

GEF-8 PROJECT IDENTIFICATION FORM (PIF)

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General Project Information

Project Title

Power System Modernization for Clean Energy Integration in Nauru

Region

Asia

GEF Project ID

12263

Country(ies)

Nauru

Type of Project

MSP

GEF Agency(ies):

UNDP

GEF Agency ID

10159

Executing Partner

The Department of Climate Change and National Resilience (DCCNR)

Executing Partner Type

Government

GEF Focal Area (s)

Climate Change

Submission Date

12/24/2025

Project Sector (CCM Only)

Renewable Energy

Taxonomy

Influencing models, Stakeholders, Transform policy and regulatory environments, Beneficiaries, Capacity, Knowledge and Research, Capacity Development, Gender Equality, Gender Mainstreaming, Focal Areas, Climate Change, Renewable Energy, Climate Change Mitigation

Type of Trust Fund

GET

Project Duration (Months)

48

GEF Project Grant: (a)

1,776,485.00

GEF Project Non-Grant: (b)

0.00

Agency Fee(s) Grant: (c)

168,765.00

Agency Fee(s) Non-Grant (d)

0.00

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

1,945,250.00

Total Co-financing

7,105,940.00

PPG Amount: (e)

50,000.00

PPG Agency Fee(s): (f)

4,750.00

PPG total amount: (e+f)

54,750.00

Total GEF Resources: (a+b+c+d+e+f)

2,000,000.00

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)

The project contributes to the GEF-8 Climate Change focal area under Pillar I, which promotes innovation, technology transfer, and enabling policies for mitigation options with systemic impacts. It advances Programming Direction 1.1 by improving system-level energy efficiency through the avoidance of renewable energy (RE) curtailment, ensuring that clean electricity already generated is fully utilized rather than wasted and Direction 1.2 by enabling the transition to decarbonized power systems through battery storage integration, and enabling grid, regulations and institutional capacity for higher utilization of variable RE. Nauru’s electricity system relies primarily on imported diesel, which drives exposure to fuel price volatility, high operating costs, and GHG emissions. Utility-scale solar has expanded renewable generation; however, limited energy storage capacity during peak PV output leads to curtailment, while diesel generation continues to cover evening demand peaks. Upfront costs, limited access to concessional finance, an underdeveloped financial sector, regulatory gaps, and institutional capacity constraints slow the adoption of emerging technologies and renewable integration. Nauru’s electricity system remains highly dependent on imported diesel, exposing the country to fuel price volatility, high operating costs, and sustained GHG emissions. Although utility-scale solar has expanded RE generation in the energy mix, the absence of Battery Energy Storage System (BESS) infrastructure prevents full use of RE capacity, forcing continued reliance on diesel during evening peaks. High upfront costs limited access to concessional finance, an underdeveloped financial sector, and regulatory gaps restrict adoption of emerging technologies; while institutional capacity constraints slows RE integration.

The proposed project will enable a resilient, efficient, and lower-emission power system by addressing these structural gaps. Its mutually reinforcing components will: (i) install a 0.6 MW/1.2 MWh BESS to add grid flexibility by storing surplus solar generation and providing firm capacity during peak demand; (ii) establish technical standards, operational protocols, and regulatory provisions for sustainable deployment of energy storage, creating pathways for RE increase and private-sector investments; and (iii) build institutional capacity—including targeted opportunities for women—to improve long-term operation.

Adding flexibility to the grid will reduce RE curtailment, improve reliability, and mitigate an estimated 1,166 tCO_{2e} annually—approximately 11,600 tCO_{2e} over the system’s lifetime. It will also reduce diesel consumption and generate annual savings of more than USD 150,000.

Without GEF support, the system would continue curtailing solar generation during peak production hours due to insufficient storage and limited operational flexibility, thereby remaining reliant on diesel generation to meet most electricity demand. Regulatory and operational gaps would also persist, including the absence of technical standards, operating protocols, Operations and Maintenance (O&M) and replacement planning, and end-of-life

procedures necessary for the reliable scale-up of battery storage. As a result, the benefits of existing solar investments would remain only partially realized, and investment risks associated with storage deployment would stay elevated.

GEF support for BESS delivers measurable climate and system performance benefits by financing a catalytic initiative that includes the enabling package required to strengthen institutional, regulatory and governance readiness for its safe operation and replication. These benefits include reductions in curtailed solar generation, measurable displacement of diesel generation and fuel consumption, and direct emission reductions consistent with the Core Indicator estimate (tCO_{2e}). Performance and sustainability will be tracked through SCADA and dispatch records, including BESS availability and response performance, adoption of regulatory instruments and technical standards, and certification operators, thereby establishing the foundations for scale-up.

Given the high concentration of GEF grant resources in Component 1, which finances the BESS investment, the project incorporates enhanced risk mitigation measures to safeguard delivery, performance and achievement of Core Indicator results. Performance and implementation risks will be managed through performance-based procurement, including staged payments linked to factory and site acceptance tests, minimum availability and efficiency thresholds, and liquidated damages for non-performance. Complementing these safeguards, Components 2 and 3 address operational and sustainability risks by formalizing technical standards and operating procedures and institutionalizing certified competencies through structured training and periodic re-certification. Together, this integrated risk management architecture reduces delivery, operational and governance risks, embeds storage management within formal utility systems, and strengthens readiness for subsequent storage investments.

By coupling infrastructure investment with regulatory strengthening and skills development, the project establishes a scalable model for advancing energy resilience in Nauru and other Small Island Developing States. This transition will enhance energy security and support the reliability of essential services such as health, water, and food systems. It will also enable replication of operational lessons in other Pacific SIDS through regional knowledge-sharing on smart-grid practices.

Indicative Project Overview

Project Objective

Strengthen renewable energy integration in Nauru’s grid through battery storage, smart grid solutions, regulatory measures, and local capacity building.

Project Components

1. Battery Storage Infrastructure for Renewable Energy Integration.

Component Type	Trust Fund
Investment	GET
GEF Project Financing (\$)	Co-financing (\$)

1,495,863.00	5,983,451.00
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Outcome:

1.1 The national grid operates with increased renewable energy penetration and reduced diesel.

Output:

1.1.1 BESS system installed, commissioned, and integrated into the national grid SCADA, with performance monitoring and service, warranty, and O&M requirements incorporated in procurement specifications.

2. Regulatory Enhancement for the Integration of Emerging Technologies.

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
68,023.00	272,092.00

Outcome:

2.1 Regulations and operational and financial arrangements enable safe operation, long-term sustainability, and scale-up of BESS and future grid modernization applications.

Output:

2.1.1 Targeted BESS and climate-resilience provisions added in the finalization of the draft NUC regulations.

2.1.2 Regulatory provisions and guidelines developed to support future smart grid applications.

2.1.3 Studies on policy options and investment mechanisms prepared to facilitate private sector participation in renewable energy.

2.1.4 Storage scale-up roadmap beyond the initial 0.6 MW/1.2 MWh

3. Capacity Development for BESS and Grid Operation.

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
86,813.00	347,252.00

Outcome:

3.1 Local institutions manage BESS and grid operations ensuring resilience, operational continuity, with participation of women.

Output:

3.1.1. Local personnel trained and certified (sex-disaggregated), supported by SOPs, mandatory refresher training and periodic re-certification, and embedded learning, including women's participation in technical functions relevant to grid operations and reporting.

3.1.2 Digital monitoring and knowledge management system operational, linked to SCADA and operational records for tracking curtailment, diesel displacement, performance indicators, automated reporting, secure documentation storage, and regional knowledge-sharing.

M&E

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing (\$)	Co-financing (\$)
30,356.00	121,424.00

Outcome:

4.1 Monitoring and evaluation activities enable timely identification of implementation challenges and support adaptive decision-making throughout the project cycle.

Output:

4.1.1 Mid-Term Review and Terminal Evaluation completed and reported through standard UNDP/GEF monitoring tools.

Component Balances

Project Components	GEF Project Financing (\$)	Co-financing (\$)
1. Battery Storage Infrastructure for Renewable Energy Integration.	1,495,863.00	5,983,451.00
2. Regulatory Enhancement for the Integration of Emerging Technologies.	68,023.00	272,092.00
3. Capacity Development for BESS and Grid Operation.	86,813.00	347,252.00
M&E	30,356.00	121,424.00
Subtotal	1,681,055.00	6,724,219.00
Project Management Cost	95,430.00	381,721.00
Total Project Cost (\$)	1,776,485.00	7,105,940.00

Please provide justification

-

PROJECT OUTLINE

A. PROJECT RATIONALE

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

The Paris Agreement underscores the urgency of reducing greenhouse gas (GHG) emissions to limit global warming. Achieving this objective requires a decarbonization of the energy sector, which is responsible for nearly three quarters of global CO₂ emissions worldwide. Electricity and heat generation, largely fossil fuel-based, are the single largest contributors to global CO₂. For SIDS, this challenge is amplified not only by structural dependence on imported fossil fuels, geographic isolation, and limited economies of scale, but also by heightened vulnerability to climate-related shocks that threaten energy security and the continuity of essential services.

