

THE NATIONAL DEVELOPMENT BANK OF PALAU

REQUEST FOR PROPOSALS

SUPPLY OF GRID CONNECTED SOLAR PHOTOVOLTAIC HOME SYSTEMS

REFERENCE:

April 2021

Document Control Sheet	
Name of the Tenderer	National Development Bank of Palau
Date of Issue	_____, 2021
Last Date and Time for submission of Queries	_____, 2021
Last Date and Time for Receipt of Bids	_____, 2021 17.00 Hrs (Palau time)
Date of Opening of Technical Bids	_____, 2021
Address for Communication	Ms. Karla West Operations Manager, National Development Bank of Palau Email: kwest@ndbp.com

Disclaimer

The information contained in this tender document and/or subsequently provided to bidder(s) or applicants, whether verbally or in documentary form by or on behalf of National Development Bank of Palau (NDBP) or any of its employees or advisors, is provided to the bidder(s) on the terms and conditions set out in this tender document and all other terms and conditions subject to which such information is provided.

This tender document is not an agreement and is not an offer or invitation by the NDBP to any parties other than the applicants who are qualified to submit the bids ("Bidders"). The purpose of this tender document is to provide the bidder(s) with information to assist the formulation of their proposals. This tender document does not claim to contain all the information each bidder may require. This tender document may not be appropriate for all persons, and it is not possible for the NDBP, their employees or advisors to consider the investment objectives, financial situation and particular needs of each bidder who reads or uses this tender document. Each bidder should conduct its own investigations and analysis and should check the accuracy, reliability and completeness of the information in this tender document and where necessary obtain independent advice from appropriate sources. The NDBP, its employees and advisors make no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of the tender document. The NDBP may at its absolute discretion, but without being under any obligation, update, amend or supplement the information in this tender document.

The bidder is expected to examine all instructions, forms, terms and specifications in the bidding document. The bid should be precise, complete and in the prescribed format as per the requirement of the bid document. Failure to furnish all information required by the bidding document or submission of a bid not responsive to the bidding documents in every respect will be at the bidder's risk and may result in rejection of the bid.

The bidder shall bear all costs associated with the preparation and submission of its bid and NDBP will in no case be held responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

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The SHS shall be delivered on or before the date specified in Section Three above.	
In the event of breach of this clause NDBP reserves the right to:	
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1 Background

Palau's National Energy Policy (NEP) has set a target of 45% of renewable energy (RE) share of the electricity generation by 2025. Solar energy is an untapped resource in Palau, which has solar irradiation estimated at 5.5 - 5.9 kW/m² per day. Backed by multilateral and bilateral agencies, a number of grid connected rooftop solar programs have been implemented from 2010 to 2019. With a Net Metering Act in place and over 100 solar home systems successfully deployed, rooftop solar remains one of the best RE options for Palau.

Asian Development Bank (ADB) has offered to provide a financial intermediation (FI) grant to the Republic of Palau to create the Disaster Resilient Clean Energy Financing (DRCEF) facility. The National Development Bank of Palau (NDBP) has been designated to administer the DRCEF. Work undertaken on the project to date has identified that the installation of grid-connected rooftop solar home systems (SHS) as an economical and feasible source of RE generation, that will allow customers to offset their energy usage through net metering.

The NDBP now wishes to install an initial number of grid connected rooftop SHS and is issuing this Request for Proposal (RFP) to secure the necessary equipment and materials for this program on Delivered Duty Paid (DDP) basis. Import custom duty for shipments under this tender has been waived off by the Government of Palau (GoP).

The ability of the equipment to perform in accordance with internationally recognised standards for solar products under tropical coastal conditions is of utmost importance. Only equipment that has been used successful for not less than five (5) years in similar environments will be considered.

2 Scope and Conditions of Supply

Proposals are sought from qualified manufacturers and system integrators (hereinafter referred to as 'bidders') for the supply of approximately 800 units of 1.7kW SHS. The initial port of delivery for the items listed herein is Koror, Republic of Palau. Consortiums are not allowed, but bidders are allowed to engage a subcontractor with the prior written approval of NDBP.

2.1 Quotation Quantity

Due to the unique requirements of this project being undertaken by NDBP, the actual quantities to be purchased are not yet fixed although a maximum quantity to be ordered is given for guidance.

- a. The maximum quantity to be ordered of the grid-connected SHS is estimated to be 800 units.
- b. The maximum quantity for each component to be ordered has been provided under the Column C in Annexure II.
- c. Prices should be quoted for the maximum quantity. Offers for partial quantities shall not be considered.
- d. NDBP may want to stagger the delivery of units and therefore may order the quantity required in multiple lots. In such case, NDBP shall issue a formal Purchase Order mentioning the lot quantity at the prices negotiated under this tender.

2.2 Additional Conditions

Specific brands for the system and its individual components have not been mentioned. However, bidders should consider proposing only established brands that have a well-established track record of performance and durability. NDBP reserves the right to purchase all or only part of the component list from any supplier.

The Supplier will provide, in the English language, full operating and maintenance manuals for each of the components offered with detailed parts lists as appropriate. These manuals shall be provided in hard copy and electronic formats.

