

## TERMS OF REFERENCE FOR CONSULTANTS

### KIR (49450-021): South Tarawa Renewable Energy Project Terms of Reference for Consultants (Firm)

#### A. Overview

1. The proposed South Tarawa Renewable Energy Project (STREP or the Project) will support upscaling of solar power generation in Kiribati. The Project will reduce dependence on fossil fuel imports by increasing the renewable energy (RE) percentage of electricity generation. The Project has been prioritized by government for climate financing and is in line with national policies and plans including the Kiribati Vision 20: 2016–2036 (KV20),<sup>1</sup> the Kiribati Development Plan 2016–2019,<sup>2</sup> the Kiribati Climate Change Policy, the Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management 2014-2023,<sup>3</sup> the *Kiribati Integrated Energy Roadmap July 2017 (KIER)*,<sup>4</sup> Kiribati Nationally Determined Contribution (NDC) under the United Nations Framework Convention on Climate Change.<sup>5</sup>

2. The Project is requested to be financed by ADB under its Pacific Renewable Energy Investment Facility.<sup>6</sup> Cofinancing is requested from development partners including the Strategic Climate Fund under the Scaling-up Renewable Energy Program in Low Income Countries (SREP) and others.<sup>7</sup> Financing for the Project is considered for approval in 2020. The proposed Project is included in the KIR Investment Plan (IP),<sup>8</sup> the preparation of which is financed by SREP and administered by the World Bank. The IP sets out the Government of Kiribati strategy for addressing the country's energy security problems and its contributions to global efforts to mitigate climate change.

3. The STREP impact is aligned with renewable energy generation increased and greenhouse gas emissions reduced in Kiribati and its outcome is increased generation and utilization of clean energy in South Tarawa. STREP has three outputs: (1) solar photovoltaic and battery storage system installed; (2) enabling framework for renewable energy adopted; and, (3) institutional capacity in renewable energy project development, management and supervision enhanced. Specific project deliverables include the following:

- a. 4.1 MW solar PV and 1.9 MW/2.6 MWh battery energy storage system installed;
- b. enabling framework for renewable energy adopted, including assessments and revisions of (i) electricity legislation, (ii) grid codes, (iii) technical standards, and (iv) model documentation for private sector engagement; and
- c. institutional capacity building for stakeholders including on project management and supervision and operation and maintenance of renewable energy generation assets.

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<sup>1</sup> Government of Kiribati, "Kiribati 20-Year Vision 2016-2036 (KV20) Draft", 2016.

<sup>2</sup> <http://www.mfed.gov.ki/sites/default/files/Kiribati%20Development%20Plan%202016%20-%202019.pdf>.

<sup>3</sup> [http://www.mfed.gov.ki/sites/default/files/KJIP%20BOOK%20WEB%20SINGLE\\_0.pdf](http://www.mfed.gov.ki/sites/default/files/KJIP%20BOOK%20WEB%20SINGLE_0.pdf).

<sup>4</sup> <https://irena.org/publications/2017/Jul/Kiribati-Integrated-Energy-Roadmap>.

<sup>5</sup> [http://www4.unfccc.int/ndcregistry/PublishedDocuments/Kiribati%20First/INDC\\_KIRIBATI.pdf](http://www4.unfccc.int/ndcregistry/PublishedDocuments/Kiribati%20First/INDC_KIRIBATI.pdf).

<sup>6</sup> ADB. 2017. *Report and Recommendation of the President to the Board of Directors: Proposed Pacific Renewable Energy Investment Facility*. Manila.

<sup>7</sup> SREP is under the Strategic Climate Fund of the Climate Investment Funds ([www.climateinvestmentfunds.org](http://www.climateinvestmentfunds.org))

<sup>8</sup> The KIR SREP Investment Plan will be made available in June 2019.

## B. The Technical Assistance

4. A transaction technical assistance (TA) is required to prepare the Project for SREP and ADB financing approval. The TA will be used to draft Kiribati's enabling legal and regulatory framework to encourage future private sector participation in RE, provide capacity building to key energy sector stakeholders, and conduct all required due diligence including grid integration and feasibility studies to ensure a well-prepared Project. ADB will engage the consultants through quality- and cost-based selection (80:20) using simplified technical proposal. The F-TRTA will have the following major outputs and activities:

- a. **Feasibility Study.** The Feasibility Study shall include (i) an RE grid integration study covering the impact of the proposed Project, and other planned RE projects, on the combined operation of the existing system and including recommendations for needed grid strengthening, (ii) a Project feasibility study for an optimized Project scope to ensure reliable, efficient and climate resilient operation of the grid-connected PV and battery combined system, (iii) all required due diligence covering technical, financial, economic, procurement, social and environmental safeguards, climate risk, social and gender assessments and reports, and implementation arrangements to prepare the project for the Strategic Climate Fund - SREP and ADB approval.
- b. **RE Enabling Framework.** The F-TRTA will support the formulation and development of a multicomponent renewable energy enabling framework to enable private sector transactions in Kiribati. The F-TRTA will specifically support the Government of Kiribati, in close collaboration and consultation with relevant agencies particularly the Office of the Attorney General, in: (i) drafting a gender sensitive Energy Act to regulate and incentivize the scaling-up of renewable energy and energy efficiency in all sectors, including recommendations for tariff setting to ensure sustainable RE project operations for public and private sector players; (ii) formulating technical standards on RE related electrical equipment, which follow New Zealand and Australian standards so that such standards can be enforced; (iii) drafting and updating grid codes to support the safe operation of the grid at high-levels of RE penetration; and (iv) preparing request for proposals, power purchase and sales agreements (PPSA), standard forms of contract and other legal documents to support participation of Independent Power Producers in Kiribati.
- c. **Capacity building support.** Based on relevant capacity assessments on the executing and implementing agencies (EA and IAs), the TA will formulate a comprehensive capacity development plan with specific recommend actions to support capacity development. Recommend implementation and procurement arrangements and assist the implementing agencies in pre-implementation works including preparation of bidding documents and assistance in procuring contractor(s). Provide classroom training in KIR on recommended capacity development activities to include: (i) operation of integrated Diesel/PV/Battery system; (ii) operation and Maintenance of PV array and BESS; (iii) procurement and management of EPC/turnkey contracts; (iv) procurement and management of Independent Power Producer contracts. The F-TRTA will also evaluate PUB's generation and network planning and simulation software needs and planning capacity development needs. Assess the various software options available in the marketplace and make recommendations on the appropriate software tools to be purchased to meet future PUB needs. Identify training needs for the selected software. The capacity building budget must cover hands-on technical national, regional and international training. It will also include

technical study visits and targeted training for MISE and PUB on networks systems planning and operations, grid integration, and O&M for PV and BESS. A multi-user network system planning, modeling and simulation software and accompanying hardware, with corresponding training, will be procured under the F-TRTA and to be installed in MISE and PUB. Designated operators will be trained specifically, in addition to utility operators under PUB. The consultants will identify, analyze and recommend the most cost-efficient tools and develop a capacity building program for approval by ADB and the EA, and IAs. Consultants must prepare a scope of work and cost estimate for any additional software procurement and training for inclusion in the ensuing investment project.

### **C. Related Activities**

5. The Government of Kiribati, ADB, World Bank and the Green Climate Fund (GCF) are financing the South Tarawa Water Supply Project (STWSP). The project will install a solar PV-powered seawater desalination plant, among other outputs. This on-grid solar plant component, to be owned and operated by the Public Utilities Board (PUB), is indicatively a 2.5 MW PV array and 2 MW Solar Smoothing Energy Storage system (SSES). A Project Design Advance (PDA) consultant team has been engaged for the project. The Consultant will need to work closely and coordinate with the PDA team on the design and specifications for both the STWSP and the STREP solar PV and battery system to ensure compatibility as well as economy and efficiency in procurement, construction and operation and maintenance activities.<sup>9</sup>

6. The Government of New Zealand commissioned a Least Cost Plan for the Kiribati Electricity Sector (the LCP).<sup>10</sup> The consultant must review the LCP including the planned grid additions to inform the grid integration study and overall feasibility study. Consultants must ensure that the proposed solar and battery projects as well as future projects are accounted for and recommend measures to ensure continued stability of the South Tarawa grid.

### **D. Implementation Arrangements**

7. The Ministry of Finance and Economic Development (MFED) will be the executing agency. The Ministry of Infrastructure and Sustainable Energy (MISE) will be the implementing agency for the RE enabling framework component while PUB will be the implementing agency for all other aspects of the Project (including procurement, installation and maintenance of the solar PV and BESS). MISE is responsible for planning, managing, and coordinating activities in the energy sector. The PUB is the state-owned vertically integrated utility responsible for providing electricity, water, and wastewater services on South Tarawa and some villages of North Tarawa.

8. A consulting firm (the Consultant) will be recruited by ADB to prepare the Project and assist in procurement and other pre-implementation works to PUB and MISE.

9. At the sole discretion of the Government and subject to satisfactory performance on this Contract, and the receipt of an acceptable proposal, the Consultant engaged to provide the services detailed in these terms of reference may be directly engaged by the government to provide follow-on project supervision services on this investment project.

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<sup>9</sup> The STWSP feasibility study will be provided at proposal preparation stage.

<sup>10</sup> The LCP, prepared by consultants ITP Renewables, will be provided at proposal preparation stage.

## **E. Consultant Scope**

10. The Consultant will deliver the following outputs within 18 months, as described in Section B and further detailed in the subsequent sections of this ToR, and following ADB's and the Government of Kiribati's policies, guidelines and requirements.

- a. Inception Report (includes the optimized project scope, project risk register)
- b. Feasibility Study (includes the RE grid integration study and all due diligence reports covering technical, financial and economic analysis, environmental and social safeguards, climate risk, social and gender assessments and their corresponding Facility Financing Proposal, and linked documents)
- c. Gender sensitive RE Enabling Framework recommendations and model documents (draft Energy Act, tariff setting/methodology, PPA, RFP)
- d. Bidding Documents
- e. Capacity Building Support
- f. Final Report

11. The Consultant shall provide procurement support during bidding and evaluation, up to Contract Award.

## **F. Consultant Tasks per Output**

### **12. Inception Report**

- a. The Consultant will review latest status of relevant ongoing and planned projects, such as the STWSP PV component, and the STREP with MFED, MISE, PUB, and ADB. The Inception Report will include a detailed workplan, project risk register, a draft Table of Contents for the Final Report, and an optimized project scope as described below.
- b. Optimize Project Scope
  - (i) Review existing SREP IP, STWSP, and LCP reports. Collect additional data as required from MISE and PUB. In consultation with ADB, MISE and PUB identify which planned projects are firm and can be included in the forecast and the grid integration study and assess potential impacts to the stability of the grid. Recommend measures to ensure continued grid stability and climate resiliency.
  - (ii) Based on demand forecasts, existing generation and network capacity, and firm planned generation projects as indicated in strategic documents (KIER, NDC, KV20), identify the least cost PV array and energy storage type(s) and capacities to be included in the Project. Possible load shedding of reverse osmosis (RO) plant to be considered based on advice from the STWSP PDA. The Consultant shall work closely with the PDA Consultant to ensure that both projects are optimized and will provide the most efficient and cost-effective solution for PUB.
  - (iii) Conduct initial site selection and assessments and stakeholder consultations, including solar resource, climate risk, social and environmental safeguards, grid and water connections, and specific siting/layouts, and required pre-implementation studies.
  - (iv) Confirm optimum PV and BESS capacities and technical parameters to match available financing and optimize project's contribution to achieving KIER, NDC and/or KV20 targets.

13. **Feasibility Study**

- a. **RE Grid Integration Study.** Assess the impact of the proposed Project, and other planned RE projects, on the combined operation of the existing grid system, and recommend optimum phasing of future projects in generation, transmission and distribution, network communications, data acquisition, monitoring and planning.
- (i) In consultation with PUB and MISE, and in collaboration with the STWSP PDA consultant, establish system operational criteria and technical standards for the South Tarawa power system, considering the requirements and specifications for STWSP and STREP, and future firm projects, as well as demand forecast and development plans.
  - (ii) Confirm suitability of proposed solution using generation and network simulation and planning software/models together with any required specialized software to be purchased under the assignment. Issues of PUB system reliability, operational regime, integration of variable generation resources, network loading, and any special protection arrangements, must be identified, recommended and costed in determining least cost plan. Analyze, compare, and assess the suitability of various planning and network simulation software and recommend the most suitable and cost-effective option. Procure the software and train or assist in training PUB, MISE and PMU staff to fully utilize such software. As necessary, recommend a cost-effective and relevant training for key staff in PUB.
  - (iii) Prepare comprehensive (whole of system) generation and network models of the South Tarawa electricity system and conduct simulations and assessment of generator loading and ramping capabilities (all generation units separately modelled) covering the various development stages to 2040, as referenced KIER, NDC, and KV20.)
  - (iv) Analyze PUB operational issues with increased requirements for load following and spinning reserve; and identify and cost any operational changes and measures to be taken by PUB to ensure successful RE integration and ensure grid stability as a result of increasing intermittent generation, particularly from both the STREP and STWSP PV and BESS
  - (v) Consider PUB system reliability, operational regime, integration of variable generation resources, network loading, and any special protection arrangements, particularly considering load shedding of large installations such as the proposed desalination plant
- b. **Project Design Concept.** Prepare overall Project design concept. Assess technical options for Project components and provide recommended minimum technical specifications and employer's requirements in the bidding documents. Identify interface between the Project and existing PUB assets including (i) scope and (ii) control, metering, signalling and protection arrangements. Review adequacy of planned and existing communication links between PUB generation assets and planned new generation assets and include in scope new communication links as required for PUB system operation. Confirm the optimum size of the PV array and BESS with due consideration of the STWSP PV array and energy storage system and the possible load shedding of the desalination plant
- (i) **Performance Specifications.** Prepare performance specifications such as performance ratio and power output based on design concept and scope of work of approved Project.

**(ii) Proposed Site(s)**

- (a) Assess and confirm suitability of proposed sites within the Bonriki water reserve, or elsewhere as identified for allocation by the Government of Kiribati., and confirm allocation of Project area with the least involuntary resettlement impacts where possible.
- (b) Either directly or through a subcontractor, undertake intrusive geotechnical and geological analysis of the site, including assessment of construction issues such as site earthworks requirements, implications for footing design, slope stability issues, access roads, borrow pits, and others, to a level sufficient for firms to bid on the subsequent turnkey contract. Conduct a risk assessment of surveying/testing activities associated with the detailed investigations and identify management measures (including health and safety) to be implemented and to be included in services contracts for any sub-contracting.
- (c) Either directly or through a subcontractor, undertake topographical and hydrological surveys of selected site.
- (d) Either directly or through a subcontractor, perform needed survey (UXO) to ensure there are no unexploded ordnances in the location of the site.
- (e) Prepare the following outputs, reflecting all measures identified in the site assessments and environmental management plan, at a level suitable for feasibility study and bidding documents; and sufficient to enable construction firms to submit detailed bids. The outputs include but are not limited to:
  - ii Project conceptual design drawings, location plans, site plans and technical specifications and drawings
  - iii Access roads and perimeter fencing design.
  - iiii Water supply design. Identify utility access points (water and electricity) during construction and operation.

