation into all future utility investments.

- Component 2: Technical Operationalization on Peleliu: Targets the physical and technical barriers in the outer islands by installing grid-forming inverters and a climate-hardened storage. This enables 'diesel-off' operation, turning the stranded 164 kW solar system into a functional, autonomous powerhouse.

While the first component addresses the knowledge and capacity gaps of PPUC related to adaptation investments, the second component targets the specific technical and physical barriers preventing the effective use of climate-resilient renewable energy infrastructure in Peleliu. By integrating robust climate risk intelligence with targeted hard adaptation investments, the project significantly enhances the adaptive capacity of electricity system. By ensuring a stable power supply, the project safeguards water-pumping stations, protects the business continuity of MSMEs (particularly women- and youth-led) and strengthens the resilience of tourism, fisheries, and agricultural value chains. There will be efforts to strengthen the capacities of MSMEs to take advantage from the provided renewable energy services.

The value proposition lies in its strategic additionality. While baseline projects focus on capacity expansion, this SCCF intervention finances the specific technical 'intelligence' (grid-forming logic) and physical hardening required for climate survival. Over its 15-to-20-year lifespan, the project will simultaneously generate significant co-benefits, including GHG emission reductions by displacing diesel consumption, providing a replicable blueprint for SIDS-wide energy adaptation.

2. Theory of Change (Toc)

The project's Theory of Change (see below graphic) rests on helping the PPUC in overcoming key barriers that are preventing both broader and specific climate resilience measures that can increase the sector's adaptation to the impacts of climate change, while increasing the amount of renewable energy entering the grid. These key barriers are summarized below and highlighted in follow-on graphic:

1. Palau has limited technical and institutional capacity to complete detailed climate change related vulnerability assessment of the physical assets of the national electricity system, and for translating assessments into adaptation planning for the electricity system.
2. PPUC has limited technical knowledge and intuitional capacity to assess, procure and implement resilience measures for the national electricity system, as well as very low financial capacity to fully invest in resilience measures for national electricity system assets.
3. PPUC lacks the specific engineering expertise and calibrated control architecture required to synchronize variable renewable energy with legacy diesel generators, resulting in the inability to operationalize stranded solar assets or ensure grid stability during climate-induced disruptions on vulnerable outer islands.
4. PPUC has very low financial capacity to self-finance the high incremental costs of climate-proofing aging infrastructure. High operational expenditures driven by reliance on imported diesel, combined with a small ratepayer base, constrain the fiscal space required to invest in necessary resilience measures without concessional external support.

The project adopts an integrated approach where process planning, finance, capacity building and knowledge management reinforce each other. This systemic approach is needed to ensure both short- and long-term outcomes that lead for enhanced adaptation to climate change of the national electricity system, while are the same time building the foundation for further adaptation and mitigation interventions beyond the support of this GEF project.

Figure 3: Theory of Change

1 Problem Statement

Palau's fossil-fuel-dependent electricity system is highly vulnerable to climate hazards, causing power cuts that undermine critical services (water and health), value chains (tourism, fisheries, and agriculture), and exacerbate national and community fiscal burdens.

2 Impact / Ultimate Goal

The project aims to strengthen the adaptive capacity of Palau's electricity system and dependent economic value chains by integrating climate-resilient renewable energy, grid, and storage solutions.

3 Long-Term Outcomes

Adaptation Benefit Climate-proof national electricity system resilient to climate variability and extreme weather events resulting into business continuity and decreased power cuts	**Adaptation Benefit** 16,696 beneficiaries (50% women/30% youth) - two tiers: 570 Peleliu residents gaining RE access; 16,126 benefiting from resilient electricity system;	**Adaptation Benefit** Increased adaptive capacity of 30 MSMEs and key value chains (e.g. tourism, fishery and agriculture) by access to essential RE services (water-energy nexus);
Adaptation Benefit 15 hectares (10 ha land, 5 ha coastal) managed in a resilient manner by benefiting from resilient RE services.	**Environmental** High-renewable energy mix, contributing to reduction of 12,500 tCO2 of GHG emissions over 20 years	**Economic** Reduced fossil fuel spending on national, household and MSME level;

4 Medium-Term Outcomes

Knowledge, Quality & Skills Transition from reactive disaster recovery to proactive data-driven climate risk management by PPUC	**Investment** Enhanced availability of reliable and affordable RE from the resilient Peleliu PV mini-grid and storage system	**Investment** Resilient electricity system protected from direct and indirect climate impacts (e.g. port closures, fuel supply disruptions)
Policy Enabling environment for climate finance and FDI for scaling adaptation measures across the electricity system		**Knowledge** Accelerated replication and joint learning through SIDS-SIDS cooperation

5 Immediate Outcomes

Knowledge, Quality & Skills Strengthened institutional capacity to identify and plan for climate risks to the national electricity system	**Investment** Operationalization of stranded assets in Peleliu, ensuring service continuity and enhanced availability of RE	**Knowledge** SIDS-SIDS information management and knowledge sharing formalized
Policy Risk data informs NAP and electricity adaptation planning	**Investment** Enhanced resilience of existing renewable energy mini-grid on Peleliu	**Quality & Skills** 200 individuals (50% women, 30% youth) on climate-resilient RE trained

6 Outputs

Knowledge GIS asset mapping, data and geolocated vulnerability assessment of PPUC;	**Investment** Feasibility assessments and EPC tender documentation.	**Quality & Skills** Training materials for capacity building of PPUC and other institutions
Policy PPUC climate resilience strategy and implementation plan; MSME guidelines;	**Investment** Gap analysis of resilience measures for existing mini-grid on Peleliu.	**Knowledge** SIDS-SIDS exchange platform

✱ Assumptions

Governance PPUC will prioritise climate change resilience and adaptation, and renewable energy, in making its future investment decisions for the national electricity system.	**Technical** Trained PPUC staff are retained to operate the new geospatial tools and hybrid systems.

Causal Pathway Summary

Immediate outcomes: Strengthened institutional capacity to identify and plan for climate risks to the national electricity system through data-driven vulnerability assessments (1.1), alongside the enhanced availability and physical resilience of critical renewable energy infrastructure on Peleliu (2.1). This directly results in the operationalization of stranded assets, ensuring service continuity, and immediate GHG emission reductions. Additionally, the risk data generated will directly inform the National Adaptation Plan (NAP) and de-risk future renewable energy projects required to meet the NDC 3.0 targets.

Intermediate outcomes: Palau will transition from reactive disaster recovery approach to proactive data-driven climate risk management. Additionally, Peleliu will have enhanced availability of renewable energy and a resilient electricity system protected from direct climate impacts as well as indirect impacts from port closures and fuel supply disruptions. This results in a resilient electricity system protected from direct climate impacts as well as indirect impacts from port closures and fuel supply disruptions. Consequently, successful demonstration allows climate finance and technical support to be mobilized for scaling up adaptation measures across the entire electricity system in Palau. The fiscal savings generated from displaced fuel consumption will improve PPUC's financial liquidity, creating space for further maintenance and resilience investments.

Long-term outcomes: Palau will possess a fully climate-proofed national electricity system that guarantees the continuity of water, healthcare, digital economy during extreme weather events. This resilient infrastructure safeguards the pathway to a high-renewable energy mix, directly contributing to the national vision of achieving net-zero emissions. Ultimately, the transition stabilizes the economy by lowering the cost of energy for the public and private sectors and decoupling national development from volatile fossil fuel imports.

Assumptions and Risks

Assumptions: The assumptions that underpin the Toc are that PPUC will prioritise climate change resilience and adaptation, and renewable energy, in making its future investment decisions for the national electricity system.

Risks: The major risks that can impede the ToC are a lack of continued support (technology transfer, capacity building and finance) to implement the needed adaptation and mitigation (i.e. renewable energy) interventions in the future and that macroeconomic circumstance or other shocks do not impede capital coming into Palau, especially for the tourism sector which is a major economic sector. There is also a minor risk of changes in government shifting future policy priorities.