2.3 Warranties

- a. Bidders are required to offer warranties for all components as defined herein and such warranty shall provide for the timely and full replacement including delivery to Koror, at no cost to NDBP, of any component that may fail or fail to perform according to the agreed specifications within the Warranty Period.
- b. It is expected that the warranty for solar panels will be 10 years for workmanship and 25 years for the output staying within 20% of the rated value. For the proposed inverter a 10-year standard warranty is expected. Other components should be warranted for not less than 10 years. Any exceptions to these warranty periods should be clearly indicated.
- c. All warranties will clearly acknowledge the extreme tropical environment in which the systems are to be installed.
- d. Spares equivalent to 5% of the supplied quantities of system and/or its individual components shall be kept at NDBP's premises free of cost by the Supplier at all times during the warranty period.

3 Pricing

- a. All prices are to be quoted as per the format prescribed in Annexure - II.
- b. Prices shall be firm and valid for 120 days from the date of the closing of this RFP
- c. Subject to any mutually agreed variations, acceptance of any proposal within the period of validity will bind the Supplier to deliver on the basis of the pricing as quoted and within the period offered.
- d. As mentioned earlier, all products are to be quoted on a Delivered Duty Paid (DDP) basis. There is no customs duty on items imported under this tender.
- e. NDBP is seeking to achieve a price point of:
 - o \$ 850 – \$ 950 USD per kW for the PV system and required Balance of System (BOS) components.

NDBP has no obligation to accept any proposal sought under this RFP.

4 Queries during Period of Request

All queries related to this RFP and prior to the closing time and date should be submitted electronically to:

<p>Ms. Karla T. West, Operations Manager, National Development Bank of Palau Email: kwest@ndbp.com</p>	<p>and copied electronically in full to:</p> <p>Ms. Alfonsa Koshiha County Manager, Asian Development Bank Email: akoshiha@adb.org</p>
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- a. Bidders who wish to be made aware of any such queries and responses should register their interest in receiving such information with the representatives listed above.
- b. No unsolicited enquiries will be accepted after the closing time and date, nor with regard to NDBP's decision on award.

5 Submission of Proposals

5.1 Items to be submitted

- a. Bidder description & qualifications, technical details of the proposed solution and other documents listed in the Technical Bid Checklist and attached as Annexure - I with this RFP document.
- b. Full pricing for each and every component offered as per the format prescribed in Annexure - II.
- c. Full descriptive material, test reports and specifications for all components. These should all be clean and legible copies written or printed in English language.
- d. A copy of all test certificates and manufacturer warranties.
- e. An acknowledgement that bidder, if selected, will enter into a Contract, draft of which is provided as Annexure - III. Any proposed variations should be indicated.
- f. Confirmation of delivery time from the date of award of contract.
- g. Any other information that the Supplier may see necessary to fully explain its offer.

5.2 Format and Signing of Proposal

- a. The bidder shall submit the Technical and Financial proposals in single stage but separate envelopes. These envelopes will be clearly marked as "Technical Bid" and "Financial Bid", as appropriate.
- b. Both the envelopes, one for Technical Bid and one for Financial Bid thus prepared, should then be kept in one common envelope and sealed. The cover should read "Request for Proposals - Supply of Grid Connected Solar Home Systems".
- c. Proposal envelope shall also indicate the name and address of the bidder. NDBP, at its own discretion, may decide to return the proposals unopened in cases where the proposals are received after the submission deadline.

5.3 Mailing Address for Proposals

Proposals shall be addressed and sent to the following address:

Addressee	Ms. Karla West
Position/Title	Operations Manager
Company	National Development Bank of Palau
Address	Main Branch, Ngetkib Village, P.O. Box 816, Koror, Republic of Palau, 96940

5.4 Submission of documents via Dropbox

Considering the current pandemic restrictions, a full set of documents for proposal should be uploaded via dropbox where postal submission is not possible. The link details can be requested by email to:

Ms. Keckereldil Ulechong

Email : kulechong@ndbp.com

5.5 Submission Deadline for Proposals

The full copy of proposals should be received by **5pm on Friday, 14,May, 2021**. Proposals received after the submission deadline will be rejected. The receipt of proposals will be acknowledged electronically by email.

5.6 Opening of Proposals and Review

Proposals will be not be opened before the submission deadline stated above. The opening of proposals may begin immediately after the submission deadline to shorten the period of evaluation. The opening of proposals will not be done in public.

5.7 Evaluation of Proposals

All information submitted will be treated in confidence to the extent protected by the laws of the Republic of Palau, and not disclosed to third parties, with the exception of NDBP, ADB, Palau Energy Office (PEO), PPUC and GoP. It is anticipated that the evaluation and decision to proceed to place orders will occur within 30 days of the opening of proposals.

