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DER Orchestration Gateway - Platform by Universal Devices

Additional submitted attachment is included below.

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Response to RFI

1. **Important grid service functions that aggregated DERs should be able to dispatch and that require validation in the near-term:**
    - **Aggregated DER cybersecurity and interoperability are important grid service functions that should be addressed as the grid becomes more decentralized.**
    - **Aggregated DER ability to address ramping support and power injection to address the variability of renewable energy sources like solar and wind is an important function.**
    - **The control and coordination mechanism of aggregated DERs should be explored as they need to balance responding to multiple grid signals simultaneously, such as providing both frequency regulation and voltage support thus enabling multi use applications.**

2. Performance Metrics for Resource Dispatchability

A successful demonstration should establish confidence in the dispatchability of distributed energy resources (DERs). Adoption rates serve as a strong indicator of success, with participation levels across various customer segments being a key measure. A demonstration should aim for:

- Industrial: 20+ participants
- Commercial: 200+ participants
- Residential: 1,000+ participants

Anything below a 25% adoption rate among potential participants may not provide sufficient confidence in scalability and market viability.

Additional metrics can include:

1. How many customer types can the solution address: Commercial, industrial, Small Medium business, residential
2. Solution cost: High, medium, low
3. Adaption rate: how many customers contacted and how many signed up
4. User engagement: Measure the user engagement with the tool

5. Measure the tools effectiveness, how many different issues can it address: duck curve, Public Shutoff notices, emergency notifications, high rate, low rate, demand response
6. How many types of devices does it address
7. What is the cost to implement an integration across various protocols, custom API
8. How does it handle custom APIs
9. What percentage saving did it demonstrate
10. Is the solution proprietary

4. Gateway Conformance Testing for Dispatchable DERs

The evolving landscape of distributed energy resources presents a growing diversity of communication protocols and interoperability challenges. While the concept of a DER gateway has historically played a role in standardizing communication, a more adaptable, scalable, and future-proof approach is needed to accommodate emerging technologies and evolving cybersecurity requirements. Universal Devices is a DER gateway manufacturer since 2003. Our business is built on selling an affordable, protocol and H/W agnostic gateway that can implement automation and efficiency of a long list of devices. It is our market experience that has brought us to the following conclusion: A strict certification framework for DER gateways may introduce limitations given the rapid pace of innovation. Many widely used protocols, such as OpenADR 2.0/3.0, OCPP, CCS, SunSpec/Modbus, and DNP3, continue to evolve. Developing certification criteria that remain relevant across all these protocols is a challenge, as new standards frequently emerge, potentially rendering predefined certification processes outdated before they can be widely adopted.

Based on our extensive gateway experience we recommend: **A more effective approach that would focus on a modular, platform-based model that integrates protocols through secure, pluggable components rather than relying on static, hardware-centric gateways.** Under this model:

- **Cybersecurity** is enforced at the platform level, ensuring that security policies are applied consistently across all integrated protocols.
- **Protocol-specific logic** is encapsulated within individual plugins, each authenticated and securely isolated from others.
- **Adaptability** is maximized, allowing new protocols to be supported with minimal disruption by simply updating or adding plugins rather than redesigning gateways.
- **Customer experience remains stable**, with a seamless transition between different protocols and service models.

An open-source platform approach would ensure transparency, broad adoption, and ongoing innovation while avoiding vendor lock-in. Standardizing secure, extensible platforms rather than rigid gateways would provide a more sustainable path forward for DER orchestration.

6. Baseline Performance Requirements for DER Gateways

Rather than focusing on the performance of traditional DER gateways, the emphasis should shift toward ensuring responsiveness in DER dispatch. In a modern, platform-based architecture:

- **Responsiveness in DER dispatch** is the primary requirement. DERs must be capable of responding to control signals within a defined timeframe (e.g., seconds to minutes, depending on grid needs).
- **Performance in DER communication** is dependent on the specific protocol and should be addressed within the protocol's implementation rather than a generalized gateway standard.
- **Interoperability** is best achieved through a platform that supports various protocols via modular plugins, rather than enforcing a one-size-fits-all approach to gateway design.

A platform-based model allows for greater flexibility in integrating diverse DERs while maintaining high standards for responsiveness and cybersecurity.

7. Scope of Research for Gateway Conformance Testing

Given the challenges associated with standardizing gateway conformance testing, research efforts would be more impactful if directed toward developing an open, modular platform architecture for DER orchestration. This approach would:

- Establish a **secure, standardized execution environment** for DER integration.
- Support **flexible and rapidly deployable** Virtual Power Plant (VPP) functionality as a plugin within the platform.
- Enable **seamless adaptation to new protocols** without requiring re-certification of gateways.
- Prioritize **extensibility and cybersecurity**, ensuring a future-proof solution for DER orchestration.

Please consider reallocating funding to traditional gateway conformance testing, a broader research initiative focused on developing an open DER orchestration platform would provide greater long-term value. By shifting focus to platform-based solutions, we can create a more adaptable, secure, and scalable framework for integrating DERs into the evolving energy landscape.

UDI strongly support CEC's efforts in advancing DER orchestration and VPP functionalities. Our expertise in developing scalable, interoperable, affordable and cyber security-focused DER management solutions align with the objectives of this research initiative. We look forward to potential collaboration opportunities to contribute to California's clean energy transition.