**(iii) Cost Estimates.** Prepare Project cost estimates to be broken down in sufficient detail to allow financial and economic evaluation. A cost estimate summary report shall: (i) clearly state the basis/assumptions behind all unit rates; (ii) reference other local costs for similar items of work, unless this can be justified not to be possible; (iii) outline justification for the level of contingency applied; and (iv) detail all other assumptions made in the preparation of the cost estimates.

**(iv) Financial Due Diligence.** Conduct Financial due diligence in accordance with ADB's requirements<sup>11</sup> including:

- (a) Following ADB's guidelines, conduct a financial management assessment of the executing and implementing agencies, including (a) assessing whether previous financial management assessments have been conducted by ADB or other agencies and, if so, reviewing the results and ascertaining whether these can be used as input, (b) assessing capacity for planning and budgeting, management and financial accounting, reporting, auditing, internal controls, and information systems (c) reviewing proposed disbursement and funds-flow arrangements, and (d) concluding on the financial management risk rating and identifying and confirming measures for addressing identified deficiencies;

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<sup>11</sup> ADB. 2014. Financial Management, Cost Estimates, Financial Analysis, and Financial Performance Indicators. *Operations Manual*. OMG2/BP. Manila. Also refer <http://www.adb.org/projects/operations/financial-management-resources>.

- (b) supporting the preparation and agreement of cost estimates and a financing plan, which are based on verifiable data and are sufficient to support project implementation; include life-cycle costs of major equipment with consideration for asset replacement and O&M expenses (spares) within the life of the plant.
  - (c) preparing financial projections and conducting financial analyses of the project and of the executing and implementing agencies, and incremental recurrent costs, to determine financial sustainability, and reviewing proposed cost-recovery and tariff policies, including affordability;
  - (d) conducting financial evaluations (financial cost-benefit analyses) including sensitivity analyses of project components that have a cost-recovery objective; and calculate the financial internal rate of return.
  - (e) where significant risks are identified to project financial sustainability or viability, proposing relevant financial performance indicators to be incorporated in financial covenants; and
  - (f) assessing and reaching agreement on financial reporting, auditing and public disclosure arrangements for the project, and, as appropriate, identifying and agreeing arrangements for receiving financial statements from executing and/or implementing agencies.
- (v) **Economic Due Diligence.** Conduct an economic analysis for the project in accordance with ADB's requirements<sup>12</sup>, including:
- (a) Assess economic costs and benefits associated with the proposed project and establish and compare the with-project and without-project scenarios. Calculate the Economic Internal Rate of Return (EIRR) for the project. Identify and analyse likely economic uncertainties that could affect the project's viability and undertake risk and sensitivity analysis in accordance with ADB's Handbook for Integrating Risk Analysis in the Economic Analysis of Projects.
  - (b) The economic analysis and economic due diligence of the project shall follow ADB's 2017 "Guidelines for the Economic Analysis of Projects" <sup>13</sup>
- (vi) **Implementation Arrangements.** Review PUB implementation capacity and recommend PUB Project implementation arrangements to include:
- (a) Organization and responsibilities of Project Management Unit (PMU) within PUB. Individual consultants will be recruited by PUB as PMU Staff or the existing PMU for the STWSP will be reinforced with experts relevant to the STREP, as appropriate.
  - (b) It is envisaged that PUB will recruit a Construction Supervision Consultant (possibly jointly with the consultant engaged for the STWSP) who will work closely with and assist the PMU in project management, design audit, and act as project owner's engineer and provide construction supervision services for PUB over the selected contractor who will execute the Project.

<sup>12</sup> ADB *Guidelines of the Economic Analysis of Projects*. Available from <https://www.adb.org/documents/guidelines-economic-analysis-projects>.

<sup>13</sup> <https://www.adb.org/sites/default/files/institutional-document/32256/economic-analysis-projects.pdf>

- (c) Preparation and maintenance of a Project Implementation Plan in Gantt chart format showing key activities and responsible parties and identifying critical path and float times.

**(vii) Procurement Approach**

- (a) A single turnkey contract with post qualification and single-stage-one-envelope procurement methodology utilising the ADB Standard Bidding Documents for the Procurement of Plant<sup>14</sup> is envisaged.
- (b) Conduct a Project Procurement Risk Assessment in accordance with the ADB Guide on Assessing Procurement Risks and Determining Project Procurement Classification (2015).<sup>15</sup> The risk assessment shall take into account all existing available similar exercises conducted under prior ADB and other donor projects. The risk assessment shall include a market analysis to ascertain the level of interest of the supply market to provide the goods and services required under the project. The ADB Guidance Notes (GN) on Strategic Procurement Planning and The Procurement Risk Framework may also be referenced.<sup>16</sup>

**(viii) Environmental Due Diligence.** Undertake an environmental assessment for the project in accordance with ADB's Safeguard Policy Statement 2009 (SPS) including:

- (a) in coordination with the social safeguards and social/gender specialists, undertake meaningful consultations with key stakeholders, beneficiaries and directly and indirectly affected people and communities as agreed with PUB and ADB.
- (b) identification and description of physical, biological and socio-economic baseline conditions of the sites and project areas.<sup>17</sup> Engage subcontractors to carry out environment related site surveys, as required, based on a TOR to be agreed with ADB
- (c) conduct an audit of PUB's existing facilities and operations and identification of corrective actions
- (d) undertake the impact assessment and identify the measures required to avoid and/or manage/mitigate adverse impacts and prepare a costed environmental management and monitoring plan (EMP) for the pre-construction (including identification of potential materials sourcing and haulage for the access road), construction and operations stages of the project
- (e) based on items (i) – (iv) prepare the initial environmental examination (IEE) for the project and ensure that environmental safeguard measures to be implemented for the Project will comply with both SPS and country safeguard system
- (f) assist the PUB prepare and submit the environmental license application for the project (including any reformatting of the IEE

<sup>14</sup> <https://www.adb.org/documents/procurement-plant-guide-2016>

<sup>15</sup> <https://www.adb.org/documents/procurement-risks>

<sup>16</sup> All reference documents are available at <https://www.adb.org/business/main>

<sup>17</sup> The baseline will be sufficiently detailed and include noise measurements given the largely urban nature of the likely project sites and include information from the social/gender assessment as required. The baseline will be specific to the sites and project areas and not include generic information about Kiribati in general unless specific contextual information is required.

- necessary to meet EIA reporting requirements under the country safeguard system)
- (g) based on the detailed design, update the assessment and EMP and ensure the updated assessment and EMP, conditions of the environmental license, TOR for contractor's environmental staff, and clear requirement for the contractor to prepare and submit their construction EMP (CEMP) for review and clearance by the PMU at least 30 days prior to commencement of any construction activities (including site clearance), are included in the bid/contract documentation for the project.
- (ix) **Social Due Diligence.** Undertake social safeguards, poverty and gender assessments for the project in accordance with ADB's requirements and other co-financiers if applicable, including but not limited to the following:
- (a) Review the scope and activities of the proposed project and conduct due diligence on its potential impacts on land acquisition and/involuntary resettlement. Site selection will minimize physical and economic displacements where possible.
  - (b) In coordination with relevant government agencies, conduct stakeholder and community consultation activities with all relevant stakeholders (e.g. affected persons, CSO/NGOs, women) including focus group consultations, interviews and surveys to examine socioeconomic characteristics of the project area and expected social and economic benefits and involuntary resettlement impacts of the project. Prepare a report on consultations with local communities as part of the safeguards documents and draft a stakeholder and community consultation plan. Relevant information such as draft safeguards documents will also be disclosed in accordance with the country's laws and ADP SPS and Communication Policy. Minutes of meetings and consultations duly signed or acknowledged by the attendees should be prepared.
  - (c) Establish the land ownership, use and access rights for all proposed infrastructure under the project. Formal records of land tenure or written advice from the relevant land authority confirming Government ownership must be obtained where government land is to be used or existing land lease agreement if applicable. A due diligence report must be prepared for government land or existing government lease. In the absence of any written or formal records, alternative agreements or documentation acceptable to the government and ADB will be facilitated between the landowners and the government. The findings will be summarized in the environmental assessment;
  - (d) If any private land is required to be acquired, restriction on land use or access will take place, assets on government and/or private land will be affected, or an easement created for any land-based infrastructure, a land acquisition and resettlement action plan (LARP) is to be prepared in accordance with the pertinent government laws and ADB Safeguard Policy Statement 2009 (SPS) and co-financiers, if any. The content of the LARP should follow prescribed content and

outline of the Resettlement Plan according to ADB SPS<sup>18</sup>. However, if safeguards impacts will also take place on government owned or lease land, then the LARP should include the outcome of the due diligence for government lands as stated in para (iii).

- (e) Assess the capacity of the executing and implementing agencies in complying with ADB's safeguards requirements such as implementing gender and social development measures and LARP and recommend capacity building measures. Potential support which could be provided by the project for physically and economically displaced persons will also be explored.
- (f) Assist the government to establish and implement the project's grievance redress mechanism during project preparation to avoid any delays associated with safeguards.
- (g) Following ADB guidelines, conduct detailed gender analysis (guided by ADB's gender and energy toolkit) and identify gender entry points for the project
- (h) Following ADB policy and requirements, assess the gender impact of the project design. Assess gender related issues in the project area and identify ways to make the project beneficial for women and men – including ensuring work on the enabling framework (e.g. draft Energy Act, tariff setting etc) is gender sensitive. Recommend measures to address gender issues and incorporate them into project design. Carry out gender analysis (guided by ADB's gender and energy toolkit), consult with stakeholders, including women, women's organizations and the Ministry of Women, Youth and Social Affairs, on key gender entry points and prepare a Gender Action Plan (GAP). The GAP should mirror the Design and Monitoring Framework (DMF) outputs and include gender-inclusive design features, gender targets, indicators and baselines, timelines, cost estimates and implementation arrangements.
- (i) Assess potential poverty and social impacts of the project and prepare a Summary Poverty Reduction and Social Strategy (SPRSS) for the project.

#### 14. **RE Enabling Framework**

- a. The KIR SREP IP report has identified incomplete legal and regulatory framework as a barrier to scaling up RE in KIR. The report notes that the Electricity Act only exists in draft form and there is no formal regulatory framework for setting electricity tariffs, creating an uncertain investment climate for potential private sector led RE investment. The report also notes the absence of an Energy Act to regulate and incentivize the scaling up of renewable energy and energy efficiency in all sectors. The Consultant will mitigate these barriers by:
  - (i) Reviewing the existing draft Electricity Act. In consultation with MISE and Government, propose revisions as appropriate to include regulations to incentivise renewable energy and energy efficiency and develop into a gender sensitive draft Energy Act. Assist MISE in

<sup>18</sup> ADB. 2009. *Safeguard Policy Statement*, Manila. <http://www.adb.org/Documents/Policies/Safeguard-Policy-Statement-June2009.pdf>

- preparing a draft Energy Act for later consideration and enactment by the parliament.
- (ii) Incorporate findings of the social, poverty, and gender analyses and consultations into the recommendations to the regulatory frameworks and policies to ensure a gender sensitive and inclusive legislation.
  - (iii) Assess the potential impact of the draft Energy Act on existing legislation in Kiribati.
  - (iv) Provide all technical inputs necessary for MISE and PUB to formulate technical standards on RE related electrical equipment, which follow New Zealand and Australian standards so that such standards can be enforced, and prepare the relevant draft documentation;
  - (v) Coordinating and working closely with the Office of the Attorney General, assist MISE and PUB in drafting and/or providing updates to grid codes to support the safe operation of the grid at high-levels of RE penetration
  - (vi) Develop regulations and model transaction documents for private sector participation in the RE market, including but not limited to request for proposals (RFP) and power purchase agreements (PPA) for independent power producers (IPP).
  - (vii) Assess existing regulatory (including tariff policy and procedures) and governance arrangements, as prescribed in law and as practiced, and compare against best practices, including suggestions for ensuring arrangements are gender sensitive.
  - (viii) Examine and identify gaps, including gender and safeguards provisions, in the (i) existing regulatory reporting requirements (e.g. the utility's regulatory chart of accounts); (ii) revenue requirement determination approaches; (iii) tariff methodologies and rate design; (iv) tariff-approval process and procedures; and (v) institutional capacity and recommend solutions and additional provisions to ensure effective regulation following international best practices
  - (ix) Assess and provide recommendations to enhance or establish the regulatory framework for setting electricity tariffs, considering renewable electricity.
  - (x) Provide recommendations to establish cost-recovery tariffs that include provisions to support financial sustainability of PUB such as incorporation of Operation and Maintenance and Asset Replacement Costs for RE generation, specifically solar PV and BESS plants/systems.

## 15. **Bidding Documents**

- a. The Consultant will conduct investigations<sup>19</sup> and prepare bidding documents as follows:
  - (i) **Geotechnical.** Based on findings and recommendations from the feasibility study, the Consultant will undertake needed geotechnical investigation of the proposed site sufficient to allow EPC/ turnkey contractors to complete bids. The Consultant may subcontract physical site investigation and earthworks laboratory analysis and other surveys, reflecting the ADB core procurement principles and in accordance ADB Procurement Guidelines (2015, as amended from time to time). Proposed subcontracted scope of works will be

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<sup>19</sup> The cost for topographical and geotechnical surveys will be included in the firm's financial proposal as provisional sums. The firm will engage suitably qualified contractors using shopping selection procedures following ADB's *Procurement Policy 2017*. Firms should allow \$15,000 for the topographical survey and \$35,000 for the geotechnical investigation, and as needed, a hydrological survey.

presented and cleared by ADB and PUB prior to advertising. The Consultant will be responsible for (a) collection of available background geotechnical data, (b) review and interpretation of site investigation and earthworks laboratory report, (c) site inspection and assessment (including slope stability if required) of access roads and solar plant site, (d) foundation assessment for solar plant site, (e) identification and assessment of borrow pits, if required, and (f) preparation of geotechnical report to attach to bidding documents, and other inputs into the EPC/turnkey bidding documents, as required.

