Request for Proposal (RFP)

Integration of Existing Energy Management System (EMS) with Distributed Energy Resources (DER) at MCAS Miramar

Issue Date: January 14, 2021

1.0   Introduction

US Ignite, Inc. ("US Ignite") is seeking proposals to wirelessly integrate the Energy Management System ("EMS") that is currently in place at the Energy and Water Operations Center ("EWOC") at Marine Corps Air Station (MCAS) Miramar ("the Station") with distributed energy resources ("DER") including photovoltaic array inverters ("PV") and backup generators ("BG") located across the station ("The Project").

This Project is part of the Energy Communications ("Energy Comms") Program under the 5G Living Lab ("5GLL"). The objective of the Project will provide the EWOC with the capability to remotely monitor and control DER across the station, improving their ability to assess their situation and respond accordingly during outages and other events. The objective of the Project is also to demonstrate a use case of the Verizon 4G LTE/5G Ultra-Wideband ("UWB") network in place under the 5GLL at the Station. If successful, technologies demonstrated during this pilot will have the opportunity to be promoted and scaled to other DoD installations during and after completion of the pilot.

The selected Proposer(s) ("DER Integration Vendor(s)") will be responsible for completing the scope of services defined below. **The Period of Performance of the Project is expected from April 1, 2022 through September 1, 2022. A total of $300,000 is available under this RFP. Multiple awards may be granted to multiple vendors under this RFP through firm-fixed price contracts.**

1.1 US Ignite Overview

US Ignite is a national nonprofit, a 501(c)(3), that is accelerating the smart city movement – and creating value for an entire ecosystem – by guiding communities into the connected future, creating a path for private sector growth, and advancing technology research that's at the heart of smart city development. Why is this important? Because local governments need to improve the quality of life and ensure economic development in their communities, particularly during a time of rapid technological change. Businesses recognize the importance of the emerging market around smart communities and need to find commercial strategies that are repeatable, scalable, and sustainable. And foundations and federal agencies need to channel their institutional aims into efforts ranging from cutting-edge research to practical economic development initiatives that deliver measurable benefits. As a trusted partner, US Ignite brings this entire smart city ecosystem together, successfully pairing financial investment with technical and organizational expertise. Through the public-private partnership programs we run, US Ignite is a catalyst for communications network advancement, and for innovation in smart city services that are powered by a   new generation of technologies. You can read more about US Ignite's programs on its [website](#).

1.2 About MCAS Miramar

MCAS Miramar is home to the 3rd Marine Aircraft Wing, which is the aviation element of the 1st Marine Expeditionary Force. It is located in Miramar, San Diego, California, about 14 miles north of downtown San Diego. Over 15,000 service members and their families from every branch of our military services, supported by civilian Marines and contracted employees call "America's Finest City" their home. The base contains 23,116 acres.

1.3 5G Living Lab Program Overview

In September 2020, US Ignite initiated the 5GLL at the Station, a technology pilot program to develop dual use applications of 5G-enabled smart city technologies that support the DoD mission. The initiative, funded through the Office of Naval Research and Naval Information Warfare Center Pacific ("NIWC-PAC"), is powered by Verizon's 4G LTE/5G Ultra-Wideband network and will support multiple pilot projects aimed at improving military base operations through technology innovation. Under the 5GLL, multiple projects such as this one are being implemented in the technology areas of energy communications, connected/autonomous vehicles, digital fortress, and unmanned aerial systems. The 5GLL also aims to develop best practices that will serve smart bases and smart communities across the country. For this project US Ignite has partnered with researchers from the Naval Postgraduate School (NPS) to ensure cyber security is maintained during the development of this Energy Communications system.

2.0 Project Overview

From Building 6311, the EWOC manages and operates distributed energy resources including but not limited to PV array inverters and backup generators located across the Station, as well as a building-level research microgrid. The building-level research microgrid is the EWOC environment for testing and validating potential new systems before being added to the larger installation-wide microgrid at the Station. Non-critical control and management of the building-level research microgrid is performed by an Intelligent Power and Energy Management ("IPEM") integrated controller system (hereafter "EMS").

Prior to the commencement of this Phase 2 of the Program, Raytheon will restore this EMS as Phase 1 of the Program. This Project's objective is to perform Phase 2 ("DER Integration") of the Energy Comms Program described below.

