



REQUEST FOR PROPOSALS:
Phase II - Puerto Rico Resilient Schools Microgrid
Project
Wednesday, April 3, 2019



Project Summary

Project Name: Puerto Rico Resilient Schools Microgrid Project, Phase II

School Sites:

Morovis, Naranjito, Barranquitas, Humacao, Canovanas, Jayuya

Task and objective: Rocky Mountain Institute has partnered with Save the Children to publish a Request for Proposals (RFP) for prospective bidders for **six (6)** resilient solar microgrids across six (6) public school sites to power critical loads for those schools.

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Important Dates

Event	Date
Mandatory Site Visit	Tues-Wed, April 9-10, 2019
Request for Clarification Submission Deadline	Wednesday, April 24, 2019
Final Responses to Request for Clarification	Monday, April 29, 2019
Proposal Submission Date	Friday, May 17, 2019
Project Award Date	Friday, May 31, 2019

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I. Introduction and Project Background

On September 20, 2017, Hurricane Maria struck Puerto Rico, setting off the largest power outage in U.S. history. The entire Puerto Rico public school system was closed for two months following Maria. School-aged children in Puerto Rico lost more than 13 million cumulative days of learning, with no comprehensive plan to recover the lost learning time. Limited energy availability also impacted schools' ability to provide meals to students. While some schools now have diesel generators, Puerto Rico's school system remains vulnerable to extended grid outage from future hurricanes.

The nonprofit organizations Rocky Mountain Institute (RMI) and Save the Children (STC) are partnering to develop solar-plus-storage microgrid projects at up to 12 public schools in communities severely impacted by Hurricane Maria. These schools were selected following in-depth assessments of the damage and material losses suffered by the schools, access to after-school programs, and reported psychosocial distress of children, their caregivers, teachers, and school social workers. The 12 microgrid projects will minimize lost learning due to power outages and ensure students are able to return to school as soon as possible in the event of a future emergency or grid outage. In addition to becoming resilient learning environments for the 2018-2019 academic year and beyond, these schools will become unofficial locations for emergency preparedness for the community.

This RFP is the last of a two-part competitive procurement process, aiming to provide resilient, renewable energy systems at **six (6)** schools to support their continued operation following future storms and extended power outages. While other public schools in Puerto Rico have closed, these high-enrollment schools have a very low likelihood of closure because they have accepted additional students from surrounding schools. In order to minimize disruption to students, all projects must be complete, commissioned, and approved by RMI by September 13th, 2019.

The scope of the proposed project must, for all six school solar microgrids, include:

1. All items detailed in **Section V: Scope of Work and Deliverables**.
2. Design, construction, and commissioning of solar-plus-storage microgrid systems build according to **Section IV: Project Specifications** such that the system is capable of powering critical loads to support school operation both during normal grid operating conditions and during outages.
3. Integration with existing energy generation systems, including the utility grid and on-site diesel generators.
4. Creating a **critical loads circuit** for specific rooms and end uses, listed in "**Exhibit A - Critical Loads**." All switches and sockets that are connected to this circuit shall be clearly and obviously labeled as such.
5. Appropriate subcontracting for roof repair and waterproofing prior to the solar microgrid installation phase.
6. Replacing current lighting in the critical areas connected to the microgrid system with LEDs, including replacing the gym overhead lighting in Jayuya with LEDs. All lighting connected to the microgrid system shall be replaced with LED lighting.



7. Replacing current fans outlined in the RFP with energy-efficient floor fans.
8. The addition of electrical timers to all internet/ethernet equipment (currently on UPS) and pumps at these sites. All six schools have internet/ethernet, and only the Naranjito and Jayuya sites have water pumps. These loads should only operate during peak solar radiation hours (11am to 2pm) and should be connected to little or no battery storage. The internet/ethernet equipment shall continue to run on the UPS when not powered by photovoltaics (PV).
9. Comply with the Resilience measures described in the **Design and Installation Requirements** section.
10. Bringing any electrical infrastructure connected to the microgrids up to applicable electrical codes and standards; these include but are not limited to relevant NEC 2017, UL, IEC, and IEEE technical codes.

II. Overview

RMI is issuing this Request for Proposals (RFP) for turnkey Engineering, Procurement, and Construction (EPC) services to be provided at six (6) public schools in Puerto Rico.

The objective of this RFP is to solicit competitive proposals from qualified and experienced contractors ("Bidders") to provide six (6) Puerto Rico public schools with cost-effective solar photovoltaic (PV) microgrid systems comprising approximately **180 kWdc of solar PV and 182 kWh of lithium-ion battery** storage, along with minor energy efficient lighting and fan upgrades, collectively referred to here as the "Project".