Nauru's case exemplifies how these pressures manifest in small island states. In 2021, the country produced 61,400 tCO₂e with more than 90% of emissions originated mainly in electricity and heat production sources^[1]. Nauru's GHG are equivalent to 0.01% of global emissions, while per capita emissions reached 5.7 tCO₂e, placing the country in 76th worldwide.

Over 98% of total energy supply continued to rely on imported fossil fuels^[2]. Electricity supply is highly concentrated in a single power station operated by the Nauru Utilities Corporation (NUC). In the period 2008–2012, the country required between 6 and 7 million liters of diesel annually to meet electricity demand. The degraded condition of power generation units has often resulted in reliability challenges and occasional load shedding^[3]. This reliance, combined with exposure to extreme weather and climate variability, increases the risk of disruptions to fuel imports and grid operations, underlining the urgency of building resilience through storage and grid modernization.

By 2022, the RE deployment remained limited with solar energy accounting for only 9% of electricity generation. During 2024 and 2025, Nauru has undertaken a significant step forward by investing in utility-scale solar generation, with a project funded by the Asian Development Bank (ADB), which will add 6 MW to the grid and includes a 5 MW/2.5 MWh BESS for grid stabilization. This project will increase the total installed solar capacity to 8.4 MW, which exceeds the country's peak demand, estimated at 5.5 MW. Despite the ADB-funded BESS addressing system stability, Nauru remains forced to curtail around 2,000 MWh/year of solar energy during peak generation hours; which reduce the expected RE benefits.

The ADB Solar Power Development Project was designed and approved in 2019 based on an optimized "first-stage" system sizing and a Cabinet decision to install an initial BESS and expand later if required. The sizing prioritized system stability and least-cost implementation while minimizing stranded-asset risk under uncertain demand and PV deployment assumptions. The feasibility analysis^[4] showed that higher

renewable penetration through load shifting would require a non-linear increase in storage capacity, with substantially higher system costs.

Since the 2019 approval of the ADB project, operating conditions have materially changed. With installed and planned solar capacity exceeding peak demand and approximately 2,000 MWh/year of curtailment, the remaining storage gap is no longer speculative but operationally demonstrated. The BESS financed under the ADB solar PV project was not dimensioned to absorb all surplus solar generation or to shift significant volumes of energy to evening peak demand periods. The current storage gap therefore relates to load shifting and diesel displacement rather than to system stability.

Domestic and international financial institution resources in Nauru are currently directed to baseline investments required to expand utility-scale generation and maintain system stability. They do not typically finance the incremental load-shifting capacity and governance framework required to reduce curtailment and enable safe, sustained, and replicable storage scale-up. Although BESS technology is commercially mature, its effective deployment in small island microgrids such as in Nauru remains sensitive to readiness in operational governance, dispatch optimization, maintenance, and institutional strengthening, particularly under high renewable penetration scenarios.

GEF support is therefore requested to finance the incremental load-shifting BESS capacity and the enabling governance framework required to address the demonstrated storage gap. This includes additional storage capacity designed to absorb surplus solar generation and shift it to evening peak demand periods, combined with the institutional, regulatory, and operational measures necessary to ensure safe, sustained, and replicable deployment. Together, these elements will convert curtailed RE into dispatchable supply, enable measurable reductions in diesel generation and fuel consumption, and establish the technical and governance foundations required for subsequent storage scale-up.

For Nauru, this intervention represents a step change from current operations by transforming solar generation from a daytime-only resource into a dispatchable component of the power system capable of meeting peak demand. Beyond reducing reliance on imported diesel and enhancing reliability for households and essential services, the project embeds operational and governance reforms that institutionalize standards, Standard Operating Procedures (SOPs), O&M and service arrangements, and certified competencies within national institutions. While modest in absolute scale, the intervention is material for a microgrid system such as Nauru's and establishes replicable governance conditions for sustained performance and future storage expansion.

Given that a significant share of the requested GEF grant is allocated to capital expenditure on the BESS investment, delivery and performance risks will be managed through safeguards embedded in procurement, commissioning, and O&M governance. Procurement will apply performance-based contracting with staged payments linked to factory and site acceptance tests and commissioning milestones, and will include minimum availability and performance requirements and remedies for non-performance. The contract will also include a long-term service and warranty package covering remote diagnostics, spare parts, software updates, and cybersecurity support, verified through independent technical supervision during design review, installation, and commissioning. Components 2 and 3 will further reduce the risk of underutilization by formalizing standards and SOPs and institutionalizing operating competencies through training-of-trainers, mandatory refresher training, and periodic re-certification.

The objective of the project is therefore to operationalize higher integration of RE by closing the demonstrated storage and governance gaps that currently limit effective integration. Although complementary to ADB's ongoing BESS investment, that intervention is treated as part of the baseline and is not counted as co-financing under this proposal.

In the absence of this project, approximately 2,000 MWh of solar generation per year will be curtailed. In a business-as-usual (BAU) situation, this lost electricity will be offset by diesel generation, resulting in around 6,000 tCO_{2e} of avoidable emissions annually, and nearly USD 800,000 per year in fuel costs. While the proposed GEF investment provides the minimum storage capacity required to reduce curtailments, it only addresses approximately 20 percent of the total battery needs. The remaining 80 percent of storage capacity—currently unfunded—represents the portion that unlocks total utilization of surplus solar production. To change the BAU situation, the project must achieve three interrelated outcomes:

- Increase RE penetration by addressing the gaps in battery storage integration, reducing diesel reliance, and strengthening resilience against supply and climate shocks.
- Adoption of technical standards, and enhance regulations to ensure sustainable deployment and operation of storage systems; while preparing the grid for future smart applications.
- Strengthen institutional and workforce capacity, including promoting women participation in technical and supervisory roles.

Key barriers and enabling factors determine whether storage investments translate into sustained operational benefits. Barriers include high upfront costs, limited access to financing for both infrastructure and the incremental enabling package, and capacity constraints in system operation, maintenance, and governance. These constraints can prevent the adoption and routine use of standards, Standard Operating Procedures (SOPs), and maintenance arrangements, increasing the risk that a BESS is underutilized or sub optimally operated. Enabling factors include a clear national commitment to RE integration, ongoing baseline investments in solar and grid stability, and the opportunity to institutionalize operational governance through adopted standards, SOPs, and maintenance arrangements supported by a digital monitoring and reporting system.

Advancing Nauru's energy transition require overcoming the following barriers:

- **Barrier 1: High upfront infrastructure cost.** Nauru's economy size, remoteness, reliance on imports, and budget constraints make it difficult to achieve economies of scale, driving infrastructure costs well above those of larger and more connected countries (IMF, 2022^[5]). These challenges are particularly acute for RE and storage infrastructure. Foreign technology providers coupled with land-related barriers contribute to increasing investment costs. Regarding land use, the Land Act^[6] require project developer negotiations with multiple customary landowners and final approval by the President, which can delay access to sites.
- **Barrier 2: Dependence on imported fuels.** Nauru relies heavily on fossil fuels used mainly in industry, transport, and electricity generation. Electricity generation remains locked into diesel-centered infrastructure, limiting pathways to diversification^[7]. In 2017, about 40% of the 27.8

million liters of imported fossil fuels were used solely for electricity generation (DCCNR, 2020). This has shaped infrastructure centered on diesel generators, most of which are outdated and operating below capacity, leading to unreliable and inefficient supply. This long-standing dependency exposes the country to international fuel price volatility.

- **Barrier 3: Limited access to financing.** Nauru faces significant barriers to mobilizing capital for energy infrastructure. Financing options are scarce, and local capacity to manage complex financial processes remains limited. Additionally, Nauru's recent classification as a high-income country has reduced its access to concessional support^[8]. In parallel, the underdeveloped financial and banking system—market by limited capital markets, high transaction costs, and lack of investment instruments—reduces alternatives to cover the financing gap^[9]. These constraints also limit the ability to finance the incremental enabling package for storage scale-up, including regulatory implementation, operational protocols, and long-term sustainability measures such as O&M, warranties, software updates, and replacement planning that reduce investment risk.
- **Barrier 4: Limited experience in the design and management of RE systems.** Nauru faces constraints in technical capacity in areas such as storage integration, grid operation, and energy efficiency. The integration of emerging energy technologies require the development of new skills through specialized training. National institutions face a shortage of qualified staff across critical areas, including fund management, project oversight, and technical operation of RE technologies. This capacity gap also limits the ability of operators to respond effectively to climate-related emergencies, leaving the energy system more exposed to disruption. In addition, limited institutionalization of operational governance (standards, SOPs, and maintenance arrangements) increases the risk that storage assets are underutilized or mismanaged, reducing dispatch benefits and weakening the basis for scale-up. Addressing this barrier requires formal adoption of SOPs, structured training and certification, and clear O&M responsibilities embedded in NUC systems.

described above create a persistent lock-in. Tackling these barriers simultaneously is essential to shift the system toward cleaner, more reliable, and affordable energy.