2.1.0 Project Scope of Services

2.1.1 Cellular Networking

The DER Integration Vendor(s) selected for this pilot will need to demonstrate monitoring & control of DER from the EMS by communicating over both the 5G Ultra-Wideband commercial network available at the Station, along with its 4G LTE core network, powered by Verizon. The purpose of communicating over both versions of the network is to demonstrate the benefits of communicating over the 5G Ultra-Wideband network in terms of security, speed, bandwidth, and other measures over and above 4G LTE. Verizon will be responsible for documenting the security, speed, and bandwidth benefits of the 5G UWB transport, and if using 5G UWB leads to increased monitoring and control functionality described in section 2.1.4, the DER Integration Vendor(s) will be responsible for reflecting that benefit in the user interfaces described in section 2.1.5.

This commercial network provides ubiquitous 4G LTE connectivity across the station, as well as pockets of 5G UWB connectivity in the radius around 7 small-cell nodes located at Mainside Miramar. An additional 19 small-cell nodes are anticipated to be commissioned by the beginning of the performance

period, and latitudinal/longitudinal locations of these nodes will be provided to the selected DER Integration Vendor(s) at the beginning of Project performance. 4G LTE and 5G UWB connectivity plans and compatible routers, modems and other cellular equipment necessary will be provided by US Ignite leveraging a subcontract with Verizon. This may include a 5G wideband router plan, a 4G LTE Router plan, HotSpot Pooled M2M plan, and 4G LTE/5G routers and mobile hotspots as required by the proposer's solution. In the 'Summary of Proposed Systems' section identified in section 3.1.2, the estimated total or rate of data usage through each of these plans or devices and the quantity of each plan and device required should be indicated. The proposed system must be compatible with routers, modems, and other equipment that are operable on the Verizon 4G LTE/5G UWB network. A suggested architecture is provided below for reference, however the vendor may propose any solution that meets the need of the project

Figure 1. Suggested Architecture: EMS Integration with PV Inverters and/or Backup Generators over 4G LTE and 5G
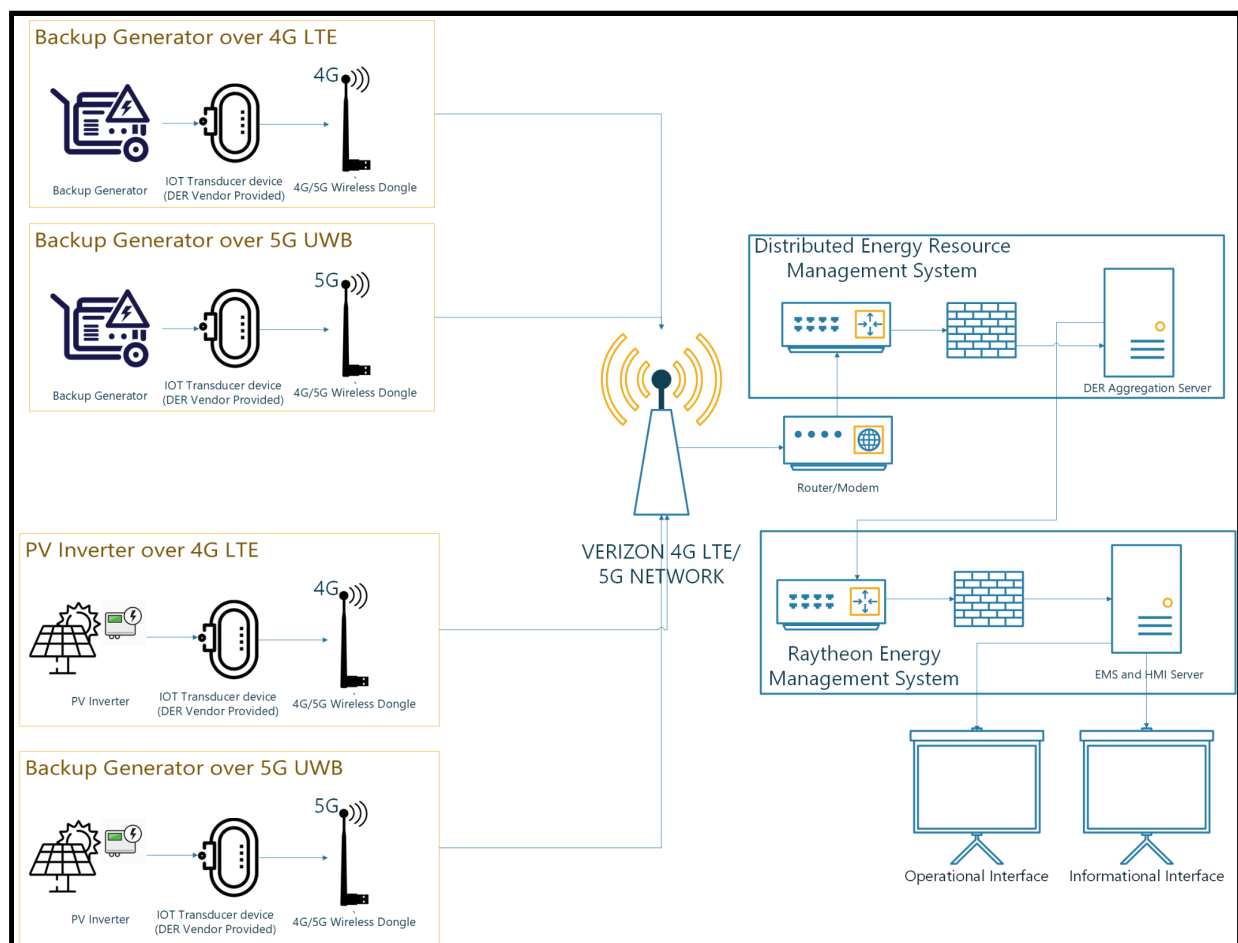
2.1.2 DER Asset Integration Options