5.7.1 Technical Evaluation Criteria

- a. The proposals will be evaluated by a tender committee that may include representatives of ADB, NDBP, PPUC and PEO.
- b. The proposals will be ranked according to their combined technical (S_t) and financial (S_f) scores using weights.
- c. W_t is the weight given to the Technical Proposal and equals 0.3; W_f is the weight given to the Financial Proposal and equals 0.7; ($W_t + W_f = 1$).
- d. The total score (S) will be determined as: $S = (S_t \times 0.3) + (S_f \times 0.7)$
- e. The firm achieving the highest total score (S) will be invited for negotiations.
- f. Methodology for calculating the financial score (S_f) is provided below:
 - f.1. The lowest price (F_{min}) will be given a financial score (S_f) of 100 points. The financial scores (S_f) of the other proposals will be computed according to the formula: $S_f = 100 \times F_{min}/F$. In this formula, S_f is the financial score, F_{min} is the lowest price and F the price of the proposal under consideration.
- g. The technical score (S_t) will be calculated using the technical evaluation criteria and their respective weights given in the below table:

Technical Evaluation Criteria

Qualification of Company (Weight)	40%
(i) Track record with grid connected solar home systems	30
(ii) Experience with overseas sales and shipping	20
(iii) ISO and/or other certifications	10
(iv) Annual revenue of more than US\$ 2 million in each of last 2 years	20
(v) Strong Technical Team	20
Total Points	100

Product Specifications (Weight)	40%
(vi) Panel Efficiency (20 points for base efficiency of 190 W_p/m^2 and 1 point for every additional W_p/m^2)	40
(vii) Conformity with specifications for the Balance of System	40
(viii) Ability to be operated and maintained in Palau	20
Total Points	100

Warranty Support (Weight)	10%
(ix) Proximity of agent	20
(x) Spare parts access (dispatch and delivery modality)	40
(xi) Warranty duration	40
Total Points	100

Delivery Time (Weight)	10%
(xii) Delivery time (Fastest)	100
Total Points (Possible)	100

Delivery time score will be calculated using the below methodology:

Delivery time score = S_{dt} : ($S_{dt} = 100 \times D_{tf}/D_t$) where D_{tf} is the shortest proposed lead time required to deliver the material in Palau after signing of contract and D_t is the completion time of the bidder.

6 Detailed Specifications of Solar Home System and Components

6.1 Photovoltaic Panels

- a. The photovoltaic (PV) modules shall be warranted for long-term reliability with output guarantees of > 90% after 10 years and >80% after 25 years under the tropical and coastal conditions in Palau. A copy of the complete warranty terms must be provided with the tender.
- b. The PV modules proposed by the bidder must comply with the following international standards:
 - a. IEC 61215
 - b. IEC 61730 Part 1 and Part 2
 - c. IEC 61701 Salt and Mist Corrosion Severity Level 6
- c. The PV panels must have been tested by an internationally recognized testing facility and certified by that facility to meet internationally accepted standards. A copy of the test certificates must be provided as part of your response
- d. The PV panels will be made of monocrystalline silicon with power output ratio of greater than 190 W_p/m^2 under standard test conditions. Polycrystalline and/or thin film type solar PV panels are not acceptable.
- e. PV panels must be framed with anodized aluminium or marine grade stainless steel with appropriate mechanisms to prevent water and corrosion damage to the active components of the panel.
- f. High strength glass must be used for the transparent cover. The backing of the panel may be high strength glass or other material impermeable to water that is accepted under the applicable international standards.
- g. The panels must be supported by frame elements to avoid bending and twisting during strong winds. The panels should be able to withstand short-term wind speeds of 60 m/s and up to 2400 Pa of uplift.
- h. Connectors should be by standard "quick connect" type socket

The bidder will include as a part of the bid response at least the following information for the panels to be supplied:

- a. V_{oc} , I_{sc} , I_{mpp} , V_{mpp} , and W_p at standard conditions
- b. The relationship between temperature and module output over the cell temperature range 25°C to 75°C
- c. Physical size and weight
- d. Details of the materials used in construction, including the frame, the connection boxes, the backing material and the encapsulation material.
- e. Number of cells per panel

6.2 Photovoltaic Module Support Structures

- a. Roofs in Palau are made of concrete, metal or wood. Most arrays are expected to be mounted on roofs made either from concrete or good quality metal roofing fastened to wooden purlins that are in turn fastened to wooden trusses. However, mountings should also be suitable for use with pre-fabricated steel buildings. For panel mounting rails, a spacing of 600 mm between purlins is to be assumed
- b. In cases, where the roof is not strong, ground mounting of panels could be required
- c. The panel mounting framing must support the panels in a manner that allows adequate air flow between the metal roofing and the back of the panels to keep heating of the panels to a minimum
- d. A spacing between the back of the panel and the highest part of the roofing metal that is between 60mm and 100mm will be acceptable
- e. All metal components and fastening hardware that are in actual contact with the steel roof must be marine grade stainless steel or a non-conducting material
- f. Direct aluminium to steel contact at any point in the assembly will not be acceptable.
- g. The tilt and direction of the roof surface will be maintained in the PV array therefore there is no requirement to provide a mounting that is not parallel to the roof surface
- h. The fastening method will be such as to always penetrate the corrugated metal at a high point on its surface and will include appropriate seals that prevent roof leaks due to the panel attachment for the life of the installation which is to be at least 20 years. Through bolting of modules is recommended
- i. All structures must be able to resist at least 20 years of outdoor exposure in the location's harsh tropical coastal environment without any appreciable corrosion or structural fatigue.
- j. Full technical specifications and detailed assembly instructions should be provided with the quotation showing the construction and assembly of the mounting structures and the details of the mounting of the modules and their attachment onto the supporting structure. These must specifically include physical size, and details of materials used in construction.
- k. Panel mountings supplied shall be standard commercial units manufactured specifically for mounting of solar panels on metal roofing and shall be adjustable to fit standard solar panels in the 300-350 W_p range.