Beyond these barriers, there are also enabling forces that push for change. The Government of Nauru has committed, through the Nauru Energy Road Map and its Nationally Determined Contribution (NDC), to achieving 50% renewable electricity in the medium term. The Government's Climate Change Policy also identifies the energy transition as a pillar of national resilience, recognizing that reducing fossil fuel dependence is essential to safeguard essential services and protect communities against the impacts of extreme weather events. The country's abundant renewable resources provide a solid basis for transitioning from fossil-based fuels to RE sources, while opportunities for climate finance remain accessible through bilateral and multilateral channels. Together, these drivers underscore the opportunity of investing in storage and regulatory readiness, ensuring that RE integration.

Delivering the project outcomes will require the active engagement of national institutions and local actors, with distinct roles as outlined below.

- The Department of Climate Change and National Resilience (DCCNR) will provide policy oversight and coordination, ensuring alignment of the project with national energy and climate strategies. DCCNR also monitors the implementation of international commitments, such as the NDC.
- The NUC is the central stakeholder, as it owns and operates the generation and distribution system. NUC will be responsible for the technical implementation of the BESS, its integration with the grid, and its day-to-day operation. Given its role as sole utility, strengthening NUC's technical capacity is essential for ensuring the sustainability of RE integration.
- Through the Project Steering Committee (PSC), the Ministry of Finance (MoF) will support long-term affordability by guiding budget integration and, where required, reviewing tariff and cost-recovery implications to finance O&M, warranties, software updates, and replacements. The (MoF) ensures fiscal oversight and alignment with public financial rules.
- The Department of Environmental Management and Agriculture (DEMA) will contribute to the preparation and adoption of protocols for the safe end-of-life management of batteries. By integrating environmental safeguards, DEMA will support with policies and regulations aiming to prevent environment and health risks.
- Local workforce. Training and certification programs will build the skills needed to operate and maintain storage systems and to manage the grid under higher RE penetration. Special attention will be given to promoting the participation of women, helping to address structural gender imbalances in the energy sector.
- While private sector participation is not expected during implementation, the project will still play a preparatory role for private sector participation. Studies on investment options and enabling policies will lay the foundation for future private engagement once regulatory and institutional conditions are in place.

The project adds value to ongoing energy and climate-related investments in Nauru. First, it enhances the impact of new solar capacity by introducing battery storage, which maximizes the use of available generation, minimizes curtailment, and enables greater displacement of diesel consumption during evening demand peaks^{[10]¹⁰}. Second, it supports regulatory and institutional gaps that have limited the uptake of RE. And third, it builds human capital by training local personnel.

The project design also reflects lessons learned from both Nauru and the Pacific region. Previous RE projects in SIDS have shown that the absence of adequate storage and local capacity leads to RE curtailment, underperformance of investments, and continued reliance on diesel. Similarly, weaknesses in institutional capacity and the absence of safeguards can increase environmental risks.

The project is structured to establish a replicable framework for battery storage integration in small Pacific islands grids. It consolidates technical solutions (BESS integration and operational performance monitoring), operational governance instruments (standards, SOPs, O&M and service arrangements, and disaster recovery protocols), and enabling measures (regulatory sequencing, cost-recovery options, and scale-up roadmaps) into an integrated package that can be adapted by other SIDS operating similar

microgrid systems. Through structured knowledge-sharing during PPG and implementation with regional energy networks and peer utilities, the project will document practical guidance and lessons learned to inform the design and implementation of comparable GEF-supported interventions in the region, including in countries such as Tuvalu, Vanuatu, and Niue, where higher renewable penetration is under preparation.

The project approach is aligned with the country's development priorities and climate commitments. Nauru's National Sustainable Development Strategy (2005–2025^[11]) and its energy roadmaps set targets to reduce dependence on fossil fuels, diversify the electricity mix, and strengthen energy security. The Updated NDC (2021–2030) commits to achieving 50% RE electricity in the medium term, while the Climate Change Policy underscores the energy transition as a pillar of climate resilience. Complementary initiatives such as the Nauru Energy Efficiency on the Demand Side (NEEDS) program reinforce this priority. The project directly contributes to these needs by addressing the main GHG sources while enhancing local capacities and creating enabling conditions for RE integration.

[1] [Greenhouse Gas Emissions in Nauru](#)

[2] [Energy Profile Nauru](#)

[3] [Second National Communication - Nauru](#)

[4] Asian Development Bank TA-9242 REG: Pacific Renewable Energy Investment Facility (formerly Pacific Renewable Energy Investment Program) - NAU-01 Project Preparation-Consultancy (49450-001) Solar Power Development Project: Feasibility Study

[5] <https://www.elibrary.imf.org/view/journals/002/2023/376/article-A001-en.xml>

[6] [Land Act 1976](#)

[7] ADB, 2022. Legal Readiness for Climate Finance and Investment in Nauru's Renewable Energy Sector (Internal document prepared for the Government of Nauru).

[8] https://minio.uninfo.org/uninfo-production-main/f4a8c115-7b2c-480e-a9d9-e6fedac4d635_NAUCCA2024.pdf

[9] (ADB). 2019. [PACIFIC FINANCE SECTOR BRIEFS: Nauru](#). Pacific Liaison and Coordination Office, October 2019.

[10] While the ADB solar initiative is complementary, it will be treated as part of the baseline rather than a source of financing for this project.

[11] https://nauru-data.sprep.org/system/files/nauru_development_strategy_2025_en_2005.pdf

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

Project Description

Theory of Change

Nauru's energy transition hinges on addressing the structural gap between growing RE capacity and the system's limited ability to absorb it. Without storage and grid modernization, the benefits of recent solar investments will remain constrained, perpetuating reliance on imported diesel. This project intervenes at that critical juncture: by deploying a BESS, establishing regulatory and operational frameworks, and building local technical capacity, it creates the conditions to maximize RE generation, reduce fossil fuel dependence, and strengthen energy security.

The project addresses the root problem of energy storage and described barriers through three interlinked components. First, the installation of a battery storage system which provides the infrastructure required to capture RE generation that would otherwise be curtailed and to reduce diesel reliance. Second, the enhancement of existing regulations (together with preparatory studies) that creates an enabling institutional and policy environment for safe and scalable renewable integration, while laying the foundation for eventual private sector participation. Third, training of workforce which is needed to operate RE and emerging technologies over time.

These components deliver as outputs a BESS integrated into the grid, regulatory provisions and technical standards adopted, studies with investment recommendations prepared, and trained personnel certified. The outputs lead to the following outcomes: increased RE penetration and reduced diesel dependence, enhanced regulations that enable RE deployment, and stronger technical capacity across the national workforce. Together, these outcomes achieve the project objective of strengthening RE integration in Nauru's national grid.

