RTI INTERNATIONAL
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Request for Proposal (RFP)

Commodity/Service Required:	Small Renewable Energy Mini-grid Projects Requiring Co-funding
Type of Procurement:	Purchase Order
Type of Contract:	Fixed Price with Payment Milestones
Term of Contract:	Approximately nine months
Contract Funding:	USAID
This Procurement supports:	USAID-PNG Electrification Partnership (USAID-PEP)
Submit Proposal to:	procurement@png-pep.org
Date of Issue of RFP:	Friday, 26 January 2024
Date of Pre-bid Conference:	Tuesday, 20 February 2024 at 2:00 – 3:00 PM (PNG time) A confirmation is required to attend the Pre-bid Conference. Attendance is limited to two representatives per company. Send your reservation request to procurement@png-pep.org by 19 February 2024, 5:00 PM (PNG Time). Interested Bidders unable to attend in person may join by Zoom.
Date Questions from Bidders Due:	4 March 2024 by 8:00 AM (PNG time)
Date Proposal Due:	**11 March 2024 by 8:00 AM (PNG time)**
Approximate Date Purchase Order Issued to Successful Bidder(s):	15 April 2024

Method of Submittal:

Submit proposal via e-mail with attached documents in MS Word/pdf format. Email to procurement@png-pep.org.

For detailed proposal submission guidance please refer to Attachment B: Instructions to Bidders, however, it is crucial that you heed the guidance below to ensure that your proposal is considered for evaluation.

In order for RTI to conduct the most efficient proposal evaluation, Bidders are required to include the items described below in their proposals. Failure to include any of the items highlighted below in your proposal may result in your proposal being rejected.

a. Cover Letter, signed by an authorized representative of the Bidder (see Attachment C for template)
b. Proof of legal registration in Papua New Guinea
c. IRC Certificate (TIN)
d. Technical Proposal (including Attachment D: Bidder Information and Technical Proposal Form)
e. Financial Proposal (see Attachment E: Pricing Template Sample)

The Bidder agrees to hold the prices in its proposal firm for 120 days from the date specified for the receipt of proposals unless another time is specified in the addendum of the RFP.

Solicitation Number:	PEP RFP-2024-001

Attachments to RFP:

1. Attachment A: Statement of Work
2. Attachment B: Instructions to Bidders
3. Attachment C: Cover Letter Template
4. Attachment D: Bidder Information and Technical Proposal Form
5. Attachment E: Pricing Template Sample
6. Attachment F: 937 Geographic Code Countries
7. Attachment G: USAID-PEP Technical Requirements and Specifications
8. Attachment H: Minimum Supply Kit – Specifications

All PO Terms and Conditions are listed on our website set forth at:
https://www.rti.org/sites/default/files/rti-po-terms_english_version_-_v1.18.pdf,
http://www.rti.org/files/PO_FAR_Clauses.pdf or for commercial items:
http://www.rti.org/files/PO_FAR_Clauses_Commercial_Items.pdf (hereinafter the "Terms").
Supplier's delivery of products, performance of services, or issuance of invoices in connection with this purchase order establishes Supplier's agreement to the Terms. The Terms may only be modified in writing signed by both parties.

All Bidders are responsible to carefully review each attachment and follow any instructions that may be relevant to this procurement.

Attachment A: Statement of Work

Description of Activity/Service:

RTI International (RTI) is implementing the USAID-PNG Electrification Partnership Activity (USAID-PEP), a five-year project funded by the United States Agency for International Development (USAID). The project aims to help PNG achieve its goal of connecting 70% of its population to electricity by 2030. To accomplish this goal, RTI aims to reach a target of at least 200,000 new off-grid household electricity connections and institutionalize key strategies that will enable PNG to achieve such by the end of the Activity. USAID-PEP is delivered through four main objectives: (1) Demonstrate measurable increase in PNG Power Limited's financial viability and operational efficiency, (2) Develop viable off-grid electrification models, (3) Demonstrate measurable improvement in PNG's regulator, and (4) Catalyze private investment for energy projects.

As part of Objective 2, 'Develop viable off-grid electrification models', RTI seeks to identify small, renewable energy mini-grid projects that have been developed/initiated by Bidders, which require co-funding of up to 50%. USAID-PEP has limited funding and may only co-fund up to 50% of a project's total cost (up to a maximum co-funding amount of USD 250,000), depending on the costs and quality of projects received. USAID-PEP anticipates funding at least six (6) projects from this RFP. USAID-PEP may also provide some technical assistance toward the projects.

Product or Service Expectations:

To be eligible to receive co-funding for your mini-grid project, the following essential requirements must be met:

1. The mini-grid project has verifiable co-funding committed towards it of at least 50% of the project cost. The co-funding must be available to enable the installation and commissioning of the mini-grid by the target date of 15 October 2024.
2. The mini-grid project must already be well developed, with well-defined technical details and costs.
3. The mini-grid must be at least 95% powered by renewable energy, e.g., solar and batteries, wind and batteries, hydro, etc. A backup diesel generator may be incorporated, however, USAID-PEP will not fund the purchase of diesel generators.
4. The mini-grid must connect at least five households and incorporate social/public infrastructure, such as health facilities, schools, churches, or other community/public facilities. Upgrades, refurbishments and expansions of an existing mini-grid will be considered as long as the project connects new households.
5. The connected houses must be within a self-contained facility, area or village that does not result in potential community issues between the houses connected to electricity and those not connected to electricity. One example of this is staff houses around health facilities and schools, which are considered to be distinct from surrounding villages.
6. The mini-grid must be in an off-grid area that is either at least 10 km away from the PNG Power electricity network or is very unlikely to be connected to the PNG Power network within 10 years.

7. There is no specific geographical focus, however, USAID-PEP has a preference to co-fund at least one project in Gulf province and Central province.
8. Documented approvals are available from landowners for the use of the land or roof spaces for the mini-grid generation system and distribution grid. After being selected for co-funding, the Supplier will also be responsible for obtaining CEPA/environmental, NEA, and building approvals, and, if necessary, conducting a land survey or roof structural assessment.
9. The mini-grid must be designed to be technically, financially and socially sustainable. To ensure its long-term viability, the mini-grid must include a payment and sustainability model that provides revenue for the operation and maintenance of the system, such as through the use of pre-paid metering or another reliable method of collecting payments.
10. The electrical, civil and mechanical design and installation of the mini-grid must meet PNG and Australia's standards, industry best practices, and international standards that apply. Attachment G contains the minimum technical and safety requirements and standards that must be adhered to.
11. Gender equity must be considered in the planning and implementation of the project.

