

2023 Distributed Solar and Storage Resources RFP:

Exhibit I. RFP Requirements List

Number	Functional Area	Capability	Requirement	Must Have	Nice to Have	Future
1.01	Business	DER Types	Respondent must provide CETA compliant resource(s)	✓		
1.02	Business	Performance	Respondents proposing dispatchable resources must provide detailed event performance measurements and perform M&V. Respondent shall specify what M&V and baseline capabilities they have.	✓		
1.03	Business	Performance	Respondent must acknowledge that PSE may implement financial penalties for non-performance of kW / kWh targets	✓		
1.04	Business	Planned outage	Respondent must provide PSE 7 days advanced notice for any planned DER outage	✓		
1.05	Business	Planned outage	Respondent must provide 7 days advanced notice for any DER testing	✓		
1.06	Business	Compliance	Respondent must comply with all applicable laws and regulations. Respondent must ensure that all proposed resources comply with all applicable PSE, WA state, and national safety standards. As applicable, respondent must support PSE's compliance with privacy laws and regulations including WAC 480-100-153 and WAC 480-90-153.	✓		
1.07	Business	Sale of information	Respondent must not sell any customer information obtained from PSE or from the customer through PSE programs	✓		
1.08	Business	Settlement	Respondent must support settlement process with both DER owners and PSE	✓		
2.01	Engineering	Asset Management	Respondent must provide the physical location of the DER resource allowing PSE to match it with the distribution feeder it is connected to. It is assumed and expected that the vendor/supplier of the project will provide the GIS data to PSE in electronic form to be consumed or entered into our SAP CIS, GIS, Virtual Power Plant, and SCADA systems.	✓		
2.02	Engineering	Asset Management	Respondent must provide DER nameplate, resource availability, response information to PSE. This information needs to be provided at individual DER level for DER > 25kVa and aggregated (at least down to feeder level) for smaller resources.	✓		

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2.03	Engineering	Communications	<p>Respondent requested to be capable of communicating using the following:</p> <ul style="list-style-type: none"> -Standards and protocols: IEEE 2030.5, DNP3 SCADA protocol devices, Modbus SCADA protocol devices, SunSpec Smart Inverter Profile (Modbus or DNP3), MESA Storage Profile (Modbus or DNP3), ICCP -Networks: LTE cellular, Broadband <p>Respondent requested to describe experience with:</p> <ul style="list-style-type: none"> -IEEE 2030.5: Describe communications experience with IEEE 2030.5 and specify equipments (i.e. battery controller, inverter, etc) controlled by the IEEE signal -LTE Cellular: What cellular carrier is being proposed and what carriers have you used in the past? Where was this done? 	✓		
2.04	Engineering	Communications	<p>Respondent requested to validate that the DER can communicate through LTE cellular or fiber connections using real-time data with IEEE 2030.5 or DNP 3.0 communication standards . Supplier to specify which cellular carrier is being proposed? Please provide what cellular carriers have you used in the past? Where was this done? What PCS (Power Control System) and inverter equipment did you communicate with (i.e., battery controller, inverter, both) ? Were Watch Dog Timers and diagnostics used if communication failures occurred?</p>	✓		