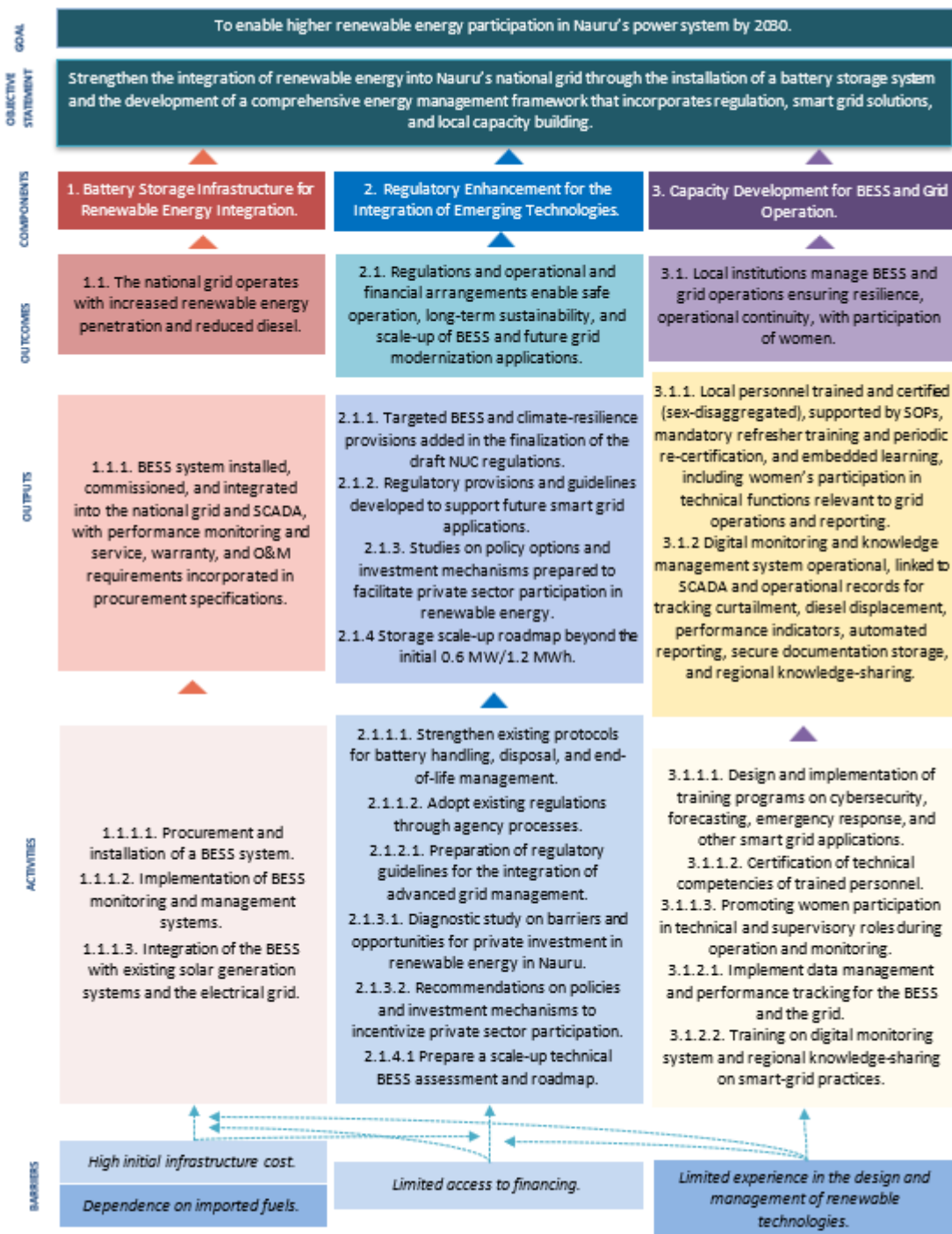
Indicative targets to be confirmed during PPG include reducing curtailed solar generation (MWh/year) and diesel generation required for serving peak demand and achieving verified direct emission reductions consistent with the Core Indicator estimate (tCO_{2e}). The project will also track changes in RE contribution to electricity supply, including the share of solar energy effectively dispatched through storage-backed operations. Targets will be validated through load and dispatch analysis and monitored through SCADA and operational records.

Sustainability of project outcomes will be secured through the institutionalization of long-term operational, financial, and governance arrangements for the BESS within NUC’s core functions. Rather than treating storage investment as a stand-alone asset, the project embeds enforceable standards, SOPs, maintenance architecture, and accountability mechanisms into routine utility operations. This approach ensures that system performance, diesel displacement, and curtailment reductions are sustained beyond the project lifecycle.

During PPG, the project will formalize these arrangements by defining operational responsibilities, compliance and reporting protocols, and mandatory trainings and periodic re-certification of operators. In parallel, a structured O&M and lifecycle financing framework will be developed to secure preventive maintenance, vendor support, spare parts, software updates, and battery replacement planning. Complementary disaster recovery protocols and a scale-up roadmap will further ensure that the initial system does not remain a stand-alone pilot but becomes the foundation for sustained performance and progressive expansion of storage capacity.

In addition, specific disaster recovery and resilience provisions will be developed for the BESS and associated interface equipment, including safe shutdown and restart procedures, post-event inspection checklists, assigned incident-response responsibilities, and minimum spare parts requirements. The project will also assess insurance and risk-transfer options for critical energy infrastructure and define an approach aligned with national risk management practices and NUC’s operating model.

The figure below presents the theory of change diagram, which focuses on the core project components (excluding the standard monitoring and evaluation “Component 4” described after the diagram).



Project Components

Component 1: Battery Storage Infrastructure for Renewable Energy Integration

This component focuses on the procurement, installation, and commissioning of a BESS the 0,6 MW/1,2 MWh with lithium-ion technology as a cornerstone infrastructure to enable greater RE integration and prepare the system for future modernization of grid operations. The system will be complementary to ADB's solar PV project under construction and will be located near the existing solar infrastructure to minimize transmission losses, and costs and maximize grid

integration. The BESS will be integrated through hybrid inverters and centralized control systems, ensuring safe operation and compatibility with existing infrastructure. A dedicated Chief Technical Assistant (CTA) will provide technical leadership across Component 1, complemented by targeted inputs from the Project Manager (PM) and Project Assistant (PA) to manage schedule, procurement interfaces, documentation, and coordination with NUC and suppliers.

Expected outcomes include an increase in the share of solar energy within Nauru's energy mix. By enhancing grid stability under variable climatic conditions, the BESS also ensures continuity of essential services such as health, water, and food supply. Identified risks include potential delays in equipment delivery or technical challenges during installation, which will be mitigated through specialized technical assistance and detailed procurement planning. Activities under this component include:

- **Procurement and installation of BESS.** According to previous experiences in SIDS and technical analyses, lithium-ion batteries are the most suitable option for Nauru due to their long lifespan, ease of installation, and capacity to handle high voltages and charging currents. This activity including technical specifications followed by procurement through bidding processes. It also includes site preparation (leveling, compaction), installation of supports and other safety systems required for containerized batteries, as well as managing the transport logistics. Mechanical assembly, electrical connections, and commissioning tests will be carried out (fault simulation and certifications). The facilities must be capable of operating under extreme weather conditions. Procurement specifications will include warranty requirements, long-term service and maintenance arrangements, availability of spare parts, vendor support provisions, and software update and cybersecurity requirements. The procurement and installation contract will include technical supervision and acceptance criteria, with staged payments linked to commissioning milestones and verified performance. These provisions will be aligned with the O&M and replacement roadmap plan to be prepared during PPG.
- **The CTA will lead the technical specification review, vendor technical due diligence, and acceptance criteria (including Factory Acceptance Testing and Site Acceptance Testing - FAT/SAT - requirements), while the PM will manage contractual sequencing and risk management and the PA will maintain procurement documentation, technical clarifications, and evidence required for acceptance and payment milestones.**
- **Adoption of monitoring and management systems to ensure safe and efficient operation.** This includes the technical integration of the existing SCADA system with the Battery Management System (BMS), Power Conversion System (PCS), and Programmable Logic Controller (PLC) of the BESS, enabling remote monitoring and centralized control. Additional sensors (temperature, gas, humidity) and fire suppression/climate control systems will also be installed. To ensure reliability, satellite communication redundancy will be implemented

along with automated anomaly response protocols. Emergency response training will explicitly include climate-related scenarios such as flooding, storms, and heat stress, ensuring operators are prepared to sustain supply during extreme events. The CTA will oversee the functional design for SCADA–BESS integration and the validation of monitoring, alarms, and cyber requirements, while the PM and PA will coordinate stakeholder inputs, mission logistics, and documentation of configuration, testing results, and training records.

- **Integration of the BESS with existing solar generation systems and the grid. A Midterm Technical Assessment (MTA) will be carried out under the technical leadership of the CTA, with PM coordination and PA support, to verify the readiness of the solar plant, interconnection equipment, protection schemes, and SCADA configurations for safe BESS coupling and dispatch. The MTA will identify corrective actions and an implementation plan to resolve any gaps before final integration and commissioning. Connection equipment (hybrid inverters or converters) will then be installed between the solar panels, the BESS, and the grid interconnection point. Protective devices will link the battery system to the main solar panel switchboard. A centralized control system will be configured to manage coordination between solar generation, batteries, and the grid. Joint operational tests will verify BESS charging/discharging while panels are active. During early implementation, the project will assess constraints beyond the solar–BESS interface, including distribution bottlenecks and load management issues that may limit absorption of variable RE. Findings will inform operational measures and a prioritized list of complementary upgrades for subsequent financing.**

Component 2: Regulatory Enhancement for the Integration of Emerging Technologies.