USAID Nationality and Source Requirements

The nationality and source requirements for equipment or items that (1) the Bidder has already installed at the project site, (2) are present in the Bidder's current inventory, or (3) will be procured for work under this RFP are as follows:

- Nationality, i.e., the place of incorporation, ownership, citizenship, residence, etc. of the Bidder of the mini-grids: The nationality of the mini-grid Bidder must be PNG or the United States of America.
- Source of mini-grid components / equipment, i.e., the country from which each mini-grid component is shipped to PNG, or PNG itself if the components are located therein at the time of the purchase: The source of mini-grid components must be PNG, the United States of America, or any 937 geographic code country (reference Attachment F). Please see important note below.
- Bidder may not offer or supply services or any commodities that are manufactured or assembled in, shipped from, transported through, or otherwise involving any of the following countries: Cuba, Iran, North Korea, or Syria.
- Any and all items that are made by Huawei Technology Company, ZTE Corporation, Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, Dahua Technology Company will not be accepted. If quotes include items from these entities, please note that they will be deemed not technically responsive, and excluded from competition.
- The US Government has implemented a blanket prohibition on providing direct government financing to international solar projects that source from Suppliers that are the subject of a withhold release order (Hoshine Silicon Industry), on the Commerce Entity List, or otherwise sanctioned for their use of forced labor. These People's Republic of China (PRC) energy companies that were added to the Commerce Entity List for their ties to forced labor are found below. NOTE: Bidders may not purchase from any of the Suppliers listed below without advance written approval from RTI/USAID.
    - Hoshine Silicon Industry (metallurgical grade silicon and silicon products) - also subject to a WRO

- Xinjiang Daqo New Energy (polysilicon, wafers)
- Xinjiang East Hope Nonferrous Metals (polysilicon, ingots, wafers)
- Xinjiang GCL-New Energy Material (polysilicon, ingots, wafers, cells, modules)
- Xinjiang Production and Construction Corps (state-owned paramilitary organization, electricity supplier)

Note: This does not mean that all PRC-produced solar panels are prohibited. Currently, the restriction is on any solar panels or products that are directly purchased using US Government funds from any of the above companies.

Please note that the Source/Nationality requirements enumerated above apply only to individual purchases over $25,000 USD. Any individual purchase not exceeding $25,000 can be made from any country except the prohibited countries. For example, a Bidder could buy $25,000 worth of solar panels from Australia, then $23,000 worth of batteries from New Zealand, and $500 worth of connectors from India and remain compliant. However, bidders are prohibited from breaking up procurements in amounts less than $25,000 to circumvent the Source/Nationality requirements.

Deliverables, Timelines, Special Terms and Conditions:

The successful Bidder will be responsible for the engineering, permits and approvals, procurement, installation, testing and commissioning, training, documentation and 1-year defects liability and support period for the mini-grid system. These tasks are indicative, and Bidders may need to undertake other tasks to successfully implement a mini-grid. Bidders should include any such tasks in their proposal.

RTI reserves the right to conduct a site survey prior to award for the purpose of verifying the accuracy and completeness of the information presented in the proposal.

Below is a list of the required deliverables/milestones for a USAID-PEP funded mini-grid project and indicative timelines. The payment amounts/percentages for each milestone will be negotiated before any purchase order is issued:

Milestone 1: Completed 4 weeks after purchase order issued

Receipt and acceptance of:

a. Government approvals and permits (e.g., building, land, CEPA/environmental, NEA, etc.) – or confirmation if not required.
b. Roof structural assessment for mounting solar PV arrays on roofs, if necessary.
c. Land survey for distribution grid design, if necessary.
d. Detailed design documentation – including, at minimum, single-line diagram, distribution grid and underground reticulation layout drawing, solar PV layout drawing (including string layout/allocation), powerhouse civil drawings, cable schedule, and electrical calculations (cable sizing calculations and protection sizing calculations).
e. Bill of materials, including critical spare parts, required accessories, and list of tools for installation and O&M.
f. Project schedule – including material logistics and team allocation to scheduled items.
g. Commissioning plan – including visual, civil, mechanical and electrical test procedures for the system and its components, i.e., solar PV panels/strings/array, shading check, inverters, battery energy storage system (BESS), distribution system, switchboards,

metering, control and communications, earthing, cables and conduit, insulation resistance, shutdown, mounting structure, concrete slump test and hammer test, etc.

Milestone 2: Completed 16 weeks after purchase order issued

Receipt and acceptance of:

a. All materials procured and delivered to site.
b. QA/QC inspection of materials by USAID-PEP.
c. Review and acceptance of operations & maintenance (O&M) training materials, O&M training program, O&M manual and logbook as per the following:
    i. The training shall be conducted for the operator and users (customers/households). It shall incorporate on-the-job training for the operator during installation.
    ii. The training and O&M manual shall follow manufacturers' recommendations, best practices, and international standards. Both the training and O&M manual shall include:
        - system operation, management and remote monitoring;
        - preventative, reactive and condition-based maintenance, including troubleshooting and emergency procedures;
        - maintaining records;
        - defects liability period and technical support options;
        - user safety and usage of the mini-grid;
        - a schedule on what needs to be done to operate and maintain the system daily, weekly, monthly, quarterly and annually; and
        - warranties and details of how warranties will be honoured
    iii. The O&M manual shall be designed with image-based directions to be suitable for users with limited technical experience. It shall include equipment details and serial numbers, a spare parts list, and all equipment/component datasheets and manuals.
    iv. The logbook provided shall be used to record what maintenance has been conducted, when it was conducted and by who.

Milestone 3: Completed 24 weeks after purchase order issued

Receipt and acceptance of:

a. Installation team mobilised to site appropriately.
b. Land prepared, compacted and cleared if required, including cutting of trees and branches that will cause shading on the solar panels or are in the path of the distribution grid.
c. Installation completed with installation/OHS reports and photos provided to USAID-PEP on a daily and weekly basis. The report template will be provided and includes various checks, such as photos of installed cables and cable markings before they are buried or hidden behind walls.
d. On-the-job training on installation and maintenance of the mini-grid provided to the operator's staff during the installation.
e. Commissioning plan implemented by the Supplier and supervised by USAID-PEP. Commissioning tests passed and accepted/signed by USAID-PEP.
f. A 7-day performance test period conducted where the system operates normally and any defects are rectified prior to the issue of the certificate of practical completion. This can

take place during the O&M training program.

g. Certificate of practical completion signed and issued by USAID-PEP.

Milestone 4: Completed 27 weeks after purchase order issued

Receipt and acceptance of:

a. Site remediated, cleaned up and waste disposed.
b. O&M practical training program conducted for the operator and users (customers/households) following the training materials and program accepted in Milestone 2.
c. Handover package – one physical copy to be provided to the operator, and electronic copies to be provided to the operator, co-funder and USAID-PEP – to include:
    i. Scope of Work (SOW).
    ii. Government approvals and permits.
    iii. Bill of materials.
    iv. Supply of critical spare parts, required accessories and required O&M tools.
    v. O&M manual and logbook.
    vi. Commissioning plan implemented by Supplier and signed by USAID-PEP.
    vii. Certificate of practical completion signed and issued by USAID-PEP.
    viii. As-built drawings – including, at minimum, single-line diagram, distribution grid and underground reticulation layout drawing, solar PV layout drawing (including string layout/allocation), powerhouse civil drawings, cable schedule, and electrical calculations (cable sizing calculations and protection sizing calculations).
    ix. As-built photos of system and main components, i.e., solar PV panels/array, mounting structure, inverters, BESS, distribution system, switchboards, metering, control and communications, earthing, powerhouse, and cables and conduit.
d. Certificate of handover signed by the co-funder and USAID-PEP.
e. Project close out meeting conducted.