- (ii) **Topographic survey.** The consultant will execute a topographic survey of the solar site(s) and any transmission alignments. The survey will include all proposed project infrastructure and any other areas which may be required for EPC/turnkey contractors to complete their designs. Proposed scope of works will be presented and cleared by ADB and PUB prior to advertising. Data will be presented on AutoCAD drawings and presented in an electronic format (.dwg and .pdf) to allow EPC/turnkey contractors to use in design.
  - (iii) Conduct a risk assessment of surveying/testing activities associated with the detailed investigations set out in (i) and (ii) above as well as for the geological/geotechnical and UXO investigations and identify management measures (including health and safety) to be implemented and/or to be included in services contracts for any sub-contracting. Confirm if need for an environmental license is triggered by any activity in the investigations. If required, assist PUB in applying for the environmental license.
  - (iv) **Conceptual Engineering Design.** The Consultant will complete conceptual engineering design suitable for Section 6 of the ADB Standard Bidding Document, suitable for EPC/turnkey procurement for the construction. Engineering design will be determined in close coordination with PUB and will include, but not be limited to:
    - (a) quantity calculations (bill of quantities [BOQ]), unit price analysis and cost estimates with supporting data and calculations.
    - (b) proposed site layout and technical design drawings suitable for EPC/turnkey contracting.
    - (c) solar resource and climate risk assessments.
    - (d) project design (and specifications) including modules, inverters, battery energy storage systems etc.
    - (e) grid details including system analysis.
    - (f) interconnection requirements.
    - (g) geotechnical assessment.
    - (h) testing and commissioning requirements.
    - (i) training requirements for PUB staff.
    - (j) site access design.
    - (k) site preparation requirements, including earthworks, and water and electricity connection/supply during construction.
    - (l) other issues such as water supply, aviation glare, fencing (security), and flooding etc.
- b. **Bidding Documents.** The Consultant will prepare a full set of bidding documents in accordance with ADB's Procurement Guidelines (2015, as amended from time to time). Draft bidding documents will be reviewed by PUB and ADB. The Consultant will incorporate comments to and obtain approval of the final bidding documents. The bidding documents will include an invitation to bid, the basic data sheet, qualification and evaluation criteria, description of the employer's requirements, technical

specifications, a letter of bid, bid forms, draft General and Particular Conditions of Contract, environmental management requirements and measures as identified in the site assessments – environmental due diligence, and other necessary documents to be included in the bidding documents as required

16. **Procurement Support.** The Consultant will facilitate procurement in accordance with ADB Procurement Guidelines (2015, as amended from time to time). The Consultant will provide support and assistance to the PUB on all aspects of the procurement process including but not limited to the following:

**a. Capacity Assessment and Planning**

- (i) Assess the procurement capacity of PUB, and other engaged government entities, and advise on any additional support required to deliver this project. Conduct a procurement risk assessment and prepare the procurement risk assessment and management plan
- (ii) Conduct a market assessment to determine the interest of the global supply market in serving the project requirements in order to package the project accordingly.
- (iii) Prepare the procurement plan in accordance with government regulations and ADB's procurement guidelines.
- (iv) Draft and update bidding documents incorporating ADB's comments prior to issuance

**b. Tender stage**

- (i) Support the advertisement for the procurement of the main turnkey contract(s), as determined during the planning stage;
- (ii) Interpret and assist in drafting responses to technical comments received from potential bidders and support the preparation of addendums and clarifications.
- (iii) Co-ordinate and attend site inspections and pre-bid meetings;
- (iv) If requested, be present at bid opening to assist with the process; and,
- (v) Support PUB and assigned evaluation panel, as requested, throughout the evaluation process, including but not limited to:
  - (a) Reviewing and providing comments on the content of technical and financial proposals;
  - (b) Assisting in the preparation of detailed clarification requests, where required;
  - (c) Interpreting responses received for compliance with requested issues and compliance with ADB procedural requirements; and.
  - (d) Providing inputs to draft and final bid evaluation reports.

**c. Contract Award**

- (i) Provide detailed support to PUB in the process of contract discussions, negotiation, finalization and award of the relevant contract in accordance with PUB and ADB requirements.

17. **Capacity building**

- a. Based on the comprehensive capacity needs assessment for PUB and MISE, formulate an appropriate capacity development plan covering all due diligence

- requirements and aspects of project design and implementation, including on operations and maintenance of the infrastructure project.
- b. The plan must include national, regional, and international training, technical study visits, seminars/workshops and other effective training approaches/methodologies, for key staff/experts of the EA and IAs. In addition, the TA must provide classroom training in KIR on recommended capacity development activities to include:
    - (i) Operation of integrated Diesel/PV/Battery system
    - (ii) Operation and Maintenance of PV array and BESS
    - (iii) Procurement and management of turnkey contracts
    - (iv) Procurement and management of Independent Power Producer contracts
  - c. Evaluate PUB's and MISE's generation and network planning and simulation software needs and planning capacity development needs. Assess the various software options available in the marketplace and make recommendations on the appropriate software tools to be purchased to meet future PUB/MISE needs. Select the most appropriate and urgently needed software, procure the software and related training package. Prepare a scope of work and cost estimate for follow on or upgraded software procurement and training for inclusion in the ensuing investment project.

18. **Final Report.** The Consultant will produce a Final report summarizing all activities and earlier reports. The Final Report will also comment on lessons learned and recommend alternative approaches for future such projects.

19. The Consultant will also prepare a full data package of all relevant background information, feasibility stage data, concept design data and assumptions, safeguards information etc. for issuance to PUB and MISE with a copy to be provided to the firm engaged to provide detailed design review and construction stage supervision activities. The Consultant shall also provide all additional data reasonably requested by the construction stage supervision firm during the implementation stage of the project

## G. Reports

20. A summary of the outputs and target dates is presented below. Reports will be submitted to PUB in both hard copy and electronic format and to ADB in electronic format. Each report will be accompanied by a PowerPoint deck summarizing the report contents and findings.

#	Output	Report	Target Completion Date	
			= NTP + # of weeks	= id submission date + # of weeks
1	Mobilization	Inception	6	
2	Hydrological, Geological Geotechnical, UXO and Topographical Survey reports	Final	14	
3	Safeguards due diligence (including gender) reports and documents	Draft	14	
		Final	22	
4	Feasibility Study (including Grid Integration Study, capacity needs assessment and all due diligence reports), Inputs to the FFP/RRP and draft linked documents	Draft	18	
		Final	28	
5	RE Enabling Framework Documents	Draft	36	
		Final	44	

6	Bidding Documents	Draft	22	
		Final	30	
7	Procurement Support	Draft BER		10
		Final BER		16
8	Capacity Building Support	Training Report	60	
9	Completion Report	Final Report	75	

BER = bid evaluation report, FFP = Facility Financing Proposal, NTP = notice to proceed, RE = renewable energy, RRP = Report and Recommendation of the President

21. ADB and the government shall endeavor to provide comments on the submitted documents within two weeks of receipt of the submitted documents by the Consultant, with the exception of the Draft feasibility report where the review period shall be four weeks. In the event that submitted documents require substantial adjustments, the Consultant shall submit a revised copy of the deliverable and the review period shall be repeated.

#### H. Indicative Milestone Payment Schedule

#	Output	Activity Preceding Payment*	Payment
1	Mobilization	Submission of Payment Request	10%
2&3	Inception Report including Optimized Project Scope and related components	Approval of Report	10%
4a	Draft Feasibility Study & Grid Integration Study	Submission of Report	10%
4b	Final Feasibility Study & Grid Integration Study, and draft FFP/RRP and linked documents <sup>20</sup>	Approval of Feasibility Study Report and submission of FFP and linked documents	15%
5	RE Enabling Framework	Approval of Framework	15%
6	Bidding Documents	Approval of Bidding Documents	15%
7	Procurement and Capacity Building Support	Issuance of Notification of Award to Preferred Bidder and Approval of Final Training Report	15%
8	Completion Report	Approval of Final Report	10%
Total Lump Sum Provision of Services (excluding Provisional Sums)			100%
<b>Provisional Sums</b>			
9	Completion of Surveys	Upon approval of relevant survey reports	Based on approved survey cost
10	Training and Workshops	Upon approval of relevant training reports	Based on approved training cost

\*Approval shall mean approval from ADB, following consolidation of inputs from government project stakeholders. Submission shall mean provision of a substantially (95%) complete version of the required output, submitted concurrently to ADB and the Government of Kiribati project stakeholders.

<sup>20</sup> Includes inputs and assistance to preparation of the Facility Financing Proposal (FFP)/Report and Recommendation of the President (RRP) and the Project Administration Manual, and preparation of all due diligence documents such as: (i) sector assessment report, (ii) financial and economic analyses, (iii) tariff and governance assessment, (iv) initial environmental examination and environmental management plan, (v) land acquisition and resettlement plan, (vi) safeguards public consultations and communication strategy, (vii) summary poverty reduction and social strategy, (viii) gender action plan, (ix) operations and maintenance strategy and plan, in addition to the full feasibility study and grid integration study.

22. A provisional sum is included in the cost estimate to cover surveys. Once the type, scope and timing of surveys is confirmed, post contract signing, the Consultant shall engage the necessary firms, as required. The Consultant shall include in its bid the costs of sourcing, engaging, managing and reporting on all surveys required under this contract.

23. A second provisional sum shall cover the costs of organizing stakeholders' consultation workshops and other outreach activities, which shall be based on the actual costs incurred during these activities by the Consultant.

## I. Consultant Team Composition

24. The Consultant will determine the number and nature of the experts to deliver the outputs. The Consultant will submit the CV's of the proposed team to deliver the outputs in accordance with the Consultant's approach and methodology. The Consultant will indicate the number of person-months inputs for each expert and the minimum time each expert will spend in-country. The team leader must be in country for at least 75% of his/her input time while other key experts must be in-country at least 60% of their input time. Only the CV's of the Key Experts identified below will be evaluated and scored. CV's of non-Key Experts, some of which are suggested below, will be evaluated on a pass-fail basis. Corresponding national technical, financial, and safeguards experts could be fielded as non-key. The following Key Experts are required.

#	Key Expert	Required Qualifications and Experience
1	RE Engineer (Team Leader)	The expert will have a degree in engineering, and at least 10 years of experience in feasibility, design, and specification of solar photovoltaic and battery storage projects of which 2 years shall have been as a team leader. Experience in developing countries, particularly in the Pacific region, and in working with development agencies is desirable. The Team Leader will be an anchor member of the team and will provide a level of effort equal to or greater than any other member of the team. S/he will be responsible for the coordination of all activities under the contract, and for delivery of required outputs, reports, and recommendations
2	Battery Energy Storage Engineer	The expert will have a degree in electrical engineering and at least 5 years of experience in designing, implementing, commissioning, operating and maintaining battery storage systems for power utilities. Experience in developing countries, particularly in the Pacific region, is desirable.
3	Legal and Regulatory Expert	The expert will have a degree in law and will have a recognized professional qualification. The expert should have at least 10 years' experience which will include drafting and review of national energy legislation and design of energy regulatory frameworks. Experience in developing countries, particularly in the Pacific region, is desirable.
4	Financial Specialist	The expert will have a degree in accounting, finance, or a related field, and will have a recognized professional accountancy qualification. The expert should have at least 10 years' experience, including in project financial due diligence (FDD) and be familiar with ADB procedures. Experience in developing countries, particularly in the Pacific region, is desirable.

#	Key Expert	Required Qualifications and Experience
5	Environment Specialist	The expert shall possess a degree in environmental science, planning or engineering, or related field, and possess at least 10 years of experience in conduct of environmental impact assessment and management plan preparation and implementation. Experience in power sector is desirable as in experience in implementation of ADB Safeguard Policy Statement. Experience in developing countries, particularly in the Pacific region, is preferred.
6	Land Acquisition/Social Safeguards Specialist	The expert shall possess a degree in Sociology or related field and have at least 10 years' experience in supporting the land acquisition process for infrastructure projects. Experience in developing countries, particularly in Pacific, is preferred as in experience in implementation of ADB Safeguard Policy Statement and preparation of Land Acquisition and Resettlement Plan including entitlement matrix and stakeholder consultations.
7	Gender Specialist	The expert should have a postgraduate degree in social sciences or public administration. The expert will have at least 10 years' experience carrying out gender analysis, gender planning, gender mainstreaming (preferably in infrastructure and energy sector) and primary gender research. Experience in the Pacific and developing Gender Action Plans for ADB (or similar development organizations) is preferred.

25. Non-key experts could include, but not be limited to, the following:

#	Key Expert	Required Qualifications and Experience
8	Power Systems Engineer	The expert is expected to have a degree in electrical engineering and at least 8 years of experience in power systems planning and modelling including integrating intermittent RE sources in small power systems and optimizing energy storage. Experience in developing countries, particularly in the Pacific region, is desirable.
9	Economist	The expert is expected to have degree level qualifications in economics, and at least 10 years of relevant experience in project economic analysis. Experience in conducting economic analysis in accordance with ADB guidelines is required. Experience in developing countries, particularly in the Pacific region, is desirable.
10	Procurement Specialist	The expert is expected to have a University degree in business administration, economics, engineering, public procurement, public policy, or other related fields and a minimum of 5 years' experience in procurement of engineer, procure and construct (EPC) and/or turnkey contracts. The expert will be familiar with ADB, or similar development organization, procurement procedures.

#	Key Expert	Required Qualifications and Experience
11	Transaction Advisor	The expert is expected to have advanced degree in finance or law and will have a recognized professional qualification. The expert should have at least 10 years’ experience which will include drafting of model transaction and legal documents for public-private partnerships and independent power producers, including but not limited to request for proposals, power purchase agreements, risk allocation. Experience in developing countries, particularly in the Pacific region, is desirable.
12	Climate Change Expert	The expert is expected to have a graduate degree in related field, and at least 7 years of relevant working experience in climate change modelling, hydrological modelling, and in climate change risk assessment in energy projects, or a combination of undergraduate degree and directly relevant professional experience. The consultant with previous experience in developing countries in the Pacific region is desirable. The consultant will prepare the climate change impact, risk, vulnerability and adaptation assessment reports for the project following ADB guidelines for climate proofing investment in the energy sector; provide inputs to due diligence documents and bidding documents to incorporate recommended climate proofing and climate resilience elements; provide inputs to climate change mitigation and emissions reductions calculations and projections and other relevant inputs to meet the overall project objectives

26. The consultant team shall include a minimum of one local engineer who will work with the Consultant team during project execution and benefit from technology transfer. The local engineer shall be qualified to degree level and have background in a specialist area as chosen by the Consultant. The local engineer will be scored on a pass/fail basis.