3. Project Components and Activities

Component 1: National Climate-Resilient Electricity Planning

This component addresses the systemic 'soft limits' to adaptation by strengthening the institutional and technical capacity of the Government of Palau and the Palau Public Utilities Corporation (PPUC). The objective is to transition the energy sector from a reactive recovery model—characterized by repetitive 'build-back' costs—to a proactive, risk-informed resilience framework.

Outcome 1.1: Enhanced adaptive capacity of the national electricity system through vulnerability assessments and adaptation planning.

1.1.1 Enhanced GIS mapping and geolocated vulnerability assessment of PPUC assets: This activity involves the systematic digitization and spatial mapping of national energy infrastructure, including generation plants, substations, and distribution lines. These assets will be overlaid with high-resolution climate hazard layers, such as projected sea-level rise, (e.g. 1-in-100-year storm surge zones), and extreme wind speed maps. This geospatial database will serve as the primary tool for PPUC to identify 'red-zone' infrastructure requiring immediate physical hardening.

1.1.2 Data collection and software modeling of climate scenarios and impacts: To move beyond static mapping, the project will implement advanced power system modeling for the Babeldaob and Koror electricity grids. By simulating climate-induced stress events, such as localized flooding or rapid cloud-cover transients, the utility can scientifically 'dimension' the required battery storage and protection equipment needed to ensure operational availability during shocks.

1.1.3 National PPUC Climate Change Resilience Strategy and Implementation Plan: The technical outputs from the GIS mapping and modeling will be codified into a formal National Resilience Strategy. This policy document will establish the regulatory and operational protocols for climate-informed utility management. It will define new engineering standards for 'typhoon-proof' installations and create a long-term investment pipeline for adaptation, ensuring that the project's impacts are mainstreamed into Palau's national development goals. This plan includes gender-sensitive energy resilience guidelines for MSMEs in the tourism, fishery, and agriculture sectors, providing a regulatory and operational roadmap that mainstreams climate-informed utility management into Palau's national development goals.

1.1.4 Energy resilience training for PPUC and MSMEs in key value chains: To ensure the sustainability of the planning tools, technical training will be provided to PPUC engineers on resilient grid management (50% women trained). Simultaneously, awareness workshops for MSMEs (particularly women- and youth-led) will focus on utilizing renewable energy services to maintain business continuity during climate disruptions. In this context, collaboration with local Civil Society Organizations (CSOs) and the private sector is a foundational element of Output 1.1.4.

The project will partner with the Palau Conservation Society (PCS) to lead community mobilization and gender-mainstreamed outreach, ensuring that the transition to 100% renewable energy is understood and supported at the household level. Concurrently, the project will engage the private sector, including MSME associations to develop 'energy resilience guidelines'. These partnerships are further amplified by regional knowledge exchange through the University of the South Pacific (USP) and the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE), ensuring that the 'Peleliu Model' benefits from South-South technical expertise and serves as a validated template for regional scaling. By integrating these diverse stakeholders, the project ensures that the shift to renewable autonomy is economically inclusive, socially safeguarded, and technically robust.

Component 2: Enhanced Availability and Resilience of PPUC's Renewable Energy Mini-grid on Peleliu

This component focuses on financing the incremental costs - the 'resilience premium' - required to operationalize and climate-proof the 164 kWp solar PV mini-grid and its associated storage infrastructure on the island of Peleliu. By introducing innovative Grid-Forming (GFM) inverter and battery technology, the project provides proactive islanding capabilities, reducing the island's reliance on fragile fossil fuel supply chains and aging diesel generators that are highly susceptible to climate-induced disruptions. Transitioning to this autonomous, resilient energy system will deliver significant fiscal relief to the local government, while protecting households and MSMEs in key value chains that are already being severely disrupted by escalating climate impacts. Unlike traditional 'grid-following'

inverters, which require a steady signal from a diesel generator to function, the project will deploy GFM inverters if technically feasible. This newer class of power electronics acts as the 'heart' of a modern electric grid. They are uniquely capable of creating and stabilizing the grid frequency and voltage independently. In remote environments like Peleliu, GFMs are the critical enabling technology that allows for a 'diesel-off' scenario, ensuring the grid remains stable even when 100% of the power is coming from variable solar and battery storage. Since this is a relatively new technology for SIDS a careful feasiblity assessment will be done. The GEF support will be only provided for climate resilience measures and renewable energy components. The project will not promote, procure, or support the installation of new diesel-based generation equipment. By optimizing the integration of GFM and BESS technology, the intervention seeks to reduce the operational runtime of existing backup units, ultimately aiming for a fully autonomous, 100% renewable energy system.

Outcome 2.1: Operationalization of the Peleliu solar PV mini-grid through resilient technology transfer.

2.1.1 Feasibility assessments and EPC (Engineering, Procurement, and Construction) documentation: Before installation, a specialized technical assessment will be conducted to define the precise configuration of the climate-resilient grid-forming inverters and Battery Energy Storage System (BESS). This ensures that the procurement process prioritizes hardware that can withstand the high-salinity, high-humidity coastal environment of Peleliu, effectively de-risking the project from premature equipment failure. This output will also include the financial structuring and mobilisation of co-funding for the full implementation of the project.

2.1.2 Engineering supervision for the installation of availability and resilience measures: To ensure the highest standards of technology transfer, expert engineering oversight will be provided throughout the installation process. This includes the commissioning of the grid-forming logic that allows the solar array to establish grid frequency and voltage independently, ensuring the system can maintain 'diesel-off' operations without compromising grid stability. The installation works will be used as much as possible to train local technical personal, particularly also female and young technical experts.

2.1.3 Installed enhanced resilience measures for existing renewable energy mini-grid on Peleliu: This output constitutes the direct physical installation of the resilient inverters and high-capacity BESS. This physical hardware upgrade enables a full 'diesel-off' operational mode, significantly reducing the runtime of existing backup generators while physically hardening the grid assets against typhoon-force winds.

2.1.4 Dissemination of results through the G-RES and GN-SEC network: The project will utilize the Global Network of Regional Sustainable Energy Centres (GN-SEC) and the Global Resilience (G-RES) platform to share lessons learned on 'diesel-off' island microgrids, positioning Palau as a regional leader in SIDS-wide energy adaptation.

4. Transformational Impact and Global Benefits

The project’s Theory of Change centers on a systemic shift toward a climate-resilient electricity sector, which increasingly decouples from climate vulnerable fossil fuel supply chains, positioning Palau as a global lighthouse for Small Island Developing States (SIDS). By moving beyond traditional 'build-and-repair' infrastructure cycles, the intervention addresses the structural barriers that currently prevent renewable energy from providing firm, reliable power during extreme climate events. This approach ensures that energy becomes a primary driver of sustainable development rather than a point of vulnerability.

Climate Change Adaptation (CCA) and Transformational Impact

As an SCCF-funded initiative, the primary rationale is the delivery of high-intensity Climate Change Adaptation (CCA) benefits through a combination of institutional de-risking and technological innovation. At the national level, the project transforms utility management by integrating high-resolution, 1-in-100-year storm surge and wind speed modeling into the Palau Public Utilities Corporation (PPUC) operational framework (Output 1.1.1). This geospatial intelligence allows the utility to move from reactive emergency response to a proactive asset-hardening strategy. By identifying 'red-zone' infrastructure before disaster strikes, the project protects the vital Energy-Water-Economic Nexus, ensuring that water pumping stations, healthcare facilities, and MSME value chains remain operational despite intensifying climate hazards. On the island of Peleliu, the project delivers a transformational technological shift by 'un-stranding' existing renewable assets. The introduction of grid-forming inverters and stabilized battery storage (Output 2.1.2) represents a move away from 'grid-following' systems that require diesel engines to function. This allows for true autonomous operation, creating a resilient energy lifeline that is immune to external fossil fuel supply chain disruptions. By physical hardening of these assets against typhoon-force winds and saltwater inundation, the project ensures that the community's transition to renewable energy is not lost to the very climate impacts it seeks to mitigate.