There exists approximately 40 BG's across the station; approximately 7 of these BG's will be in the range of the 5G nodes being installed, and the remainder will be covered by 4G LTE. Similarly there are approximately 15 PV's across the station; approximately 5 PV's are in the range of 5G nodes, and the remainder are covered by 4G LTE. The DER Integration Vendor(s) will be required to perform one of the Integration Set Options below. If Proposers propose to perform Integration Set D, then you must specify

the number and type of DER proposed to integrate. Integration Option D is the highest priority and Option C is the second highest priority.

Table 1. Integration Set Options	
Option	**Description**
A	Integrate one BG using 4G LTE, and another using 5G
B	Integrate one PV using 4G LTE, and another using 5G
C	Integrate one BG and one PV using 4G LTE, and another BG and PV using 5G
D	Integrate 2 or more BG and/or PV using 4G LTE and 5G (specify)

Makes and models of the PV's and BG's to be considered under this project can be found in Appendix A, a map of which will be provided to the DER Integration Vendor(s) following contract award. The communication protocols and supported monitoring and control functions readily supported by these DER assets are unknown, and a requirement of the DER Integration Vendor(s) will be to survey the documentation (and if necessary, the physical equipment) associated with each all assets of the type they propose to integrate, in order to confirm their ability to provide the monitoring and control capabilities described below. The DER Integration Vendor will then be required to provide a summary report of their ROM estimate time/cost required to integrate each DER, which will be critical for the EWOC and DoD to understand how the demonstrated technology could be scaled to DER assets across the Station and across other DoD installations.

2.1.3 Integration with the existing EMS

Prior to commencement of this Project, Raytheon will have installed Microgrid Controller Software Architecture called IPEM that has been tested and validated for use in various microgrid programs. The EMS has already been successfully interfaced with the roof-top PV inverters & HVAC system at Building 6311. The DER Integration Vendor(s) will be required to aggregate all control and monitoring data from the DER assets on a central server and provide the data via a singular Point of Presence (DER Management System shown in Figure 1) to the EMS over a standard application layer protocol such as Modbus, CANbus, OPC, etc. The DER Integration Vendor(s) shall work with Raytheon in mapping these data points from the DER Management System to the EMS. Raytheon uses an open-source database (https://www.influxdata.com/) for storing the time-series data points. The DER Integration Vendor(s) shall store the aggregated data in a secure server and retain backup in a Network Attached Storage (NAS). The DER Integration Vendor(s) shall also be responsible to procure and install any additional hardware that would be required to integrate the DER solution to the EMS.