The desired outcome of this RFP is the successful negotiation and execution of an EPC Agreement for the scope of services described herein. Only one successful bidder shall be awarded the work. The goal of this RFP is to contract an EPC firm through an EPC Agreement that will design and build the systems on the six public school sites. The winning EPC must complete, commission, and obtain RMI approval for the Project by September 13th, 2019.

Each bidder is encouraged to include a proposal for operations and maintenance (O&M) services for a 10-year term following installation. Bids for O&M are optional (not required to be considered for award of the primary EPC contract) and will be considered separately. The winning bidder for the EPC Contract may be different from the winning bidder for the O&M Contract, but preference will be given to the winning bidder. For details, see the *Operations and Maintenance Requirements* section.

III. Site Details and Layout

All of these schools are PREPA customers. This section contains details of each site, including maps illustrating the buildings that house critical loads and the point of connection (labeled POC in the diagram) with PREPA.



A. Morovis

Site Name: Morovis
Address: Morovis Elementary Urban School
 Calle del Carmen Final, Pueblo, Morovis, PR ([Google Maps](#))
Coordinates: 18°19'34.68"N, 66°24'33.48"W

Population	This school has 400+ students and 148 of them have special needs (53 students have severe disabilities).
Electricity reliability	After the hurricanes this school was without electricity for 4-5 months. This school experiences earthquakes.
Maintenance of School	This school is maintained by <i>Oficina para el Mejoramiento de las Escuelas Publicas</i> (OMEP).
Electrical Observations	We observed at least two illegal taps. The school has five different PREPA meters. 240/120 V Single-phase



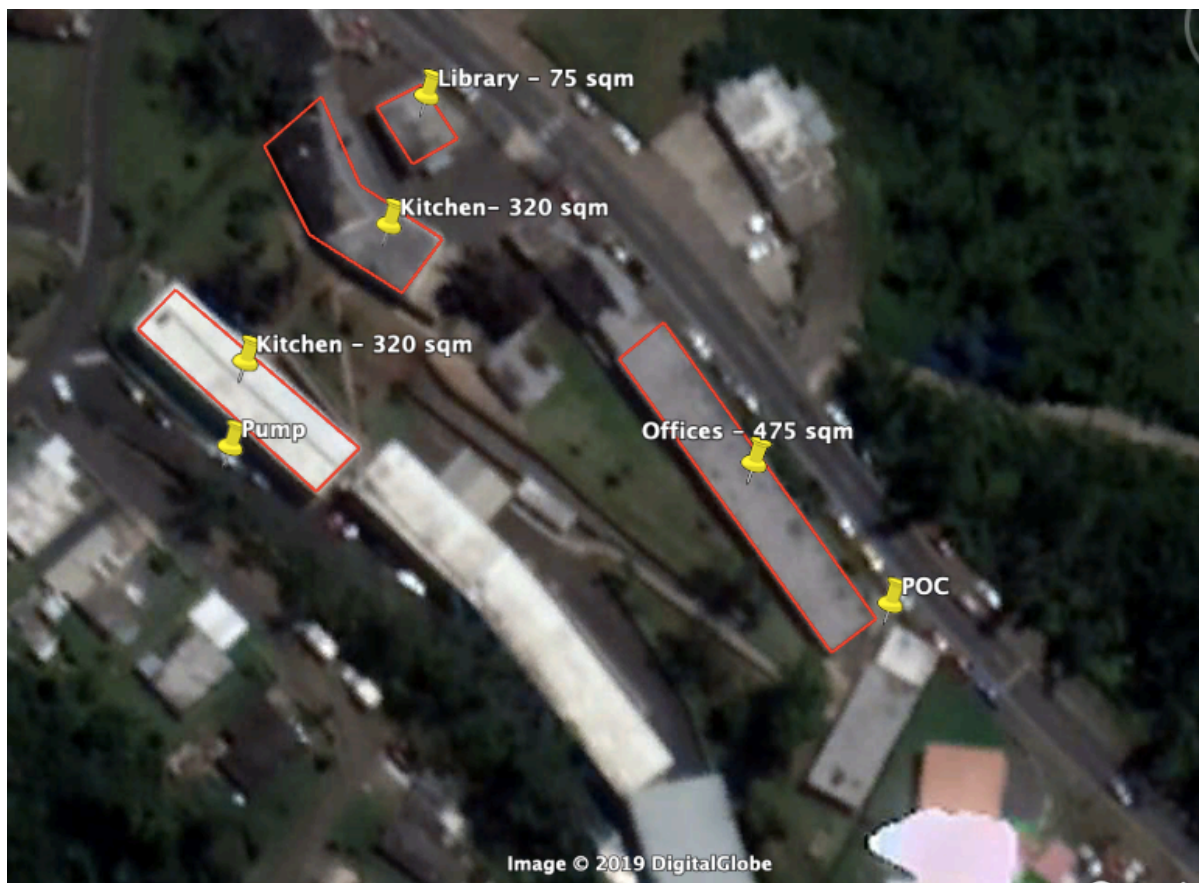
Critical Load Location	Minimum Loads Served
Kitchen	Two large refrigerators, one large freezer, one large cooler, 30 LED lights, one oven, two outlets.
Class Room #1	12 LED lights, one floor fan, three plug loads (one to power TV)
Classroom #'s 2-6	41 lights across the five classrooms, five fans (one in each classroom), two mini-fridges.
Office	Three desktop computers, two laptop computers, one wifi router, 10 LED lights, three fans, one wifi box, four plug loads.