**J. Counterpart Facilities**

27. The Government through MISE and PUB shall provide counterpart in-kind support in the form of counterpart staff (within MISE, PUB and the Project Management Unit) and access to meeting facilities, and assistance in logistics, acquiring necessary permits and licenses, as applicable and in arranging meetings, consultations and capacity building activities.

**K. Preparation of Proposals**

28. Proposing entities are requested to prepare a concise, detailed and logical description of how they propose to deliver on the outputs of the contract in the section of their proposal called “Technical Approach and Methodology”. The provision of generic information shall be avoided. In this narrative, entities should be explicit in explaining how they will achieve the outputs and include any relevant information on their past experience of delivering similar projects and in similar contexts and jurisdictions.

29. Only one curriculum vitae (CV) must be submitted for each key and non-key expert included in the proposal. Only the CVs of key experts will be scored as part of the technical evaluation of proposals. The CVs of non-key experts will not be individually scored, however ADB will review and individually approve or reject each CV of non-key expert positions in the proposal and consider the suitability of the bidders proposed team.

30. All positions under the contract, both key and non-key experts, must be included and budgeted for in the financial proposal, using the forms provided in the RFP. Within the approach and methodology, the Consultant shall link the number of person months proposed to the delivery of the outputs, justifying the allocation accordingly.

31. The Consultants Personnel schedule shall clearly show the percentage of home and field presence of each team member and both full time and intermittent time application to the project. Noting the system restrictions in CMS on the contents of the online personnel schedule, the Consultant is also encouraged to overlay the contents of its work schedule (TECH-3) with its personnel schedule (TECH-4) on a separately included Work Plan in order to further elaborate on how the inputs of its staff are aligned with the completion of outputs under the project. This may be included separately as part of the submission. The Consultant shall include all costs necessary to undertake this assignment within its proposal.

**PAL (49450-024): Renewable Energy Project  
Terms of Reference for Consultants**

**A. Overview**

1. The Palau government has requested ADB support in pursuit of its renewable energy and GHG emission reduction targets. Palau is interested in accessing concessional financing (or grants) to support development of renewable energy targets, and has requested ADB assistance in accessing such financing, including from the Green Climate Fund (GCF). The Palau government has requested that ADB serve as Palau's Accredited Entity to GCF for this purpose.

2. Palau's NDCs target a 22% decrease in GHG emissions reductions below its 2005 basely by 2025, with a corresponding target of a 45% renewable energy contribution in power generation. Transaction Technical Assistance for renewable energy investments was agreed during the April 2018 country programming mission to Palau. A \$6 million Renewable Energy Project for 2020 approval is now included in Palau's COBP.

3. In the interim, following consultations with Palau Public Utilities Corporation (PPUC), the Palau Energy Administration (PEA), the Palau Minister of Finance, and the Palau National Energy Committee were held in August 2018, short-term technical assistance to PEA was prepared to assess requirements for secondary legislation (implementing regulations) to enable it to perform the regulatory functions assigned to it under RPPL 10-23 that was adopted in April 2018. An individual consultant under TA 9242-REG was mobilized to Palau in October 2018. This STTA was concluded in March 2019.

4. A TRTA is required to prepare the Palau Renewable Energy Project for 2020 approval. The TRTA will consist of two phases: (i) analysis of PPUC's current operations and preparation of a least-cost generation expansion plan for PPUC and enumeration of corresponding generation investment projects, and (ii) full technical and economic due diligence of identified and agreed candidate investment projects for inclusion in the proposed Renewable Energy Project.

**B. Phase 1 – Least-Cost Generation Expansion Plan**

5. The scope of the assignment will be for generation serving loads on PPUC's main system in Koror State and on Babeldaob Island which serves the majority of Palau's population and 98% of total electricity demand. Koror-Babeldaob 2016 system peak load was recorded at 12 MW, with annual generation of 83.7 GWh.

6. Tasks and Outputs:

- (a) Review all available information on the performance of the PPUC Koror-Babeldaob power system, including cost of service. Where no sufficiently documented cost of service analysis exists, one must be prepared based on available PPUC data;
- (b) Prepare a 15-year demand and load forecast for the Koror-Babeldaob system;
- (c) Review and document condition and performance of existing PPUC Koror-Babeldaob power assets (generation and network), including anticipated asset replacement;
- (d) Document current and planned renewable generation assets on the Koror-Babeldaob system, including all existing grid-connected PV and prospective IPP PV developments;

- (e) Review existing renewable resource assessments (solar, wind, and marine where applicable) and, where additional resource assessments are required for completeness, document the need for additional resource assessments and provide estimated costs and time requirements;
- (f) Review existing analyses of the condition and capacity of the Koror-Babeldaob network;
- (g) Propose a least-cost generation pathway (technology-agnostic, including both renewable and conventional generation) to serve the forecasted load and system demand;
- (h) Propose a prioritized enumeration of generation expansion investments consistent with the least-cost generation pathway, indicating size, location, technology, anticipated availability and capacity factors, anticipated total dispatch post-commissioning, and total estimated costs (including all costs associated with dispatch and integration with existing or other anticipated generation assets, e.g. IPP PV). This list of prospective projects should also include a preliminary assessment of potential land-acquisition challenges associated with each site;
- (i) Review PPUC's current corporation-wide commercial performance and report on its performance per acknowledged industry-standard utility KPIs. This should also include documentation of PPUC's governance and corporate/organizational structure and financial performance per each of its areas of operation (power and water/sanitation). Include documentation (with verification of source data) on power operations physical KPIs on system reliability, power quality, and total system losses.

### C. Summary Resource Requirement – Phase One:

- 7. Estimated period of performance: 4 months;
- 8. Experts required: (i) Power Engineer and Team Leader: 2 person-months (ii) Power system planning expert (economist) and (least-cost-plan task leader): 3 person-months; and (iii) utility commercial and financial management expert: 1 person-month.

### D. Phase 2 – Full Technical and Economic Due Diligence/Feasibility Study Preparation

9. Phase 2 will prepare full technical and economic due diligence for the proposed project, including all required components of an eventual RRP or Facility Financing Proposal (FFP) for the ensuing project to a high degree of “project readiness” (procurement packages). It is anticipated that the ensuing investment project (or sub-projects) will be primarily PV (with associated integration and dispatch and stability controls, including storage), but may also include wind if sufficient wind resource data exists demonstrating viability. The economic analysis and economic due diligence of the project shall follow ADB's 2017 *“Guidelines for the Economic Analysis of Projects”*<sup>1</sup>

10. Based on the least-cost generation expansion analysis (Phase 1) and project investment scope to be agreed with PPUC and Government of Palau (subject to confirmation of available financing), **indicative** personnel assignments and respective tasks/outputs are described in paragraphs 11-21 below. Bidders are expected to propose a personnel schedule and team

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<sup>1</sup> <https://www.adb.org/sites/default/files/institutional-document/32256/economic-analysis-projects.pdf>

composition that they believe can best deliver the required outputs and are not required to follow this *indicative* personnel schedule.

11. **Team Leader** (6 person-months – full time). The Team Leader will be responsible for management of the consultant team’s work and overall completion of all consultant outputs and deliverables. The Team Leader will guide preparation of all project feasibility study components, preparation of bidding documents, and production of all reports and presentations.

12. The Team Leader should be qualified and experienced as a power engineer, and will have primary responsibility for preparation of all outputs of a power-engineering nature, including (i) preparation of technical specifications and cost estimates for all network components, including integration, control, dispatch, and grid-stability requirements (including battery storage), and (ii) and input to relevant procurement packages. The team leader will have overall responsibility for delivery of outputs of all other team members and will manage coordination with project stakeholders (PPUC and Government of Palau).

13. **Solar Power Expert** (2 person-months). The Solar Power Expert will support the team leader in determining the appropriate sizing and siting of all solar power installations included in the project scope and will prepare detailed cost estimates and specifications for all associated procurement packages to achieve the performance targets.

14. **Wind Power Engineer** (2 person-months). The wind power engineer will support the team leader in determining the appropriate sizing and siting of all wind turbine generator installations included in the project scope, and will prepare detailed cost estimates and specifications for all associated procurement packages to achieve the performance targets.

15. **Civil Engineer** (2 person-months). The civil engineer will undertake civil engineering design work for all project sites as input to relevant procurement packages, including technical specifications and cost estimates.

16. **Procurement Specialist** (2 person-months). The specialist will undertake detailed procurement-risk and capacity-gap analysis of the executing and implementing agencies, and prepare project bidding documents for all packages, in conjunction with other consultant team members under the direction of the team leader. The specialist will prepare relevant portions of the RRP (FFP), including the project administration manual and component chapters (including the project procurement plan).

17. **Environment Specialist** (2 person-months). The specialist will (i) prepare the environmental assessment for the project, (ii) consult with stakeholders, (iii) incorporate appropriate mitigation measures into the project design, (iv) quantify the project environmental benefits, (v) develop a grievance redress mechanism, (vi) identify and manage environmental surveys, including flora and fauna surveys, (vii) assess climate and disaster-related risks, (viii) estimate CO2 emission reductions and potential for carbon financing, and (ix) prepare an initial environmental examination.

18. **Social Safeguards Specialist** (2 person-months). The specialist will undertake social, poverty, and gender related assessments in accordance with ADB guidelines. The specialist will confirm land acquisition and resettlement (if any) requirements of the project. The specialist will also conduct a stakeholder analysis and prepare a consultation and participation plan for the project to ensure continuing stakeholder engagement during implementation. If the project requires land acquisition/resettlement, the specialists will: (i) review the country systems on land

acquisition/resettlement and identify any inconsistencies between ADB requirements and the country systems; (ii) assess land acquisition/resettlement impacts; and (iii) develop a resettlement plan(s) following ADB's requirements. If the project impacts indigenous peoples, the specialists will also prepare an indigenous peoples plan following ADB's format. As necessary, the Consultant will (i) organize and conduct surveys, (ii) develop and implement a stakeholder and community consultation plan, (iii) assess the pro-poor impacts of the project, (iv) assess the gender impact of the project, (v) prepare Poverty and Social Assessments (PSA) and Summary Poverty Reduction and Social Strategy (SPRSS), (vi) assess vulnerabilities and risks associated with HIV/AIDS and other possible health impacts, (vii) prepare socioeconomic monitoring and management plans, (viii) work with the gender specialist in preparing a gender action plan, and (ix) assist the EA to undertake stakeholder consultations. The specialist should possess at least ten years' experience in projects of similar nature and complexity, preferably in the Pacific region.

19. **Economic Specialist** (1 person-month). The economic specialist will lead the economic assessment of the project to produce robust demonstration of the economic benefits of the project, per ADB's requirements for funding approval. An advanced degree in economics and at least five years' experience in economic analysis of investment projects is required.

20. **Financial Specialist** (1 person-month). The financial specialist will undertake financial analysis of the project and prepare the requisite RRP (FFP) material, coupling it with the financial management assessment of PPUC (prepared in Phase 1). The specialist will: prepare project cost estimates and financing plan; conduct financial management assessments of the executing and implementing agencies; conduct financial viability evaluation of the project; conduct financial analysis and sustainability assessment of the executing and implementing agencies; design funds flow and disbursement arrangements; design reporting and auditing arrangements; and design financial covenants and financial management action plans. The specialist will conduct such work in accordance with relevant ADB guidelines, including: ADB's technical guidance note (TGN) for Financial Management Assessments (2015); TGN for project financial reporting and auditing (2015); TGN for preparation of cost estimates (2014); and, where not covered under these TGNs, in accordance with ADB's 2005 publication "Financial Management and Analysis of Projects". The specialist should have at least five years' experience in similar assignments and possess relevant educational and professional qualifications.

21. **Gender Specialist** (1 person-month) The expert should have an advanced degree in social sciences or public administration. The expert will have substantial relevant experience carrying out gender analysis, gender planning, gender mainstreaming (preferably in infrastructure and energy sector) and primary gender research. Experience in the Pacific and developing Gender Action Plans for ADB (or similar development organizations) is preferred. Among other tasks, the specialist will prepare a gender action plan including monitoring and reporting procedures and templates.

#### **E. Summary Resource Requirement – Phase Two:**

22. Estimated period of performance: 6 months;

23. Experts required: Team Leader (6 person-months – full time); Solar Power Expert (2 person-months); Wind Power Engineer (2 person-months); Civil Engineer (2 person-months); Procurement Specialist (2 person-months); Environment Specialist (2 person-months); Social Safeguards Specialist (2 person-months); Economic Specialist (1 person-month); Financial Specialist (1 person-month); Gender Specialist (1 person-month).

## **RMI (49450-019): Majuro Power Network Strengthening Project (Phase 2) Terms of Reference for Consultants**

### **A. Overview**

1. In November 2017, ADB approved a grant of \$2.0 million (G0554) to the Republic of the Marshall Islands to support investments in an advanced metering infrastructure (AMI) on the Marshalls Energy Company's (MEC) network on Majuro Atoll to allow MEC to manage power more efficiently, reduce losses on the Majuro power system, reduce diesel fuel consumption for power generation, and improve revenue collection. Data provided by the AMI will also inform the design of future investments in MEC's power system, including in renewable energy generation, to be financed by ADB or other sources.
2. The Majuro Power Network Strengthening Project is currently in implementation. Procurement for the delivery and installation of the AMI is currently being prepared. The AMI is anticipated to be installed and in full operation by mid-2020. Information generated by the AMI will allow MEC to identify further network investments to reduce technical and commercial losses stemming from sub-optimal network configuration, improper transformer sizing for served loads, and unrecorded consumption (e.g. malfunctioning customer meters or illicit connections).
3. The Majuro Power Network Strengthening Project (Phase 2) will fund the implementation of network strengthening measures, including network reconfiguration, transformer replacement, and installation of revenue-enhancing customer meters (e.g. reliable and accurate three-phase end-user meters for large customers).
4. The project will be processed and implemented as a component of the proposed Majuro Waste to Energy Project for which TRTA consultants are currently being recruited with funding from the High-Level Technology Fund. Due to the diverse nature of these two investments, separate TRTA consultants for each are required.

### **B. Full Technical and Economic Due Diligence/Feasibility Study Preparation**

5. The TRTA will prepare full technical and economic due diligence for the Majuro Power Network Strengthening Project (Phase 2). The economic analysis and economic due diligence of the project shall follow ADB's 2017 "*Guidelines for the Economic Analysis of Projects*"<sup>2</sup> Project due diligence will commence during the commissioning phase of the current Majuro Power Network Strengthening Project, likely in Q2 2020. **Indicative** personnel assignments and respective tasks/outputs are described in paragraphs 6-13 below. Bidders are expected to propose a personnel schedule and team composition that they believe can best deliver the required outputs and are not required to follow this *indicative* personnel schedule.:
6. **Team Leader** (6 person-months, intermittent). The team leader will be an electrical engineer with experience in the operation of power distribution systems, with specific experience in revenue protection. The team leader will have overall responsibility for delivery of all TRTA outputs, which will include a program for network efficiency and reliability investments. Based on an analysis of MEC's distribution network's operations, the AMI system being installed under the current project, and MEC's revenue performance, the team leader will elaborate an investment program to reduce technical and commercial losses to include, inter alia, network investments in

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<sup>2</sup> <https://www.adb.org/sites/default/files/institutional-document/32256/economic-analysis-projects.pdf>

conductors and transformers (to reduce physical losses) and in customer meters (with emphasis on three-phase large consumers).