2.1.4 Monitoring and Control Requirements

The DER Integration Vendor will need to coordinate with the EWOC the appropriate sample frequency for data acquisition, which should be no more than 5-10 seconds/message. No custom data feature development is expected of the DER Integration Vendor(s); only data features that are readily provided by assets are to be included. Although not required, monitoring and control functionality shall be compatible to the greatest extent possible with the operating requirements of California Rule 21 tariff, IEEE Standard 1547-2018 (a.k.a. SunSpec Modbus), IEEE 1547.1-2020, as well as the IEEE 2030.5-2018 networking standard.

For BG's, the DER Integration Vendor(s) will only be expected to provide monitoring capabilities. For each BG, the list of desired data features are below in order of priority.

- Asset ID
- Operational Status - On/Off State
- Operational Status - Run Time per Session
- Operational Status - Run Time per Period
- Communication Status
- Auto-Transfer Switch Status
- Alarms
- Battery Information
- Generator voltage
- Generator amperage
- Fuel Level
- Engine oil pressure
- Engine coolant temperature
- Engine RPM (Revolutions per Minute)
- Compartment louver position and control (depending on hardware manufacturer)
- Compartment temperature (depending on hardware manufacturer)
- Other data features to be proposed

For PV's, the DER Integration Vendor(s) will be expected to provide monitoring and control capabilities. EMS-side control functionality will be developed by Raytheon, but development of functionality for DER-side acceptance of that control will be required of the DER Integration Vendor. For each PV, the list of desired data features and control capabilities are below in order of priority:

- Monitoring
    - Asset ID
    - KW output
    - Power factor
- Control
    - VAR output
    - KW output
    - Power factor
    - On/Off/Ramp
    - Schedule On/Off
    - Delay Interval timer (If available)

2.1.5 User Interface Development

The DER Integration Vendor(s) will be responsible for developing two custom human machine interfaces (HMI) for the EMS; one Operational Interface ("OI") with authorization to provide control functionality and alert notifications to EWOC staff, and another Informational Interface ("II") with more limited visibility to be presented at the Public Utility Awareness Display ("PUAD") located at the entrance to the EWOC Building. These interfaces will be developed by expanding existing government-furnished wireframes (design diagrams) and source code to be provided by Raytheon, and with back-end database integration support from Raytheon. In the II the DER Integration Vendor(s) is to provide monitoring information only, and in the OI the DER Integration Vendor(s) is to provide both monitoring and control functionality of assets overlaid on a geographic representation of the Station. The DER Integration Vendor will be required to coordinate the design of these interfaces with the EWOC, ideally through a workshop or design session should time permit.

2.1.6 Cybersecurity

As a research project the solutions demonstrated during this pilot will not need to undergo ATO/RMF authorization during the Project, but proposed solutions should be capable of undergoing such authorization in order to be scaled beyond the research microgrid in the future. In particular, although not

required, proposers should consider the NIST standards 1108r4, 800-213, and 800-213A when selecting their proposed solution. The DER Integration Vendor(s) will be required to provide DER data, documentation and coordination to researchers from the Naval Postgraduate School, who will be developing an offline modeling framework for cyber anomaly detection associated with communication and control messages being transmitted between the DER and EMS over the Verizon 4G LTE/5G UWB network. In this framework, convolutional neural networks and other unsupervised learning models will be used to build a prediction-based anomaly detection platform that will reduce false alarm rates and limit power consumption. Any potential performance tradeoffs will be analyzed.

2.1.7 Test/Commissioning and Training

The DER Integration Vendor(s) will be responsible for coordinating with EWOC and NIWC-PAC staff in defining and mutually concurring on a test and commissioning plan for the system proposed. This will include defining scenarios for normal operation and disruptions/outages under which the system is expected to operate, and what information and control actions are anticipated to be supported under each of those scenarios. The DER Integration Vendor will then be anticipated to perform point-to-point as well as overall scenario validation tests of the system, prior to acceptance by US Ignite and the project team. This includes all mutually agreed upon data transmission, control functionality, and user interface specifications; communication validation will be performed by Verizon.

Following acceptance of commissioning by EWOC, the DER Integration Vendor(s) will be responsible for developing an operating manual to EWOC and training them on the proposed system's use and maintenance.