B. Naranjito

Site Name: Naranjito
Address: Escuela S U Pedro Fernandez
 PR-152, Naranjito, PR ([Google Maps](#))
Coordinates: 18°14'51.77"N, 66°17'2.87"W

Maintenance of School	This school is maintained by <i>Oficina para el Mejoramiento de las Escuelas Publicas</i> (OMEP).
Electrical Observations	240/120 V Single-phase
Electrical Improvements	Wiring in library needs to be improved.



Critical Load Location	Minimum Loads Served
Kitchen	One large refrigerator, one large freezer, one large cooler, 30 LED lights, one oven, two outlets
Library	18 lights across the room, one fan, four desktop computers, one small printer, one wifi router, one wifi box.
Office	Two desktop computers, one wifi router, eight LED lights, one fan, one wifi box, four plug loads, one big printer.
Water infrastructure	There is one water pump. This pump does not have to be secured with batteries and during an outage can be powered by the PV system.



C. Barranquitas

Site Name: Barranquitas
Address: Escuela de Segunda Unidad Federico Degetau
 PR-156, Barranquitas, PR ([Google Maps](#))
Coordinates: 18°11'24.05"N, 66°20'32.71"W

Maintenance of School	This school is maintained by <i>Oficina para el Mejoramiento de las Escuelas Publicas</i> (OMEP)
Electrical Observations	240/120 V Single-phase



Critical Load Location	Minimum Loads Served
Kitchen	One large refrigerator, one small refrigerator, one large freezer, one large cooler, 20 LED lights, one oven, two outlets, one fan.
Library	14 lights across the room, one fan, six laptop computers, one large printer, one wifi router, one wifi box, two plug loads.
Office	One desktop computer, four laptop computers, one wifi router, five LED lights, one fan, two plug loads, one small printer.



D. Humacao

Site Name: Humacao

Address: Escuela Cándido Berríos

Carr 3 km 87 Hm 1 Bo, Candelero Arriba, Humacao, PR ([Google Maps](#))

Coordinates: 18° 6'0.81"N, 65°49'46.04"W

Electricity reliability	After Maria this school was without electricity for 5-6 months.
Maintenance of School	This school is maintained by <i>Oficina para el Mejoramiento de las Escuelas Publicas</i> (OMEP).
Electrical Observations	The school has several different PREPA meters, but the critical loads are serviced by two meters 240/120 V Single-Phase
Infrastructure	This school experiences severe flooding. All installed electrical equipment associated with this installation must be above historical flooding water level. All major equipment, including batteries and inverters, must be at a minimum three feet above the ground to prevent water damage.



Critical Load Location	Minimum Loads Served
Kitchen	One large refrigerator, one small freezer, one large cooler, seven LED lights (kitchen and food storage areas), one oven, two outlets, two fans.
Library + Offices	12 lights (four across the two offices), two fans, one desktop computer, one small printer, one wifi router, one wifi box.
Office	One desktop computer, one wifi router, eight LED lights, one fan, one wifi box, two plug loads, one big printer.



E. Canovanas

Site Name: Canóvanas
Address: Escuela Francisco (Paco) Davila
 Calle 1, Juncos, Canóvanas, PR ([Google Maps](#))
Coordinates: 18°16'15.92"N, 65°54'46.48"

Maintenance of School	This school is maintained by <i>Edificios Publicos</i> .
Electrical Observations	The school has a central PREPA meter 480V 3-phase 4 wire There is a generator that broke from overuse after Hurricane Maria.
Infrastructure	There are already some critical load circuits in this school.



Critical load location	Minimum Loads Served
Kitchen	Two small refrigerators, one large freezer, one large cooler, 39 LED lights, one oven, two outlets, one fan.
Library	15 lights, one fan, eight desktop computers, one small printer, one wifi router, one wifi box. This room already has a critical load circuit and outlets are marked by orange plugs.
Teacher lounge	One desktop computer, one wifi router, 24 LED lights (including bathrooms and hallway), one fan one plug load, one small printer.