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2.05	Engineering	Grid Operation	<p>Respondent must adhere to all applicable PSE interconnection processes, comply with all applicable PSE technical specifications and open industry communication standards, including the interconnection requirements set forth in:</p> <ul style="list-style-type: none"> -PSE's Tariff Schedule 152 - Interconnection with Electric Generators (https://www.pse.com/-/media/Project/PSE/Portal/Rate-documents/Electric/elec_sch_152.pdf) -IEEE 1547-2018: Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power System Interfaces (https://standards.ieee.org/products-services/standards-related/pdf/electric-power-systems.html), and -PSE's Technical Specification and Operating Procedures for Interconnection of Generation Facilities Not Subject to FERC Jurisdiction (https://www.oasis.oati.com/woa/docs/PSEI/PSEIdocs/PSE-ET-160.70_NonFERC_19Aug07.pdf) <p>Respondent must provide DER inverter specifications to PSE including, but not limited to:</p> <ul style="list-style-type: none"> -Rated AC output power, current, and voltage; -Power factor range of adjustability; -Available voltage and frequency protective elements; -Available grid support functions (anti-islanding, voltage ride through, voltage support, etc.); -Available communication protocols; -Grid standard (IEEE 1547 and UL1741) compliance information 	✓		
2.06	Engineering	Inverter		✓		
3.01	IT	Cybersecurity	Respondent must meet industry best practices for security standards set by NIST-IR 7628	✓		
3.02	IT	Cybersecurity	Respondent shall remove or disable all software components that are not required for the operation and maintenance of the device prior to the Factory Acceptance Testing (FAT). The Respondent shall provide documentation on what is removed and/or disabled	✓		
3.03	IT	Cybersecurity	Respondent shall provide, within a pre-negotiated period, appropriate software and service updates and/or workarounds to mitigate all vulnerabilities associated with the product and to maintain the established level of system security	✓		

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3.04	IT	Cybersecurity	Respondent shall certify that its systems and products have undergone cyber security testing by leading and independent government sanctioned organizations	✓		
3.05	IT	Cybersecurity	After contract award, the Respondent shall provide notification of known security vulnerabilities affecting the Respondent supplied or required operating system, application and critical third-party software within a pre-negotiated period after public disclosure	✓		
3.06	IT	Cybersecurity	After contract award, the Respondent shall provide notification of a patch(es) affecting security within a pre-negotiated period, as identified in the patch management process. The Respondent shall apply, test and validate the appropriate updates and/or workarounds on a baseline reference system before distribution. Mitigation of these vulnerabilities shall occur within a pre-negotiated period	✓		
3.07	IT	Data security	Respondent must comply with PSE's Security Addendum (Consultant or Hosted) and ensure data security for all relevant usage, metering, settlement, and customer information.	✓		
3.08	IT	Integration	For VPP interfacing resources, Respondent is requested to provide a list of presently operational VPP interfaces and a separate list of VPP interfaces that have only been piloted.	✓		

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3.09 IT	Standards		<p>Respondent requested that system be capable of fully complying with and capable of communicating to DER (BESS or PV storage system) using a smart inverter with its PCS system. PSE requires that the Smart Inverter incorporate or embed into its controls the SunSpec interoperability standards. These standards and communication protocols shall be as follows:</p> <ul style="list-style-type: none"> * IEEE 2030.5 * DNP3.0 * Modbus TCP <p>The above communication protocols shall provide open interoperability and real-time communication to the PCS control system and components which the Smart Inverter is part of the controls equipment.</p> <p>Security with the Smart Inverter shall also include: PSE security requirements, TLS, PKI infrastructure, Digital Certificates and authority, encryption (SHA-256), authentication, authorization, identities, and client identification with the above communications.</p> <p>The Sunspec Standard shall provide a DER and Device Information Data Model to collect, read, and write data to the Smart Inverter. This shall consist of CSIP profile for the inverter, monitoring power production data (kWH, kW, Delivered, Received, charging ramp rates, alarms, charging schedules, events, over/under voltage, over/under current, Frequency, and all power-voltage imbalances). It shall also provide connect and disconnect functions, High/low voltage ride through, Volt-Var, and PF control functions. PSE requires reporting data capabilities as well with Real and Reactive Power, Volts, Amps, Hz, and PF for all 3 phases + Neutral including Averages.</p>		✓	