2.2.0 Other Services

2.2.1 Decommissioning and/or Annual Operations and Maintenance

The proposed solutions will be left operating in place following this demonstration pilot, but the DER Integration Vendor will be required to decommission the proposed solution if requested by EWOC staff. Should decommissioning be requested, the DER Integration Vendor will be expected to return all equipment integrated with during this project to their original state.

2.2.2 Annual Operations and Maintenance

Following successful completion of the demonstration project by the DER Integration Vendor, EWOC may request ongoing service and support. The scope of what this ongoing service and support would include is to be defined by Proposers.

2.3 Project Deliverables

1. Provide a summary report of the ROM estimate of the time/cost required to scale the integration pilot to the full set of DER at the Station.

2. Procure and install all necessary hardware, software, and computing and networking equipment (IOT Devices, routers, modems, servers, workstations, switches, etc.).

3. Provide Operational Interface and Informational Interface validated against EWOC design requirements.

4. Provide DER data, in a standard format, and documentation to cybersecurity researchers from the Naval Postgraduate School (NPS) to support cyber anomaly detection framework development.

5. Develop an operational scenario list and perform point-to-point and overall scenario commission tests, based on monitoring and control requirements, 4G/5G connectivity requirements, and interface

features mutually agreed upon by Proposer and US Ignite.

6. Provide and explain updated network diagram, system architecture/design manual, data sheets of components used, general arrangement drawings, and registry drawings, and other vendor engineering drawings as appropriate.

7. Participate in weekly or bi-weekly program meetings with stakeholders remotely or in-person as needed.

8. Provide monthly reports on work performed, as well as a final report to include the documents described above.

2.4 Project Schedule

The following schedule outlines the key milestones required to be met by the DER Integration Vendor(s).

Table 2. Project Schedule	
Milestone	**Deadline**
RFP Responses due	3/1/22
Contract award	4/1/22
UI designs and monitoring/control features confirmed; DER integration feasibility survey complete	5/1/22
Commission tests mutually agreed upon	8/1/22
Commission tests complete	8/15/22
EWOC training complete, final report delivered (Pilot Complete)	9/1/22

3.0 Solicitation Responses

3.1 Questions and Answers

All clarification questions must be submitted **by Feb 4, 2022 no later than 8:00 PM Eastern Daylight Time (EDT).**

US Ignite will endeavor to respond to all parties no later than Feb 11, 2021 8:00 PM EDT.

3.2 Proposals

All proposals must be submitted **by March 1, 2022 no later than 8:00 PM EDT.**

Proposals (and questions) should be submitted via email to bases@us-ignite.org

Proposals must include:

3.2.1.0 **Technical Summary** on the approach that would be taken for the Project (10 page limit). The Technical Summary <u>must</u> include the following sections:

    3.2.1.1 **Statement of Work,** with clear identification of choice of integration set (A, B, C or D). Proposers have the option (but are not required) in this section to indicate particular DER assets they would target.

    3.2.1.2 **Summary of Proposed Systems**, including which data features described in section 2.1.4 are anticipated to be provided.

    3.2.1.3 **Timeline**

    3.2.1.4 **Deliverables**

3.2.2.0 **Description of Other Services** (not counted in Technical Summary page limit)

    3.2.2.1 Annual Operations and Maintenance

    3.2.2.2 Decommissioning

3.2.2 **Technical Specification Sheets** for proposed systems (not counted in Technical Summary page limit)

3.2.3 **Cost Proposal** (see Appendix B) (not counted in Technical Summary page limit)

3.2.4 **Resumes** of individuals your organization will commit to the Project, including any planned sub-contractors. Please note any individuals located in the Southern California area with ability to support the Project in person (not counted in Technical Summary page limit)

3.2.5 **List of Relevant Projects**, including with similar energy management, federal, or DoD clients (5-page limit and does not count in Technical Summary page limit).

Proposals will be evaluated based on the following criteria.