Alignment with SCCF Core Indicators

The project's transformational outcomes are mapped directly to the SCCF/GEF-8 Results Measurement Framework to ensure maximum accountability and impact:

  - CI 1: 16,696 direct beneficiaries (50% women, 30% youth envisaged) with two tiers: (i) 570 residents and MSMEs of Peleliu gaining direct access to solar PV mini-grid energy services; and (ii) 16,126 residents nationwide benefiting from a more climate-resilient electricity system,
- CI 2: 15 hectares (10 ha land, 5 ha coastal) managed in a climate-resilient manner by benefiting from resilient renewable energy services.
- CI 3: 3 policy documents/plans adopted, including the PPUC Climate Change Resilience Strategy, its Implementation Plan and energy resilience guidelines for MSMEs
- CI 4: 200 individuals (50% women, 30% youth) trained in resilient RE system operations.
- CI 5: 30 MSMEs (50% women and 30% youth led) in key value chains, like tourism and fisheries, benefit from climate-resilient renewable energy.

Systemic Transformation and Regional Scaling

The project ensures systemic transformation by simultaneously addressing policy, technology, finance, and knowledge barriers. The development of national gender-sensitive resilience guidelines for MSMEs ensures that the private sector is an active partner in adaptation, while the financial structuring of co-funding models provides a template for future utility-scale investments. To amplify these impacts beyond Palau, the project integrates a robust knowledge-sharing mechanism through the Global Network of Regional Sustainable Energy Centres (GN-SEC) and the G-RES platform. This positions Palau's 'diesel-off' resilient model as a replicable blueprint for over 50 other SIDS facing similar climate-energy paradoxes.

5. Global Environment Benefits (GEBs) and Additionality

The project delivers tangible GEBs primarily by increasing the climate resilience of Palau's national electricity grid, ensuring the continuous availability of clean energy despite intensifying climate shocks.

While the project is primarily driven by the urgent need for Climate Change Adaptation (CCA), it generates substantial mitigation co-benefits by resolving the 'adaptation-mitigation paradox' common in SIDS. In the baseline, renewable energy assets are often curtailed or rendered 'stranded' because the grid lacks the stability to operate without constant diesel support. By deploying grid-forming inverters and stabilized storage (Output 2.1.3), the project enables 'diesel-off' operations on Peleliu, allowing the 164 kW solar array to satisfy the island's load without fossil fuel combustion. This shift is estimated to displace approximately significant quantities of imported diesel annually, resulting in a direct reduction of over 3,894 metric tons of CO_2e over the system's 20-year operational lifespan. Beyond this direct impact, the project targets an indirect mitigation potential of approximately 71,240 tons of CO_2e by establishing a replicable blueprint for un-stranding similar RE assets across the national portfolio. These benefits are further protected through the physical hardening of infrastructure against 1-in-100-year storm surges and typhoon-force winds, ensuring that the carbon-reduction potential of the asset is not lost to extreme weather events. The project will directly benefit 16,696 people through enhanced energy security and the development of a landmark National Climate Resilience Strategy and Implementation Plan. By establishing the first formal engineering standards for resilient RE-BESS integration (Output 1.1.3), the project prevents the carbon-intensive 'rebuild-and-repair' cycles that currently drain national resources.

6. Private Sector Engagement

The project is designed to catalyze private sector resilience by de-risking the energy landscape upon which Palau's economy depends. While national investments by development partners, such as the ADB and AIFFP, improve the macro-stability of the grid, this SCCF intervention focuses on the 'last-mile' resilience of MSMEs that are most vulnerable to climate-induced power disruptions. By shifting from passive consultation to active partnership, the project ensures that the private sector is both a beneficiary and a co-developer of Palau's energy future.

Private sector actors will be integrated into the project's technical core to ensure outcomes reflect real-world economic risks. During the Vulnerability Assessment and GIS mapping (Output 1.1.1), industry associations in tourism, fisheries, and agriculture will provide ground-level data to identify 'economic red-zones' where energy failure leads to immediate high-value losses. Similarly, the private sector will play a central role in the consultation phase of grid feasibility studies (Output 2.1.1), ensuring that the dimensions of the proposed RE-BESS enhancements are aligned with the actual load growth and reliability requirements of Palau's commercial engines. Under Core Indicator 5, the project specifically targets 30 MSMEs in key value chains to become 'climate-proofed' prosumers. The development of Energy Resilience Guidelines (Output 1.1.3) will provide these businesses with technical manuals to align their continuity plans with new PPUC engineering standards. Furthermore, specialized training for 200 individuals (Output 1.1.4), with a 50% target for women, will empower women-led businesses to lead the transition to decentralized, renewable solutions. By proving the technical and financial viability of 'diesel-off' operations, the project lowers the risk premium for future private investment, while the estimated $1.35 million in lifetime fuel savings contributes to long-term tariff stability for all commercial stakeholders.

7. Gender Mainstreaming

The project's outcomes are designed to be responsive to electricity consumers as a whole, but certain outputs will be responsive to gender and social inclusion (i.e. youth and vulnerable people) mainstreaming. The vulnerability assessment and resilience planning for PPUC will evaluate the differential impact of electricity disruptions on women and other vulnerable groups of people in Palau. The adaptation planning will prioritize regions where vulnerable groups are most impacted. As part of Component 2, ways to enhance participation of women in the project activities by way of providing jobs and livelihoods will be explored. All vulnerable groups will be engaged during the consultation phases of Outputs 1.1.1, 2.1.1, and 2.1.3 where their inputs will be included in the considerations for planning, design and implementation. A Gender and Youth Action

Plan will be developed and guide the execution and reporting of the project with regard to the established gender and youth indicators.

8. Knowledge Management and Learning

Knowledge Management (KM) is a core pillar of this project, ensuring that technical innovations and policy shifts are integrated into Palau's institutional memory. Under Component 1 (Output 1.1.1), the project systematically increases the capacity of the Palau Public Utilities Corporation (PPUC) and government agencies by addressing the 'know-how gap' regarding climate impacts on the national electricity system. By quantifying the risks of storm surges and typhoon-force winds, the project enables stakeholders to correlate climate-hardened infrastructure with the preservation of national livelihoods and dollar-value assets.

The primary knowledge product is the PPUC Climate Change Resilience Strategy and Implementation Plan, a living roadmap that codifies engineering standards and operational protocols. This plan includes a framework for continuous knowledge strengthening, institutionalizing GIS-based vulnerability mapping and standardized reporting tools. By embedding these practices into daily operations, the project ensures the ability to assess and mitigate climate risk remains a permanent national capability, independent of external consulting cycles.

To ensure scaling and replication, the project will produce and disseminate specific lessons learned on gender mainstreaming and the integration of gender perspectives in SIDS utility management. These insights will be shared by leveraging the GN-SEC Gender and Youth Focal Point Network and the Gender Energy Compact Network. By participating in these global coalitions, the project will contribute to the 2026 international push for inclusive energy transitions—highlighting Palau's success in achieving a 50% female participation rate in technical training (Output 1.1.4) and supporting women-led MSMEs.