Milestone 5: 1 year after certificate of handover signed (typically 5% payment)

Receipt and acceptance of:

a. Completion of 1-year defects liability period, which shall be in effect commencing from the date of the signing of the certificate of handover by all parties. During this period, the Supplier shall provide O&M technical support services as needed to the operator.

Pricing

Bidders shall submit a price quote using the table below or in Excel format in the general format shown below with per unit costs, including GST, and terms of payment. All prices must be in PNG Kina. A sample template in Excel format is located at Attachment E.

Item #	Description	Qty.	Unit	Unit Price	Total Fixed Price	Co-funding	Funded by RTI	Notes
1	**Item AAAA**	2	Each	PGK XXXX	PGK XXXX	PGK XXXX	PGK XXXX	
2	**Expert BBB**	2	Days	PGK XXXX	PGK XXXX	PGK XXXX	PGK XXXX	
3								
Sub Total Value					PGK XXX	PGK XXX		
GST XX %					PGK XXX	PGK XXX		
Total Value					PGK XXX	PGK XXX		

By signing this attachment, the Bidder confirms a complete understanding of the specifications and fully intends to deliver items/services that comply with the above listed specifications.

Signature:	
Title:	
Date:	

Attachment B: Instructions to Bidders

1. **Procurement Narrative Description**: The Buyer (RTI) intends to purchase commodities and/or services identified in Attachment A. The Buyer intends to purchase the quantities (for commodities) and/or services (based on deliverables identified in the Statement of Work). The term of the Ordering Agreement shall be from Award Date to the Delivery date of the Bidder unless extended by mutual agreement of the parties. The Buyer intends to award to responsible Bidders based on conformance to the listed specifications, the ability to service this contract, and selling price.

2. **Procuring Activity**: This procurement will be made by **Research Triangle Institute (RTI International) LLC**, located at

   1st Floor, Gordons Business Centre, Hohola
   P.O. Box 209, Vision City
   Port Moresby, National Capital District
   Papua New Guinea

   who has a purchase requirement in support of a project funded by

   USAID

   RTI shall award the initial quantities and/or services and any option quantities (if exercised by RTI) to Bidder by a properly executed Purchase Order as set forth within the terms of this properly executed agreement.

3. **Proposal Requirements**. All Bidders shall submit a proposal which contains offers for all items and options included in this RFP. All information presented in the Bidder's proposal will be considered during RTI's evaluation. Failure to submit the information required in this RFP may result in Bidder's proposal being deemed non-responsive. Bidders are responsible for submitting proposals, and any modifications, revisions, or withdrawals, so as to reach RTI's office designated in the RFP by the time and date specified in the RFP. Any proposal, modification, revision, or withdrawal of a proposal received at the RTI office designated in the RFP after the exact time specified for receipt of proposals is "late" and may not be considered at the discretion of the RTI Procurement Officer.

   The Bidder's proposal shall include the following:

   (a) The solicitation number (Include in Cover Letter)

   (b) The date submitted (Include in Cover Letter)

   (c) The name, address, and telephone number of the Bidder and authorized signature of same (Include in Cover Letter)

   (d) Validity period of proposal (Include in Cover Letter)

   (e) Past performance information, to include recent and relevant contracts for the same or similar items and other references (including points of contact with telephone numbers, and other relevant information) (Include in Bidder Information and Technical Proposal Form)

   (f) If RTI informs Bidder that the Commodity is intended for export and the Commodity is not classified for export under Export Classification Control Number (ECCN) "EAR99" of the U.S. Department of Commerce Export Administration Regulations

(EAR), then Bidder must provide RTI the correct ECCN and the name of Bidder's representative responsible for Trade Compliance who can confirm the export classification.

(g) Acknowledgment of solicitation amendments (if any)

(h) Special Note: The Bidder, by his response to this RFP and accompanying signatures, confirms that the terms and conditions associated with this RFP document have been agreed to and all of its attachments have been carefully read and understood and all related questions answered.

4. Bidders will be required to submit the response to the RFP in an email with an attached zip file containing two folders: (1) Eligibility Requirements Folder and (2) Proposal Folder. Information submitted in the Proposal Folder will be referenced for scoring during the proposal evaluation, utilizing the factors outlined in Attachment B, paragraph 11.

1) Eligibility Requirements Folder:

Eligibility Folder Requirements: Proposals will only be evaluated if eligibility requirements are met and all documents listed below are submitted with the proposal.
1. Cover Letter (template located in Attachment C)
2. Proof of Legal Registration in Papua New Guinea
3. IRC Certificate (TIN)

2) The Proposal Folder shall consist of two sub-folders: (1) Technical Proposal folder and (2) Financial Proposal folder. Information submitted under each sub-folder will be referenced for scoring during the proposal evaluation, utilizing the factors outlined below in Attachment B, paragraph 11. Bidders shall present separate technical and financial proposals for each site they bid on.

Technical Proposal Requirements
The information in this sub-folder will be evaluated against the technical evaluation factors: Technical Approach and Design (30 points), Project Delivery Schedule (10 points), Payment and Sustainability Model, and Risk Assessment (10 points), Organizational Capabilities and Experience (10 points), and Past Performance (10 points). The sub-folder must include the completed Attachment D: Bidder Information and Technical Proposal Form, addressing the Statement of Work, and include any relevant attachments. It shall contain sufficient detail to allow RTI to evaluate the project fairly with minimum possible misinterpretation.
Financial Proposal Folder Requirements
The information in this sub-folder will contribute to the financial evaluation factors: Co-funding (10 points) and Pricing (20 points). The sub-folder must include the following – 1. Details/profile of project co-funder/s, the amount of co-funding provided, when

(approximate date) that the co-funding will be available for the project, and evidence of commitment, such as an official letter.

2. Submit a line-item pricing table in Excel format with per unit costs, including GST, co-funding and terms of payment. Bidders may price proposals using the Attachment E: Pricing Template Sample or the Bidder may utilize another format with clear and concise pricing. All prices must be in PNG Kina. Include budget justification notes detailing how funds will be allocated during the project, including the proposed level of effort of staff who will work on the project. Bidders shall present a separate pricing table for each site they bid on.

   Provide a payment address and include any pricing instructions, discount terms, special requirements or terms if applicable. Ensure all project costs are captured in the pricing table. Pricing must include guaranteed firm fixed prices for items requested. Modifications during project implementation will not be allowed without very strong justification.

5. **Questions Concerning the Procurement:** All questions in regard to this RFP should be directed to

USAID-PEP Procurement

at this email address:

procurement@png-pep.org

The cut-off date for questions is.

4 March 2024 by 8:00 AM (PNG time)

6. **Notifications and Deliveries**: Time is of the essence for this procurement. Bidder shall deliver the items or services no later than the dates set forth in the contract that will be agreed by both parties as a result of this RFP. The Bidder shall immediately contact the Buyer's Procurement Officer if the specifications, availability, or the delivery schedule(s) changes. Exceptional delays will result in financial penalties being imposed on Bidder.

7. **Documentation**: The following documents will be required for payment for each item:
   a. A detailed invoice listing purchase order number, bank information with wiring instructions (when applicable)
   b. Packing list
   c. All relevant product/service documentation (manuals, warranty doc, certificate of analysis, etc.)