F. Jayuya

Site Name: Jayuya
Address: Escuela Superior Josefina León Zayas
 PR-141R, Jayuya, PR ([Google Maps](#))
Coordinates: 18°13'7.60"N, 66°35'17.19"W

Electricity Reliability	After the hurricanes they were without electricity for three months.
Maintenance of School	School is maintained by <i>Edificios Publicos</i> .
Electrical Observations	Wiring seems to be in good condition There is one diesel generator that broke from overuse after Hurricane Maria The school has several central PREPA meters 480V 3 phase 4 wire



Critical Load Location	Minimum Loads Served
Kitchen	Two large refrigerators, one large freezer, one large cooler, 40 LED lights, two ovens, one outlet, one fan.
Technology Rooms	18 lights, one floor fan, 26 desktop computers, one small printer, one wifi router, 2 plug loads.
Admin Office	One desktop computer, four laptops, one wifi router, one wifi box, communication loads, 20 LED lights (including bathrooms), one fans, two plug load, one big printer.
Water infrastructure	This school has two pumps. These pumps do not have to be secured with batteries and during an outage can be powered by the PV system



IV. Project Specifications

A. Sizing and Design

All solar microgrids shall be designed to be +/- 5% the solar PV capacity and usable battery storage capacity described in the table below. If you propose a system size outside of these tolerances, please provide a detailed rationale in the proposal.

#	Site	Proposed Solar Capacity Target (kWdc)	Proposed Nominal Battery Storage (kWh)**	Proposed Usable Battery Storage (kWh)
1	Morovis	33 kWdc	40 kWh	29 kWh
2	Naranjito	33 kWdc	25 kWh	18 kWh
3	Barranquitas	29 kWdc	29 kWh	21 kWh
4	Humacao	19 kWdc	21 kWh	15 kWh
5	Canovanas	20 kWdc	31 kWh	22 kWh
6	Jayuya	46 kWdc	36 kWh	26 kWh
	TOTALS	180 kWdc	182 kWh	131 kWh

The solar and battery capacities in the table above were reached by running a HOMER model based on the load profiles derived from school site visits. The load profiles focus only on the critical loads at each site and assume these loads are being used for a certain period of time each day, based on interviews of school staff.

**The battery sizes listed are the nominal energy of the battery bank. This battery bank size assumes a 90% round-trip efficiency and a 20% minimum state of charge. The usable battery storage required is listed on the table taking into account those assumptions. These battery characteristics are not required but should serve as guidelines for your battery choice.

See “**Exhibit A – Critical Loads**” for more information.

B. Design and Installation Requirements

This section provides guidelines for the design and installation of the solar microgrid systems. It is agreed that the system shall comply with NEC 2017 requirements and that the installer will perform the work following industry standards in a timely manner. That being said, NEC 2017 rapid shutdown requirements are not required.



It is understood that worker safety—and the safety of students and staff—is of top priority and that safety rules shall be enforced by the EPC Contractor, who will be responsible for work safety. Any violation of the safety rules will result in the immediate expulsion of the faulty worker from the job site. Furthermore, since the project site is a public school, all workers working the presence of children shall sign and comply with the Child Safeguarding Policy and provide background check documentation as outlined in “**Exhibit F - Child Safeguarding Policy**”.

All major work that might be disruptive to students such as onsite roof repair and electrical repair work that requires shutting off electricity shall occur before the beginning of the 2019- 2020 school year in early August or outside school hours. All other work must be done during school operating hours Monday-Friday from 8-5pm unless otherwise arranged with the school.

General

- Systems shall be interconnected to the PREPA (or other legal arrangement such as a future concessionaire) grid.
- Systems (including supports and wiring) shall not interfere with any existing roof drains, water drainage, expansion joints, air intakes, electrical and mechanical equipment, or antennas.
- All PV hardware and structural components shall be corrosion-resistant.
- All equipment and racking shall be designed and verified by a Structural Engineer to withstand sustained winds of at least 157 MPH; preferred 175 MPH.
- Project must be compliant with all applicable building, mechanical, fire, seismic, structural and electrical codes and standards; these include but are not limited to relevant NEC 2017, UL, IEC, IEEE, and ASCE technical codes.
- Solar layout shall meet all local fire department, code and ordinance requirements for roof access.
- All components and equipment should be installed as per manufacturer's specifications and in accordance with NEC 2017 workspace clearance requirements.
- All equipment should be secured with necessary anti-theft mechanisms to reduce the possibility of theft (include anti-theft screws).
- Please locate all equipment such that serviceability is maximized, and conduit and wire run lengths are minimized.
- EPC shall provide confirmation that the PV systems will be designed to comply with applicable PREPA interconnection requirements.
- Remote monitoring capabilities are required.
- Microgrid controls should prioritize the energy sources in the following order: PV, Grid, Batteries.
- The system must be capable of exporting electricity to the grid in order to receive net energy metering credits.
- All batteries must be located indoors or, if no viable option exists for an indoor location, must be contained within an anti-theft container. All inverters must be located indoors or, if no viable option exists, they should be locked such that they cannot be accessed by students or unauthorized persons.
- All installation work should be performed by appropriately trained and certified individuals.
- Projects must be complete, commissioned, and approved by RMI by September 13th, 2019.