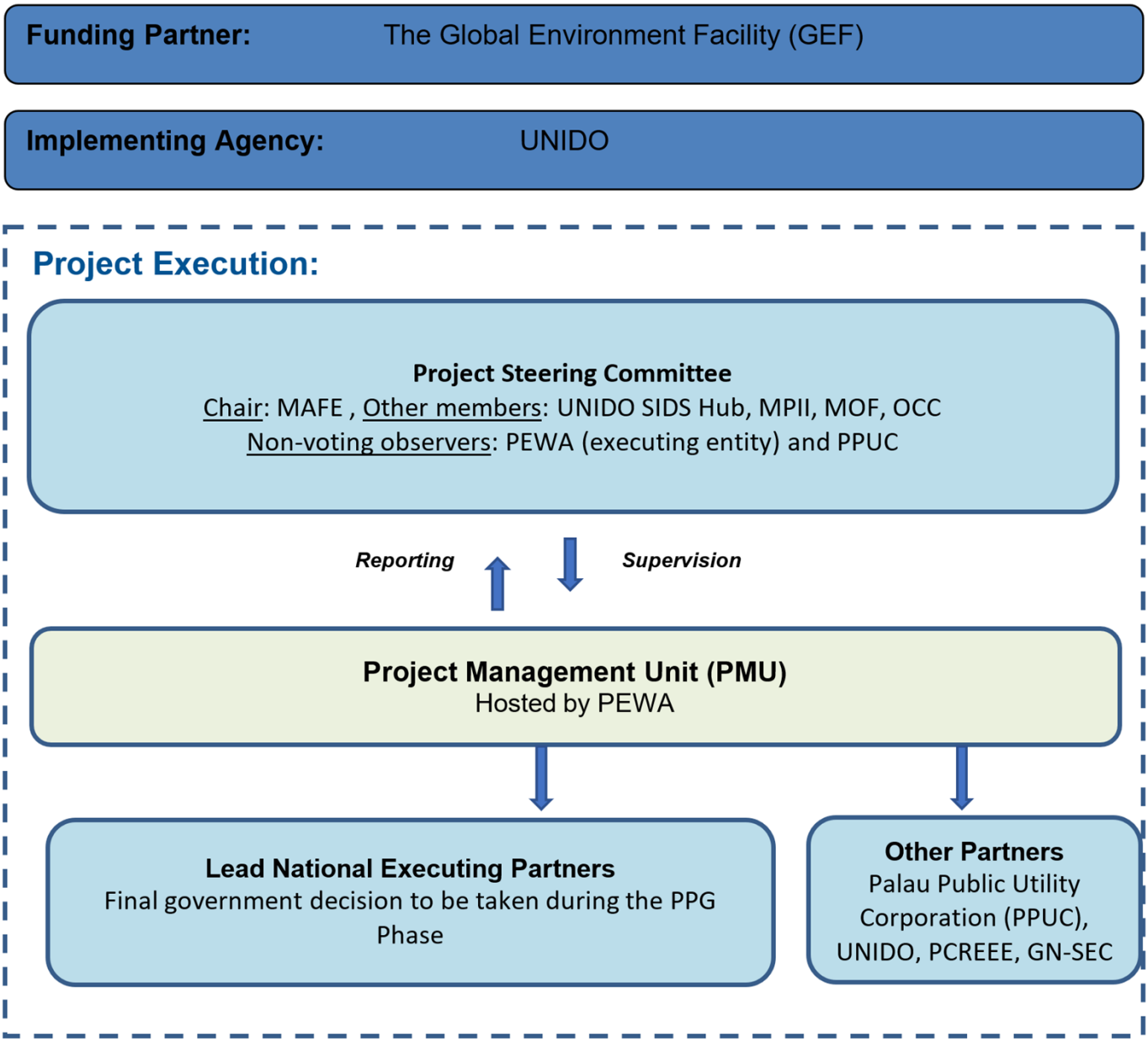
Finally, through Output 2.1.4, technical findings from the Peleliu pilot—such as the performance of grid-forming inverters in high-salinity environments - will be disseminated via the G-RES platform and the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE). This transforms a local resilience project into a global learning resource, providing other Small Island Developing States with a proven blueprint for 'diesel-off' renewable integration and gender-responsive energy planning.

9. Stakeholder coordination and implementation structure

UNIDO, through the Sustainable and Just Energy Transition Unit (ECA/JET) and in coordination with the UNIDO-Barbados SIDS Hub in Bridgetown, will serve as the implementing agency. UNIDO provides technical oversight and ensures the project's strategic alignment with the Global-RES program. Drawing on lessons learned from established SIDS initiatives, UNIDO will facilitate robust SIDS-SIDS cooperation through the Global Network of Regional Sustainable Energy Centres (GN-SEC).

As the host of the GN-SEC platform, UNIDO ECA/JET facilitates South-South and triangular cooperation between the centers. In coordination with the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE)—and leveraging inter-regional exchange with the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE) and other centers such as CEREEAC, SACREEE, SICREEE, and ECREEE—UNIDO will facilitate the transfer of clean energy expertise, technical blueprints, and gender-mainstreaming models to other SIDS regions. Further information on these global networks is available at www.gn-sec.net. The institutional structure of this project and a summary of the stakeholder roles are given in the below figure and table.

Figure 4: Implementation Structure



Engagement is continuous and participatory. The project adopts a multi-stakeholder, co-creation model designed to ensure ownership, complementarity, and long-term sustainability. To achieve these objectives, the project engages a broad range of stakeholders across governmental, regional, private, civil society, and academic sectors. This partnership architecture ensures vertical integration (from policy to practice) and horizontal collaboration (from national to regional), thereby maximizing impact and replication potential, particularly for the SCCF adaptation goals. The project will closely cooperate with other GEF/GCF funded projects as explained above.
During the PIF development phase, several consultations with CSOs and private sector associations were undertaken (see below). Initial views and needs, including regard the ESS process were integrated in the PIF. Further consultations will be undertaken during the PPG phase.

Type	Entity	Level of engagement	Contribution	Component
Governance	**Ministry of Agriculture, Fisheries and**	MAFE is the ministry responsible for environment and is the	Operational guidance: Guidance in matters of	1 and 2

	Environment (MAFE)	GEF focal point for Palau. MAFE is a steering committee member and chair.	GEF supported projects and processes.	
Governance & Execution	**Ministry of Public Infrastructure and Industries (MPII) - Capital Improvement Program (CIP)**	MPII-CPI manages government contracting and procurement of capital investment projects in national infrastructure. Most probably, MPII acts as an official co-Executing Entity (decision to be taken during the PPG phase) and is a steering committee member.	Resources mobilization: Addressing the government procurement, contracts and contracts management of vendors providing services under all Outputs.	1 and 2
Governance & Execution	**Palau Energy & Water Administration (PEWA)**	PEWA, under the Ministry of Finance, acts as an international contact point and represents Palau in overseas energy meetings. It is also the project coordination unit for a number of power and water sector projects in Palau. Most probably, PEWA acts as an official co-Executing Entity coordinating the project work and hosts the Project Management Unit (PMU) – the decision will be taken during the PPG phase.	Project management and coordination: Addressing the GEF project management and coordination of activities (all Outputs), as well as coordination with other development partner projects in the electricity sector.	1 and 2
Execution	**Palau Public Utilities Corporation (PPUC)**	PPUC is the organization operating the national electricity system. PPUC acts another Partner assisting with the execution – the decision will be taken during the PPG phase.	Technical Support: In-kind technical assistance to vendors supplying the services under the outputs (all Outputs).	1 and 2

Implementing Agency	**UNIDO (Sustainable and Just Energy Transition Unit (ECA/JET)** in coordination with the UNIDO-Barbados SIDS Hub in Bridgetown)	Implementing Agency (GEF). High: Technical Oversight and Regional Coordination. Ensures project alignment with Global-RES and SIDS-SIDS cooperation framework.	Regional Technical Support: The SIDS Hub acts as the regional coordination point. ECA/JET provides specialized technical oversight, facilitates SIDS-SIDS cooperation and replication through the GN-SEC program (e.g., CCREEE), transfers cleantech tools, and supports knowledge transfer.	1 and 2
Governance & Policy	**Office of Climate Change, Office of the President (OCC)**	OCC is the office under the Office of the President responsible for coordination of national climate change policy and planning. OCC would be a Steering Committee member.	Operational guidance: Guidance in matters related to climate change policy and planning, and the integration with other national climate change project outcomes (all Outputs).	1
Financial Partners	**Asian Development Bank (ADB) & Australian Infrastructure Financing Facility for the Pacific (AIFFP)**	Major development partners providing baseline financing for Palau's energy sector reforms and national grid upgrades.	Co-financing & Alignment: Ensures the SCCF-funded adaptation measures (BESS and hardening) are integrated into larger baseline infrastructure investments.	1 and 2
CSO / NGO / Academic	**University of the South Pacific (USP)**	USP is the premier regional university and a key knowledge partner. It facilitates SIDS-SIDS cooperation through its regional campuses and specialized centers like PACE-SD.	Knowledge Transfer & Academic Exchange: Facilitates South-South learning, peer-to-peer technical exchange, and provides academic support for climate resilience research and student involvement (Component 2).	2
CSO / NGO	**Palau Conservation Society (PCS)**	PCS is a local non-profit organization focused on conservation and sustainable development. PCS would be an outreach partner	Community Mobilization: Facilitate community engagement, gender mainstreaming, and ensure community-level knowledge transfer	1 and 2

		and steering committee member.	of project benefits (Output 1.1.4).	
Regional Hubs	**Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE)**	PCREEE is the regional GN-SEC center for the Pacific. PCREEE acts as a technical partner for regional scaling.	SIDS-SIDS Knowledge Transfer: Facilitate the dissemination of technical blueprints and lessons learned to other Pacific Island countries (Output 2.1.4).	2
Other	**Private Sector**	The private sector is another Partner who are commercial businesses (incl. tourism) and households are significantly impacted by the availability of the electricity system.	Knowledge Transfer: Facilitate knowledge on the changes to the electricity system and its availability / reliability and how this impacts their members (Outputs 1.1.1 and 2.1.3).	1 and 2

10. UNIDO Legal context

The Government of the Republic of Palau agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed and entered into force on 18 July 2008.