8. **Payment Terms**: Refer to RTI purchase order terms and conditions found at https://www.rti.org/sites/default/files/rti-po-terms_english_version_-_v1.18.pdf, http://www.rti.org/files/PO_FAR_Clauses.pdf, or http://www.rti.org/files/PO_FAR_Clauses_Commercial_Items.pdf. Payment can be made via wire transfer or other acceptable form**.** Bidders may propose alternative payment terms and they will be considered in the evaluation process.

9. **Alternative Proposals**: Bidders are permitted to offer "alternatives" should they not be able to meet the listed requirements. Any alternative proposals shall still satisfy the minimum requirements set forth in Attachment A: Statement of Work.
10. **Inspection Process**: Each item shall be inspected prior to final acceptance of the item. All significant discrepancies, shortages, and/or faults must be satisfactorily corrected and satisfactorily documented prior to delivery and release of payment.
11. **Evaluation and Award Process:** The RTI Procurement Officer will award a contract resulting from this solicitation to the responsible Bidder(s) whose proposal conforms to the requirements of the RFP, and will be most advantageous to RTI, price and other factors considered. The award will be made to the Bidder whose proposal represents the **best value** to the project and to RTI. For the purpose of this RFP, the technical factors and past performance when combined are significantly more important than price for the purposes of evaluating and selecting the "best value" awardee. RTI intends to evaluate proposals and award a contract without discussions with Bidders. Therefore, the Bidder's initial proposal should contain the Bidder's best terms from a price and technical standpoint. However, RTI reserves the right to conduct discussions if later determined by the RTI Procurement Officer to be necessary.

    Each proposal shall be evaluated against the following evaluation factors:

Technical Evaluation Criteria	**Maximum Points**
Factor 1: Technical Approach and Design	
Adequacy and quality of the proposed technical approach and technical designs in response to the Statement of Work.	30
Factor 2. Project Delivery Schedule	
Adequacy and reasonableness of the project delivery schedule timeline. Is the schedule realistic and implementable? Will the plan meet the target date of 15 October 2024 for completion of installation and commissioning?	10
Factor 3: Payment and Sustainability Model, and Risk Assessment	
Adequacy and reasonableness of the payment and sustainability model, including consideration of the owner and operator of the mini-grid. Is the payment and sustainability model realistic? Adequacy and reasonableness of the risks identified that could affect the installation and operation of the system and the measures to be taken to mitigate these risks. Are the mitigation measures realistic?	10
Factor 4: Organizational Capabilities and Experience	
Adequacy and quality of the capabilities and experience of both the administrative lead organization and technical lead organization to complete the proposed work.	10
Factor 5: Past Performance	
Quality of the feedback received from references for similar work.	10

Financial Evaluation Criteria	Maximum Points
Factor 1: Co-funding	
Amount of co-funding offered, availability of the co-funding deployment to meet the target date of 15 October 2024, and level of commitment from the co-funder.	10
Factor 2: Pricing	
Fairness and reasonableness of the prices offered.	20

12. **Award Notice**. A written notice of award or acceptance of an offer, mailed or otherwise furnished to the successful Bidder within the time acceptance specified in the offer, shall result in a binding contract without further action by either party.
13. **Validity of Proposal.** This RFP in no way obligates RTI to make an award, nor does it commit RTI to pay any costs incurred by the Bidder in the preparation and submission of a proposal or amendments to a proposal. Your proposal shall be considered valid for 120 days after submission.
14. **Representations and Certifications.** Winning Bidders under a US Federal Contract are required to complete and sign the RTI Representations and Certifications for award values over $10,000.
15. **Anti- Kick Back Act of 1986.** Anti-Kickback Act of 1986 as referenced in FAR 52.203-7 is hereby incorporated into this Request for Proposal as a condition of acceptance. If you have reasonable grounds to believe that a violation, as described in Paragraph (b) of FAR 52.203-7 may have occurred, you should report this suspected violation to the RTI's Ethics Hotline at 1 877-212-7220 or by sending an e-mail to ethics@rti.org. You may report a suspected violation anonymously.
16. **The John S. McCain National Defense Authorization Act for fiscal year 2019 – section 889**. RTI cannot use any equipment or services from specific companies, or their subsidiaries and affiliates, including Huawei Technologies Company, ZTE Corporation, Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, Aventura Technologies, Kaspersky Lab – Russian hardware & software products, and Dahua Technology Company ("Covered Technology"). In response to this request for proposal, please do not provide a quote which includes any Covered Technology. Any quote which includes Covered Technology will be deemed non-responsive. Additionally, if the United States Government is the source of funds for this RFP, the resulting Supplier (Bidder) shall not provide any equipment, system, or service that uses Covered Technology as a substantial or essential component.

Attachment C: Cover Letter Template (attached in Word document format)

Attachment D: Bidder Information and Technical Proposal Form (attached in Word document format)

Attachment E: Pricing Template Sample (attached in Excel spreadsheet format)

Attachment F: 937 Geographic Code Countries

Countries included in the 937 Geographic Code per ADS 310 (310maa_020612):

Afghanistan	Gambia, The	Myanmar
Bangladesh	Guinea	Nepal
Benin	Guinea-Bisau	Niger
Burkina Faso	Haiti	Rwanda
Burundi	Kenya	Sierra Leone
Cambodia	Korea, Dem Rep.	Somalia
Central African Republic	Kyrgyz Republic	Tajikistan
Chad	Liberia	Tanzania
Comoros	Madagascar	Togo
Congo, Dem. Rep	Malawi	Uganda
Eritrea	Mali	Zimbabwe
Ethiopia	Mozambique	
Angola	India	São Tomé and Principe
Armenia	Iraq	Senegal
Belize	Kiribati	Solomon Islands
Bhutan	Kosovo	Sri Lanka
Bolivia	Lao PDR	Sudan
Cameroon	Lesotho	Swaziland
Cape Verde	Marshall Islands	Syrian Arab Republic
Congo, Rep	Mauritania	Timor- Leste
Côte d'Ivoire	Micronesia, Fed. Sts.	Tonga

Djibouti	Moldova	Turkmenistan
Egypt, Arab Rep.	Mongolia	Tuvalu
El Salvador	Morocco	Ukraine
Fiji	Nicaragua	Uzbekistan
Georgia	Nigeria	Vanuatu
Ghana	Pakistan	Vietnam
Guatemala	Papua New Guinea	West Bank and Gaza
Guyana	Paraguay	Yemen, Rep.
Honduras	Philippines	Zambia
Indonesia	Samoa	

Attachment G: USAID-PEP Technical Requirements and Specifications

The mini-grid system, components, design and installation shall meet all applicable standards in Papua New Guinea and Australia, including the following at minimum (note: the latest editions of standards shall apply):

- PNG Power Electrical Trade Circular
- AS/NZS 3000:2018 – Electrical Wiring Rules
- AS/NZS 3008 – Electrical installations - Selection of cables
- AS 1768:2021 – Lightning Protection

For solar and battery energy storage system (BESS) mini grids, the following design and installation standards shall be met:

- AS 4509.1:2009 Stand-alone power systems – Safety and installation
- AS 4509.2:2010 Stand-alone power systems – System design
- AS/NZS 5033:2021 – Installation and safety requirements for photovoltaic (PV) arrays
- AS/NZS 5139:2019 – Electrical installations - Safety of battery systems for use with power conversion equipment
- AS 3011 – Electrical installations - Secondary batteries installed in buildings
- AS 2676 – Installation, maintenance, testing and replacement of secondary batteries in buildings
- AS/NZS 4777 – Grid connection of energy systems via inverters

For civil/structural design and installation, the following standards shall be met:

- HB 212 – Design Wind Speeds for the Asia-Pacific Region.
- PNGS 1001: Parts 1 & 2 – General Structural Design and Design Loadings for Buildings Part 1 - General Design Requirements Part 2 - Dead and Live Loads
- PNGS 1001.4 – Earthquake loading
- AS/NZS 1170.0 – Structural Design Actions - General Principles
- AS/NZS 1170.1 – Structural Design Actions - Permanent, imposed and other actions
- AS/NZS 1170.2:2021 – Structural design actions - Wind actions

In addition, the following minimum technical requirements and standards shall be met, and datasheets and other evidence shall be provided of this.

REQUIREMENTS FOR ALL MINI-GRIDS:

Item	Minimum Requirements
System (overall)	• The system shall be modular to allow for further expansion when required. • Anti-theft measures and systems (such as PV module locking fasteners / fittings) shall be provided.[1]

[1] Anti-theft systems and technologies may include those described in the following pages – https://www.energymatters.com.au/panels-modules/solar-panel-security/

Item	Minimum Requirements
	• A 1-year defects liability period shall be in effect commencing from the date of the signing of the certificate of handover by all parties. During this period, the Supplier shall provide O&M technical support services as needed to the operator.
Control, monitoring and visualization system	• A control, monitoring and visualization system shall be designed and installed to monitor the performance of the system components (including energy meters), manage the charging and discharging of any batteries and automatically start and shutdown connected backup gensets according to a set control algorithm. An automatic transfer switch shall be installed to allow starting and stopping the generator when required, e.g., starting when the battery voltage falls beyond a nominated depth of discharge, and stopping when the battery bank reaches 100% capacity or when the PV array / generation begins to supply power to the inverter at full capacity. • The system shall have digital panels and gauges to display parameters of the system. • The system shall have configurable alarms to indicate faults and other conditions. • Communication for remote monitoring and control using mobile communication (i.e., SIM card) shall be included. • Data logging with storage devices that can capture and store data for a month or more is highly preferred. • 2 years warranty on the power management, control and remote monitoring system.
Switchboards (distribution/protection boards, combiner boxes, etc.)	• Switchboards shall include suitably sized busbars, overcurrent protection, surge protection devices (SPDs), earthing, isolators/disconnection switches and other switchgear. • In addition, the main distribution board shall include a suitably sized main switch/isolator, distribution isolators, load shedding contactor, Class 1 energy meter and an appropriately sized Type 1 SPD. • Selection, sizing and installation of switchgear shall comply with the PNG Power Electrical Trade Circular, AS/NZS 3000, AS/NZS 3008, and AS 4509. • (For solar PV systems) PV strings shall be protected with both PV fuses and Type II SPDs that are appropriately sized. • Spare fuses shall be supplied. • Switchboards shall be corrosion proof with sufficient IP rating for their installation location and include mounting attachments. • Switchboards shall be installed with sufficient cable entry allowances.
Household distribution boards	• Where connected households require new distribution boards – a Minimum Supply Kit (MSK), at minimum, shall be supplied and installed as per Attachment H: Minimum Supply Kit - Specifications. Each MSK includes a Type II 16A RCD Circuit Breaker to protect the

https://sinovoltaics.com/technology/kleptovoltaics-a-comparison-of-solar-pv-plant-anti-theft-technologies/

Item	Minimum Requirements
	included 2 x 10A double GPOs, with space for an energy meter.
Cabling and wiring	• Suitable cable sizes and types shall be designed and installed in conformity with the PNG Power Electrical Trade Circular or AS/NZS 3000 Electrical Wiring Rules for all cabling, including for PV arrays, batteries, inverters, control systems, powerhouse, distribution grid and building/household wiring. • All cabling shall be marked, and color coded to allow for identification in conformity with the PNG Power Electrical Trade Circular or AS/NZS 3000 Electrical Wiring Rules. • Associated cabling accessories shall be installed, including but not limited to conduits, glands, cable tray, connectors, heat shrinks, ducts, and labels. • Insulated circular PVC or XLPE cables shall be used for AC and DC cabling with a minimum temperature breakdown rating of 90°C – apart from solar PV cables, which shall comply to PV1-F or equivalent. • All cable entry to and from enclosures shall be through the underside of the enclosures and glanded and sealed to ensure that IP rating of the enclosure is maintained. • For underground conduit: o Trenches shall be located to permit changes of direction in easy stages eliminating strain on cables or ducts. o The location pits shall be planned and approved before any trenching is commenced. o Accurate records of underground reticulation routes shall be kept for later inclusion in as-built drawings. o All underground conduits shall be heavy duty UPVC type, suitable for underground installation and shall comply with all current Australian Standards relating to underground installation. o Underground conduit carrying or intended for electrical power cables shall be orange in colour. Installation shall comply with the requirements of AS 3000 Category A system. o Trenches shall be excavated to a depth not less than 150mm below the minimum depth of laying. Minimum depth of laying shall be 500mm to top of conduit and greater where required for trafficable areas. o The bottom of the trench shall be cleared of all rocks, stones and other hard and sharp materials. Stones or sharp objects having a nominal dimension of 25mm or greater shall be removed from the backfill materials. o Trenches shall be backfilled in maximum layers of 150mm and shall be mechanically rammed and consolidated to the compaction of surrounding adjacent material. o Conduit shall be watertight at all joints. o Conduit shall use sweep bends where changing direction.

Item	Minimum Requirements
	○ Where running downhill to, and entering a building, conduit shall be installed to prevent any liquid in the conduit from entering the building. ○ Buried entries to ducts and conduits shall be sealed with a pliable non-setting waterproof compound immediately after installation.
Earthing system	• A suitable earthing system shall be designed and installed as per the PNG Power Electrical Trade Circular, AS/NZS 3000 Electrical Wiring Rules, and AS/NZS 5033:2021 (for solar PV systems). • All the equipment shall be interconnected by an equipotential bonding and the resistance to earth shall not exceed 0.5 ohm. • The earthing conductor of the PV arrays shall be buried if it is longer than 50 m. In such a case, the conductor shall be made of bare copper with a minimum cross-section of 25 mm^2 to minimise corrosion. • The earthing conductors shall be always as close as possible to the active conductors to minimize the induced loop areas. • The earthing of the electric equipment (inverters, distribution boards, etc.) shall always follow the manufacturer's requirements. The minimum cross-section for the earthing conductor shall be 6 mm^2.
Light/appliance fittings (where applicable)	• Where lights or appliances will be provided as part of the project, only energy efficient lights/appliances shall be selected, e.g., LED lights.
Pre-paid metering system	• Shall conform to IEC 62052 and IEC 62053, or equivalent standards. • Shall have anti-tampering features. • Shall include any IT equipment required to administer the pre-paid metering system. • Shall not require communications to the mobile network or internet to function.
Powerhouse (where applicable)	• Shall be sufficiently sized to accommodate all required electrical equipment (e.g., BESS, inverters, charge controllers, switchboards, and control, remote monitoring and visualization system) and spare parts, accounting for the manufacturers' clearance requirements. The design shall be able to accommodate a potential future expansion of 25% of the system's size. • Installation of equipment within the containerized powerhouse shall ensure sufficient space to allow for ease of operation and maintenance and shall ensure compliance with any specific installation conditions as stipulated by equipment manufacturers (in terms of spacing, air flow, etc.). • Construction of the powerhouse, including all foundations, shall comply with all design documentation, manufacturer specifications and installation manuals, all relevant PNG and international standards and codes, and be appropriate for site-specific conditions. • The powerhouse must be designed to meet wind speed classification level I in accordance with HB 212-2002 (i.e., 3 s gust, 10 m height, open