Roofing

- The roofing work must include a waterproofing guarantee such that the schools' roofs remain free of water damage for 10 years.
- A roofing expert must provide their assessment of the roof to determine the most cost-effective solution that assures a 10-year waterproofing warranty under the footprint of every array.
- For all PV arrays included in the project, apply necessary coatings to ensure roof waterproofing for 10+ years in that area.
- Do not use any roofs that require structural repair. EPC is responsible for ensuring that each rooftop used can support the full weight of the array for the lifetime of the project. EPC must not use rooftops that are deemed too damaged to support the array. Roof replacement is not part of the scope.
- For locations installing PV panels on multiple rooftops, all rooftops are subject to the above-mentioned specifications.
- EPC contractor may install PV panels on a roof adjacent to the intended use area, so long as the line losses involved do not exceed the maximum, as stated in the "Conductors" requirements.
- For your proposal to be deemed complete, EPC proposal must include a Roofing Plan, detailing the approach to waterproofing, materials, roofing company details, and roofing quote.
- The Jayuya school does not require waterproofing. EPC must still seal and waterproof penetrations from the array.

Racking System

- All racking shall be built using aluminum (preferred), stainless steel, or galvanized steel.
- The racking system shall be securely bolted to the roof and all roof penetrations shall be properly flashed to ensure roof waterproofing remain intact.
- The PV mounting structure and the PV array shall constitute an assembly that can sustain 157 MPH wind speeds, preferred 175 MPH. See Resilience section below.
- EPC Contractor, or subcontractor firm, shall evaluate roof capability of supporting the weight of the array.

Photovoltaic Modules / Arrays

- All photovoltaic modules shall be guaranteed by the manufacturer to retain an output power of at least 80% of their nominal value over a period of at least 20 years. Positive tolerance on modules output preferable.
- All PV modules shall be equipped with bypass diodes.
- All PV modules shall be UL listed.
- All PV modules shall have a minimum uplift rating of 3,200Pa.
- PV modules shall be provided with PV wire leads terminated by MC4 connectors preferably long enough to allow for leapfrog wiring.
- All exposed wire shall be specified as photovoltaic (PV) wire as per UL 4703.
- UL listed electrical conductors rated at 90°C and specified for wet location shall be used in conduits for PV connections when leaving the array.
- Each string shall be protected by an overcurrent protection device rated as per NEC 2017.



- Each string shall be connected to a device allowing for manual disconnect.
- The use of a DC circuit breaker is the preferred method for over current protection and manual disconnect of each string.
- Existing roof should be left in good condition, with no cracks, damage, broken shingles, or excessive visible wear.
- All roof penetrations should be properly flashed where required: Must comply with IBC standards and product manufacturer installation instructions.
- All conductors should be securely managed underneath the array: conductors may not be loose and may not contact roof surface.
- All wire management devices should be UL listed and intended for solar array installations.
- All conductors leaving the array should be in conduits, and bend radius shall be no smaller than 5 times the diameter of the conductor.
- All array conductors shall be properly supported within 12 inches maximum of entering a box and every 4.5 Ft maximum along the way.

Inverters

- All solar inverters shall be UL-listed with a minimum efficiency of 94% at all power levels.
- All battery inverters used shall be UL-listed with a minimum efficiency of 90% at all power levels.
- Solar and battery inverters shall be protected by properly-sized circuit breakers.
- For solar inverters, the PV source open circuit voltage shall be kept below the inverter maximum input voltage. Low temperature VOC adjustment should apply as per PV manufacturer's specification or NEC 2017.
- Lightning arrestors are required for each site.