This component focuses on supporting the necessary adjustments to existing regulations and standards to enable the safe, efficient, and sustainable deployment of technologies such as BESS, smart grids, and variable RE. It addresses the absence of legal provisions for energy storage technologies, ensuring alignment with international best practices. The component also provides guidelines that enable future smart grid applications that prepare the ground for eventual private sector participation in the medium to long term. Regarding climate-resilient safeguards, the component aims to enhance technical specifications to ensure that storage and grid operations can withstand extreme weather events. In addition, Component 2 will deliver a storage scale-up roadmap beyond the initial 0.6 MW/1.2 MWh system. The roadmap will define the technical pathway (including grid constraints beyond the solar–BESS interface), sequencing, institutional responsibilities, and financing options required to expand storage capacity and avoid a stand-alone pilot outcome. Activities under this component include:

- **Strengthen existing protocols for battery handling, and end-of-life management.** This activity will review international standards and Nauru’s current waste management framework to enhance procedures for the safe handling, transport, recycling, and disposal of batteries. The revised protocols will integrate climate-resilient measures (e.g., heat-resistant storage and safe containment for tropical conditions) and contingency provisions for extreme weather events.
- **Adopt existing regulations.** Building on existing regulations, the project will support discussions and regulatory enhancements to ensure that BESS-specific provisions are formally endorsed, remaining compatible with future grid modernization and expanded RE integration. DCCNR will lead policy and regulatory coordination and the formal endorsement process for regulatory updates, with NUC providing technical guidance. The project will define responsibilities for periodic review and update of the regulations, including documentation and reporting compliance requirements linked to operational performance and safety. The project will establish a plan that clarifies institutional responsibilities for implementation, compliance monitoring, and periodic review, linking regulatory provisions to operational performance and safety standards. The plan will set out implementation milestones and accountability mechanisms to ensure that regulatory updates are effectively operationalized. Gender considerations will be integrated throughout the regulatory process, including in stakeholder consultations and workforce development provisions.
- **Preparation of regulatory guidelines for grid management.** This activity develops forward-compatible guidelines that, once additional physical upgrades are in place, will enable smart grid functionalities such as RE forecasting, voltage/frequency regulation, thresholds to operate under climate-related stress conditions, and improved supply–demand balancing.
- **Analysis of barriers and opportunities for crafting policies promoting private investment in RE.** This activity identifies structural investment gaps and provides recommendations to attract private sector participation. It also includes finding options for creating an enabling environment in the medium to long term, while recognizing that private participation is not expected during project implementation.
- **The project will define cost-recovery and budget integration mechanisms to ensure sustainable financing of BESS O&M, warranties, software updates, and lifecycle replacement.** These arrangements will be aligned with NUC’s operating model to secure long-term financial viability of the installed capacity.
- **Develop a scale-up roadmap supported by load profiling and dispatch simulations, identifying phased technical measures, sequencing, and responsible institutions to address system constraints beyond the initial solar–BESS**

interface, including distribution bottlenecks and demand-side management requirements.

Component 3: Capacity Development for BESS and Grid Operation.

The component focuses on strengthening the capacity of Nauru's institutions to independently operate the BESS and manage grid operations with higher levels of variable RE integration. It addresses skill gaps not only in battery storage management but also in advanced grid operation, ensuring that RE integration can be sustained and expanded over time. A core emphasis is on maintaining system functionality under extreme weather conditions. The component activities will include deliberate measures to promote the participation of women into technical and supervisory positions. To mitigate the structural risk of staff turnover, the project will institutionalize technical competencies within NUC's operational systems rather than rely on individual expertise. This will be achieved through standardized procedures, training-of-trainers arrangements, competency certification, digital knowledge retention mechanisms, and periodic refresher requirements embedded in routine utility operations. By anchoring skills in formal processes, documentation, and certified practice, the project aims continuity of BESS operation, and advanced grid management under higher renewable penetration levels. Gender-responsive capacity development measures will be embedded within all training, certification and supervisory strengthening activities, ensuring the systematic inclusion of women in technical and supervisory roles. Activities under this component include:

- Undertake training programs on cybersecurity, forecasting, emergency response, and other smart grid applications. Trainings will combine theoretical modules and hands-on instruction aligned with international standards covering cybersecurity, demand forecasting, grid synchronization, emergency preparedness, and BESS operation under stress conditions. The sub activities will include training-of-trainers, standardized onboarding modules for new staff, and refresher sessions to mitigate staff rotation risk and preserve operational continuity.
- Certification of technical competencies. Certification will ensure that skills acquired are formally recognized and institutionalized through a competency register.
- Promoting women's participation in technical and supervisory roles. Working in partnership with NUC, the project will implement recruitment practices designed to foster equal opportunities for women in control-room, maintenance, and supervisory positions.
- Institutionalize succession and knowledge retention arrangements for BESS operation. This activity will establish a formal succession framework defining role-based competency profiles, handover protocols, and continuity safeguards

to manage staff turnover risk. It will integrate structured onboarding pathways and incident documentation practices within NUC's internal systems to preserve operational memory and maintain safe BESS performance over time.

- **Development of a digital monitoring system to strengthen institutional capacity for RE integration and operational decision-making. The system will include data tracking, automated reporting, and adaptive feedback mechanisms, complemented with tailored training for NUC staff, and regional knowledge-sharing on operational lessons and smart-grid practices. The system will also host SOPs, checklists, training modules, and will support re-certification tracking to institutionalize learning.**

Component 4: Monitoring and Evaluation (M&E)

This component covers standard monitoring, reporting, and evaluation activities, including the preparation of Project Implementation Reports (PIRs), and a Terminal Evaluation (TE). The TE will follow UNDP Evaluation Office criteria (relevance, effectiveness, efficiency, impact, and sustainability) and will generate actionable insights to improve project performance and inform future initiatives. The TE will evaluate results and sustainability prospects and draw lessons to guide replication. Monitoring and reporting will include gender-specific results. PIRs, and the TE will report on progress against gender indicators and on the implementation status of the Gender Action Plan, including sex-disaggregated participation in training and certification and women's roles in operational functions relevant to BESS operation and maintenance and grid management.

Global Environmental and/or Adaptation Benefits that Would Not Be Achieved Without the GEF Project

The project will enable an estimated 11,659 tCO₂ of direct lifetime emission reductions, achieved by increasing utilization of existing solar capacity and displacing diesel generation currently required to meet evening and contingency demand.

In addition, the project creates the conditions for future expansion of battery storage in Nauru. If the remaining financing gap for longer-duration storage is closed in the coming years, the resulting increase in RE utilization could lead to approximately 60,000 tCO₂ of avoided emissions over the system lifetime. Applying a conservative causality factor of 20%, the consequential indirect emission reductions attributable to the GEF intervention are estimated at approximately 9,328 tCO₂.

This initiative will also facilitate knowledge exchange within the Pacific region, particularly operational practices that reduce solar curtailment in small island grids with high variable RE shares, supporting future replication in similar systems.

Without the project, structural barriers such as the absence of storage infrastructure, limited access to concessional finance, and scarce technical expertise, would persist.

As a result, solar generation and other variable RE power generation would continue to be curtailed, RE potential wasted, and reliance on imported diesel prolonged.

By financing the installation of facilities that increase RE participation, the GEF project will enable a different trajectory in the country, making available energy storage to ensure full utilization of RE power generation that would otherwise be lost. It also advances the introduction of technical standards, regulatory provisions, and assessments that contribute with the enabling conditions for safe and scalable RE integration and pave the way for private sector participation. Moreover, through training programs with deliberate inclusion of women, the project addresses gender inequalities and embeds skills within national institutions, ensuring that outcomes endure beyond its lifetime.

Closing the remaining financing gap for the complete 3.1 MW/6.2 MWh BESS would increase solar-based electricity production and unlock the potential for approximately 60,000 tCO₂ of avoided emissions over the system lifetime. The proposed GEF investment enables these additional benefits by establishing the regulatory, technical, and operational readiness required to mobilize financing for the larger battery capacity and the smart-grid functionalities needed to fully displace diesel reliance.

Contributions, Roles, and Sustainability of Environmental Benefits

The sustainability of environmental benefits rests on a distribution of responsibilities aligned with institutional mandates and strengthened technical capacities. NUC will lead the technical implementation, including installation, operation, and maintenance of the BESS system. Its institutional capacity will be reinforced through targeted trainings, ensuring that local staff can manage storage systems and RE integration independently over time. To ensure continuity of benefits, the project will define, during PPG, cost-recovery and budget integration guidelines to cover O&M, warranties, software updates, and replacement costs. The guidelines will be designed to ensure fiscal feasibility and alignment with public financial management regulations.

DCCNR will provide policy oversight and ensure alignment with national climate policies strategies, coordinating integration across relevant institutions and embedding project outcomes within the country's broader commitments. The DEMA will support providing environmental guidelines and protocols linked to national regulations for safe handling and end-of-life management of batteries, ensuring that storage deployment does not pose environmental risks.

Knowledge Creation, Management, and Sharing

The project will generate hands-on knowledge on the integration of RE through storage, and regulation of emerging technologies. Knowledge will be created through gathering data on in-filed operations, feasibility studies, technical discussions, and

lessons learned as well as trainings of personnel. This will include regional knowledge-sharing with East Pacific utilities on smart-grid practices and operational lessons from BESS integration.

Technical documentation will be co-developed with national stakeholders, covering BESS operation and safety, battery end-of-life management, and regulatory guidelines for RE integration and smart grid readiness. These resources will ensure local ownership, alignment with international standards, and transferability to other SIDS contexts.

The project's digital monitoring platform will capture operational data to support performance evaluation, inform regulatory updates, and guide process improvements. Lessons learned will be systematized into case studies and best practices, addressing not only infrastructure operations but also regulatory reforms, and identification of enabling conditions for private sector participation.