Item	Minimum Requirements
	country terrain nominal 50-year return period of 32 m/s and nominal 500-year return period of 40 m/s). The Supplier shall supply evidence confirming the powerhouse meets this standard. • Design life of the structure shall be 25 years. • The roof and walls shall contain insulation or be constructed of materials that reduce heat transfer into the powerhouse. • The entrance door shall be solid and weatherproof and shall have a key locking system. The door shall open outwards. • The powerhouse shall have suitable earthing connection and protection. • The powerhouse shall provide sufficient environmental protection (IP rating, thermal loading, fire resistance, etc.) for all enclosed power system equipment to operate safely. • The Supplier shall provide a warranty. • The powerhouse shall be designed to prevent insects, rats and other pests from easily entering, using mesh and other prevention measures. • The powerhouse shall include active ventilation, and where appropriate – sufficient LED lighting for working inside, a double GPO inside and two (2) security lights outside. • A fire detection system and fire extinguisher shall be included.
Signage and labelling	• Safety signage and labelling of key components shall be provided and installed as per the PNG Power Electrical Trade Circular, AS/NZS 3000 Electrical Wiring Rules, and (for solar PV system) AS 4509.1 and 4509.2. • Additional safety signage and labelling shall be provided and installed that will assist the ongoing maintenance and operation of the system. Signage shall include emergency contact details, including that of local police, firefighters, the Supplier, and other relevant contacts, e.g., Provincial Health Authority where applicable. • All signs and labels shall be fit for purpose, made of durable materials and color coded as per the requirements of the relevant standards. Size of the signs and associated text heights shall be visible for purposes intended.
Critical spare parts, accessories and O&M tools	• Critical spare parts, required accessories and required O&M tools shall be provided by the Supplier.

SPECIFIC REQUIREMENTS FOR SOLAR AND BESS MINI-GRIDS:

Item	Minimum Requirements
System (overall)	• The solar PV modules and batteries may be designed as either an AC or DC coupled system.
Solar PV	• Only one (1) solar PV manufacturer and model shall be used in the system. • Manufacturer shall have been present in the solar PV manufacturing

Item	Minimum Requirements
	market for at least 10 years. • Life expectancy in excess of 25 years. • Minimum 10-year manufacturer's warranty covering defects and workmanship. • Performance warranty – maximum STC power degradation of 10% during the first 10 years and 20% during a period of 25 years. • Complies to IEC 61215 and IEC 61730 or meets the Australian Clean Energy Council's list of approved products[2].
PV mounting structure	• The mounting structure must be designed to meet wind speed classification level I in accordance with HB 212-2002 (i.e., 3 s gust, 10 m height, open country terrain nominal 50-year return period of 32 m/s and nominal 500-year return period of 40 m/s). The Supplier shall supply evidence confirming the mounting structure is certified to this standard. • All support structure components including brackets and fasteners must be able to resist at least 20 years of outdoor exposure in a harsh, tropical marine environment without any appreciable corrosion or structural fatigue. • PV panel frames shall be through bolted using a locking fastener tightened to a specified torque rating. The bolted connections shall be vibration resistant. • For roof-mounted solar PV, the roof shall be assessed by the Supplier and strengthening of roof components shall be provided where needed. PV modules shall be installed flush mounted on indicated existing rooftops in areas that maximize solar access and minimize shading. • The mounting structure shall have a minimum 10-year manufacturer's warranty covering defects and workmanship.
Lithium-ion or equivalent BESS	• Only one (1) BESS manufacturer and model shall be used in the system. • Life expectancy in excess of 10 years. Minimum cycle life of 5000 cycles at 80% depth of discharge at 20°C. • Minimum 5-year manufacturer defect warranty from the date battery received. • All battery equipment shall be capable of normal operation without the need for air conditioning, with minimum ambient temperature operational range 15°C - 45°C. • Battery racks shall be of suitable strength and design for local seismic conditions and shall be securely anchored to the floor to avoid movement. • Protected with appropriately sized DC circuit breakers or fuses, internally or externally. • Complies to IEC 62619 or meets the Australian Clean Energy Council's list of approved products[3].

[2] https://www.cleanenergycouncil.org.au/industry/products
[3] https://www.cleanenergycouncil.org.au/industry/products

Item	Minimum Requirements
	• Specifications provided shall include (1) minimum and maximum state of charge; (2) round trip efficiency; and (3) stand-by losses.
Inverters (i.e., battery inverter/chargers, PV inverters, depending on DC or AC coupling)	• Manufacturers shall have been present in the inverter manufacturing market for at least 5 years. • Minimum 5-year manufacturer's warranty covering defects and workmanship. • IP rating of ≥ IP65 if outdoors and ≥ IP20 if indoors. • Protected with appropriately sized overcurrent protection and Type II surge protection devices (SPDs), either internally or externally. • Includes mounting attachments and is installed with manufacturer's recommended clearances. • Battery inverter/chargers must be able to be operated in a hybrid manner with a diesel genset, i.e., it can switch on the genset and control its operation to charge the batteries as needed. • Battery inverter/chargers must be able to supply/accommodate the existing reactive loads with a power factor of not less than 0.9. • Battery inverter/chargers must be able to provide double the specified power for 5 seconds or more without damage. • For PV inverters, the ratio between the PV capacity (kWp @ STC) and the nominal AC output of the inverter at 35°C shall be ≤ 1.3 • Depending on the Australian Clean Energy Council's inverter categories required standards[4], the inverter shall comply to IEC 62109-1, IEC 62109-2, IEC 62477-1, AS/NZS 4777.2:2020 or AS/NZS 4777.2:2020 Appendix M, Alternatively, the inverter shall meet the Australian Clean Energy Council's list of approved products.
Charge controllers (for DC coupled systems)	• Manufacturer shall have been present in the charge controller manufacturing market for at least 5 years. • Minimum 5-year product warranty. • MPPT charge controllers to be used with an efficiency of 95% or better. • Standby power consumption of 2.5W or lower. • Data logging included. • Display preferred. • Includes mounting attachments and is installed with manufacturer's recommended clearances. • Protected with appropriately sized overcurrent protection. • Complies to IEC 62509 and/or UL 1741.
Cabling and wiring	• Solar PV cables shall comply to PV1-F or equivalent. They shall be UV resistant and flame retardant. • Wiring between PV array and batteries will not cause a voltage drop of more than 3% at the rated Isc of the arrays at standard conditions. Calculations shall be provided with detailed design. • Wiring between batteries and inverters will be no more than 4 meters apart and the copper connecting wires will introduce no more than 2%

[4] https://assets.cleanenergycouncil.org.au/documents/products/CEC-inverter_listing_categories_2021.pdf

Item	Minimum Requirements
	voltage drop when the inverters are operating at rated capacity. Calculations shall be provided with detailed design.