Coordination and Cooperation with Ongoing Initiatives and Project.

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

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

Alignment with other programs and projects

This project acts as a strategic 'force multiplier' for Palau's climate portfolio by bridging the gap between national-level planning and localized, high-intensity infrastructure resilience. It is specifically designed to complement and scale the following ongoing GEF, GCF, and bilateral initiatives:

<u>GEF-Funded Alignment</u>

- The GEF project in Palau is part of the G-RES program, which comprises a global-regional component and a growing portfolio of national projects. The global-regional project (GEF ID: 12229) will accelerate national progress by strengthening coordination, ensuring policy coherence, facilitating SIDS–SIDS cooperation, and sharing best practices in climate risk assessments, energy policy development, and integrated resource and resilience planning—including gender responsive and socially inclusive approaches.
- GEF-8 Blue and Green Islands Integrated Program (BGI-IP) (GEF ID: 11252 / Palau Child Project): The BGI-IP focuses on nature-based solutions and the sustainable management of tourism and

fisheries. This new project provides the essential infrastructure backbone for those goals. By securing the energy-water nexus, the intervention ensures that the eco-tourism MSMEs and sustainable fisheries promoted by the BGI-IP remain viable during and after extreme weather events, when power-dependent cold chains and water pumps are most at risk.

- GEF-8 Global Electric Mobility Program (GEF ID: 11516 / Palau Child Project ID: 11074): As Palau transitions its marine and land transport sectors to electric power, grid stability and resilience become paramount. This project ensures that future charging infrastructure for electric boats on Peleliu is supported by a climate-hardened mini-grid, preventing the e-mobility transition from being stalled by the fragility of legacy diesel systems.

GCF-Funded Alignment

- GCF FP259: Adapting Tuna-Dependent Pacific Island Communities and Economies to Climate Change: This regional GCF program builds resilience in tuna-dependent economies through improved forecasting and post-harvest improvements. This project provides the localized technical operationalization necessary to protect the cold-storage MSMEs that are the primary beneficiaries of the GCF's fisheries resilience efforts on Peleliu, ensuring the catch is preserved even during prolonged climate-induced grid outages.
- GCF FP147: Enhancing Climate Information and Knowledge Services for Resilience in 5 Island Countries: FP147 focuses on the generation and dissemination of climate and weather information. This project operationalizes that data by integrating it into PPUC's national disaster response protocols and a GIS vulnerability framework, transforming raw climate information into concrete engineering and maintenance actions.
- GCF FP036: Pacific Islands Renewable Energy Investment Program (Ongoing): While the regional GCF program supports the broad shift from diesel to renewables, its implementation often faces 'last-mile' technical barriers in isolated sub-islands. This project provides the specific grid-forming technology and localized storage capacity that regional facilities cannot easily customize. It transitions Peleliu from a 'renewable-augmented diesel' model to a true 'diesel-off' resilient model.

Bilateral and Multilateral Energy Projects:

- Australian Infrastructure Financing Facility for the Pacific (AIFFP) – Palau Renewable Energy Integration Project (Active 2025–2026): This project focuses on upgrading the national grid to handle higher levels of renewable penetration and includes a Battery Energy Storage System (BESS) for the Koror-Babeldaob grid. This SCCF project complements the AIFFP investment by extending these grid-stability and equipment-hardening protocols to isolated systems like Peleliu, which are not covered by the main grid upgrades.
- ADB Energy Transition Project (formerly Smart Grid Project) (ADB ID: 49450-037 / 49450-032): The ADB project installs a utility-scale BESS and upgrades protection systems to reduce blackouts. This SCCF project provides a vital demonstration of grid-forming logic that serves as a scalable model for PPUC to manage variable renewable energy (VRE) across the entire national system, moving beyond simple storage to full system autonomy.
- JICA Project for Upgrading and Maintenance of the National Power Grid (Active 2024–2026): JICA is supporting the reinforcement of the transmission network, including the completion of the 34.5kV Malakal-Kokusai line. This project adds a climate-adaptation layer to JICA's hardware improvements by providing the digital 'brain' (GIS mapping) to ensure assets are managed according to long-term sea-level rise and storm-surge projections.

Core Indicators

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

META INFORMATION – SCCF

LDCF **false**	SCCF-B (Window B) on technology transfer **false**	SCCF-A (Window-A) on climate Change adaptation **true**

Is this project LDCF SCCF challenge program? **false**
This Project involves at least one small island developing State(SIDS). **true**
This Project involves at least one fragile and conflict affected state. **false**
This Project will provide direct adaptation benefits to the private sector. **true**
This Project is explicitly related to the formulation and/or implementation of national adaptation plans (NAPs). **true**
This project will collaborate with activities begin supported by other adaptation funds. If yes, please select below

Green Climate Fund **false**	Adaptation Fund **false**	Pilot Program for Climate Resilience (PPCR) **false**

This Project has an urban focus. **false**
This project will directly engage local communities in project design and implementation **true**
This project will support South-South knowledge exchange **true**
This Project covers the following sector(s)[the total should be 100%]: *

Agriculture	0.00%
Nature-based management	0.00%
Climate information services	10.00%
Coastal zone management	10.00%
Water resources management	0.00%
Disaster risk management	10.00%
Other infrastructure	50.00%
Tourism	10.00%
Health	0.00%
Other (Please specify comments) Renewable energy Infrastructure	10.00%
Total	100.00%

This Project targets the following Climate change Exacerbated/introduced challenges:*

Sea level rise **true**	Change in mean temperature	Increased climatic variability **true**	Natural hazards **true**

	true		
Land degradation **false**	Coastal and/or Coral reef degradation **false**	Groundwater quality/quantity **false**	

CORE INDICATORS – SCCF

	Total	Male	Female	% for Women
CORE INDICATOR 1 Total number of direct beneficiaries	16,696	8,348.00	8,348.00	50.00%
CORE INDICATOR 2 (a) Area of land managed for climate resilience (ha) (b) Coastal and marine area managed for climate resilience (ha)	10.00 5.00			
CORE INDICATOR 3 Number of policies/plans/ frameworks/institutions for to strengthen climate adaptation	3.00			
CORE INDICATOR 4 Number of people trained or with awareness raised	200	100.00	100.00	50.00%
CORE INDICATOR 5 Number of private sector enterprises engaged in climate change adaptation and resilience	30.00			