Batteries

- Battery bank shall be designed to sustain a maximum ambient temperature without major losses.
- DC Voltage drop shall not exceed 0.2 volts per cell above 45°C.
- The designed daily depth of discharge (DOD) and total number of cycles shall be specified by the EPC contractor. However, fewer daily cycles is preferred since it would improve battery life.
- All batteries and inverters must be located indoors or, if no viable option exists for an indoor location, must be contained within an anti-theft container.
- Batteries shall be installed in a container that is appropriate for its environment (indoor/outdoor) and the enclosure should be electrically isolated to ensure safety of school staff and children. Preferably, batteries shall be enclosed in a locking battery box, well ventilated with a properly-installed temperature sensor. For any outside installation it should be in a NEMA 4x box.
- The battery bank shall be protected by a properly-sized class T fuse.
- Battery bank shall be designed to protect each facility's critical loads.
- Protected loads shall be located on back-up load panels with automatic transfer switch
- Required battery chemistry: Lithium Ion.



Conductors

- A maximum of 3% voltage drop shall be allowed on all AC circuits. A maximum of 2% voltage drop shall be allowed on all DC circuits.
- All underground conductors shall be rated for use in wet locations.
- All conductors shall be copper-stranded, unless otherwise specified.
- All conductors shall be UL-approved and rated at 90°C for wet locations.
- All conductors shall be derated for ambient temperatures, installation method, and number of conductors per conduit as per NEC 2017.

Conduits

- Conductor fill factor shall be as per NEC 2017 Chapter 9. For runways greater than 100 feet, the next bigger conduit size shall be used for ease of installation.
- The 4 ninety-degree bend rule applies. Properly sized junction boxes (above ground) and hand holes or manholes (underground) shall be used where needed.
- Raceway depth for underground installations shall be as per NEC 2017.
- Conduits shall be fastened as per NEC 2017.

Junction / Combiner Boxes

- Combiner boxes shall be rated for the maximum system voltage. Fused combiner boxes are preferred.
- Junction/combiner boxes shall be easily accessible for inspection.
- Junction box fill shall be as per NEC 2017.
- All outdoor boxes shall be rated at least per NEMA 3R.
- Proper rain tight connectors shall be used when installed outdoor.
- Additional approved sealing method shall be used when entering the top of an outdoor box. Myers hub are a good option.
- UL listed surge protectors are mandatory on each combiner box.

Splicing

- All splicing shall be accessible for visual inspections and shall be of the waterproof type if located underground.

Grounding

- The PV array equipment and all metallic components must be properly bonded and grounded, unless otherwise specified.
- All grounding of equipment shall be in accordance with NEC 2017.
- Grounding conductors are not allowed to be spliced unless using irreversible compression-type connectors.
- Grounding bushings shall be used to terminate all metallic conduits where required.



Resilience

To ensure that the proposed system may withstand hurricane-force winds, the EPC Contractor must:

- Specify high-load (at least 3,200 Pa uplift for roof mount and 5,400 Pa uplift for ground mount) PV modules

Perform structural engineering in accordance with ASCE 7 and site conditions, with calculations for wind forces, reactions, and attachment design.

- Check with racking manufacturer that actual site conditions comply with their base condition assumptions from wind-tunnel testing.
- Specify bolt QA/QC process to avoid inadequate torquing of bolts.
- Specify bolt hardware locking solution.
- Specify through-bolting of modules as opposed to top-down or T clamps, or if top clamping is required, use clamps that hold modules individually or independently.
- Require structural engineer review of lateral loads due to racking and electrical hardware—often lateral loads are missed, and recent failures have proven them to be a critical source of weakness (e.g., combiner boxes attached to end solar array posts caused increased loading and led to failure).
- Specify all hardware be sized based on 25 years (or project life) of corrosion.
- Do Not use self-tapping screws.

Microgrid Controls

The microgrid controller shall allow the microgrid system to manage itself, operate autonomously or while grid-connected, and seamlessly connect to and disconnect from the main distribution grid for the exchange of power and possibly the supply of ancillary services. The controller shall present the microgrid to the larger grid as a single controllable entity. The controller shall feature the following Transition and Dispatch functions as a minimum.

The **Transition** functions shall include:

- Unplanned islanding,
- Planned islanding,
- Reconnection, and
- Black start.

The Transition functions also access services from the **Dispatch** function to achieve real and reactive power balancing necessary for successful planned islanding and reconnection.

The Dispatch functions include the dispatching of microgrid assets and providing them with appropriate setpoints, and dispatching while connected and while islanded. The Dispatch functions generate and execute dispatch orders to particular microgrid assets in accordance with dispatch rules, which shall be according to the following priority:

1. PV
2. Grid
3. Batteries

The controller shall also receive microgrid system state information and maintain a current state of the system database for its own calculations.



Operations and Maintenance Requirements (If proposing an O&M services contract)

Preference will be given to the winning EPC bidder. However, we reserve the right to award the O&M contract to another bidder in the case that 1) it is lower cost or 2) the winning EPC did not provide an O&M proposal.