Knowledge will be disseminated through regional and international networks, including technical workshops, South–South exchanges, and open-access platforms. By documenting practical experience in integrating storage with solar generation, strengthening regulatory frameworks, and building inclusive human capital, the project will contribute evidence and models that can inform replication and scaling of RE integration efforts across SIDS.

Strengthening National Policies and Regulatory Coherence

The project will strengthen Nauru's energy policy and regulatory framework by supporting the development of standards, protocols, and regulatory provisions that enable the safe, efficient and sustainable deployment of BESS and RE integration. While designed with an immediate focus on storage, these instruments also establish a broader enabling environment for RE and other emerging technologies. By embedding climate-resilience requirements into these frameworks, the project ensures that energy infrastructure and operations are better prepared to withstand extreme weather events and continue delivering essential services. By aligning regulatory practice with international standards and adapting them to Nauru's specific conditions, the project reduces risks and provides clarity for future investments.

The regulatory outputs will prepare the system for grid modernization, including applications such as forecasting, voltage and frequency regulation, and supply–demand balancing. This ensures that once investments and capacities are in place, Nauru will have the groundwork to adopt smart grid functionalities. Similarly, commissioning financial and commercial assessments, including tariff and other cost-recovery implications for BESS O&M, warranties, software updates, and replacement, the project will support the definition of long-term policy and financing

arrangements capable of sustaining BESS operations and facilitating scale-up and future private participation where feasible.

Building on this foundation, the project expects that regulatory provisions are not only designed but also enforced effectively. These measures directly support the gradual modernization of the grid, while the integration of gender-responsive elements in training strengthens inclusiveness, setting a precedent for more equitable policy reforms across the energy sector.

Transformational Nature of the Project and Potential for Scaling Up

The GEF resources will drive transformational change in Nauru’s energy sector because it supports the reconfiguration of the power system to absorb higher shares of RE. Central to this shift is the deployment of a BESS, which provides the option to capture generation that would otherwise be curtailed. By absorbing excess RE power output, it reduces wasted potential and lowers diesel use in daily operations. Its modular design provides flexibility to expand in line with future demand, marking a first step toward closing the storage gap that must be filled for RE to displace fossil fuels at scale.

As a catalytic investment, GEF resources reduce technical and regulatory uncertainty, demonstrate operational performance, and create an investment pathway for financing the remaining 70 percent of storage capacity to utilize the total solar-based electricity expected to be curtail. This mobilization effect is also relevant to accelerating the transition from a partially RE grid to a fully renewable-powered mix.

Beyond infrastructure, the project strengthens the regulatory and institutional readiness required for emerging technologies such as battery storage and advanced grid management. It develops technical standards, operational protocols, and regulatory provisions that align with international best practice while being adapted to Nauru’s context. These measures reduce technical and investment risks, provide long-term clarity for decision-making, and prepare the system to integrate future applications such as forecasting, frequency regulation, and supply–demand balancing.

The project also strengthens Nauru’s resilience to climate and fuel supply shocks by reducing dependence on imported diesel and ensuring continuity of essential services. By enabling storage and more reliable integration of solar generation, the project safeguards critical infrastructure such as health facilities, water supply, and food storage. This resilience adds long-term value, positioning RE integration not only as a mitigation measure but also as a foundation for energy security and social stability.

Last, the project’s integrated approach creates conditions for scaling up both nationally and across other SIDS. The combination of storage infrastructure, regulatory frameworks, and institutional capacity establishes a replicable platform for additional investments in BESS and RE integration. Regionally, it provides a demonstration model for overcoming structural barriers common to SIDS, offering lessons on how to reduce fossil fuel dependence, enhance resilience, and achieve GHG reductions. By showing how BESS can simultaneously enable RE integration and strengthen climate resilience, the project delivers a model with direct applicability across the Pacific and other regions.

Coordination and Cooperation with Ongoing Initiatives and Project.

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

No

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

The project is designed to complement the ADB initiative Solar Power Development Project (FFP NAU 49450). In doing so, it creates the necessary synergies to expand Nauru’s solar generation capacity. While the ADB project addresses tapping the power RE generation potential, the GEF-financed BESS provides the flexibility required to capture excess RE production that would otherwise be curtailed.

The deployment of BESS facility is planned for co-location with the new ADB solar facilities, enabling efficient interconnection and minimizing transmission losses. This proximity optimize resources, allowing both initiatives to benefit from shared infrastructure, interconnection points, and monitoring systems. Coordination between NUC and DCCNR, will ensure that operational data from both systems is centralized into SCADA platform, improving real-time monitoring and adaptive energy management. Institutional synergies are also anticipated with the ADB.

Technical trainings will also require institutional coordination. While the content of training modules will be discussed with ADB staff for consistency, they are expected to build NUC and DCCNR's capacity beyond the scope of this single project.

Furthermore, the institutional knowledge generated through the BESS and RE integration project's capacity-building, technical documentation, and monitoring frameworks will be available to inform ongoing RE initiatives in the region.

During PPG, the project will formalize coordination with relevant Pacific regional energy institutions and networks to support peer learning, access to specialized technical expertise, and validation of operational and regulatory approaches for BESS integration in small island grids. This coordination will include technical exchanges related to SOPs, O&M and service arrangements, end-of-life protocols, and regulatory sequencing. Outputs from these exchanges will inform the BESS scale-up roadmap and the knowledge management measures embedded in the project design.

Regarding UNDP's role in the execution of the project, the implementation modality and the potential need for execution services will be assessed and determined during the PPG, in line with the revised GEF policy on allowable exceptions.

Core Indicators

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO₂e (direct)	11659	0	0	0
Expected metric tons of CO₂e (indirect)	9932	0	0	0

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

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

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

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO₂e (direct)	11,659			
Expected metric tons of CO₂e (indirect)	9,932			
Anticipated start year of accounting	2039			
Duration of accounting	10			

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

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

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

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

Indicator 11 People benefiting from GEF-financed investments

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	5,892			
Male	6,108			
Total	12,000	0	0	0

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

The target for GHG emissions mitigated was estimated based on the technical design and operational parameters of the BESS system. The calculation assumes a total storage capacity of 1.2 MWh, operating at approximately 85 percent efficiency with an average daily discharge of 1 MWh. Emission reductions were derived using the grid emission factor of 0.98 tCO₂e per MWh, consistent with national assumptions adopted by the DCCNR.

Based on these parameters, the installation of a BESS with a storage capacity of 1.2 MWh is expected to achieve an annual direct emission reduction of approximately 1,166 tCO₂e, representing a cumulative lifetime direct GHG emission reduction of about 11,659 tCO₂e over a 10-year period. This corresponds to the project's immediate contribution to Nauru's climate mitigation commitments and the achievement of global environmental benefits.

In addition to these impacts, the project is expected to generate consequential (indirect) GHG emission reductions through replication and catalytic effects expected to occur after project completion. These reductions are linked to Nauru's long-term storage requirements and the Government's ability to mobilize additional financing for scaling up BESS deployment. By supporting investment readiness and demonstrating feasibility, the project aims to help close the financing gap, paving the way for a larger-scale BESS deployment. It is estimated that a larger-scale system, comparable to the originally proposed 3.1 MW/6.2 MWh capacity intended to address the nation's energy storage gap, could yield additional emission reductions of 4,966 tCO₂e per year (49,660 tCO₂e over the lifetime). Based on these potential future reductions, applying a 20% causality factor, an estimated 9,932 tCO₂e in consequential (indirect) emission reductions can be attributed to the project's catalytic role.

Beyond national-level replication, the project is also expected to generate broader catalytic effects across Pacific Island Countries (PICs). As many PICs face similar constraints—limited storage capacity, high curtailment of solar generation, and institutional gaps in operating emerging technologies—the operational experience, regulatory lessons, and digital monitoring tools developed under this project provide a transferable model for accelerating RE integration in comparable island grids. Through the regional knowledge-sharing activity under Output 3.1.2, the project will document and disseminate practical insights on BESS operation, smart-grid practices, and approaches to reducing diesel reliance. By strengthening peer-to-peer exchanges and providing evidence of viable storage solutions in small systems, the project will contribute to replication and inform future investments across the region, supporting broader decarbonization efforts.

Regarding project beneficiaries, given that nearly 100 percent of households in Nauru are connected to the national grid, the project's interventions—aimed at improving power supply quality and reliability while enabling greater RE penetration—will benefit all grid-connected consumers.

Key Risks

	Rating	Explanation of risk and mitigation measures
CONTEXT		
Climate	Moderate	1. Cyclones/strong storms, storm surge, and flooding: <ul style="list-style-type: none"> • Robust anchoring system for battery containers and other BESS components, designed for cyclone-rated wind loading.