Engineering Standard: HQH-GCG 018
First Issued: 30.04.1991 Reviewed & Reissued: 25.07.2016

TRADE CIRCULAR 33 MINIMUM SUPPLY KITS

33.1 GENERAL

33.1.1 Application

In an effort to expand and accelerate rural electrification, PNG Power has introduced a Minimum Supply Kit (MSK) for the wiring of rural houses. The Trade Circular No.33 provides provisions and restriction for safety use of the Minimum Supply Kit.

33.2 MINIMUM SUPPLY KIT HIRE PURCHASES

PNG Power supplies and installs this kit and the customer purchases it on hire purchase.

33.3 MAXIMUM DEMAND

The kits are intended to supply individual appliances rated up to **10 amps** and a total installation maximum demand of up to **16 amps.** The connection of **higher** power appliances is **not** permitted. Electrical Contractors must not adapt or extend these Minimum Supply Kits.

33.4 KIT TO BE PROTECTED BY RCD CIRCUIT BREAKER

Minimum Supply Kit shall be supplied with Type II 16A RCD Circuit Breaker to protect 2 x 10A Double GPOs.

33.5 THE RECOMMENDED CABLES

The flexible cords shall be used to supply lights, equipment or other appliances ensuring not to overload the carrying of the conductor.

The flexible cords used to supply lights, appliances or equipment shall be used within the vicinity of the premises only.

33.6 PROHIBITED AREA OF USE

The used of extension cords or TPS cables installed in expose condition to supply other premises or locations on permanent basics are **prohibited.**

NOTE: The inclusion of Residual Current Device (RCD) shall minimize electrical shocks or electrocution and increase safety.

PNG POWER Ltd
MATERIAL SPECIFICATION

VOCAB NUMBER	ITEM DESCRIPTION
151004	KIT, MINIMUM SERVICE SUPPLY

SPECIFICATION DETAILS

1. The Minimum Service Supply Kit shall consist of a 2mm Galvanised Bond Metal Box and cover painted finish with high quality cream coloured paint.
2. It shall:

   a) Have a 16amp single pole, 8kA, Miniature Circuit Breaker (MCB) mounted on a standard DIN mounting rail as shown on drawing SC-8/6.
   b) Have 2 x 10 amps Double General-Purpose socket outlet (GPO) of CLIPSAL or PDL make or similar installed as shown on the drawing SC-8/5.
   c) Incorporate two 7 Hole Links (Neutral & Earth) rated at 80 amps and mounted as shown on drawing SC-8/6.
   d) Have provision for mounting of standard PNG Power single phase Cycle or Easy Pay Kwhr Meter on a raised metal panel.

3. The Enclosure box shall have hinge door cover with locks and shall have provisions for cut out holes to allow the socket outlets and the PNG Power meter to penetrate through. Dimensions for the cut-out hole for the meter to be confirmed with PNG Power prior to fabrication of cut out holes Meter specifications and dimensions will be provided with specification at the time of tender.
4. The box shall have suitable holes for wall mounting on hooks or protruding screws and appropriate "knockout" holes to permit incoming mains and for outgoing earth wire at the top and bottom.
5. It shall be wired with 2.5mm² switchboard grade coloured wiring as per the wiring diagram on Drawing SC-8/6 attached.
6. It shall general be in accordance with the Drawing No. SC-8/5 and SC8/6. Tender or Supplier is required to provided their outline drawing for PNG Power approval.

- **Unit of Measure:** Each
- **Rejection:** PNG Power Ltd reserves all rights to reject whole or part of the order not complying with this specification and is not liable for any cost or loss with the return of rejects to the Supplier. Facilitation of Invoice Credit must commence between the supplier and PNG Power Ltd through the process of PNG Power Ltd Discrepancy Report provisions.

Drawing References: SC 8/5 & SC 8/6 ***Manufacturer's Product Code:***

ENGINEERING STANDARDS APPROVAL

Approval by: Grevasius Peni
TL Standards & Materials

Signature: 