7. As the project will take place entirely within the boundaries of existing infrastructure, it is anticipated that the project categorization will be “C” with respect to environment and social safeguards.

8. **Environment Specialist** (1 person-month - intermittent). The specialist will (i) prepare the environmental assessment for the project, (ii) consult with stakeholders, (iii) incorporate appropriate mitigation measures into the project design, (iv) quantify the project environmental benefits, (v) develop a grievance redress mechanism, (vi) identify and manage environmental surveys, including flora and fauna surveys, (vii) assess climate and disaster-related risks, (viii) estimate CO2 emission reductions and potential for carbon financing, and (ix) prepare an initial environmental examination.

9. **Social Safeguards Specialist** (1 person-months - intermittent). The specialist will undertake social, poverty, and gender related assessments in accordance with ADB guidelines. The specialist will confirm land acquisition and resettlement (if any) requirements of the project and document any legacy concerns that may exist with respect to acquisition of land and rights-of-ways of existing infrastructure. The specialist will (i) prepare Poverty and Social Assessments (PSA) and a Summary Poverty Reduction and Social Strategy (SPRSS), (ii) assess vulnerabilities and risks associated with HIV/AIDS and other possible health impacts, (iii) prepare socioeconomic monitoring and management plans, (iv) work with the gender specialist to prepare a gender action plan, and (v) assist the IA to undertake stakeholder consultations.

10. **Procurement Specialist** (1 person-months - intermittent). The specialist will undertake detailed procurement-risk and capacity-gap analysis of the implementing agency, and prepare project bidding documents for all packages, in conjunction with other consultant team members under the direction of the team leader. The specialist will prepare relevant portions of the RRP (FFP), including the project administration manual and component chapters (including the project procurement plan) *as relates to the Majuro Power Network Strengthening Project (Phase 2) of the ensuing project.*

11. **Economic Specialist** (0.5 person-month - intermittent). The economic specialist will lead the economic assessment of the project to produce robust demonstration of the economic benefits of the project, per ADB’s requirements for funding approval. An advanced degree in economics and at least five years’ experience in economic analysis of investment projects is required. The economic analysis and economic due diligence of the project shall follow ADB’s 2017 “*Guidelines for the Economic Analysis of Projects*”<sup>3</sup>

12. **Financial Specialist** (0.5 person-month - intermittent). The financial specialist will undertake financial analysis of the project and prepare the requisite RRP (FFP) material, coupling it with the financial management assessment of MEC already prepared under the current Majuro Power Network Strengthening Project. The specialist will conduct such work in accordance with relevant ADB guidelines, including: ADB’s technical guidance note (TGN) for Financial Management Assessments (2015); TGN for project financial reporting and auditing (2015); TGN for preparation of cost estimates (2014); and, where not covered under these TGNs, in accordance with ADB’s 2005 publication “Financial Management and Analysis of Projects”. The

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<sup>3</sup> <https://www.adb.org/sites/default/files/institutional-document/32256/economic-analysis-projects.pdf>

specialist should have at least five years' experience in similar assignments and possess relevant educational and professional qualifications.

13. **Gender Specialist** (1 person-month). The expert should have an advanced degree in social sciences or public administration. The expert will have substantial relevant experience carrying out gender analysis, gender planning, gender mainstreaming (preferably in infrastructure and energy sector) and primary gender research. Experience in the Pacific and developing Gender Action Plans for ADB (or similar development organizations) is preferred. Among other tasks, the specialist will prepare a gender action plan including monitoring and reporting procedures and templates.

### **C. Summary Resource Requirement**

14. Estimated period of performance: up to **6 months**.

### **D. Personnel Requirements**

- (i) Team Leader (6 person-months – intermittent)
- (ii) Environment Specialist (1 person-month - intermittent)
- (iii) Social Safeguards Specialist (1 person-month - intermittent)
- (iv) Procurement Specialist (1 person-months - intermittent)
- (v) Economic Specialist (1 person-month - intermittent)
- (vi) Financial Specialist (1 person-month - intermittent)
- (vii) Gender Specialist (1 person-month - intermittent)

## **COO (49450-xxx): Aitutaki Renewable Energy Project Terms of Reference for Consultants (Firm)**

### **A. Overview**

1. The proposed Aitutaki Renewable Energy Project (AREP or the Project) will support upscaling of renewable energy generation in Aitutaki. The Project will reduce dependence on fossil fuel imports by increasing the renewable energy (RE) percentage of electricity generation. The Project is the second of three stages to reach the 100% Aitutaki renewable energy target set out in the Cook Islands Renewable Energy Chart Implementation Plan (CIRECIP). Stage 1, which included installation of 750 kW PV, 500 kW/250kWh BESS, a small diesel generator and instrumentation and control system, is being implemented under the COO Renewable Energy Sector Project and is about to be completed. Stage 1 will deliver approximately 24% renewable energy contribution into the Aitutaki Power Supply (APS) system. It also provides an opportunity for APS to build capacity, experience, and data in the use and integration of solar PV with diesel generation. Stage 3 envisions large scale PV (~2MW) and BESS (10 MWh) to enable the Aitutaki Power System to reach close to 100% renewable energy penetration and with prolonged periods of zero diesel operation.

2. The staged implementation approach to increasing renewable generation allows for power system behavior to be observed after each stage, and the approach to be slightly modified in the next phase. This approach also allows for operations crews to become familiar with new technologies, as well as for the community to get accustomed to large scale renewable plants.

3. The proposed Stage 2 Project is requested to be financed by ADB under its Pacific Renewable Energy Investment Facility.<sup>1</sup> Financing for the Project is considered for approval in 2021. Two options will be considered for Stage 2 which will enable 43% renewable energy penetration on the island: installation of 900 kW wind or 1 MW of PV, with a standby battery and a synchronous condenser. The TRTA will conduct all required due diligence to prepare the Project.

4. Specific project deliverables include the following:

- a. Installation of 3 by 300 kW wind turbines or 1 MW solar PV, standby battery and synchronous converter; and
- b. institutional capacity building for stakeholders including project management, construction supervision, and operation and maintenance support.

### **B. The Technical Assistance**

5. A transaction technical assistance (TA) is required to prepare the Project ADB financing approval. The TA will conduct all required due diligence including grid integration and feasibility studies to ensure a well-prepared Project. ADB will engage the consultants following the streamlined approach under the Facility. The TA will have the following major outputs and activities:

- a. **Feasibility Study.** The Feasibility Study shall include (i) an RE grid integration study covering the impact of the proposed Project, and proposed Stage 3 RE projects, on

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<sup>1</sup> ADB. 2017. *Report and Recommendation of the President to the Board of Directors: Proposed Pacific Renewable Energy Investment Facility*. Manila.

the combined operation of the existing system and including recommendations for needed grid strengthening, (ii) a Project feasibility study for an optimized Project scope to ensure reliable, efficient and climate resilient operation of the grid-connected PV and battery combined system, (iii) all required due diligence covering technical, financial, economic, procurement, social and environmental safeguards, climate risk, social and gender assessments and reports, and implementation arrangements to prepare the project for ADB approval.

- b. **Capacity building support.** Based on relevant capacity assessments on the executing and implementing agencies (EA and IAs), the TA will formulate a comprehensive capacity development plan with specific recommend actions to support capacity development. Recommend implementation and procurement arrangements and assist the implementing agencies in pre-implementation works including preparation of bidding documents and assistance in procuring contractor(s). Consultants must propose and implement capacity development activities to include: (i) operation of integrated wind or PV with diesel/battery and condenser system; (ii) operation and maintenance of the hybrid system. The TA will also evaluate the EA and IA's generation and network planning and simulation software needs and planning capacity development needs. Assess the various software options available in the marketplace and make recommendations on the appropriate software tools to be purchased to meet future needs. Identify training needs for the selected software.

### C. Related Project: Cook Islands Renewable Energy Sector Project (CIRESPP)

6. The proposed project follows the completion of the Cook Islands Renewable Energy Sector Project (CIRESPP), which includes Stage 1 of the Aitutaki 100% renewable energy journey. The impact of the CIRESPP is aligned with increased energy security in an environmentally sustainable manner. The outcome will be increased access to a higher share of electricity generated by renewable energy sources. The original project outputs were: (i) Solar photovoltaic power system development, and (ii) institutional strengthening and project management support. CIRESPP will:

- a. construct up to five solar photovoltaic (PV) power plants with a total installed capacity of about 2.0 MWp coupled with batteries to store electricity from solar energy;
- b. rehabilitate the existing distribution network for Phase 1 subprojects;
- c. install a single unit of a battery energy storage system (BESS) with a preliminary capacity of 1.0 MW/4.0 MWh at the Rarotonga airport;
- d. install a single unit of 4.0 MW/2.0 MWh BESS for grid stability at the diesel power station, and two units of 1.0 MW/4.0 MWh (a total of 2.0 MW/8.0 MWh) BESS for load shifting capability at the Rarotonga airport;
- e. provide institutional strengthening to the government to develop the energy efficiency policy implementation plan;<sup>2</sup> and
- f. conduct an operation and maintenance (O&M) training including a program manual for O&M of BESS to the staff of Te Aponga Uira (TAU) and of the Government of Cook Islands (GCI).

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<sup>2</sup> It includes an energy audit and monitoring scheme to enhance demand-side energy efficiency practices for targeted major electricity consumer groups; develop the capacity to assess renewable energy technologies and set appropriate off-take tariffs for power purchase agreements in projects funded by the private sector; and update the Cook Islands Renewable Energy Chart Implementation Plan (CIRESPP) by reexamining the electricity load demand up to 2020, the renewable technology choices, and a least-cost investment plan.

7. The CIRESPP executing agency is the Ministry of Finance and Economic Management (MFEM) and the implementing agencies are the Renewable Energy Development Division (REDD), Office of the Prime Minister, for Aitutaki, Atiu, Mangaia, Mauke, and Mitiaro outer islands; and TAU for Rarotonga.

#### **D. Implementation Arrangements**

8. The Ministry of Finance and Economic Management (MFEM) will be the executing agency. REDD (in coordination with the Aitutaki Power Supply - APS) will be the implementing agency. The existing Project Management Unit (PMU) under CIRESPP will be retained. A consulting firm (the Consultant) will be recruited by ADB to prepare the Project and provide assistance to procurement and other pre-implementation works.

#### **E. Consultant Scope**

9. The Consultant will deliver the following outputs within 18 months, as described in Section B and further detailed in the subsequent sections of this TOR, and following ADB's and the Cook Islands Government policies, guidelines and requirements.

- a. Inception Report (includes the optimized project scope, project risk register)
- b. Feasibility Study (includes the RE grid integration study and all due diligence reports covering technical, financial and economic analysis, environmental and social safeguards, climate risk, social and gender assessments and their corresponding Report and Recommendation of the President/Facility Financing Proposal, and linked documents)
- c. Bidding Documents
- d. Capacity Building Support
- e. Final Report

10. The Consultant shall provide procurement support during bidding and evaluation, up to Contract Award.

#### **F. Consultant Tasks per Output**

##### **11. Inception Report**

- a. The Consultant will review latest status of relevant ongoing and planned projects. The Inception Report will include a detailed workplan, project risk register, a draft Table of Contents for the Final Report, and an optimized project scope as described below.
- b. Optimize Project Scope
  - (i) Review existing reports, collect additional data as required for the grid integration study and assess potential impacts to the stability of the grid. Recommend measures to ensure continued grid stability and climate resiliency.
  - (ii) Identify the cost-effective hybrid solution of renewable energy (wind and/or PV) and energy storage type(s) and capacities to be included in the Project. The Consultant shall work closely with the existing CIRESPP project owner's engineer and PMU to ensure the project is optimized and will provide the most efficient and cost-effective solution for Aitutaki.
  - (iii) Conduct initial site selection and assessments and stakeholder consultations, including solar resource, climate risk, social and environmental safeguards, grid and water connections, and specific siting/layouts, and required pre-implementation studies.

- (iv) Confirm optimum wind and/or PV and BESS capacities and technical parameters to match available financing and optimize project's contribution to achieving CIRECIP targets.