		<ul style="list-style-type: none"> • Elevate critical equipment above ground and above expected flood levels to prevent flood damage. • Design drainage systems for heavy rainfall and include water ingress protection for critical enclosures (IP rating/door sealing). • Include safe shutdown and restart procedures and post-event inspection checklists within the O&M documentation. <p>2. High temperatures, salt-laden humidity, and marine corrosion:</p> <ul style="list-style-type: none"> • Use battery cooling systems adapted to tropical conditions. • Prioritize sealed containers with marine-grade anti-corrosion materials/coatings and corrosion-resistant fittings. • Install containers with reflective roofs.
Environmental and Social	Moderate	<p>1. Population growth: • Promote rational energy use in households to avoid peak demand. • Design a modular BESS expansion plan. 2. Non-compliance with gender action plan: • Promote professional training for women in technical/engineering fields related to energy. • Guarantee female participation quotas. 3. Freshwater scarcity: • Install rainwater harvesting systems and reserve tanks at BESS facilities for non-potable use (fire control, cleaning). • Install alternative fire suppression systems (chemical foam, CO₂ systems). • Integrate solar desalination units for potable use. 4. Land tenure and lease agreement risk: • Review and strengthen the lease contract to include automatic renewal clauses and safeguards against third-party claims. • Secure agreements with local authorities to guarantee continuity. • Identify and assess alternative backup sites with prior technical and social studies.</p>
Political and Governance	Low	<p>1. Institutional transparency: • Adopt international standards (UNDP Accountability Framework and Anti-Fraud Policy) to support transparency. • Publish BESS contracts, progress, and costs online (UNDP standards) accessible to investors and citizens.</p>
INNOVATION		
Institutional and Policy	Moderate	<p>1. Lack of BESS battery disposal regulations: • Develop a regulatory framework for damaged/end-of-life batteries. • Include regional battery recycling agreements. • Explore pilot programs with local suppliers for safe battery handling.</p>
Technological	Moderate	<p>1. Obsolescence or technical failure of the BESS or SCADA: • Select components with international standards and proven performance in tropical climates. • Sign contracts with suppliers guaranteeing technical support for at least 5 years. • Include performance-based contracting with staged payments linked to FAT/SAT and commissioning milestones, minimum availability/efficiency thresholds, and remedies for non-performance (e.g., liquidated damages). • Implement critical control and storage redundancies. 2. Cybersecurity and software failures: • Conduct regular penetration testing and data backups. 3. Electrochemical hazards (thermal runaway, off-gassing, fire) affecting personnel safety and asset integrity: • Specify applicable safety</p>

		<p>standards and testing requirements in procurement and commissioning. • Require fire detection, gas detection/venting where applicable, and an appropriate suppression strategy integrated into the container design. • Integrate emergency response procedures, PPE requirements, and incident reporting templates into SOPs and training. • Conduct periodic emergency drills and refresher safety training. The procurement processes and capacities of the executing partner that will be conducting the procurement will be assessed as part of the Partnership Capacity Assessment Tool (PCAT). This includes a procurement assessment. If the results are deemed to insufficiently consider supply chain risks and supplier codes of conduct, then the possibility of having UNDP conduct the procurement for the project will be considered. In case the procurement is performed by the executing partner, requirements including forced labour bidder declarations, qualification requirements and strengthened contractual provision in procurements of solar panels/solar will be included. For procurements performed by UNDP, UNDP’s procurement policies require adherence to International Labour Standards, including a bidder declaration referring to the adherence to UN Supplier Code of Conduct (including adherence to International Labour Standards) and the General Terms and Conditions for Contracts: “Standards of Conduct” notes that Contractors and sub-Contractors need to comply with UN Supplier Code of Conduct and UNDP Social and Environmental Standards. UNDP can reject services that do not meet the requirements of the contract. UNDP will monitor the risk and implementation of the “Standards of Conduct” and can terminate a contract if supplier found to be in violation of contractual requirements.</p>
Financial and Business Model	Moderate	<p>1. Financial model may not support long-term O&M of the BESS: • Develop a long-term financial plan covering maintenance, tariffs, and battery replacement. 2. Uncertainty in battery replacement costs: • Define options for a replacement financing mechanism, including budget integration and potential co-financing sources.</p>
EXECUTION		
Capacity	Moderate	<p>1. BESS operation failures due to lack of local expertise: • Train local technicians in operation/maintenance with international experts. • Implement mandatory safety protocols. 2. Turnover/rotation of trained technical staff reduces operational continuity: • Apply a training-of-trainers approach and standardized onboarding modules for new staff. • Maintain a competency register and implement mandatory refresher training and periodic re-certification. • Embed SOPs, checklists, and troubleshooting guides in NUC systems and the digital platform to preserve institutional knowledge. 3. BESS-SCADA incompatibility: • Conduct technical compatibility tests before installation. • Update SCADA (if needed) to adapt to BESS. • Train local staff in troubleshooting communication failures. • Include manual operation mode as backup. 4. Delays in BESS grid connection: • Coordinate detailed timeline with stakeholders and conduct advance technical tests. 5. Delays in BESS integration due to warranty limitations of the existing solar system: • Evaluate whether contractual mechanisms exist to permit modifications or exceptions</p>

		under certain conditions. • Coordinate with the solar system provider and agree on potential BESS integration pathways that do not void the warranty. • Plan BESS integration into the solar system upon warranty expiration. 6. Underutilization/suboptimal dispatch of the BESS due to incomplete adoption of SOPs and O&M arrangements. • Formalize SOPs during PPG; implement mandatory refresher training and periodic re-certification; integrate utilization KPIs into SCADA reporting.
Fiduciary	Moderate	1. BESS maintenance dependent on external services: • Negotiate agreements with regional providers to reduce response times and stabilize prices. • Train locals in basic BESS maintenance to reduce external dependency. 2. Inability to insure BESS assets: • Establish contractual agreements with international suppliers including warranties and insurance clauses. • Explore regional insurance options or multilateral contingency funds.
Stakeholder	Moderate	1. Lack of coordination among government institutions (NUC, DCCNR): • Establish an inter-agency coordination committee. • Assign technical focal points responsible for follow-up. 2. Contractor non-compliance (delays, technical failures): • Include clear penalty clauses in contracts. • Ensure independent technical supervision during critical phases. • Apply independent verification of acceptance tests (FAT/SAT) and commissioning results prior to final payment.
Other		-
Overall Risk Rating	Moderate	The combination of technological, contractual, climatic, and institutional factors results in a moderate risk level. The proposed measures ensure the ability to respond to disruptions or delays, emphasizing contractual flexibility, local capacity building, effective inter-institutional coordination, and robust supervision to guarantee the project’s technical and operational sustainability. The risk management approach also addresses cyclone and flooding exposure, marine corrosion, electrochemical safety hazards, and staff turnover risks through formalized SOPs, contractual service requirements, and mandatory refresher training and re-certification.

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 GEF-8 Programming Strategies

The project is fully aligned with the GEF-8 programming strategies^{[1]¹²}, particularly in the climate change focal area. This initiative aims to reduce GHG emissions by decreasing reliance on diesel-based power generation, replacing it with stored solar energy. This directly addresses the GEF-8 objective to promote transformative shifts toward decarbonized and resilient energy systems. Additionally, by incorporating advanced technologies such as batteries and smart management systems, the project supports the clean technologies mentioned in the GEF-8 climate approach.

Although it does not directly address land degradation, the project contributes indirectly by reducing the need for infrastructure related to the transport, handling, and storage of fossil fuels activities that can negatively impact fragile soils like those in Nauru. By limiting the environmental impacts, it protects the natural resources from collateral impacts associated with energy infrastructure installation and operation, aligning with the GEF-8 objectives in this focal area.

Furthermore, the project promotes social inclusion and capacity development, integrating a gender perspective in its design and implementation. Through technical training programs with explicit female participation targets, it seeks to empower women in traditionally male-dominated roles, reducing structural gaps and fostering a just energy transition. This dimension addresses GEF-8's cross-cutting priorities, which establish gender equity and institutional strengthening as essential components for the long-term sustainability of environmental interventions.

The project is directly linked to GEF-8's integrated "Blue and Green Islands" program^{[2]¹³}. This initiative promotes resilient and sustainable energy solutions for islands vulnerable to climate change. Strengthening local energy infrastructure through energy storage is aligned with the program goals related to transforming island energy systems into more self-sufficient, resilient, and low-carbon models.

Finally, the project aligns with the core principles of the GEF-8 programmatic approach, which seeks transformative impact through integrated, multisectoral, and long-term interventions. By tackling structural drivers of environmental degradation, delivering co-benefits in climate mitigation, social equity, and energy efficiency, and fostering technical innovation, the project represents a catalytic investment in sustainable development.