Date: 21/10/20

DATA REVIEW ENDORSEMENT

NAME	TITLE	SIGNATURE	DATE
Rawali Rawali	**Engineer - Standards and Materials**		

PNG POWER Ltd

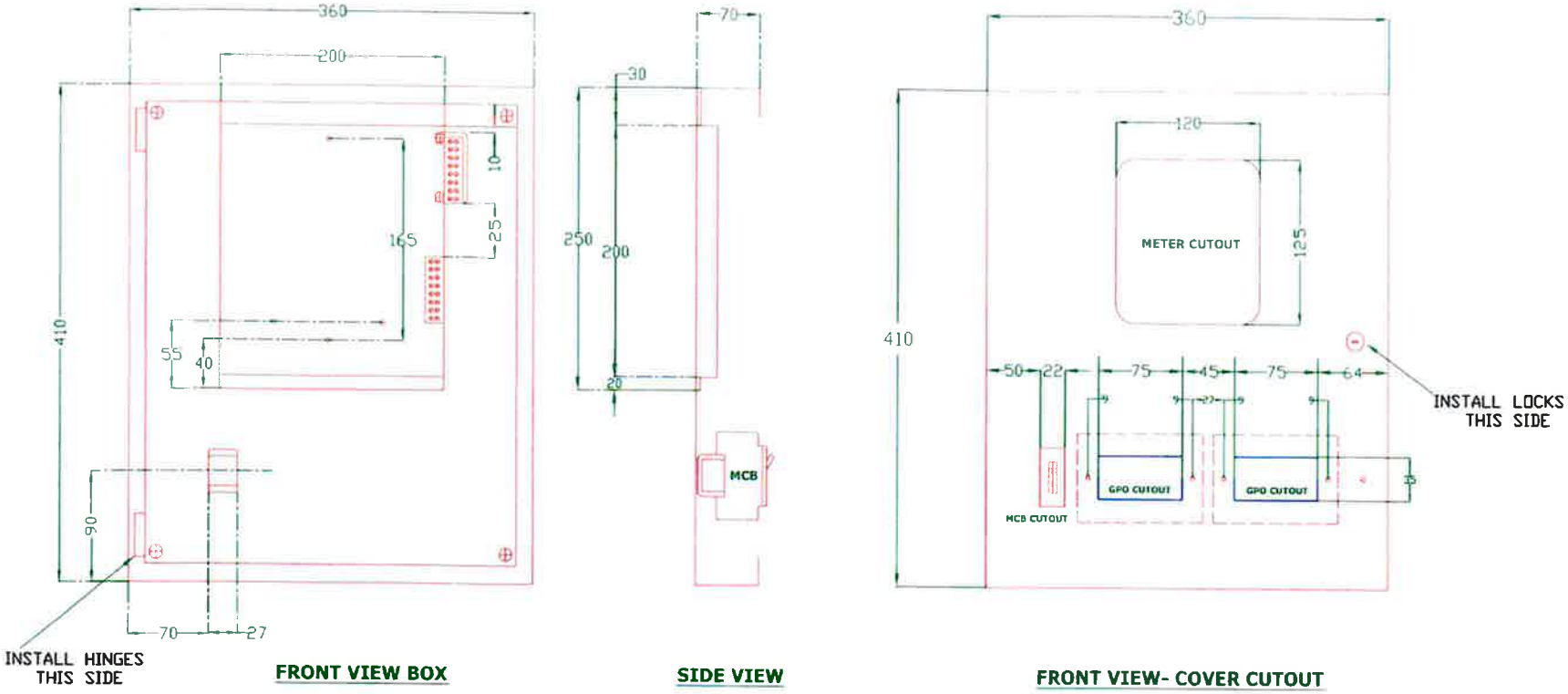
Interoffice Memo

To:	A/SMIM	**Date**	04th November 2016
From:	Team Leader – Materials & Standards PEBU	**cc**	TL Tenders & Contracts
Subject	**Minimum Supply Kit Specification and Tender**		

1. Attached is File PRM038-13/29818
2. It has now been confirmed that PPL will maintain the use of Landis Gyr+ cash power single phase meters with the Minimum Supply Kit (MSK) for the time being until a new meter is confirmed.
3. The revised specification is included in the file.

Grevasius Peni
Standards & Materials Engineer
TL –Materials & Standards

PNG POWER Ltd



FRONT VIEW BOX

SIDE VIEW

FRONT VIEW- COVER CUTOUT

NOTE

1. Drawing to be read in conjunction with vocab 151004 Material Specification.
2. Dimension shown in mm
3. Cover cut outs suit Easy Pay Meter MODEL Landis +Gyr, CASHPOWER GEM Type 10-GM017, 230V-10(80)A, 50Hz
4. Cut out Holes dimensions for Easy Pay Meter (EPM) to be confirm with PNG Power Ltd before fabrication
5. Cut out Holes Dimension for MCB & GPOs to be confirm with suppliers before fabrication

CAD Filename	Rev.	Revision	By	Date
C:/ACAD/DWG/SC-8/5/ACAD.DWG	A.	REDRAWN MINOR CHANGES, NOTES CHANGED	QUINTEN F	15/01/07
Date Plotted: 15th JAN, 2007	Scale: NTS			

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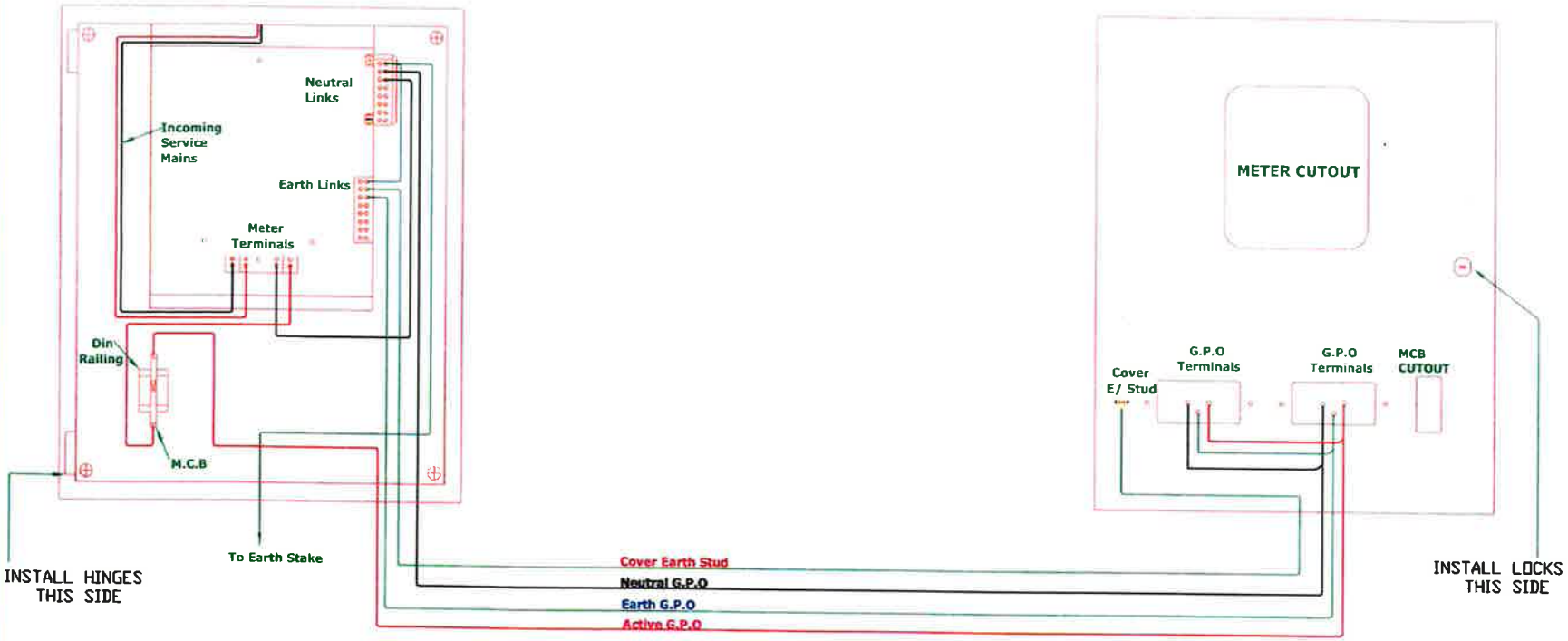
Drawn	E.TOMARITA 01/06/05	Location	DISTRIBUTION STANDARDS & MATERIALS
Designed		Title	MINIMUM SERVICE SUPPLY KIT
Checked	S.ILA	A3	
Endorsed	G.PEYO	Number	SC - 8/5
Approved	G.FAE	Revision	Sheet 1 OF 1



FRONT VIEW BOX

BACK VIEW- COVER CUT OUT

CAD Filename	Rev.	Revision	By	Date
C:/ACAD/DWG/SC-6/6/ACAD.DWG	A.	REDRAWN MINOR CHANGES, SHEET CHANGED TO P/L	QUINTEN F	17/01/07
Date Plotted: 17th JAN, 2007	Scale: MTS			

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Drawn	E.TONARITA 14/06/95	Location	DISTRIBUTION STANDARDS & MATERIALS
Designed	E.TONARITA 14/06/95	Title	MINIMUM SERVICE SUPPLY KIT WIRING DIAGRAM
Checked	S.DA	A3	
Endorsed	G.PERI	Number	SC - 8/6
Approved	G.FAE	Revision	Sheet 1 OF 1

SPECIFICATION DETAILS FOR VOCAB 151004

PNG POWER Ltd