6.3 Wiring

- a. Panel wiring shall be single conductor double insulated stranded copper wire with the conductor at least 4mm² in cross-sectional area or AWG 10 or larger.
- b. The minimum insulation voltage specification for the supplied cable will be 600VDC.
- c. The outside insulation sheath shall be specifically intended for outdoor use in high UV and high ambient temperature environments.
- d. Wire specifically intended for use in grid-connected solar systems should be proposed.
- e. Indoor wiring shall be standard two conductor house wiring 12AWG or 2.5 mm² stranded or solid copper wire.
- a. Supplier will provide full specifications for the wire and insulation materials that are supplied.

6.4 Dedicated Inverters

- a. String inverters with an input rating suitable for a 1.7kW SHS and designed for on-grid applications should be proposed.
- b. Inverter must have an efficiency rating of > 97% and be designed to provide a pure sine wave output at 120V 60Hz.
- c. They must be suitable for outdoor installation with an IP65 rating or above and suitably protected to be able last in a tropical, coastal environment.
- d. Other features that need to be included are:
 - i. Inbuilt MPPT charge controller
 - ii. Inbuilt isolation transformer to protect from grid surges and noise.
 - iii. User friendly Informative LCD display
 - iv. Dual MCB protection against short circuit protection for AC and DC
 - v. Option to select source priority between solar and grid
 - vi. Safe for home use with comprehensive protection features such as over-current, short-circuit, reverse polarity and anti-islanding
 - vii. Pure sine wave output for safety and noiseless operation of connected appliances
 - viii. Inbuilt communication through RS485 and/or wi-fi
- e. Should comply with grid regulations of Palau and international standards for safety - IEC 62109 - 1&2

6.5 Energy Meters

- a. Energy Meters for net metering purposes will be supplied by Palau Public Utility Company (PPUC). The recommended meter by the local utility is GE make with model number I-210+C.

7 ANNEXURE I – Format and Contents of the Technical Bid for SHS

The technical bid should provide detailed information about the bidder, its qualifications and the proposed solution. Following documents should be provided by the bidder as part of the Technical Bid:

- Company Profile - please include company presentation, brochure and link to your website
- Proof of executed projects & reference installations for each item that you are quoting for
- Copy of ISO and/or any other certification(s), if any
- Specifications and test reports of solar panels, inverters, mounting equipment and other system accessories. These should all be in English, in clean and legible copies
- Estimated delivery schedule
- Detailed installation process along with proper O&M instructions and manual
- Audited financial statements for the last 2 years (optional). However, this information must be provided if you wish to score points for the technical evaluation criteria # (iv).
- An acknowledgement that, if selected, your company will be willing enter into the Contract as shown in Annexure - III. Any proposed variations should be indicated
- Any such other information that you may see necessary to fully explain your proposal

8 ANNEXURE II – Format and Contents of the Financial Bid for SHS

The below format should be used for preparing the financial bid. Please review the information provided in this Annexure carefully while preparing the financial bid.

Estimated Quantity of Home Systems = 800				
A	B	C	D	E
Component	Quantity Per Home System	Estimated Maximum Quantity to be supplied (= Column B X 800)	Unit Price (US\$)	Total Price (US\$)
Solar Panels				
Inverter	1			
Mounting System	1 set			
Wiring and Disconnects	1 set			
Balance of System (Other than inverter, mounting system, wiring and disconnects)	1 set			
Total				

- Prices shall be quoted in United States Dollars
- The number of panels per SHS is to be suggested by the bidder
- Unit prices in column D should be quoted on Delivery Duty Paid (DDP) basis
- There is no custom duty on items imported under this tender
- Any and all incidental costs (like travel, stay, courier etc.) associated with this project shall be borne by the bidder. NDBP shall not compensate separately for these costs.
- Storage space for the imported material during the project and for spares after the project will be provided by NDBP
- Prevailing average wage of skilled workers in Palau is US\$ 3.5/hour

9 ANNEXURE III – Installation and training on site for Solar Home System

Compliance criteria of project management resources for this project

Criteria for Foreign Installation team	Compliance (Y/N)	Comments
Minimum [15] years of experience in electrical installations		
Minimum [7] years of PV installations		
Safety Harness & Lanyard Training		
Work at Height Training		
Licence for operating Mobile Elevating Work Platforms, Mast Climbing Work Platforms or Construction Hoists [(e.g. PAL Card)]		
Advanced understanding of electrical science, inspection & testing procedures, fault diagnosis and rectification and installation design accompanied by a relevant qualification from a governmental body [(e.g. BS 7671 IEE Regulation 18th Edition Level 3)]		
Competency to work on the installation, commissioning and maintenance of low voltage electrical and electronic devices and appliances in a consumer's electrical installation [(e.g. ECS gold card)]		
Site Supervision Safety Training		
Site Management Safety Training		
Qualification in Electrotechnical Services - Electrical Installation [(e.g. 2356 -31 - Level 3)]		
Qualification in Inspection, Testing and Certification of Electrical Installation [(e.g. 2391-10 - Level 3)]		

In addition to the supply of quality systems, the bidder should consider the following:

Installation: Installation of all the systems for over 1 year. (Extension to be agreed if necessary)

Training and localization: Consider localization of installation and maintenance throughout the project (about 2 years) by mobilizing local staff (up to 4 experts), providing quality training and on-job supervision to carry out maintenance and installation services.