Table 3. Scoring Criteria	
Scoring criteria	**Weight**
Impact on visibility and control over DER assets (number of DER assets and data features)	25%
Ability to demonstrate solution over 4G LTE/5G UWB network	20%
Value of proposal given cost and deliverables	20%
Demonstration of capability to perform the work required in the timeline available	10%
Demonstration of project team's experience performing similar projects	10%
Ability to support the project locally from the Southern California region	10%
Clarity and completeness of proposal	5%

APPENDIX A - Supporting Documentation

Included below is a list of PV inverters and Backup Generators available for consideration to be connected to the EMS. Additional information may be provided by US Ignite or EWOC staff as available, and additional information may need to be collected by the successful bidder to this solicitation during the execution of the scope of work. Manuals are available for most of the inverters associated with the PV systems described below, and locations, manufacturers, model numbers and serial numbers are available for most backup generators included in the scope of this project. If there are challenges or if it is not feasible to integrate any of the below resources, the Project team can look for alternative options. A map of the 5G node locations, as well as a network diagram including the IPEM will also be provided to the successful bidder following execution of a non-disclosure agreement.

Table 4. List of PV Inverters to be Considered for Integration with EMS

Manufacturer	Model No.	Count	Protocol	Data Sheet Available
SMA	SB 7.0-1SP-US-40	4		
PV Powered	PVP 100kW	3	Modbus	http://www.solarvu.net/green/doc/PVP75-100KW.pdf
SMA	STP 15000TL-US-10	2		
SMA	SB 7.0-1SP-US-41	2		
SMA	SB3000US	1		
SMA	STP 30000TL-US-10	1		
SMA	STP 24000TL-US-10	1		
SMA	STP 20000TL-US-10	1	Modbus	https://files.sma.de/downloads/STPTL-US12-30-DUS173127W.PDF
PV Powered	PVP 30kW	1	Modbus	
SATCON	PVS-250	1	Modbus	http://www.satcon.com/uploads/products/en/250kW-PG-US-UL.pdf

| SATCON | PVS-135 | 1 | Modbus | http://www.satcon.com/temp_foreign/downloads/solutions/135kW-PG-US.pdf |

Table 5. Backup Generators to be Considered for Integration with EMS				
Manufacturer	**Model Number**	**Count**	**Protocol**	**Data Sheet available**
KOHLER	4045TF270E	4		https://resources.kohler.com/power/kohler/industrial/pdf/tp6290.pdf
KOHLER	50REOZJD	2		
ONAN	200RD	2		
CAT	3306	1		
CAT	D100-6	1		
CAT	DP0P3	1		
CAT	S9L01309	1		
CAT	YCEXL0239AAA	1		
CUMMINS	150ROZ281	1		
GENERAC	18 DTA/SD500	1		
GENERAC	F3AE9685A-E	1		
GENERAC	SD350	1	Modbus	https://legacy.genconnect.generac.com/Media/vwDoc.axd?d=c007e205-2881-4af4-93a0-1036994f27e2
KOHLER	100REOZJF	1		
KOHLER	10REOZDB	1		
KOHLER	20REOZJC	1		
KOHLER	20ROZJ21	1		
KOHLER	20ROZJB	1		
KOHLER	230REOZV	1		

KOHLER	30REOZJB	1		
KOHLER	350REOZJ	1		
KOHLER	40REOZJC	1		
KOHLER	50REOZJB	1		
KOHLER	50REOZJC	1		
KOHLER	50REOZJD	1		
KOHLER	50ROZJ	1		
KOHLER	600REOZVB	1		
KOHLER	60R0Z281	1		
KOHLER	80REOZJF	1		
KOHLER	RG6068L008985	1		
KOHLER	RG6090L0022231	1		
KOHLER	4045TG150	1		

Existing Energy Management System

Raytheon has developed a Microgrid Controller Software Architecture called IPEM (Intelligent Power and Energy Management), for use in various microgrid programs. With a history of development going back over 10 years, IPEM has been deployed at multiple different facilities, and is the central focus of Raytheon's many Microgrid Integration efforts, for which Raytheon is the Prime. IPEM's design is built upon the following pillars: real-time subsystem control and status, long-term data collection, modular and flexible functionality, fully-integrated data visualization HMI, and multi-level security protocols. IPEM has algorithms that enable high-level microgrid operations capabilities such as Black start and Seamless transition scenarios. These modes of operation range from ESS State of Charge Management, to Peak-Shaving, Load-Shedding, Frequency Regulation, and Islanding. IPEM has already successfully interfaced with multiple devices and protocols within the microgrid industry: inverters, batteries, meters, JACE devices, Modbus, Moxa, MPower, ChargePoint, and OPC. IPEM is a robust solution for controlling and maintaining microgrid integrity in a variety of scenarios and configurations.