Key Risks

	Rating	Explanation of risk and mitigation measures
CONTEXT		
Climate	Moderate	Assessment: Typhoons, flooding, supply chain disruptions, or economic downturns could affect implementation, operations (assets), and project timelines. Mitigation Measures: Integrate climate resilience and disaster preparedness modules into planning, procurement, and designs. Maintain flexible implementation timelines.
Environmental and Social	Moderate	Assessment: Environmental and social impacts can arise from the planning and implementation (of assets) under the project. Mitigation Measures: Environmental and social aspects will be part of the planning, feasibility

		studies, and implementation of management plans of activities. Collaborate with PEWA, MAFE, and EQPB to ensure compliance with national environmental regulations The planning and feasibly study will include activities during development and parts in the results for gender and social inclusion. Including indicators for engagement and monitoring future considerations. A Gender and Youth Action Plan, Stakeholder Engagement Plan, and Grievance Redress Mechanism will be implemented and monitored. These measures will ensure equitable participation, especially of women and youth, and strengthen the adaptive capacities and livelihoods of vulnerable groups.
Political and Governance	Low	Assessment: Policy shifts or institutional restructuring of climate and development finance could impart electricity sector investments. Mitigation Measures: The project outcomes are aligned with Palau's Climate Change Policy, Energy Sector Roadmap and NDC 3.0. Resilience measures will be included in the NAP that is currently under development.
INNOVATION		
Institutional and Policy	Low	Assessment: There is a risk that continued investment in resilience measures (as per the adaption plan output) will be delayed due to lowered global input for climate finance support impacting the transitional impact of the project. National circumstances can also limit the level of operation and maintenance (O&M) of the enhanced assets under this project reducing their positive impacts. Mitigation Measures: Ensure that there is a mechanism for PPUC, PEWA and OCC to coordinate information on support needs for the electricity sector. Ensure that PPUC has planned for and streamlined O&M costs into the governance and planning by institutionalizing O&M into the adaption plan. As well that practice from the resilience measures installed under the project are transferred to additional grid improvements outside of the project.
Technological	Moderate	Assessment: While standard solar PV technology is well proven globally, the specific introduction of advanced grid-forming (GFM) inverter control and the seamless integration of a Battery Energy Storage System (BESS) to achieve 'diesel-off' autonomous operation within an isolated, remote mini-grid presents technical and operational complexities that are new to PPUC. Mitigation Measures: To mitigate these complexities, the feasibility study (Output 2.1.1) will explicitly define the optimal operational parameters for the GFM and BESS configurations. The EPC tender documentation will strictly require bidders to demonstrate a proven track record of successful technology integration in similar remote or SIDS contexts, and mandatory factory testing will be enforced prior to shipment to Palau to prevent on-site failures. During implementation, robust Owner's Engineer supervision will ensure rigorous adherence to installation standards. Furthermore, the project mandates that vendors deliver comprehensive, specialized training to PPUC engineers on the specific software and hardware interfaces prior to full system handover.
Financial and Business Model	Low	Assessment: There is a minor risk that parallel investments to stabilize the grid (by other development partners) are delayed or not implemented, which would

		lower the indirect mitigation results of the project. Mitigation Measures: Continued coordination with PEWA, PPUC and other development partners on the implementation and support needs for enhancing the electricity grid to allow for increased share of renewable energy.
EXECUTION		
Capacity	Moderate	Assessment: SOEs (i.e. PPUC) and Government entities (PEWA, CIP, OC, MAFE…) have limited human capacity in Palau, which has a very small population but highly educated set of professionals. This leads to two potential risks: (1) That the in-kind human capacity that is needed for implementation support from PPUC and other Government entities is limited or delayed, and (2) that these same entities may experience coordination delays due to overlapping mandates, competing institutional priorities, and limited project management capacity. Mitigation Measures: The Project Steering Committee (PSC) has the purpose to facilitate and communicate the human capacity needs and coordination of the project's activities. In addition, the PMU will have a professional working full time to ensure timely management of operational issues and daily coordination to achieve results, including managing the feedback loop for M&E between the executing entities and the PSC.
Fiduciary	Low	Assessment: Inaccurate, inconsistent, and/or delayed reporting of project spending in early phases of the project can delay or prevent spending in follow-on phases. Mitigation measures: Government has appointed CIP to handle the fiduciary elements of the project because CIP has the most experience in the area of expertise in Palau. CIP will work closely with the PMU on reporting the financing for the project.
Stakeholder	Low	Assessment: The key stakeholders that directly impact the project outcomes are included in the PIF development and are a part of the steering committee. Stakeholder risks may arise outside of the above group during physical implementation due to land sue rights, understanding economic impacts, and perceived lack of inclusion…etc. Mitigation Measures: Are to ensure adequately timed PSC meetings of at least every quarter, and monthly updates of project progress. Stakeholder consultations will be included in the processes of the project outputs (i.e. adaptation planning and feasibility studies).
Other		
Overall Risk Rating	Moderate	The Overall Project Risk is rated as Medium. This determination was made using a standard risk assessment that evaluates the probability of occurrence and the potential severity of impact for each identified risk category. While political, environmental, and social risks are assessed as Low due to strong national ownership, established institutional baseline capacities, and a minimal physical footprint, the overall rating is elevated to Medium to accurately reflect the specific technological and logistical complexities of deploying advanced Grid-Forming (GFM) inverters and BESS in a remote SIDS

		environment. This overall rating represents a composite assessment, concluding that while the technical barriers are non-trivial, the targeted procurement strategies and rigorous capacity-building mitigation measures embedded in the project design are sufficient to manage and overcome them.

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)

Alignment with SCCF Adaptation Programming Objectives (GEF-8 Framework)

The proposed project is fully aligned with the GEF-8 Programming Strategy on Adaptation to Climate Change, specifically targeting the **Special Climate Change Fund (SCCF) Window A**. It prioritizes transformational adaptation, private-sector engagement, and a 'whole-of-society' approach to build resilience in Palau—a highly vulnerable Small Island Developing State (SIDS). The project targets the high-risk electricity sector, where the energy-water nexus makes power reliability a matter of immediate survival and economic security against worsening tropical storms and sea-level rise.

The GEF Programming Strategy explicitly mentions the importance of adaptive measures in the infrastructure sector in SIDS. Moreover, it has a strong focus on technology transfer and the strengthening of private-sector capacities and engagement. The South-South and triangular approach of the broader Global-RES (G-RES) program aligns with the GEF's focus on regional and inter-regional cooperation via the Global Network of Regional Sustainable Energy Centres (GN-SEC), facilitating the transfer of innovative climate-resilient technologies.

Alignment with SCCF Adaptation Pillars and Project Objectives

The project achieves its objectives by systematically building resilience across critical infrastructure, economic systems, and institutional policy, overcoming the interlocking financial and technical barriers to adaptation.

Pillar I: Building Climate-Resilient Systems and Infrastructure
This pillar addresses the physical and economic risks posed by climate change to Palau's national electricity system and dependent value chains.

- **Infrastructure Resilience (The 'Resilience Premium')**: The operationalization and 'hardening' of the Peleliu mini-grid serves as the primary adaptation measure. SCCF resources fund the incremental cost of grid-forming technology and physical infrastructure hardening, enabling 24/7 autonomous, 'diesel-off' power. This shields outer island communities from climate-induced fuel supply chain disruptions and grid outages.
- **Private Sector & Value Chain Resilience:** By stabilizing the grid, the project de-risks critical MSME value chains, particularly tourism (guest houses) and fisheries (cold storage), preventing the cascading economic losses (historically 2–5% of monthly GDP) erased by climate-induced power failures.
- **Operational Resilience:** Through the implementation of comprehensive GIS vulnerability mapping, the Palau Public Utilities Corporation (PPUC) will shift from reactive disaster response to predictive

asset management, lowering its long-term operational vulnerability to storm surges and preserving fiscal buffers.

Pillar II: Integrating Adaptation into Planning and Policy

This pillar addresses the institutional frameworks necessary for sustained, long-term national adaptive capacity:

- **Policy and Standards (NAP Operationalization)**: The project ensures that risk-informed asset management directly supports the strategic goals of the National Adaptation Plan (NAP). The development of the National Climate Resilience Strategy for the Energy Sector embeds climate risk considerations directly into PPUC's procurement and planning protocols, ensuring future infrastructure is designed for 2050 climate scenarios rather than historical baselines.
- **Institutional Capacity Building:** The project strengthens the technical capacity of PPUC, the Ministry of Public Infrastructure and Industries (MPII), and the Office of Climate Change (OCC) to manage climate-resilient systems and attract future climate finance.
- **Monitoring for Resilience:** The establishment of a rigorous tracking framework enables PPUC to monitor resilience metrics (e.g., asset exposure reduction, outage recovery times) rather than just financial performance, supporting compliance with the Paris Agreement's Enhanced Transparency Framework (ETF).