## 12. **Feasibility Study**

- a. **RE Grid Integration Study.** Assess the impact of the proposed Project, and other planned RE projects, on the combined operation of the existing grid system, and recommend optimum phasing of future projects in generation, transmission and distribution, network communications, data acquisition, monitoring and planning.
  - (i) In consultation with the EA and IA, establish system operational criteria and technical standards for the Aitutaki power system, considering demand forecast and development plans.
  - (ii) Confirm suitability of proposed solution using generation and network simulation and planning software/models together with any required specialized software to be purchased under the assignment. Analyze, compare, and assess the suitability of various planning and network simulation software and recommend the most suitable and cost-effective option. Procure the software and train or assist in training relevant staff.
  - (iii) Analyze APS system operational issues with increased requirements for load following and spinning reserve; and identify and cost any operational changes and measures to be taken to ensure successful RE integration and ensure grid stability as a result of increasing intermittent generation
  - (iv) Consider APS system reliability, operational regime, integration of variable generation resources, network loading, and any special protection arrangements,
- b. **Project Design Concept.** Prepare overall Project design concept. Assess technical options for Project components and provide recommended minimum technical specifications and employer's requirements in the bidding documents. Identify interface between the Project and existing assets including (i) scope and (ii) control, metering, signalling and protection arrangements. Review adequacy of planned and existing communication links between generation assets and planned new generation assets and include in scope new communication links as required for APS system operation. Confirm the optimum size of the Wind/PV array and BESS.
  - (i) **Performance Specifications.** Prepare performance specifications such as performance ratio and power output based on design concept and scope of work of approved Project.
  - (ii) **Proposed Site(s)**
    - (a) Assess and confirm suitability of proposed sites, or elsewhere as identified for allocation by the Government, and confirm allocation of Project area with the least involuntary resettlement impacts where possible.
    - (b) Either directly or through a subcontractor, undertake intrusive geotechnical and geological analysis of the site, including assessment of construction issues such as site earthworks requirements, implications for footing design, slope stability issues, access roads, borrow pits, and others, to a level sufficient for firms to bid on the subsequent turnkey contract. Conduct a risk assessment of surveying/testing activities associated with the detailed investigations and identify management measures (including

- health and safety) to be implemented and/or to be included in services contracts for any sub-contracting.
- (c) Either directly or through a subcontractor, undertake topographical and hydrological surveys of selected site.
  - (d) Prepare the following outputs, reflecting all measures identified in the site assessments and environmental management plan, at a level suitable for feasibility study and bidding documents; and sufficient to enable construction firms to submit detailed bids. The outputs include but are not limited to:
    - ii Project conceptual design drawings, location plans, site plans and technical specifications and drawings
    - iii Access roads and perimeter fencing design.
    - iiii Water supply design. Identify utility access points (water and electricity) during construction and operation.
- (iii) **Cost Estimates.** Prepare Project cost estimates to be broken down in sufficient detail to allow financial and economic evaluation. A cost estimate summary report shall: (i) clearly state the basis/assumptions behind all unit rates; (ii) reference other local costs for similar items of work, unless this can be justified not to be possible; (iii) outline justification for the level of contingency applied; and (iv) detail all other assumptions made in the preparation of the cost estimates.
- (iv) **Financial Due Diligence.** Conduct Financial due diligence in accordance with ADB's requirements<sup>3</sup> including:
- (a) Following ADB's guidelines, conduct a financial management assessment of the executing and implementing agencies, including (a) assessing whether previous financial management assessments have been conducted by ADB or other agencies and, if so, reviewing the results and ascertaining whether these can be used as input, (b) assessing capacity for planning and budgeting, management and financial accounting, reporting, auditing, internal controls, and information systems (c) reviewing proposed disbursement and funds-flow arrangements, and (d) concluding on the financial management risk rating and identifying and confirming measures for addressing identified deficiencies;
  - (b) supporting the preparation and agreement of cost estimates and a financing plan, which are based on verifiable data and are sufficient to support project implementation; include life-cycle costs of major equipment with consideration for asset replacement and O&M expenses (spares) within the life of the plant.
  - (c) preparing financial projections and conducting financial analyses of the project and of the executing and implementing agencies, and incremental recurrent costs, to determine financial sustainability, and reviewing proposed cost-recovery and tariff policies, including affordability;
  - (d) conducting financial evaluations (financial cost-benefit analyses) including sensitivity analyses of project components that have a cost-recovery objective; and calculate the financial internal rate of return.

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<sup>3</sup> ADB. 2014. Financial Management, Cost Estimates, Financial Analysis, and Financial Performance Indicators. *Operations Manual*. OMG2/BP. Manila. Also refer <http://www.adb.org/projects/operations/financial-management-resources>

- (e) where significant risks are identified to project financial sustainability or viability, proposing relevant financial performance indicators to be incorporated in financial covenants; and
  - (f) assessing and reaching agreement on financial reporting, auditing and public disclosure arrangements for the project, and, as appropriate, identifying and agreeing arrangements for receiving financial statements from executing and/or implementing agencies.
- (v) **Economic Due Diligence.** Conduct an economic analysis for the project in accordance with ADB's requirements<sup>4</sup>, including:
- (a) Assess economic costs and benefits associated with the proposed project and establish and compare the with-project and without-project scenarios. Calculate the Economic Internal Rate of Return (EIRR) for the project. Identify and analyse likely economic uncertainties that could affect the project's viability and undertake risk and sensitivity analysis in accordance with ADB's *Handbook for Integrating Risk Analysis in the Economic Analysis of Projects*.
  - (b) The economic analysis and economic due diligence of the project shall follow ADB's 2017 "Guidelines for the Economic Analysis of Projects"<sup>5</sup>
- (vi) **Implementation Arrangements.** Review implementation capacity and recommend suitable Project implementation arrangements
- (vii) **Procurement Approach.**
- (a) **A single turnkey contract with post qualification and single-stage-one-envelope** procurement methodology utilising the ADB Standard Bidding Documents for the Procurement of Plant<sup>6</sup> is envisaged.
  - (b) Conduct a Project Procurement Risk Assessment in accordance with the ADB Guide on Assessing Procurement Risks and Determining Project Procurement Classification (2015).<sup>7</sup> The risk assessment shall take into account all existing available similar exercises conducted under prior ADB and other donor projects. The risk assessment shall include a market analysis to ascertain the level of interest of the supply market to provide the goods and services required under the project. The ADB Guidance Notes (GN) on Strategic Procurement Planning and The Procurement Risk Framework may also be referenced in this regard.<sup>8</sup>
- (viii) **Environmental Due Diligence.** Undertake an environmental assessment for the project in accordance with ADB's Safeguard Policy Statement 2009 (SPS) including:
- (a) in coordination with the social safeguards and social/gender specialists, undertake meaningful consultations with key stakeholders, beneficiaries and directly and indirectly affected people and communities as agreed with APS, REDD and ADB.

<sup>4</sup> ADB *Guidelines of the Economic Analysis of Projects*. Available from <https://www.adb.org/documents/guidelines-economic-analysis-projects>.

<sup>5</sup> <https://www.adb.org/sites/default/files/institutional-document/32256/economic-analysis-projects.pdf>

<sup>6</sup> <https://www.adb.org/documents/procurement-plant-guide-2016>

<sup>7</sup> <https://www.adb.org/documents/procurement-risks>

<sup>8</sup> All reference documents are available at <https://www.adb.org/business/main>

- (b) identification and description of physical, biological and socio-economic baseline conditions of the sites and project areas.<sup>9</sup> Engage subcontractors to carry out environment related site surveys, as required, based on a TOR to be agreed with ADB
  - (c) conduct an audit of existing facilities and operations and identification of corrective actions
  - (d) undertake the impact assessment and identify the measures required to avoid and/or manage/mitigate adverse impacts and prepare a costed environmental management and monitoring plan (EMP) for the pre-construction (including identification of potential materials sourcing and haulage for the access road), construction and operations stages of the project
  - (e) based on items (i) – (iv) prepare the initial environmental examination (IEE) for the project and ensure that environmental safeguard measures to be implemented for the Project will comply with both SPS and country safeguard system
  - (f) assist the IA prepare and submit the environmental license application for the project (including any reformatting of the IEE necessary to meet EIA reporting requirements under the country safeguard system)
  - (g) based on the detailed design, update the assessment and EMP and ensure the updated assessment and EMP, conditions of the environmental license, TOR for contractor's environmental staff, and clear requirement for the contractor to prepare and submit their construction EMP (CEMP) for review and clearance by the PMU at least 30 days prior to commencement of any construction activities (including site clearance), are included in the bid/contract documentation for the project.
- (ix) **Social Due Diligence.** Undertake social safeguards, poverty and gender assessments for the project in accordance with ADB's requirements and other co-financiers if applicable, including but not limited to the following:
- (a) Review the scope and activities of the proposed project and conduct due diligence on its potential impacts on land acquisition and/involuntary resettlement. Site selection will minimize physical and economic displacements where possible.
  - (b) In coordination with relevant government agencies, conduct stakeholder and community consultation activities with all relevant stakeholders (e.g. affected persons, CSO/NGOs, women) including focus group consultations, interviews and surveys to examine socioeconomic characteristics of the project area and expected social and economic benefits and involuntary resettlement impacts of the project. Prepare a report on consultations with local communities as part of the safeguards documents and draft a stakeholder and community consultation plan. Relevant information such as draft safeguards documents will also be disclosed in accordance with the country's laws and ADP SPS and

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<sup>9</sup> The baseline will be sufficiently detailed and include noise measurements given the largely urban nature of the likely project sites and include information from the social/gender assessment as required. The baseline will be specific to the sites and project areas and not include generic information about Aitutaki in general unless specific contextual information is required.

Communication Policy. Minutes of meetings and consultations duly signed or acknowledged by the attendees should be prepared.

- (c) Establish the land ownership, use and access rights for all proposed infrastructure under the project. Formal records of land tenure or written advice from the relevant land authority confirming Government ownership must be obtained where government land is to be used or existing land lease agreement if applicable. A due diligence report must be prepared for government land or existing government lease. In the absence of any written or formal records, alternative agreements or documentation acceptable to the government and ADB will be facilitated between the landowners and the government. The findings will also be summarized in the environmental assessment;
- (d) If any private land is required to be acquired, restriction on land use or access will take place, assets on government and/or private land will be affected, or an easement created for any land-based infrastructure, a land acquisition and resettlement action plan (LARP) is to be prepared in accordance with the pertinent government laws and ADB Safeguard Policy Statement 2009 (SPS) and co-financiers, if any. The content of the LARP should follow prescribed content and outline of the Resettlement Plan according to ADB SPS<sup>10</sup>. However, if safeguards impacts will also take place on government owned or lease land, then the LARP should include the outcome of the due diligence for government lands as stated in para (iii).
- (e) Ascertain the capacity of the executing agency/implementing agency in complying with ADB's safeguards requirements such as implementing gender and/or social development measures and LARP and recommend capacity building measures. Potential support which could be provided by the project for physically and economically displaced persons will also be explored.
- (f) Assist the government to establish and implement the project's grievance redress mechanism during project preparation to avoid any delays associated with safeguards.
- (g) Following ADB guidelines, conduct detailed gender analysis (guided by ADB's gender and energy toolkit) and identify gender entry points for the project
- (h) Following ADB policy and requirements, assess the gender impact of the project design. Assess gender related issues in the project area and identify ways to make the project beneficial for women and men. Recommend measures to address gender issues and incorporate them into project design. Carry out gender analysis (guided by ADB's gender and energy toolkit), consult with stakeholders, including women, women's organizations, on key gender entry points and prepare a Gender Action Plan (GAP). The GAP should mirror the Design and Monitoring Framework (DMF) outputs and include gender-inclusive design features, gender targets, indicators and baselines, timelines, cost estimates and implementation arrangements.
- (i) Assess potential poverty and social impacts of the project and prepare a Summary Poverty Reduction and Social Strategy (SPRSS) for the project.

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<sup>10</sup> ADB. 2009. *Safeguard Policy Statement*, Manila. <http://www.adb.org/Documents/Policies/Safeguard-Policy-Statement-June2009.pdf>

### 13. **Bidding Documents**

- a. The Consultant will conduct investigations<sup>11</sup> and prepare bidding documents as follows:
- (i) **Geotechnical.** Based on findings and recommendations from the feasibility study, the Consultant will undertake needed geotechnical investigation of the proposed site sufficient to allow EPC or turnkey contractors to complete bids. The Consultant may subcontract physical site investigation and earthworks laboratory analysis and other surveys, reflecting the ADB core procurement principles and in accordance ADB Procurement Guidelines (2015, as amended from time to time). Proposed subcontracted scope of works will be presented and cleared by ADB and IA prior to advertising. The Consultant will be responsible for (a) collection of available background geotechnical data, (b) review and interpretation of site investigation and earthworks laboratory report, (c) site inspection and assessment (including slope stability if required) of access roads and solar plant site, (d) foundation assessment for solar plant site, (e) identification and assessment of borrow pits, if required, and (f) preparation of geotechnical report to attach to bidding documents, and other inputs into the EPC/turnkey bidding documents, as required.
  - (ii) **Topographic survey.** The consultant will execute a topographic survey of the solar site(s) and any transmission alignments. The survey will include all proposed project infrastructure and any other areas which may be required for EPC/turnkey contractors to complete their designs. Proposed scope of works will be presented and cleared by ADB and IA prior to advertising. Data will be presented on AutoCAD drawings and presented in an electronic format (.dwg and .pdf) to allow EPC/turnkey contractors to use in design.
  - (iii) Conduct a risk assessment of surveying/testing activities associated with the detailed investigations set out in (i) and (ii) above as well as for the geological/geotechnical investigations and identify management measures (including health and safety) to be implemented and/or to be included in services contracts for any sub-contracting. Confirm if need for an environmental license is triggered by any activity in the investigations. If required, assist THE IA in applying for the environmental license.
  - (iv) **Conceptual Engineering Design.** The Consultant will complete conceptual engineering design suitable for Section 6 of the ADB Standard Bidding Document, suitable for EPC/turnkey procurement for the construction. Engineering design will be determined in close coordination with THE IA and will include, but not be limited to:
    - (a) quantity calculations (bill of quantities [BOQ]), unit price analysis and cost estimates with supporting data and calculations.
    - (b) proposed site layout and technical design drawings suitable for EPC/turnkey contracting.
    - (c) Wind and solar resource and climate risk assessments.
    - (d) project design (and specifications) including modules, inverters, battery energy storage systems etc.
    - (e) grid details including system analysis.

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<sup>11</sup> The cost for topographical and geotechnical surveys will be included in the firm's financial proposal as provisional sums. The firm will engage suitably qualified contractors using shopping selection procedures following ADB's *Procurement Policy 2017*. Firms should allow \$15,000 for the topographical survey and \$35,000 for the geotechnical investigation, and as needed, a hydrological survey.

- (f) interconnection requirements.
- (g) geotechnical assessment.
- (h) testing and commissioning requirements.
- (i) training requirements for the IA staff.
- (j) site access design.
- (k) site preparation requirements, including earthworks, and water and electricity connection/supply during construction.
- (l) other issues such as water supply, aviation glare, fencing (security), and flooding etc.

- b. **Bidding Documents.** The Consultant will prepare a full set of bidding documents in accordance with ADB's Procurement Guidelines (2015, as amended from time to time). Draft bidding documents will be reviewed by IA and ADB. The Consultant will incorporate comments to and obtain approval of the final bidding documents. The bidding documents will include an invitation to bid, the basic data sheet, qualification and evaluation criteria, description of the employer's requirements, technical specifications, a letter of bid, bid forms, draft General and Particular Conditions of Contract, environmental management requirements and measures as identified in the site assessments – environmental due diligence, and other necessary documents to be included in the bidding documents as required

14. **Procurement Support.** The Consultant will facilitate procurement in accordance with ADB Procurement Guidelines (2015, as amended from time to time). The Consultant will provide support and assistance to the IA on all aspects of the procurement process including but not limited to the following:

a. **Capacity Assessment and Planning**

- (i) Assess the procurement capacity of the IA, and other engaged government entities, and advise on any additional support required to deliver this project. Conduct a procurement risk assessment and prepare the procurement risk assessment and management plan
- (ii) Conduct a market assessment to determine the interest of the global supply market in serving the project requirements
- (iii) Prepare the procurement plan in accordance with government regulations and ADB's procurement guidelines.
- (iv) Draft and update bidding documents incorporating ADB's comments prior to issuance

b. **Tender Stage**

- (i) Support the advertisement for the procurement of the main turnkey contract(s), as determined during the planning stage;
- (ii) Interpret and assist in drafting responses to technical comments received from potential bidders and support the preparation of addendums and clarifications.
- (iii) Co-ordinate and attend site inspections and pre-bid meetings;
- (iv) If requested, be present at bid opening to assist with the process; and,
- (v) Support the EA and IA and assigned evaluation panel, as requested, throughout the evaluation process, including but not limited to:
  - (a) Reviewing and providing comments on the content of technical and financial proposals;
  - (b) Assisting in the preparation of detailed clarification requests, where required;

- (c) Interpreting responses received for compliance with requested issues and compliance with ADB procedural requirements; and.
- (d) Providing inputs to draft and final bid evaluation reports.