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3.1	IT	Standards	Supplier/Respondent must have the ability with their PCS system (Power Control System) to have rate schedules managed by the VPP. The expectation is that system supports both direct and indirect control with rate and charging schedules. This can be managed by an Aggregator using open protocols such as IEEE-2030.5 or DNP 3.0 but must coordinate and integrate with the VPP via OpenADR 2.0b as a VEN. If direct control is used by PSE VPP/DERMS system then the supplier shall support PSE standards of IT/OT communications direct to the energy storage controller.	✓		
4.01	Load Office	DER Control	Respondent must have the ability to be managed by, interface with, and directly be controlled by the PSE VPP with AutoGrid for solar deployments >=0.5MW and <2MW and FOTM BESS <2MW	✓		
4.02	Load Office	Dispatch	Supplier/Respondent must have the capability with its DER site controls, communication to aggregators and VPP to indicate resource availability, readiness, and equipment states of all components at the DER to dispatch the DER resource.	✓		
4.03	Load Office	Forecasting	Respondent required to have the capability to provide generation capacity up to 48 hours in advance	✓		
4.04	Load Office	Forecasting	Respondent requested to have the capability to provide generation capacity up to 7 days in advance		✓	
5.01	Operations	Alarms	The Supplier/Respondent shall have the ability to provide DER controls which manage all states, alarms and events to the VPP. This shall include watch dog timers for communication, loss of end-points or loss of physical or communication to the site. If the communications are lost the communications shall retry to establish communications. If communications are lost an alert and alarm shall occur. All states and events shall also be managed so that root cause analysis can be determined to what caused the failure.		✓	
5.02	Operations	Control	Supplier/ Respondent shall have the capability to respond to real time control from the VPP (source) to the DER PCS controls (site). Communications shall have the ability to perform read request, respond and write data including all PCS configuration controller data.		✓	

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5.03	Operations	Control	Supplier/Respondent must be capable of enabling control of the DER site from the VPP. The interval between control command request and response back to the VPP should be less than 15 seconds. PSE ultimately desires to have 5 second or better response time from request from the VPP to response from the DER.	✓		
5.04	Operations	Data interval	Supplier/Respondent must be capable of enabling processes for the DER site to be managed from the VPP for all data collection with DER Asset Production Resource data. PSE desires to have 15 second response time from a read request and write from the VPP to the DER. PSE ultimately desires to have 5 second or better response time from read request from the VPP to response from the DER.	✓		
5.05	Operations	Event response	Respondent's time window for providing full capacity for a dispatched event, which PSE notifies an hour ahead, is how large (within a minute, five mins, etc...)?	✓		
5.06	Operations	Event response	Respondent must be able to provide confirmation of opt-out of events to the VPP	✓		
5.07	Operations	Event response	Respondent must be able to receive event notifications from the VPP	✓		
5.08	Operations	Event response	Respondent must be able to respond to day-ahead events. Respondent shall describe their notification requirements in order to successfully respond to an event, including minimum advanced notice time interval.	✓		
5.09	Operations	Event response	Respondent requested to have the capability to respond to hour-ahead events		✓	
5.1	Operations	Ride-through	Respondent must ensure that inverters ride-through momentary outages according to standard IEEE 1547 -2018, standard CA-21, and standard UL-1741.	✓		
5.11	Operations	SCADA	Respondent is required, for direct connect DER, to provide interconnection architecture (building upon included diagrams and including more detail) that shows the connectivity with meter, DER, utility service point, transformer highlighting the energy flow, and the communication standards used to communicate between the devices.	✓		
5.12	Operations	SCADA	Respondent must provide uptime availability of DER for monitoring, control, and metering purposes to the PSE SCADA system for DER > 25 kVA	✓		
5.13	Operations	SCADA	Respondent requested to provide communication status of the DER monitoring, control, dispatch link.		✓	

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5.14	Operations	SCADA	Respondent must be able to curtail DER when instructed by PSE for DER > 25kVA	✓		
5.15	Operations	SCADA	Respondent is requested to provide digital and analog points for SCADA connected DER > 25 kVA		✓	
5.16	Operations	VPP	Respondent requested to provide DER status, performance, and configuration data to the VPP		✓	
5.17	Operations	Maintenance	For any response with a PSE ownership option, Respondent shall provide equipment maintenance requirements	✓		
6.01	Planning	Forecast	Respondent shall provide to PSE annually updated 8760 DER forecast and normative load shapes for DERs >=500kVA.	✓		