Contribution to Adaptation Core Indicators and Co-Benefit

The project's success is defined by its contribution to measurable adaptation outcomes tracked rigorously through SCCF Core Indicators and aligned with GEF-8 global indicators:

This is a SCCF fund project; the SCCF core indicators for this project are listed below.

SCCF Core Indicator	Male	Female (50%)	Youth (30%)	Total Target	Description / Rationale
CI 1: Number of direct beneficiaries	8,348	**8,348**	**5,009**	**16,696**	Two tiers: (i) 570 residents of Peleliu (direct RE access); (ii) 16,126 residents nationwide (resilient grid benefits). +1
CI 2: Land & Coastal Area (ha)	N/A	N/A	N/A	**15 ha**	Includes 10 ha of critical utility land and 5 ha of coastal buffer managed for resilience against erosion.
CI 3: Policies & Frameworks	N/A	N/A	N/A	**3**	Includes the PPUC Resilience Strategy, Implementation Plan, and MSME Resilience Guidelines.
CI 4: Number of people trained	100	**100**	**60**	**200**	Specialized training for PPUC staff and MSME

					operators in resilient RE system operations.
CI 5: Private enterprises engaged	15*	**15***	**9***	**30**	Targeted MSMEs in tourism and fisheries receiving resilience planning (targets women/youth-led businesses).

The Number of direct beneficiaries (1) is based on the population and housing census of 2020 for the areas covered by the electricity grid that is addressed under the project. The total number of policies, plans, and frameworks that will mainstream climate resilience (3) are the adaptation strategy and implementation plan for PPUC (Outcome 1) and this includes an M&E framework and at least biennial monitoring and reporting. While three institutions (OCC, PPUC, PEWA, and CIP) will be able to attract additional climate finance based on the Outcomes of project, and people from these institutions will be trained ware of climate change impacts and appropriate adaptation responses as a part of Outcomes 1 and 2.

Alignment with GEF-8 Climate Change Mitigation (CCM) Strategy and Core Indicator 6

Although this project is financed exclusively through SCCF Window A to address critical adaptation needs, it is also delivering Climate Change Mitigation (CCM) co-benefits, in line with the integrated mitigation and adaptation approach of the G-RES. The intervention aligns directly with GEF-8 CCM Strategy Entry Point 1.2: “Enable the transition to decarbonized power systems.” By deploying grid-forming (GFM) inverters and Battery Energy Storage Systems (BESS) to operationalize the Peleliu mini-grid, the project transitions the island away from conventional generation toward a 100% renewable, 'diesel-off' autonomous system. While the primary driver for this transition is adaptation (ensuring power continuity during climate-induced supply chain disruptions), the operational reality inherently displaces fossil fuel consumption. This systemic shift from diesel reliance to decarbonized power generation will result in an estimated direct and indirect reduction of 75,134 tCO2e over the 20-year lifespan of the technology (3,894 directly through the mini-grid and 71,240 tCO2e through replication). These mitigation co-benefits are formally tracked under GEF Core Indicator 6 (Greenhouse Gas Emissions Mitigated), successfully bridging Palau's adaptation and mitigation commitments under the Paris Agreement.

National Alignment: Palau’s Policy Framework and Regional Synergy

The proposed project is a country-driven intervention designed to operationalize Palau’s national climate and energy mandates. By bridging the gap between high-level policy and site-specific implementation, the project serves as a critical milestone for the following frameworks:

- Draft Palau Climate Change Policy (2025–2035): The project directly implements Intervention F.1, which mandates the evaluation of climate risks to utility facilities and the subsequent upgrading of vulnerable infrastructure. It establishes the required 'site-specific risk assessments' and executes hard adaptation interventions in Peleliu to protect assets most exposed to climate-induced disruptions.
- Draft NDC 3.0 (2026): As a core mitigation co-benefit, the project supports Palau’s target of a 42% GHG reduction by 2035. The 'rehabilitation of the Peleliu mini-grid' is explicitly identified in the NDC as a required 'Additional Measure.' Specifically, the project provides the 'enhanced grid control systems' (GFM) and 'additional BESS' cited in the NDC as the primary technologies needed to overcome technical grid curtailment barriers.
- Palau Development Plan (2023–2026) & RE Roadmap (2022–2050): By displacing volatile fuel imports, the project fulfills the PDP’s mandate for a 'financially and economically self-sustainable

energy supply.' It serves as the technical proof-of-concept for the Roadmap's goal of 100% renewable electricity, demonstrating a replicable 'diesel-off' model for national scale-up to other stranded grids.
- National Adaptation Plan (NAP) Process: As Palau initiates its NAP process in 2026, the risk-informed asset management frameworks and geospatial vulnerability data generated by this project will serve as foundational technical inputs for the NAP's critical infrastructure pillar.

Regional Alignment: Pacific Regional Policies

The barriers addressed by this project—technical grid instability, high fuel dependency, and infrastructure vulnerability—are common across the Pacific. Consequently, the project is aligned with several key regional frameworks coordinated by the Pacific Community (SPC) and the Pacific Islands Forum (PIFS):

- 2050 Strategy for the Blue Pacific Continent: The project supports the thematic areas of 'Climate Change and Disasters' and 'Technology and Connectivity,' promoting a resilient, future-ready Pacific through innovative energy solutions.
- Framework for Energy Security and Resilience in the Pacific (FESRIP) 2021–2030: Coordinated by SPC, this framework promotes a 'whole-of-sector' approach to energy security. This project specifically addresses FESRIP's goals regarding the deployment of technically proven, climate-resilient technological solutions (like GFM BESS) and the integration of gender and equity into energy planning.
- Framework for Resilient Development in the Pacific (FRDP) 2017–2030: The project operationalizes the FRDP's goals of integrated adaptation and low-carbon development. By hardening the Peleliu mini-grid, it provides a 'living lab' for the disaster preparedness and recovery principles championed by the Pacific Resilience Partnership (PRP).

PCREEE Regional Business Plan: As a partner of the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE), the project contributes to the regional mandate to enhance the productivity of key industries (fisheries, tourism) through sustainable energy innovation.

By aligning with these SPC-led policies, the project ensures that the 'Peleliu Blueprint' is not just a national success but a scalable regional asset. The lessons learned will be systematically disseminated through the GN-SEC and PCREEE platforms, enabling fund-level learning and performance enhancements across all Pacific Island Countries. UNIDO and PCREEE are planning to launch the G-RES Program during the upcoming meeting of Pacific Energy and Transport Ministers in PNG in May 2026.

Alignment with the 2030 Agenda for Sustainable Development

The project delivers broad impacts across Agenda 2030, moving beyond energy to address the interlinked nature of resource security and sustainable growth in SIDS.

- SDG 13 (Climate Action): This is the primary goal, with a heavy emphasis on Adaptation. The project strengthens resilience and adaptive capacity to climate-related hazards (Target 13.1) and integrates climate change measures into national policies and planning (Target 13.2).
- SDG 7 (Affordable and Clean Energy): Framed as a resilience measure, the project ensures universal access to reliable and modern energy services for remote island populations (Target 7.1) and substantially increases the share of renewable energy in the national mix by resolving technical curtailment (Target 7.2).
- SDG 9 (Industry, Innovation, and Infrastructure): The project promotes resilient infrastructure and fosters innovation through the transfer of resilient technology. It also has a focus on MSMEs.
- SDG 6 (Clean Water and Sanitation): The project adopts a Water-Energy Nexus approach. In Palau, water security is entirely dependent on energy security, as water treatment, pumping, and desalination

systems require a stable power supply. By hardening the Peleliu mini-grid and ensuring 24/7 autonomous RE power, the project secures the 'essential service nexus,' protecting the community's access to clean water during and after climate-induced disasters (Target 6.1 and 6.4).