- Winning Supplier will conduct training and certification for installing and maintenance for local installers. The installation team should comprise of 50% local residents, who have been trained by the Supplier. For an additional fee the Supplier can quote to maintain the systems for 2 years. The supplier's trainer(s) will observe and oversee installations of a minimum 25% of total installations. (Minimum % to be advised by winning Supplier).

Operation Manual: Develop a standard operating manual for the local team to carry their task effectively, complying with the product's requirements and power grid standards as per the USA.

10 ANNEXURE IV – Draft Contract for supply of Solar Home Systems

The successful bidder will be required to enter into a contract with NDBP for SHS as the case may be. The detailed terms and conditions of supply are mentioned below:

CONTRACT

Contract Title and Number	Grid Connected 1.7kW Solar Home Systems (SHS)
Name and Address and Contact information of Supplier	Vendor Name: Contact Name: Address: 1) 2) Phone: E-mail:
Contract amount	\$ [Insert Amount] for SHS
Beginning and Completion Date	<i>Contract period is xx calendar days.</i> <i>Contract execution date by Supplier:</i> _____ <i>Contract completion date:</i> _____
NDBP Project Manager	_____, <i>President, National Development Bank of Palau</i> Phone: E-Mail:

This agreement and contract (hereafter referred to as "Contract") is made and entered into this _____ **day of**, _____, **2021**, by and between the National Development Bank of Palau hereinafter referred to as 'NDBP' and **[Insert Supplier Name]**, hereinafter referred to as 'Supplier'.

Whereas, NDBP has an immediate need for ____ units of 1.7kW Solar Home Systems (SHS), specified for deployment under a renewable energy program for the Republic of Palau; and

Whereas, NDBP issued a Request for Proposals (RFP) for the supply and installation of 800 units 1.7kW SHS; and

Whereas, pursuant to the RFP, NDBP received proposals from various companies; and

Whereas, NDBP evaluated the proposals from each bidder; and

Whereas, Supplier's proposal was determined by NDBP to provide the best products and services at the best price and that entering into this Contract is in the best interest of NDBP;

Now therefore, in consideration of the mutual covenants, terms, and conditions set forth in this Contract, Attachment A Request for Proposal and Attachment B (Supplier's Proposal), product details and specifications, and subsequent communications), both incorporated by this reference and made a part hereof, NDBP and Supplier agree as follows:

SECTION ONE:

DESCRIPTION OF SCOPE OF SUPPLIER'S OBLIGATIONS AND WORK

Supplier shall, in accordance with the terms of this Contract and within the Contract time specified in Section Three of this Contract, sell, supply. Supplier shall arrange all insurances as necessary for the DDP delivery of the shipment to the port of Koror and beyond to NDBP's Designated warehouse in Koror or Airai with all accessories, components, and parts as per the specifications mentioned below in subsections A & B. Supplier shall provide all necessary parts list, operating and maintenance manuals in English for regular maintenance and overhauls of the supplied items. Supplier shall also perform other obligations specified for it elsewhere in this Contract.

A. Grid Connected 1.7kW Solar Home Systems

Supplier shall sell, supply, deliver, and transfer ownership to NDBP of the 1.7kW SHS, with the specifications indicated as follows:

Product Name	Product Make	Ordered Quantity	Spare Quantity	Total Quantity
Solar Panels				
Inverters				
Mounting Equipment				
Wiring and Disconnects				
Other Accessories				

The components of the SHS must meet the following specifications as appropriate:

1. Photovoltaic Panels

- a. The photovoltaic (PV) modules shall be warranted for long-term reliability with output guarantees of > 90% after 10 years and >80% after 25 years under the tropical, coastal conditions in Palau. A copy of the complete warranty terms must be provided with the tender.
- b. The PV modules proposed by Supplier must comply with the following international standards:
 - i. IEC 61215
 - ii. IEC 61730 Part 1 and Part 2
 - iii. IEC 61701 Salt and Mist Corrosion Severity Level 6

- c. The PV panels must have been tested by an internationally recognized testing facility and certified by that facility to meet internationally accepted standards. A copy of the test certificates must be provided with the tender
- d. Cells will be made of monocrystalline silicon with power output ratio of greater than $190 \text{ W}_p/\text{m}^2$ under standard test conditions. Polycrystalline and/or thin film type construction is not acceptable.
- e. PV modules must be framed with anodized aluminium or marine grade stainless steel with appropriate mechanisms to prevent water and corrosion damage to the active components of the panel.
- f. High strength glass must be used for the transparent covers. The backing of the panels may be high strength glass or other material impermeable to water that is accepted under the applicable international standards.
- g. The panels must be supported by frame elements to avoid bending and twisting during strong winds. The panels should be able to withstand short-term wind speeds of 60 m/s and up to 2400 Pa of uplift.
- h. Connectors should be by standard "quick connect" type socket
- i. Supplier shall provide test certificates and warranty documentation for the panels before shipping the material to Palau