At a minimum, the O&M contract should include:

- Regular preventive and corrective maintenance including:
 - Detailed inspection of all equipment.
 - Cleaning of all panels and remove any debris in installation area.
 - Ensure proper functioning of inverter and batteries and perform routine preventive maintenance on battery banks and inverter, per manufacturer's operating guidelines.
 - Submitting warranty request to manufacturers in the case of equipment malfunctioning.
 - Inspect all foundations for cracks and premature failure.
 - Make adjustment to the structure and replacement of required support pieces.
- Remote monitoring:
 - If and when an issue to a system is detected, Company will notify the School and schedule a service visit.
 - Provide customer with access to the online monitoring portal for the system.

V. Scope of Work and Deliverables

A. Installation

The EPC Contractor shall perform the needed mobilization for the installation and commissioning of the solar microgrid system, utilizing all solar energy industry good practices, and shall be held accountable for any liability caused by EPC crew members or subcontractors on client's facility.

The EPC Contractor shall procure and safely install all solar equipment for the school sites, including but not limited to PV panels, inverters, conduit, wires, breakers, racking, junction boxes, batteries, microgrid controls, and monitoring equipment. By accepting this request, your company will supply the following scope, included but not limited to the following areas.

The EPC Contractor shall perform and manage the installation and commissioning of the solar microgrid. including the electrical protection system, selectivity, and grounding system – to match the designed outputs and system characteristics. The installation shall maintain the integrity of building structures and electrical systems, complying with client's safety and environmental standards, NEC 2017 standards, and proposed timeline described in your proposal. Projects must be complete, commissioned, and approved by RMI by September 13th, 2019.

EPC shall be responsible for a 1-year Workmanship Warranty. EPC shall be responsible for all required permitting with local agencies.



B. Electrical Work

The EPC shall include in their scope of work the repair of any electrical issues at the sites that are deemed unsafe or would possibly damage equipment installed as part of the Project. This shall include reversing any illegal wire taps observed at the sites. Additionally, should the solar microgrid project require any electrical upgrades to the existing system, including panels, breakers, wiring, or other, this shall be specified in your narrative and included in the project cost, and the work shall be performed by EPC. EPC should observe all electrical issues during the site visit and it is recommended that the EPC leave contingency in their pricing in case there are unforeseen electrical repairs needed.

C. Energy Efficiency Measures

The EPC shall include in their pricing and scope of work the following energy efficiency measures:

1. Replace T8 and T12 fluorescent lighting with LED lighting in the critical load areas. For the kitchen areas, if the number of lights outlined is not enough for the whole area, please prioritize the cooking and pantry areas. All lighting connected to the microgrid system shall be replaced with LED lighting.
2. Supplement AC with energy efficient floor fan as designated in critical load descriptions or replace any damaged existing ceiling fan with a new energy efficient one.
3. Add Electrical Timers to the Internet/Ethernet equipment and water pumps at Naranjito and Jayuya such that these run only during peak sun hours (11am to 2pm).

The estimated number for each piece of energy efficiency equipment are indicated in the table below. The EPC is responsible for confirming these numbers.

	T8 LEDs	Halogen LEDs	Fans	Timers
Morovis	81		9	1
Naranjito	56		3	2
Barranquitas	39		3	1
Humacao	27		5	1
Canovanas	78		3	1
Jayuya	78	30	12	2
TOTALS	359	30	35	8

The energy efficiency equipment should be similar to the following:

LED Lighting – <https://www.1000bulbs.com/product/208557/LEDT-10073.html>

Floor Fan – <https://www.bestbuy.com/site/vornado-energy-smart-floor-fan-white/5824420.p?skuId=5824420>



Circuit Timers - <https://www.apc.com/shop/us/en/products/APC-Power-Saving-Timer-Essential-SurgeArrest-4-Outlet-Wall-Tap-120V/P-P4GC?>

D. Documentation

At the end of the project, the EPC Contractor must provide the following documentation to RMI:

- All technical documentation, including components data sheets and warranties
- Installation and operation manuals
- Electronic copies of as-built system equipment list, layouts, and single line diagrams

E. Employee Policy

EPC Contractor must promote equal opportunity treatment for local employees hiring under your company's contract for and during the project, providing lodging options. EPC Contractor must provide all necessary safety equipment to installers onsite, including but not limited to hard hats, fall protection for all work to be performed 6 ft above ground level, bright color working vests, and insulating gloves.

Most project team members must live in Puerto Rico. See "**Exhibit C - EPC Qualification Form**".

F. Equipment Availability

In your Project Narrative, please specify where you will acquire the solar microgrid system equipment and specify the availability of the equipment in your warehouse or with your distributor, including lead time needed to procure. All shipping costs shall be included in your quote.