Project Alignment with National Plans, Policies, and Strategies:

- Nauru National Climate Change Policy^{[3]¹⁴}: Complementing the ongoing ADB solar PV project with BESS will reduce CO₂ emissions, strengthen climate resilience, and enable greater RE participation in the energy mix. This supports key policy strategies such as increasing RE adoption to improve grid security, reduce fuel import dependence, and lower GHG emissions.
- Nauru Energy Policy Framework^{[4]¹⁵}: The BESS will optimize solar energy use, preventing electricity surplus curtailments and reducing diesel generation. The training component will ensure operational sustainability and promote local technical autonomy. These actions align with strategies to: 1) promote renewable energy use, 2) develop national capacities in clean technologies, 3) ensure equity in energy access, and 4) strengthen sector skill bases.
- Framework for Climate Change Adaptation and Disaster Risk Reduction^{[5]¹⁶}: Technical training considered in the project has the potential to drive sustainable development and climate resilience.

This component addresses the limited human capacity identified as a critical challenge to achieving Nauru’s adaptation and development goals.

- Nauru Energy Roadmap 2023-2030: The BESS included in the project is essential for increasing the share of RE sources in the energy mix. Operation and maintenance training will ensure system continuity. The project will contribute to several action plans, including: 1) strengthening local skills to meet energy sector demand, 2) improving energy efficiency, and 3) developing national capacity to operate solar PV and storage systems, advancing toward the 75% RE generation target by 2030.
- Nationally Determined Contribution (NDC^[6]¹⁷): The estimated reduction of 406 tons of CO₂ annually, resulting from diesel displacement, will directly support the zero-emissions goal for 2050. The gender approach in training reflects Nauru’s commitment to promote equality in the energy sector, linked to contributions such as: 1) establishing a stable and affordable energy grid, and 2) developing capacity to operate storage systems, with special attention to female representation.
- National Sustainable Development Strategy 2019-2030^[7]¹⁸: The BESS will improve energy security and promote qualified local employment, including women. These actions fulfill objectives to: 1) build a just society guaranteeing equal opportunities (social and community area), and 2) provide reliable, affordable, and sustainable energy supply for socioeconomic development (infrastructure area).

[1] https://www.thegef.org/sites/default/files/documents/2022-04/GEF_R.08_29_Rev.01_GEF8_Programming_Directions.pdf

[2] https://www.thegef.org/sites/default/files/documents/2022-10/GEF_IP_BlueGreenIslands_2022_10_12.pdf

[3] <https://nauru-data.sprep.org/resource/nauru-national-climate-change-policy>

[4] <https://nauru-data.sprep.org/resource/nauru-energy-policy-framework>

[5] <https://nauru-data.sprep.org/resource/ronadapt-2015>

[6] <https://unfccc.int/sites/default/files/NDC/2022-06/Nauru%20Updated%20NDC%20pdf.pdf>

[7] <https://naurufinance.info/wp-content/uploads/2020/07/Final-NSDS-2019-2030.pdf>

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: No

Civil Society Organizations: No

Private Sector: No

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

Key institutional stakeholders were actively consulted during the development of the PIF, in alignment with GEF policy requirements. This included national agencies such as the DCCNR and NUC, which have direct roles in previous project execution, and energy planning. Their contributions were critical in defining the project's theory of change, technical scope, co-financing strategy, and alignment with national priorities.

Regarding the specific groups:

- **Indigenous Peoples and Local Communities:** The project site (BESS installation) does not directly impact or require relocation of local communities. The land is government-leased and does not involve communal or customary land rights. Thus, consultation with local communities was not deemed necessary at the PIF stage.
- **Civil Society Organizations (CSOs):** Given the technical nature and centralized institutional ownership of the BESS infrastructure, no direct CSO representatives were identified at the PIF stage.
- **Private Sector:** The private sector will not have a direct role in the implementation, ownership, or operational management of the project. Its involvement is limited to the provision of goods and services—such as the supply of battery systems, installation services, or technical support. As such, private sector actors were not engaged during the PIF.

During PPG, the project will organize stakeholder consultations and information activities with local communities, CSOs, and relevant private sector actors. These engagements will ensure that stakeholders are adequately informed about BESS safety, fire risk management, emergency procedures, and end-of-life handling, and will provide a channel to capture concerns to inform final design choices (including site-specific safety measures, SOPs, and communication protocols). The PPG process will document consultation outcomes, including participant lists, key issues raised, and responses incorporated into the project design and monitoring arrangements.

(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?

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

Environmental and Social Safeguard (ESS) Risks

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

Yes

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

E. OTHER REQUIREMENTS

Knowledge management

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

Yes

ANNEX A: FINANCING TABLES

GEF Financing Table

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

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant(\$)	Agency Fee(\$)	Total GEF Financing (\$)
UNDP	GET	Nauru	Climate Change	CC STAR Allocation: CCM-1-1	Grant	1,776,485.00	168,765.00	1,945,250.00
Total GEF Resources (\$)						1,776,485.00	168,765.00	1,945,250.00

Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount (\$)

50000

PPG Agency Fee (\$)

4750

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG(\$)	Agency Fee(\$)	Total PPG Funding(\$)
UNDP	GET	Nauru	Climate Change	CC STAR Allocation: CCM-1-1	Grant	50,000.00	4,750.00	54,750.00
Total PPG Amount (\$)						50,000.00	4,750.00	54,750.00

Please provide justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total(\$)
UNDP	GET	Nauru	Biodiversity	BD STAR Allocation	1,340,000.00
UNDP	GET	Nauru	Land Degradation	LD STAR Allocation	660,000.00
Total GEF Resources					2,000,000.00

Indicative Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing(\$)	Co-financing(\$)
CCM-1-1	GET	1,776,485.00	7105940
Total Project Cost		1,776,485.00	7,105,940.00

Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Government (DCCNR)	Grant	Investment mobilized	7105940
Total Co-financing				7,105,940.00

Describe how any "Investment Mobilized" was identified

The project is co-financed by the Government of the recipient country in the amount of US\$7.1 million (representing a ratio of 4:1 to GEF funding), provided entirely in kind. This co-financing is allocated as follows: USD 6.1 million for BESS infrastructure (prepaid land lease, grid integration equipment, and technical assets); USD 0.5 million for capacity development; USD 0.12 million for gender equity initiatives; USD 0.18 million for monitoring and evaluation systems; and USD 0.2 million for project management costs (PMC).

Of this total, USD 7.1 million (97.9%) qualifies as Investment Mobilized, as it generates durable assets with a useful life exceeding one year. This includes:

- 100% of BESS infrastructure, capacity development, and M&E systems;
- 60% of gender equity funding (intangible protocol design);
- 30% of PMC (physical equipment for the Project Management Unit).

The remaining components (2.1%) constitute recurrent operational expenditures under PMC and gender equity workshops.

3 Note: Make this into a “pop-up” which appears only if PPG was selected, and if amount requested is above limits, they have to justify it

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	Nancy Bennet	7/15/2025	Nancy Bennet	1917774657	nancy.bennet@undp.org
Project Coordinator	Sergio Quiros Navas	7/15/2025	Sergio Quiros Navas	639695269056	sergio.quiros.navas@undp.org

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

Name	Position	Ministry	Date (MM/DD/YYYY)
Berilyn Jeremiah	Secretary for Environment Management & Agriculture GEF Focal Point	Department of Environmental Management and Agriculture	10/22/2025

ANNEX C: PROJECT LOCATION

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

Nauru is located approximately 40 kilometers south of the equator in the Pacific Ocean, specifically between coordinates 0.51°S – 0.55°S and 166.91°E – 166.95°E. The BESS will be installed in the vicinity of the Nauru Solar Power Development Project, located at coordinates 0.54°S 166.43°E (-0.54,166.43), in the district of Meneng.



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

SESP

ANNEX E: RIO MARKERS

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

ANNEX F: TAXONOMY WORKSHEET

Level 1	Level 2	Level 3	Level 4
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Influencing Models	Transform policy and regulatory environments.	Technology Innovation; Policy and Regulatory Frameworks.	Technology Innovation: Deployment of lithium-ion BESS, SCADA integration, modular and scalable systems. Policy and Regulatory Frameworks: Development of battery waste management protocols, occupational safety manuals, integration with national climate and energy policies.
Stakeholders	Beneficiaries.	National Government; Local Communities.	National Government: DCCNR coordination, policy alignment. Local Communities: Awareness-raising and social inclusion in energy transition.
Capacity, Knowledge and Research	Capacity Development.	Institutional Capacity Strengthening; Training and Certification; Best Practices and Lessons Learned.	Institutional Capacity Strengthening: Creation of technical protocols, integration into national regulations. Training and Certification: Technical training for 20 NUC personnel (with gender parity), emergency protocols, BESS operation. Best Practices and Lessons Learned: Documentation, regional dissemination, case studies.
Gender Equality	Gender Mainstreaming	Beneficiaries	Targeted recruitment into energy sector roles during and post-installation. Female participation in certification programs, inclusive curricula, mentorship programs.
Focal Area/Theme	Climate Change	Climate Change Mitigation	Renewable Energy: Full integration of solar generation with battery storage to reduce diesel reliance.