2. Photovoltaic Module Support Structures

- a. Roofs in Palau are made of concrete, metal or wood. Most arrays are expected to be mounted on roofs made either from concrete or good quality metal roofing fastened to wooden purlins that are in turn fastened to wooden trusses. However, mountings should also be suitable for use with pre-fabricated steel buildings. For panel mounting rails, a spacing of 600 mm between purlins is to be assumed
- b. In cases, where the roof is not strong, ground mounting of panels could be required
- c. The panel mounting framing must support the panels in a manner that allows adequate air flow between the metal roofing and the back of the panels to keep heating of the panels to a minimum
- d. A spacing between the back of the panel and the highest part of the roofing metal that is between 60mm and 100mm will be acceptable
- e. All metal components and fastening hardware that are in actual contact with the steel roof must be marine grade stainless steel or a non-conducting material
- f. Direct aluminium to steel contact at any point in the assembly will not be acceptable.
- g. The tilt and direction of the roof surface will be maintained in the PV array therefore there is no requirement to provide a mounting that is not parallel to the roof surface
- h. The fastening method will be such as to always penetrate the corrugated metal at a high point on its surface and will include appropriate seals that prevent roof leaks due to the panel attachment for the life of the installation which is to be at least 20 years. Through bolting of modules is recommended
- i. All structures must be able to resist at least 20 years of outdoor exposure in the location's harsh tropical coastal environment without any appreciable corrosion or structural fatigue.
- j. Full technical specifications and detailed assembly instructions should be provided with the quotation showing the construction and assembly of the mounting structures and the details of the mounting of the modules and their attachment onto the supporting structure. These must specifically include physical size, and details of materials used in construction.
- k. Panel mountings supplied shall be standard commercial units manufactured specifically for mounting of solar panels on metal roofing and shall be adjustable to fit standard solar panels in the $300\text{-}350\text{W}_p$ range.

3. Wiring

- a. Panel wiring shall be single conductor double insulated stranded copper wire with the conductor at least 4mm² in cross-sectional area or AWG 10 or larger.
- b. The minimum insulation voltage specification for the supplied cable will be 600VDC.
- c. The outside insulation sheath shall be specifically intended for outdoor use in high UV and high ambient temperature environments.
- d. Wire specifically intended for use in grid-connected solar systems should be proposed.
- e. Indoor wiring shall be standard two conductor house wiring 12AWG or 2.5 mm² stranded or solid copper wire.
- f. Supplier will provide full specifications for the wire and insulation materials that are supplied.

4. Dedicated Inverters

- a. String inverters with an input rating suitable for a 1.7kW SHS and designed for on-grid applications should be proposed.
- b. Inverter must have an efficiency rating of > 97% and be designed to provide a pure sine wave output at 120V 60Hz.
- c. They must be suitable for outdoor installation with an IP65 rating or above and suitably protected to be able last in a tropical, coastal environment.
- d. Other features that need to be included are:
 - i. Inbuilt MPPT charge controller
 - ii. Inbuilt isolation transformer to protect from grid surges and noise.
 - iii. User friendly Informative LCD display
 - iv. Dual MCB protection against short circuit protection for AC and DC
 - v. Option to select source priority between solar and grid
 - vi. Safe for home use with comprehensive protection features such as over-current, short-circuit, reverse polarity and anti-islanding
 - vii. Pure sine wave output for safety and noiseless operation of connected appliances
 - viii. Inbuilt communication through RS485 and/or wi-fi
- e. Should comply with grid regulations of Palau and international standards for safety - IEC 62109 - 1&2

B. Manuals

Concurrent with the delivery to NDBP of the SHS, Supplier shall provide installation, operation, maintenance and parts list manuals written in the English language for regular maintenance and major overhauls of the items supplied to NDBP as part of this Contract.

SECTION TWO: REPORTING

The NDBP Contracting Officer is the NDBP President. Supplier shall liaise with the NDBP Contracting Officer or her designated representative throughout the duration of this Contract. Matters of an unusual nature should be reported immediately to the NDBP President.

SECTION THREE: CONTRACT TIME

Supplier shall fully carry out and perform all of its duties and obligation set forth in this Contract within (...) calendar days after the date of execution of this Contract by Supplier. Supplier understands that prompt performance of all work is required by NDBP in order to meet its schedules and commitments and that time is of the essence with, in, and under this Contract. The Contract period may only be extended by a written agreement between NDBP and Supplier.

SECTION FOUR: CONTRACT PRICE

Pursuant to the terms of Section Five of this Contract, NDBP will pay Supplier the total sum of [United States Dollars] (**US\$[Insert Amount in number]**) for full performance by Supplier of all of Supplier’s duties and obligations set forth in this contract. The total Contract price breakdown is as follows:

Product Name	Product Make	General Specifications	Unit Price (US\$)	Quantity	Amount (US\$)
Solar Panels					
Inverters					
Mounting Equipment					
Wiring and Disconnects					
Other Accessories					
Total					

All the unit prices mentioned above are on Delivered Duty Paid (DDP) basis

It is understood and accepted by Supplier that the price of \$ [Insert Amount] towards supply of ____ units of SHS is NDBP’s total monetary obligation owed to Supplier under this Contract and, upon full payment of such sum to Contactor by NDBP, Supplier shall have no other claims or demands for payment against or on NDBP and NDBP shall have no further liability to Supplier under this Contract.