- SDG 12 (Responsible Consumption and Production): The project promotes the sustainable management and efficient use of natural resources (Target 12.2) by reducing reliance on imported fossil fuels. Furthermore, the development of resilience guidelines for 30 MSMEs promotes sustainable practices in the tourism and fisheries sectors (Target 12.b), while the risk-informed asset management framework reduces systemic waste by shifting from reactive 'fail-and-fix' models to sustainable, predictive maintenance (Target 12.5).

Alignment with and Comparative Advantage of UNIDO

The United Nations Industrial Development Organization (UNIDO) brings a strong comparative advantage to the implementation of this project, rooted in its mandate to promote inclusive and sustainable industrial development (ISID) and its extensive experience in supporting low-carbon, resource-efficient, and climate-resilient transitions in developing countries and SIDS.

UNIDO's leadership in the industrial energy efficiency, renewable energy, and circular economy domains positions it uniquely to deliver integrated technical, policy, and financial solutions for energy utilities. In the Pacific, UNIDO has a long-standing presence through the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE) established with UNIDO support as part of the Global Network of Regional Sustainable Energy Centres (GN-SEC). End of 2025, UNIDO has launched its Global SIDS Hub in Bridgetown, Barbados.

Moreover, this project for Palau is a country-level intervention developed under the framework of the GEF and bilateral donor (e.g., Austria) supported G-RES, coordinated by UNIDO. This global program, in partnership with the Global Network of Regional Sustainable Energy Centres (GN-SEC), seeks to accelerate the deployment of climate-resilient renewable energy and energy efficiency (RE&EE) and resource efficient technologies in SIDS.

D. POLICY REQUIREMENTS

Gender Equality and Women's Empowerment:

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

Yes

Stakeholder Engagement

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

Yes

Were the following stakeholders consulted during project identification phase:

Indigenous Peoples and Local Communities: Yes

Civil Society Organizations: Yes

Private Sector: Yes

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

The consultation took place between August and December 2025 and were conducted by the UNIDO Sustainable and Just Energy Transition Unit (ECA/JET). Two country missions took place in September and December 2025. Private sector and CSO stakeholders were primarily consulted as part of the NDC 3.0 validation and development process in September 2025 (see below). This process included high-level discussions on electricity sector planning, grid stability, and the specific adaptation interventions mirrored in this PIF. While these broader consultations established the baseline and sectoral buy-in, detailed technical discussions focusing exclusively on the PIF's operational specifics will be a priority during the PPG phase. In summary, the following stakeholders were consulted by mostly on-line means:

Date	Participants	Means of Consultation
03.09.25	Ministry of Agriculture, Fisheries and the Environment. Palau Public Utilities Corporation. Office of Climate Change, Office of the President.	In person
10.09.25	The project was discussed during the NDC 3.0 validation, including with with CSOs and private sector associations, such as Palau Conservation Society (PCS), Palau Pledge, Omekesang (Disabilities NGO), Palau Red Cross, Palau Resource Institut, Palau Organic Growers Association, Palau Livestock Association, Palau Conservation Society, Peleliu traditional leadership and levelihood groups.	In person
11.09.25	Environmental Quality Protection Board. Office of Climate Change, Office of the President. Asia Development Bank. (as part of NDC 3.0 validation) and Palau Public Utilities Corporation. Office of Climate Change, Office of the President. Asia Development Bank, Private Sector, and Civil Society Organizations. (as part of NDC 3.0 validation)	In person
20.10.25	Ministry of Agriculture, Fisheries and the Environment. Palau Public Utilities Corporation. Office of Climate Change, Office of the President.	On-line
01.12.25	Palau Public Utilities Corporation	In person
02.12.25	Office of Climate Change, Office of the President.	In person
03.12.25	Palau Energy & Water Administration, Ministry of Finance and Office of Climate Change, Office of the President.	In person
24.12.25 to 05.01.26	Palau Energy & Water Administration, Ministry of Finance and Office of Climate Change, Office of the President.	Email correspondence
05.01.26	Palau Public Utilities Corporation	On-line

Consultations particularly with CSOs, private sector and vulnerable communities will be strengthened during the PPG phase.

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

Private Sector

Will there be private sector engagement in the project?

Yes

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

Yes

Environmental and Social Safeguard (ESS) Risks

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

Yes

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

E. OTHER REQUIREMENTS

Knowledge management

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

Yes

ANNEX A: FINANCING TABLES

GEF Financing Table

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

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant($)	Agency Fee($)	Total GEF Financing ($)

UNIDO	SCCF-A	Palau	Climate Change	SCCF-A Country allocation	Grant	2,639,726.00	250,774.00	2,890,500.00
Total GEF Resources ($)						**2,639,726.00**	**250,774.00**	**2,890,500.00**

Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount ($)

100000

PPG Agency Fee ($)

9500

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG($)	Agency Fee($)	Total PPG Funding($)
UNIDO	SCCF-A	Palau	Climate Change	SCCF-A Country allocation	Grant	100,000.00	9,500.00	109,500.00
Total PPG Amount ($)						**100,000.00**	**9,500.00**	**109,500.00**

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($)	Co-financing($)
CCA-2-1	SCCF-A	2,639,726.00	4900000
Total Project Cost		**2,639,726.00**	**4,900,000.00**

Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Donor Agency	UNIDO	Grant	Investment mobilized	80300
Donor Agency	International Partnerships Austria, South Korea	Grant	Investment mobilized	500000
Others	ADB, AIFFP	Loans	Investment mobilized	3169700
Recipient Country Government	Palau Public Utilities Company (PPUC)	In-kind	Recurrent expenditures	250000
Others	Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE)	In-kind	Recurrent expenditures	300000
Private Sector	MSMEs	Equity	Investment mobilized	600000
Total Co-financing				**4,900,000.00**

Describe how any "Investment Mobilized" was identified

Investment for the resilience upgrading of the solar PV mini-grid system was identified during consultations in Palau. The solar mini-grid system was funded by South Korea.

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	UNIDO	2/14/2026	Ganna Onysko	+431260263647	G.ONYSKO@unido.org
GEF Agency Coordinator	UNIDO	2/14/2026	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)
Lincy Lee Marino	GEF OFP – Palau	Ministry of Agriculture, Fisheries, and the Environment	6/26/2025

ANNEX C: PROJECT LOCATION

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

Location Name

	Aatitude	Longitude	Description
Peleliu State (Central)	**7°00’45” N**	**134°15’01” E**	General island coordinates for the project
Kloulklubed (Utility Hub)	**7°02’31” N**	**134°15’27” E**	Primary location of the PPUC power station and proposed BESS installation.
Northern Interventions	**7°05’00” N**	**134°15’36” E**	Secondary grid infrastructure and vulnerable coastal sections.

Map of Interventions

- High-Intensity Zone (Peleliu): Focused on the synchronization of the 168kW solar PV plant with new 2.2 MW resilient diesel capacity and grid-forming storage. This zone covers approximately 15 hectares of managed land and coastal buffer (Core Indicator 2).
- Systemic Support Zone (National): While the physical hardware is localized to Peleliu, the GIS Vulnerability Framework and Asset Management protocols cover the national utility grid managed by PPUC in Koror and Babeldaob, ensuring stability for 16,696 residents.

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
GHG emission calculation
ESS Screening Sheet

ANNEX E: RIO MARKERS

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

ANNEX F: TAXONOMY WORKSHEET

Project Component	Key Intervention Focus	Climate Change Mitigation (UNFCCC)	Climate Change Adaptation (UNFCCC)	Justification / Rationale
1. Enhanced vulnerability planning for the national electricity system	Energy system resilience policy and planning	Significant Objective 1	Principal Objective 2	The primary driver is building adaptive capacity and predictive maintenance frameworks for utility resilience. Significant (Mitigation): Supports renewable integration, which reduces grid emissions as a co-benefit.
2. Enhanced availability and resilience of PPUC's existing renewable energy mini-grid on Peleliu	Implementing resilient clean energy technologies	Significant Objective 1	Principal Objective 2	Principal (Adaptation): The upgraded solar PV mini-grid system is designed for 'diesel-off' autonomous power during disasters (adaptation). Significant (Mitigation): Directly displaces diesel fuel, resulting in the 12,500 tons of CO2e co-benefit.