G. Net Energy Metering

- EPC Contractor shall coordinate with PREPA to ensure that the project satisfies all criteria for interconnection of the project to the PREPA electric distribution system. This includes coordinating all negotiations, meetings, design reviews, and conducting interactions with PREPA necessary to completing system interconnection.
- EPC Contractor is responsible for preparing required submissions for obtaining the Net Energy Metering (NEM) and interconnection agreement from the utility. The appropriate organization within the Department of Education will sign the NEM and interconnection agreements, not the contractor.
- EPC Contractor shall manage interconnection and startup of project in coordination with PREPA. EPC Contractor shall, at its own expense, pay any interconnection, processing, and other fees and expenses as may be required by PREPA for interconnection and operation of the project.



VI. Selection Criteria

The proposal will be evaluated on the following criteria:

Project Narrative	30%
EPC Qualifications	10%
Pricing	50%
Timeline	10%

Please See “**Exhibit B – Selection Criteria**” for a more detailed table.

VII. Proposal Requirements

The submitted proposal shall include all of the following. **Any sections incomplete or missing will disqualify bidder:**

1. Project Narrative – Must include the following sections:
 - Scope of work, including any exclusions/exceptions. Please discuss electrical work and energy efficiency measures here.
 - **Design and Installation Narrative** – Please provide a rationale for your approach to the design and installation of the project, including your choice of equipment, approach to critical circuitry, resilience measures, and anti-theft/safety measures. You must specifically demonstrate, in detail, how your project design and approach meet the needs of these schools, including how you plan to limit students’ access to system controls.
 - **Staffing Plan** - This should include a team summary, resumes for management-level staff and installation team leads (one per crew), and professional Electrician and PV installer licenses. Most project team members must live in Puerto Rico.
 - **Roofing Plan** - This must include roofing company name and details, approach to roofing per school, materials used, and overall roofing quote. Incomplete or missing Roofing Plans will disqualify bidder.
 - **Staging Plan** - In the Staging Plan, please indicate how you plan to store materials at the site during construction and how you plan to have construction vehicles enter and exit the site. Please also indicate if there is anything you need the client to provide while onsite, such as access to electricity, water, restrooms, etc. or whether you will be providing these necessities. Access to the site will be strictly limited to working personnel.
 - **Quality Control and Risk Mitigation Plan** - This must include how you propose to maintain the safety of your employees and any students and school staff present during and after installation.



2. Proposed System Design

- Your System Design must include layouts, a single line diagram of the entire system, and system details such as estimated annual energy production in kWh/year.
- Production estimates shall account for shade effects at each array location.
- The single line diagram shall include all conductor and conduit sizes.
- Data sheets for equipment proposed.

3. EPC Qualification Form (**Exhibit C**)

- If awarded the project, all onsite personnel that is in the presence of children will be required to complete a background check, inclusive of the installation crew and any subcontractors, as outlined in "Exhibit F - Child Safeguarding Policy".
- Please include copies of your business' registration.

4. Equipment and Pricing List (**Exhibit D**)

- The quote contained within the proposal shall follow the format contained within Exhibit D and should include all items not marked as optional.
- The 1-year workmanship warranty shall be included in the Labor Cost.
- The proposal may optionally include a quote for a 10-year O&M Services Contract. This contract should be quoted as a prepaid, lump sum contract payable upon system commissioning.
- Please do not omit any costs in Exhibit D.

5. Project Timeline (**Exhibit E**)

- Projects must be complete, commissioned, and approved by RMI by September 13th, 2019

VIII. Important Notes

RMI is a nonprofit that may receive pledged donations from equipment manufacturers and distributors including but not limited to PV modules, racking, inverters, and batteries, other equipment necessary for the project, and donated labor given that they meet the above stated specifications. A preference will be made to any bidder that is able to integrate donated equipment into the project.

IX. Submission Instructions and Deadline

All contractors may submit their requests for clarification regarding the RFP to amifsud@rmi.org and mkerins@rmi.org. All such requests shall be to be submitted by **Wednesday, April 24, 2019**.

To be considered for this bidding process, please present your Proposal following the proposal requirements described in this RFP by 11:59 pm Atlantic Time on **Friday, May 17, 2019**. All proposals must be submitted via email to both Ana Sophia Mifsud (amifsud@rmi.org) and Megan Kerins (mkerins@rmi.org). No physical copy is required.



X. Execution of EPC Agreement

The scope of this RFP includes the turnkey EPC services for the implementation of the Project and will be executed through an EPC Agreement. RMI will execute an EPC Agreement with the successful bidder for a negotiated dollar amount (USD). The winning bidder will be considered the EPC Contractor, and RMI will be the purchaser, owner, and operator of the constructed system during the project installation period.