SECTION FIVE: PROGRESS AND FINAL PAYMENT

Payment of Supplier under this Contract shall be as follows:

- a. 80% of the Contract price upon receipt and their satisfactory inspection, by NDBP or their designated representative, as to compliance in all aspects, of the SHS, their accessories, components and parts material at the designated location in Palau;
- b. 20% of the Contract price within 180 days of receipt and satisfactory inspection by NDBP or their designated representative or within 30 days of the equipment installation, testing, and commissioning by NDBP’s contractor, whichever is earlier.

Supplier shall invoice NDBP for each item specified above, invoices shall carry a NET30 payment term. Before payments are made and as a condition for the release of payment on

each invoice, the NDBP Project Manager shall certify each invoice for full assurance of compliance with industry quality standards and technical specifications detailed in this Contract and its attachments.

SECTION SIX: CHANGE ORDERS

NDBP may, by written change order, require changes within the general scope of this Contract, in the schedule, specifications, or quantity or work to be performed under and pursuant to this Contract, and Supplier shall be entitled to an adequate adjustment in the price or time or performance required by such change. Such equitable adjustment shall not exceed the most favourable price charged by Supplier for similar work and shall not exceed the sum of US Dollars Twenty Five Thousand (\$25,000). Supplier shall present all claims for equitable adjustment in writing to NDBP within ten (10) days of such written change order, or such additional time as NDBP, in its discretion, may allow, and shall contain such supporting information and documentation regarding the cost of such changes as NDBP may require. If not so presented, such claim shall be deemed waived. Nothing in this Contract shall be construed as relieving Supplier from proceeding with the Contract, as changed. In order to be binding, any and all amendments, including change orders, to this contract must be in writing, signed by both parties.

SECTION SEVEN: DELIVERY

The SHS shall be delivered on or before the date specified in Section Three above. In the event of breach of this clause NDBP reserves the right to:

- a. Terminate this Contract without liability by giving an immediate notice and to charge Supplier with any loss incurred as a result of the Supplier's failure to make the delivery within the time specified; or
- b. Charge a penalty of 0.1% of the total Contract price for every day of delay or breach of the delivery schedule by Supplier.

SECTION EIGHT: CONFIDENTIAL INFORMATION

All media, documents, files, plans, drawings, reports, computer disks, magnetic media, electronic communications and reports, materials and information of any nature that are made available by NDBP to Supplier or that may become available to Supplier by virtue of this Contract or the relationship created by this Contract shall be held in strict confidence by Supplier and shall be used only in the performance of this Contract. All confidential disclosures made or such confidential information that is made available to Supplier by NDBP is made in reliance on this assurance.

SECTION NINE: OWNERSHIP OF WORK PRODUCTS

Any and all records, files, documents, plans, drawings, reports, storage media, and other materials and work products produced or modified by the Supplier under this Contract shall become the property of NDBP upon payment of the contract price. NDBP shall have the complete right to use and re-use such work products in any manner deemed appropriate by NDBP.

SECTION TEN: WARRANTIES

The Supplier will provide warranties for all components as defined herein and such warranty shall provide for the timely full replacement including delivery to Koror, at no cost to NDBP, of any component that may fail or fail to perform according to the agreed specifications within the Warranty Period.

The Supplier undertakes to maintain spares equivalent to 5% of the systems and/or components that have been installed at all times during the warranty period. These spares shall be provided to NDBP at no cost and shall be stored at a place designated by NDBP.

It is expected that the warranty for solar panels will be 10 years for physical problems and 25 years for the output staying within 20% of the rated value. For the inverter and mounting equipment and electrical accessories the warranty is 10-years from the date of installation. Any exceptions to these periods should be clearly indicated.

All warranties will clearly acknowledge the extreme tropical environment in which the systems are to be installed.

SECTION ELEVEN: FAULTY WORK OR PRODUCTS; WARRANTIES

Supplier shall perform all of its duties and obligations specified in and by this Contract in a professional manner meeting or exceeding the professional standards of the industry. Supplier shall guarantee the operational integrity of the products, work and services to be provided under this Contract and full compliance with the terms of this Contract and its attachments for the duration of time such products, work and services are utilized by NDBP, beginning from the date of the acceptance letter by the NDBP President. Any faults, defects, or problems discovered during this period shall be corrected promptly (within 10 days) by the Supplier at Supplier's expense.

If during the agreed warranty period for the products any of the work is found to not conform with the requirements of this Contract, Supplier shall correct it at Supplier's expense promptly after receipt of written notice from NDBP to do so; if Supplier fails to do so, NDBP may make a claim against Supplier for breach of warranty.

If Supplier fails to make the necessary corrections, or persistently fails to perform in accordance with this Contract, NDBP may issue a written order to Supplier to stop its performance hereunder until the cause for the order is corrected or eliminated; provided, however, that the right of NDBP to stop performance by Supplier shall not give rise to a duty on the part of NDBP to exercise this right for the benefit of Supplier or any other person or entity.

SECTION TWELVE: DELIVERY SCHEDULE; TERMINATION; REMEDIES

Time is of the essence of this Contract. Supplier acknowledges that NDBP has an immediate need for the SHS. and the services specified in this Contract. In the event that Supplier fails to perform as scheduled in this Contract, Supplier will be in breach of this Contract, and NDBP shall have the right to monetary compensation for value of replacement goods and services to complete the project and to terminate this Contract upon written notice to Supplier. NDBP shall also have all the rights and remedies provided by law, including but not limited to an award of reasonable attorney's fees and court costs in favour of it and against Supplier in the event of litigation initiated by NDBP against Supplier, in which NDBP is the prevailing party.