IPEM (including the HMI) is written in C++, with Qt as the cross-platform framework. Windows has been the focus platform for recent development but it will run on Linux with some additional effort to ensure proper behavior.

Table 6. Energy Management System Equipment Sheet			
Item	**Hardware with configuration**	**P/N**	**Data Sheet**
1	HPE ProLiant DL20 Gen10 E-2224 1P 16GB-U S100i 2LFF 290W PS Server	DL20	https://www.hpe.com/psnow/doc/PSN1012180693IEEN.pdf
2	HPE ProLiant DL20 Gen10 E-2224 1P 16GB-U S100i 2LFF 290W PS Server	DL20	https://www.hpe.com/psnow/doc/PSN1012180693IEEN.pdf
3	Cisco FirePOWER Firewall	ASA5506-K9	https://www.cisco.com/c/en/us/products/collateral/security/asa-firepower-services/datasheet-c78-742475.html
4	Cisco 2960-CX Switch 8 GE	WS-C2960CX-8TC-L	https://www.cisco.com/c/en/us/products/collateral/switches/catalyst-3560-cx-series-switches/datasheet-c78-733229.html

APPENDIX B - Cost Proposal

Proposers must complete the 'Base Cost Proposal' table, which must fully encompass all activities described in Sections 3.1.1 (Statement of Work) and 3.1.4 (Deliverables) of their proposal. Do not include O&M or decommissioning costs in this table.

Table 7. Base Cost Proposal		
Item	**Description**	**Fixed-Price Amounts for Period**
A	Bill of Materials (i.e., hardware/software computing and networking infrastructure such as IOT devices, power modules, workstations, etc.)	
B	Labor	
C	Travel	
D	Consultants/Subcontractors	
E	Other direct costs (please specify)	
F	General and administrative expense	
G	Other indirect costs (please specify)	
	Total Cost	

Proposers must also complete the 'Base Cost Proposal Annual O&M' table to provide annual operations and maintenance costs of their proposed solution following this pilot. This O&M will not be considered as part of the total cost of the proposal.

Table 8. Base Cost Proposal Annual O&M		
Item	**Description**	**Fixed-Price Amounts post-pilot**
A	One year ongoing maintenance and support post-pilot	
	Total Cost	

Decommissioning Cost Proposal

Proposers must complete the 'Decommissioning Cost Proposal' table, which must fully encompass all activities required to return the MCAS Miramar systems included in this Project to their previous state. This decommissioning cost will not be considered as part of the total cost of the proposal.

Table 9. Decommissioning Cost		
Item	**Description**	**Fixed-Price Amount**
A	Decommissioning Cost	
Total Cost		

Table 10. Small Business Concerns		
Small Business/Small Business Concerns	**Total Contract Percentage/Total Contract Value**	**Name of Small Businesses/Small Business Concerns Involved In Proposal**
Please provide the percentage % and total contract value that $ will be committed to one or more of the following: Small Business (SB), Small Disadvantaged Business (SDB), 8(a) Certified SDB, Historically Underutilized Business Zone Small Business (HUBZone SB), Service-Disabled-Veteran-Owned Small Business (SDVOSB), or Woman-Owned Small Business (WOSB) concerns	**%** **$**	

APPENDIX C - Insurance Requirements

If awarded, the contractor is required in accordance with FAR 52.228-5 "Insurance--Work on a Government Installation" and shall be maintained in the minimum amounts shown:

(1) Workers' compensation and employers' liability: minimum of $100,000

(2) Comprehensive general liability: $500,000 per occurrence

(3) Automobile liability:

$200,000 per person

$500,000 per occurrence

$20,000 per occurrence for property damage

(b) Upon notification of contract award, the contractor shall furnish to US Ignite, Inc., as required by paragraph (b) of the FAR 52.228-5 "Insurance--Work on a Government Installation" clause, a certificate or written statement of insurance prior to commencement of work under this contract. The written statement of insurance must contain the following information: policy number, policyholder, carrier, amount of coverage, dates of effectiveness (i.e., performance period), and contract number. The contract number shall be cited on the certificate of insurance.