**c. Contract Award**

- (i) Provide detailed support to the EA and IA in the process of contract discussions, negotiation, finalization and award of the relevant contract in accordance with the IA and ADB requirements.

**15. Capacity building**

- a. Formulate an appropriate capacity development plan covering all due diligence requirements and aspects of project design and implementation, including on operations and maintenance of the infrastructure project.
- b. The plan must include national, regional, and international training, technical study visits, seminars/workshops and other effective training approaches/methodologies, for key staff/experts of the EA and IAs. In addition, the TA must provide classroom training on recommended capacity development activities to include:
  - (i) Operation of integrated Diesel/PV/Battery system
  - (ii) Operation and Maintenance of PV array and BESS
  - (iii) Procurement and management of turnkey contracts
  - (iv) Procurement and management of Independent Power Producer contracts
- c. Evaluate the APS generation and network planning and simulation software needs and planning capacity development needs. Assess the various software options available in the marketplace and make recommendations on the appropriate software tools to be purchased to meet future needs. Select the most appropriate and urgently needed software, procure the software and related training package. Prepare a scope of work and cost estimate for follow on or upgraded software procurement and training for inclusion in the ensuing investment project.

**16. Final Report.** The Consultant will produce a Final report summarizing all activities and earlier reports. The Final Report will also comment on lessons learned and recommend alternative approaches for future such projects.

**17.** The Consultant will also prepare a full data package of all relevant background information, feasibility stage data, concept design data and assumptions, safeguards information etc. for issuance to the IA with a copy to be provided to the firm engaged to provide detailed design review and construction stage supervision activities. The Consultant shall also provide all additional data reasonably requested by the construction stage supervision firm during the implementation stage of the project

**G. Reports**

**18.** A summary of the outputs and target dates is presented below. Reports will be submitted to the IA in both hard copy and electronic format and to ADB in electronic format. Each report will be accompanied by a PowerPoint deck summarizing the report contents and findings

#	Output	Report	Target Completion Date	
			= NTP + # of weeks	= Bid submission date + # of weeks
1	Mobilization	Inception	6	
2	Hydrological, Geological Geotechnical, and Topographical Survey reports	Final	14	
3	Safeguards due diligence (including gender) reports and documents	Draft	14	
		Final	22	
4	Feasibility Study (including Grid Integration Study, capacity needs assessment and all due diligence reports), Inputs to the FFP/RRP and draft linked documents	Draft	18	
		Final	28	
5	Bidding Documents	Draft	22	
		Final	30	
6	Procurement Support	Draft BER		10
		Final BER		16
7	Capacity Building Support	Training Report	60	
8	Completion Report	Final Report	75	

BER = bid evaluation report, FFP = facility financing proposal, NTP = notice to proceed, RE = renewable energy, RRP = report and recommendation of the President.

19. ADB and the government shall endeavor to provide comments on the submitted documents within two weeks of receipt of the submitted documents by the Consultant, with the exception of the draft feasibility report where the review period shall be four weeks. In the event submitted documents require substantial adjustments, the Consultant shall submit a revised copy of the deliverable and the review period shall be repeated.

## H. Indicative Milestone Payment Schedule

#	Output	Activity Preceding Payment*	Payment
1	Mobilization	Submission of Payment Request	10%
2&3	Inception Report including Optimized Project Scope and related components	Approval of Report	10%
4a	Draft Feasibility Study & Grid Integration Study	Submission of Report	15%
4b	Final Feasibility Study & Grid Integration Study, and draft FFP/RRP and linked documents <sup>12</sup>	Approval of Feasibility Study Report and submission of FFP and linked documents	20%
5	Bidding Documents	Approval of Bidding Documents	20%

<sup>12</sup> Includes inputs and assistance to preparation of the Facility Financing Proposal (FFP)/Report and Recommendation of the President (RRP) and the Project Administration Manual, and preparation of all due diligence documents such as: (i) sector assessment report, (ii) financial and economic analyses, (iii) tariff and governance assessment, (iv) initial environmental examination and environmental management plan, (v) land acquisition and resettlement plan, (vi) safeguards public consultations and communication strategy, (vii) summary poverty reduction and social strategy, (viii) gender action plan, (ix) operations and maintenance strategy and plan, (x) climate risk and vulnerability assessment, in addition to the full feasibility study and grid integration study

6	Procurement and Capacity Building Support	Issuance of Notification of Award to Preferred Bidder and Approval of Final Training Report	15%
7	Completion Report	Approval of Final Report	10%
Total Lump Sum Provision of Services (excluding Provisional Sums)			100%
<b>Provisional Sums</b>			
9	Completion of Surveys	Upon approval of relevant survey reports	Based on approved survey cost
10	Training and Workshops	Upon approval of relevant training reports	Based on approved training cost

\*Approval shall mean approval from ADB, following consolidation of inputs from government project stakeholders. Submission shall mean provision of a substantially (95%) complete version of the required output, submitted concurrently to ADB and the Cook Islands Government project stakeholders.

20. A provisional sum is included in the cost estimate to cover surveys. Once the type, scope and timing of surveys is confirmed, post contract signing, the Consultant shall engage the necessary firms, as required. The Consultant shall include in its offer for the costs of sourcing, engaging, managing and reporting on all surveys required under this contract.

21. A second provisional sum shall cover the costs of organizing stakeholders' consultation workshops and other outreach activities, which shall be based on the actual costs incurred during these activities by the Consultant.

## I. Consultant Team Composition

22. The Consultant will determine the number and nature of the experts to deliver the outputs. The Consultant will submit the CV's of the proposed team to deliver the outputs in accordance with the Consultant's approach and methodology. The Consultant will indicate the number of person-months inputs for each expert and the minimum time each expert will spend in-country. The team leader must be in country for at least 75% of his/her input time while other key experts must be in-country at least 60% of their input time. Only the CV's of the Key Experts identified below will be evaluated and scored. CV's of non-Key Experts, some of which are suggested below, will be evaluated on a pass-fail basis. Corresponding national technical, financial, and safeguards experts could be fielded as non-key. The following Key Experts are required.

#	Key Expert	Required Qualifications and Experience
1	RE Engineer (Team Leader)	The expert will have a degree in engineering, and at least 10 years of experience in feasibility, design, and specification of wind and/or solar photovoltaic and battery storage projects of which 2 years shall have been as a team leader. Experience in developing countries, particularly in the Pacific region, and in working with development agencies is desirable. The Team Leader will be an anchor member of the team and will provide a level of effort equal to or greater than any other member of the team. S/he will be responsible for the coordination of all activities under the contract, and for delivery of required outputs, reports, and recommendations

#	Key Expert	Required Qualifications and Experience
2	Battery Energy Storage Engineer	The expert will have a degree in electrical engineering and at least 5 years of experience in designing, implementing, commissioning, operating and maintaining battery storage systems for power utilities. Experience in power systems planning and modelling including integrating intermittent RE sources in small power systems and optimizing energy storage. Experience in developing countries, particularly in the Pacific region, is desirable. Experience in developing countries, particularly in the Pacific region, is desirable.
3	Financial Specialist	The expert will have a degree in accounting, finance, or a related field, and will have a recognized professional accountancy qualification. The expert should have at least 10 years' experience, including in project financial due diligence (FDD) and be familiar with ADB procedures. Experience in developing countries, particularly in the Pacific region, is desirable.
4	Environment Specialist	The expert shall possess a degree in environmental science, planning or engineering, or related field, and possess at least 10 years of experience in conduct of environmental impact assessment and management plan preparation and implementation. Experience in power sector is desirable as in experience in implementation of ADB Safeguard Policy Statement. Experience in developing countries, particularly in the Pacific region, is preferred.
5	Land Acquisition/Social Safeguards Specialist	The expert shall possess a degree in Sociology or related field and have at least 10 years' experience in supporting the land acquisition process for infrastructure projects. Experience in developing countries, particularly in Pacific, is preferred as in experience in implementation of ADB Safeguard Policy Statement and preparation of Land Acquisition and Resettlement Plan including entitlement matrix and stakeholder consultations.

23. Non-key experts could include, but not be limited to, the following:

#	Key Expert	Required Qualifications and Experience
6	Wind Power Engineer	The expert is expected to have a degree in electrical engineering and at least 8 years of experience in designing and implementing wind power projects including integration in small power systems and in hybrid operation. Experience in developing countries, particularly in the Pacific region, is desirable.
7	Gender Specialist	The expert should have a postgraduate degree in social sciences or public administration. The expert will have at least 10 years' experience carrying out gender analysis, gender planning, gender mainstreaming (preferably in infrastructure and energy sector) and primary gender research. Experience in the Pacific and developing Gender Action Plans for ADB (or similar development organizations) is preferred.

#	Key Expert	Required Qualifications and Experience
8	Economist	The expert is expected to have degree level qualifications in economics, and at least 10 years of relevant experience in project economic analysis. Experience in conducting economic analysis in accordance with ADB guidelines is required. Experience in developing countries, particularly in the Pacific region, is desirable.
9	Procurement Specialist	The expert is expected to have a University degree in business administration, economics, engineering, public procurement, public policy, or other related fields and a minimum of 5 years' experience in procurement of engineer, procure and construct (EPC) and/or turnkey contracts. The expert will be familiar with ADB, or similar development organization, procurement procedures.
10	Climate Change Expert	The expert is expected to have a graduate degree in related field, and at least 7 years of relevant working experience in climate change modelling, hydrological modelling, and in climate change risk assessment in energy projects, or a combination of undergraduate degree and directly relevant professional experience. The consultant with previous experience in developing countries in the Pacific region is desirable. The consultant will prepare the climate change impact, risk, vulnerability and adaptation assessment reports for the project following ADB guidelines for climate proofing investment in the energy sector; provide inputs to due diligence documents and bidding documents to incorporate recommended climate proofing and climate resilience elements; provide inputs to climate change mitigation and emissions reductions calculations and projections and other relevant inputs to meet the overall project objectives

24. The consultant team shall include a minimum of one local engineer who will work with the Consultant team during project execution and benefit from technology transfer. The local engineer shall be qualified to degree level and have background in a specialist area as chosen by the Consultant. The local engineer will be scored on a pass/fail basis.

#### **J. Counterpart Facilities**

25. The Government through REDD shall provide counterpart in-kind support in the form of counterpart staff and access to meeting facilities, and assistance in logistics, acquiring necessary permits and licenses, as applicable and in arranging meetings, consultations and capacity building activities.

#### **K. Preparation of Proposals**

26. Proposing entities are requested to prepare a concise, detailed and logical description of how they propose to deliver on the outputs of the contract in the section of their proposal called "Approach and Methodology". The provision of generic information shall be avoided. In this narrative, entities should be explicit in explaining how they will achieve the outputs and include any relevant information on their past experience of delivering similar projects and in similar contexts and jurisdictions.

27. Only one curriculum vitae (CV) must be submitted for each key and non-key expert included in the proposal. Only the CVs of key experts will be scored as part of the technical evaluation of proposals. The CVs of non-key experts will not be individually scored, however ADB will review and individually approve or reject each CV of non-key expert positions in the proposal and consider the suitability of the bidders proposed team.

28. All positions under the contract, both key and non-key experts, must be included and budgeted for in the financial proposal, using the forms provided in the RFP. Within the approach and methodology, the Consultant shall link the number of person months proposed to the delivery of the outputs, justifying the allocation accordingly.

29. The Consultants Personnel schedule shall clearly show the percentage of home and field presence of each team member and both full time and intermittent time application to the project. The Consultant is also encouraged to overlay the contents of its work schedule (TECH-3) with its personnel schedule (TECH-4) in order to further elaborate on how the inputs of its staff are aligned with the completion of outputs under the project. This may be included separately as part of the submission.

30. The Consultant shall include all costs necessary to undertake this assignment within its proposal.

## FSM (49450-023): Renewable Energy Development Project (Phase 2) Terms of Reference for Consultants

### A. Overview

1. The Pohnpei Utilities Corporation (PUC) is a public corporation of the Pohnpei State Government and is the primary provider of electricity, water and sewerage services in that state. PUC is governed by a seven-member board appointed by the governor and approved by the state legislature. State policy and planning is directed by the Pohnpei State Energy Commission.
2. In line with national renewable energy targets, and in support of improved reliability and cost-reduction objectives, PUC's board of directors has called for the expansion of hydroelectric capacity to reliably serve its 7000 customers with reduced power generation costs while reducing PUC's exposure high fossil-fuel price volatility.
3. PUC's system has a peak load of 6 MW, served by a diesel fleet with a combined available capacity of 5,850 kW (of 14.5 MW nominally installed), 725 kW of run-of-river hydro, and 980 kW of grid-connected solar PV, including 600 kWp at the Pohnlangas solar farm site. In December 2018, the World Bank approved a project to replace PUC's ageing and inefficient diesel generation with 7.5 MW of new medium-speed generation units. The project also includes investments in reliability enhancements for PUC's distribution network.
4. The Asian Development Bank is currently preparing investments in PUC that support PUC's objective of exploiting to maximal economic advantage its options for renewable generation. Current investments in process (pending anticipated 2019 funding approval) will include up to 9 MW of additional solar PV investment coupled with 1 MWh of battery storage capacity.
5. To further complement the existing and planned renewable generation capacities, PUC has requested support for the expansion of hydroelectric generation. The Lehnmesi river system has been identified as a potentially viable site for hydroelectric development. Past investigations suggest that a small storage reservoir with approximately 9 MWh of storage capacity and 3 MW of output would be viable and would provide PUC a low-cost source of dispatchable generation as short-term alternative to diesel generation.

### B. Full Technical and Economic Due Diligence/Feasibility Study Preparation

6. The TRTA will prepare full technical and economic due diligence for the Lehnmesi hydropower scheme, including all required components of an eventual RRP (FFP) for the ensuing project to a high degree of "project readiness" (procurement packages). The economic analysis and economic due diligence of the project shall follow ADB's 2017 "*Guidelines for the Economic Analysis of Projects*"<sup>13</sup>. **Indicative** personnel assignments and respective tasks/outputs are described in paragraphs 7-17 below. Bidders are expected to propose a personnel schedule and team composition that they believe can best deliver the required outputs and are not required to follow this *indicative* personnel schedule.
7. **Team Leader** (12 person-months – intermittent). The Team Leader will be responsible for management of the consultant team's work and overall completion of all consultant outputs

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<sup>13</sup> <https://www.adb.org/sites/default/files/institutional-document/32256/economic-analysis-projects.pdf>

and deliverables. The Team Leader will guide preparation of all project feasibility study components, preparation of bidding documents, and production of all reports and presentations.