SECTION THIRTEEN: INDEMNIFICATION & INSURANCE

Supplier shall indemnify NDBP and hold NDBP and NDBP's agents, servants, and employees, entirely harmless from and against any and all claims, damages, losses and expenses, including attorney's fees and court costs, arising out of or resulting from or in any way relating to Supplier's actions, services, work, and performance under this Contract. Supplier shall further indemnify NDBP for any payment due to Supplier's suppliers and or sub-suppliers in connection with this contract.

Supplier shall arrange all insurances as necessary for the DDP delivery of the shipment to the port of Koror and beyond to NDBP's Designated warehouse in Koror or Airai. This cover shall also provide for loss or damage to all goods shipped up until they are unloaded at NDBP's designated warehouse within Koror or Airai. Evidence of such insurance shall be provided to the NDBP together with the shipping documents.

SECTION FOURTEEN: COVENANT NOT TO ASSIGN

It is agreed by the parties that there will be no assignment or transfer by Supplier of this Contract, nor of any interest in this Contract, without NDBP's prior written approval, and Supplier further covenants that Supplier and not a sub-contractor shall perform all duties and responsibilities to be performed hereunder. Should Supplier decide to engage a subcontractor, NDBP shall have the right to evaluate and accept or reject such a subcontractor.

SECTION FIFTEEN: APPLICABLE LAWS; VENUE

This Contract shall be construed and enforced in accordance with the laws of the Republic of Palau. All claims and cases regarding this Contract shall be instituted only in the Palau Supreme Court or any competent court of Palau, and judgments, rulings, decisions and orders rendered in such matters shall be enforceable in any courts outside of Palau against Supplier. Supplier specifically agrees to the jurisdiction of any competent Palau court, including the Palau Supreme Court, over it, and its officers and officials and in any and all cases, disputes, or claims brought before the court for resolution in Palau and agrees to be bound by Palau Court judgments and orders.

SECTION SIXTEEN: ATTORNEYS' FEES

In the event any action or case is filed in relation to this Contract, the unsuccessful party in the action or case shall pay to the successful party, in addition to all the sums that either party may be called on to pay, a reasonable sum for the successful party's attorney's fees, including but not limited to those incurred for the enforcement of judgments, rulings decisions or orders and court costs, in and outside Palau.

SECTION SEVENTEEN PROHIBITION AGAINST GRATUITIES, KICKBACKS OR CONTINGENCY FEES

It shall be a breach of ethical standards for Supplier to offer, give or agree to give an employee or former employee of NDBP, or for any employee or former employee of NDBP to solicit, demand, accept or agree to accept from Supplier, a gratuity or an offer of employment in connection with any decision, approval, disapproval, or recommendation, pertaining to this contract. Supplier by execution of this Contract hereby warrants that it has not retained for a contingency fee any person to solicit or secure this or any contract of NDBP.

SECTION EIGHTEEN: MISCELLANEOUS PROVISIONS

Supplier agrees to retain all records of or relating to this Contract, including but not limited to all invoices, payment receipts, drawings, plans, files, and other documents of or relating to this contract for three years after final payment and closure of any pending matters, and to permit NDBP unhindered access to such records.

NDBP shall have the right to examine, copy, and audit books and records of Supplier and any sub-contractor relating to this contract up to a year after the date of the Letter of Acceptance from NDBP pursuant to this Contract.

No waiver by any party of any right on any occasion shall be construed as a bar or waiver of any right or remedy on any future occasion.

As a condition precedent to receiving final payment of compensation under this Contract, Supplier shall execute and deliver a release, in a form approved by NDBP, of all claims known or unknown at the time of the final payment, against NDBP, their agents, and employees. If any obligations, liens, claims, security interests, or other encumbrances arising out to this Contract remain unsatisfied after payment is made to Supplier, Supplier agrees to indemnify or otherwise pay to NDBP any amounts NDBP may be compelled to pay in discharging such items, including all costs and reasonable attorney's fees.

SECTION NINETEEN: NON-EXCLUSIVITY

Notwithstanding any decision that NDBP may make to purchase products from Supplier, NDBP reserves the right that at any time, at any price, and without limitation, it may buy the same, similar, or replacement products from another supplier.

SECTION TWENTY: FORCE MAJEURE

Neither party will be in default nor liable for any delay or failure to comply with this Agreement due to any cause beyond the control of the affected party, excluding labour disputes, provided such party promptly notifies the other.

SECTION TWENTY-ONE: ENTIRE AGREEMENT

This Contract with its attachments (A and B) constitutes the entire binding agreement between the parties hereto and any prior understanding or representation of any kind preceding the date of this Contract shall not be binding on either party except to the extent incorporated in this Contract. No modification or amendment of this Contract shall be effect or binding on any of the parties hereto unless the same is reduced to writing and signed by the parties or their duly authorized agents.

IN WITNESS WHEREOF, each party to this agreement has caused it to be executed on the dates indicated below.

The National Development Bank of Palau
Approved as to form and legality:

Date:

NDBP Legal Counsel

Date:

Ms. Claire Harvey
President, NDBP

Certified for the availability of funds:

Account No:

Date:

CFO/Comptroller, NDBP

SUPPLIER:

Date:

[Insert Supplier Name]