8. The Team Leader should be qualified and experienced as a hydropower engineer, and will have primary responsibility for preparation of all outputs of a hydropower nature, including (i) hydrological and geotechnical assessments, (ii) modelling of the proposed hydroelectric plant's integration with PUC's existing and planned generation capacities, (iii) determination of reservoir and plant size, (iv) preparation of technical specifications and cost estimates for all network components, including integration, control, dispatch, and grid-stability requirements (including battery storage), and (v) and input to relevant procurement packages. The team leader will have overall responsibility for delivery of outputs of all other team members, and will manage coordination with project stakeholders (PUC, Government of Pohnpei, and FSM National Government).

9. **Hydropower Expert** (6 person-months - intermittent). Complementing the team leader, the expert should have an advanced degree in engineering or other relevant field; and at least 8 years of experience in small hydropower engineering with the design, specification and commissioning of small hydropower plants.

10. Together with the Team Leader and other team members, the activities to be undertaken will include but not limited to the following:

- a. Review existing documents and data relating to the Lehnmesi site.
- b. Review existing reports and other relevant documents to (a) confirm reliability, quality, and adequacy of hydrological assessment data, (b) undertake a desktop assessment to prepare probability-based forecasts for the expected power production in kWh, disaggregated by month.
- c. Derive avoided annual diesel consumption and annual GHG emissions (e.g. carbon dioxide and the other air pollutants) of the proposed hydropower plant.
- d. Develop scope and design including scheme drawings and general specifications to include a view on suitability for intended use and compliance with all material regulatory requirements.
- e. Review and update, if necessary, the fundamental siting arrangements, including confirmation of land acquisition and applicable water rights requirements.
- f. In conjunction with the Team Leader, other relevant team experts, and PUC personnel, assess and identify additional system integration and control modifications (if any) to minimize curtailment of hydropower generation (within the bounds of what is economically justifiable).
- g. Identify and specify; a) requirements for the hydropower plant to comply with requirements for integration with the existing and planned PUC generation and network assets; b) requirements for grid connection of the plants.
- h. Identify and specify; a) technical data inputs and calculations for accuracy, reasonableness and consistency with projection of energy production, project contracts and permits; b) reasonableness and adequacy of parameters of the financial model sensitivity scenarios (including suggesting potential scenarios of plant availability related to the probability of major maintenance); and c) working capital and major maintenance requirements, O&M, inventory of spare parts, projected operating budget for each plant, and other relevant technical aspects that should be considered in the financial model.

- i. Prepare notes for hydrological resource assessment and energy yield forecasting, which is part of the technical due diligence report and write the relevant technical portions of the RRP (FFP) document.
- j. Prepare detailed capital and O&M cost estimates; and procurement packaging plan.

11. **Civil Engineer** (6 person-months - intermittent). The civil engineer will undertake civil engineering design work as input to relevant procurement packages, including technical specifications and cost estimates.

12. **Environment Specialist** (6 person-months - intermittent). The specialist will (i) prepare the environmental assessment for the project, (ii) consult with stakeholders, (iii) incorporate appropriate mitigation measures into the project design, (iv) quantify the project environmental benefits, (v) develop a grievance redress mechanism, (vi) identify and manage environmental surveys, including flora and fauna surveys, (vii) assess climate and disaster-related risks, (viii) estimate CO<sub>2</sub> emission reductions and potential for carbon financing, and (ix) prepare an initial environmental examination.

13. **Social Safeguards Specialist** (6 person-months - intermittent). The specialist will undertake social, poverty, and gender related assessments in accordance with ADB guidelines. The specialist will confirm land acquisition and resettlement (if any) requirements of the project. The specialist will also conduct a stakeholder analysis and prepare a consultation and participation plan for the project to ensure continuing stakeholder engagement during implementation. If the project requires land acquisition/resettlement, the specialists will: (i) review the country systems on land acquisition/resettlement and identify any inconsistencies between ADB requirements and the country systems; (ii) assess land acquisition/resettlement impacts; and (iii) develop a resettlement plan(s) following ADB's requirements. If the project impacts indigenous peoples, the specialists will also prepare an indigenous people plan following ADB's format. As necessary, the Consultant will (i) organize and conduct surveys, (ii) develop and implement a stakeholder and community consultation plan, (iii) assess the pro-poor impacts of the project, (iv) assess the gender impact of the project, (v) prepare Poverty and Social Assessments (PSA) and Summary Poverty Reduction and Social Strategy (SPRSS), (vi) assess vulnerabilities and risks associated with HIV/AIDS and other possible health impacts, (vii) prepare socioeconomic monitoring and management plans, (viii) work with the gender specialist to prepare a gender action plan, and (ix) assist the EA to undertake stakeholder consultations. The specialist should possess at least ten years' experience in projects of similar nature and complexity, preferably in the Pacific region.

14. **Procurement Specialist** (4 person-months - intermittent). The specialist will undertake detailed procurement-risk and capacity-gap analysis of the executing and implementing agencies, and prepare project bidding documents for all packages, in conjunction with other consultant team members under the direction of the team leader. The specialist will prepare relevant portions of the RRP (FFP), including the project administration manual and component chapters (including the project procurement plan).

15. **Economic Specialist** (1 person-month - intermittent). The economic specialist will lead the economic assessment of the project to produce robust demonstration of the economic benefits of the project, per ADB's requirements for funding approval. An advanced degree in economics and at least five years' experience in economic analysis of investment projects is required. The

economic analysis and economic due diligence of the project shall follow ADB's 2017 "Guidelines for the Economic Analysis of Projects"<sup>14</sup>

16. **Financial Specialist** (1 person-month - intermittent). The financial specialist will undertake financial analysis of the project and prepare the requisite RRP (FFP) material, coupling it with the financial management assessment of PPUC (prepared in Phase 1). The specialist will: prepare project cost estimates and financing plan; conduct financial management assessments of the executing and implementing agencies; conduct financial viability evaluation of the project; conduct financial analysis and sustainability assessment of the executing and implementing agencies; design funds flow and disbursement arrangements; design reporting and auditing arrangements; and design financial covenants and financial management action plans. The specialist will conduct such work in accordance with relevant ADB guidelines, including: ADB's technical guidance note (TGN) for Financial Management Assessments (2015); TGN for project financial reporting and auditing (2015); TGN for preparation of cost estimates (2014); and, where not covered under these TGNs, in accordance with ADB's 2005 publication "Financial Management and Analysis of Projects". The specialist should have at least five years' experience in similar assignments and possess relevant educational and professional qualifications.

17. **Gender Specialist** (2 person-months). The expert should have an advanced degree in social sciences or public administration. The expert will have substantial relevant experience carrying out gender analysis, gender planning, gender mainstreaming (preferably in infrastructure and energy sector) and primary gender research. Experience in the Pacific and developing Gender Action Plans for ADB (or similar development organizations) is preferred. Among other tasks, the specialist will prepare a gender action plan including monitoring and reporting procedures and templates.

### C. Summary Resource Requirement

18. Estimated period of performance: up to **24 months**.

### D. Personnel Requirements

- a. Team Leader (12 person-months – intermittent)
- b. Hydropower Expert (6 person-months - intermittent)
- c. Civil Engineer (6 person-months - intermittent)
- d. Environment Specialist (6 person-months - intermittent)
- e. Social Safeguards Specialist (6 person-months - intermittent)
- f. Procurement Specialist (4 person-months - intermittent)
- g. Economic Specialist (1 person-month - intermittent)
- h. Financial Specialist (1 person-month - intermittent)
- i. Gender Specialist (2 person-months - intermittent)

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<sup>14</sup> <https://www.adb.org/sites/default/files/institutional-document/32256/economic-analysis-projects.pdf>

## **NAU (49450-009): Solar Power Development Project**

### **Terms of Reference for Engineering and Environmental Support Services to Cover Site Preparation Activities**

#### **A. Background**

1. Asian Development Bank (ADB) provided technical assistance to the Government of Nauru (GoN) under TA 9242 to conduct a solar power expansion plan and prepare a feasibility study for the resulting recommended project. The recommended project (the project) comprises a 6 MW photovoltaic (PV) array combined with a 5.0 MW /2.5 MWh battery energy storage system (BESS) on an 8-hectare (ha) site previously used for phosphate mining.

2. The site needs to be prepared before the PV array and BESS can be installed. The site was mined for phosphate during the 1970s and 1980s. The now abandoned site is uneven and characterized by limestone pinnacles and voids between the pinnacles where phosphate originally existed. Site preparation includes breaking a part of the pinnacles, using the broken part of pinnacles to fill the voids, and adding surface fill to produce a number of level areas of compacted site. Site preparation will include using heavy machinery to break the rock with limited drilling and blasting of the pinnacles.

3. The site is to be prepared by Nauru Utilities Corporation (NUC), Nauru's state-owned monopoly power and water utility. NUC will implement the project and be the Project owner. NUC will contract Nauru Rehabilitation Corporation (NRC), Nauru's state-owned enterprise for land rehabilitation, to prepare the site. Site preparation works will be conducted over a one year period starting in July 2019. This TOR relates to consultancy specification and supervision services (the Services) for site preparation.

4. This TOR will be conducted in cooperation with Department of Commerce, Industry, and Environment (CIE), the government agency responsible for oversight of the power sector and for reviewing and clearing environmental assessments and management plans in Nauru.

5. The TOR will be guided by the environmental protection requirements of Nauru, ADB's Safeguard Policy Statement (2009), and the project's Initial Environmental Examination (IEE) and Environmental Management Plan (EMP).

#### **B. Implementation of the Services and Works**

6. ADB will recruit a firm to provide an international environment specialist, an international engineer, and a national environment engineer to assist in NRC to plan and implement site preparation activities. Key tasks include:

- a. Lead implementation of the environmental and engineering monitoring programs of site preparation.
- b. Report non-compliance to NRC, ADB, NUC, and CIE and propose corrective actions
- c. Monitor and report on corrective actions.

### C. Consultant Tasks, Qualifications, and Level of Effort

	Consultant Tasks	Qualifications	Level of Effort
1	<p><b>Team Leader</b></p> <ol style="list-style-type: none"> <li>1. Provide coordination and direction to the consultant team</li> <li>2. ADB and NUC coordination and communication</li> </ol> <p><b>Output/s:</b> Completion report</p>	<ul style="list-style-type: none"> <li>• Bachelor's degree in engineering</li> <li>• 5 years' project management experience</li> <li>• Experience leading ADB projects</li> </ul>	<ul style="list-style-type: none"> <li>• 0.50 months</li> <li>• All time home-based</li> </ul>
1	<p><b>International Engineering Specialist</b></p> <ol style="list-style-type: none"> <li>1. Assist NRC to implement site preparation activities in accordance with the agreed upon methodology, technical specifications, occupational, health, and safety standards, and quality inspection and test plans</li> <li>2. Assess quality and availability of the equipment to be used</li> <li>3. Assist NRC in updating a work program with key milestone activities</li> <li>4. Conduct inspections of site preparation progress.</li> <li>5. Issue remedial instructions in case of non-conformance with the agreed upon methodology technical specifications, or occupational health and safety standards.</li> <li>6. Prepare report to confirm % of site preparation completion at ADB financing effectiveness milestone date</li> <li>7. Provide training on engineering aspects to NUC, CIE and NRC staff</li> </ol> <p><b>Output/s:</b> Engineering sections to weekly, monthly and final reports.</p>	<ul style="list-style-type: none"> <li>• a bachelor's degree in geotechnical or civil engineering</li> <li>• 8 years' experience to include specifications and quality control measures for ground preparation and rectification.</li> </ul>	<ul style="list-style-type: none"> <li>• 4 person months</li> <li>• At least 90% of time to be spent in Nauru</li> <li>• 7 visits to Nauru are envisaged over the 9-month period of the Services.</li> </ul>
2	<p><b>International Environment Specialist</b></p> <ol style="list-style-type: none"> <li>1. Assist NRC to implement the Site Environmental Management Plan</li> <li>2. Mentor the environmental officer/engineer on the environmental management requirements for the activities, prepare the checklists and monitoring/reporting system</li> <li>3. Accompanied by the environmental officer/engineer undertake monitoring and conduct inspections of site preparation to assess compliance with the SEMP using monitoring checklists and photographs as needed. Provide information to the Engineer for issue of corrective action requests and/or instructions as required for non-compliances with the approved SEMP.</li> </ol>	<ul style="list-style-type: none"> <li>• a degree in environmental science, planning or engineering</li> <li>• eight years' experience as an environmental expert to include preparing IEEs and SEMP, and monitoring their implementation</li> </ul>	<ul style="list-style-type: none"> <li>• 4 person months</li> <li>• At least 80% of time to be spent in Nauru</li> <li>• 7 visits to Nauru are envisaged over the 9-month period of the Services.</li> </ul>

	<b>Consultant Tasks</b>	<b>Qualifications</b>	<b>Level of Effort</b>
	<ol style="list-style-type: none"> <li>4. Ensure that required environmental safeguards are implemented for the period of the land clearing activities;</li> <li>5. coordinate and work with NUC and NRC to implement the project's communications and consultation plan with respect to notices and information to the public regarding</li> <li>6. coordinate and work with the NUC to implement the project's grievance redress mechanism during the land clearing activities; and</li> <li>7. provide on-the job training on the environmental aspects to CIE and NRC</li> </ol> <p><b>Outputs</b></p> <ol style="list-style-type: none"> <li>1. Environmental sections of weekly, monthly, and final reports</li> <li>2. 2 semi-annual safeguards monitoring reports</li> </ol>		
3	<p><b>Environmental Officer/Engineer</b></p> <ol style="list-style-type: none"> <li>1. Monitor implementation of site preparation to ensure compliance with SEMP and site preparation methodology, technical specifications, and occupational, health, and safety standards.</li> <li>2. Assist international consultants in preparation of reports</li> <li>3. Prepare weekly and monthly reports.</li> </ol> <p><b>Output/s:</b> Weekly and monthly reports for engineering and environmental safeguards</p>	<ul style="list-style-type: none"> <li>• Engineering or environmental qualifications</li> <li>• 3 years' professional experience</li> </ul>	<ul style="list-style-type: none"> <li>• 7 person months, 100% in Nauru</li> </ul>