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## **SunSpec Alliance Comments Regarding EV Interoperability**

*Additional submitted attachment is included below.*



February 2, 2021

Docket No. 19-TRAN-02

California Energy Commission  
Docket Unit, MS-4  
1516 Ninth Street  
Sacramento, CA 95814-5512

RE: Post Workshop Comments of SunSpec Alliance on Draft Solicitation Concept for Interoperability Testing Events

Dear Commissioners and Staff,

SunSpec Alliance submits these comments in response to the California Energy Commission's ("CEC" or "the Commission") concept presented by staff at the workshop held on January 19, 2021 regarding a draft solicitation for interoperability testing events.

### **About SunSpec**

The SunSpec Alliance is a trade alliance of 120+ solar-, energy storage-, and electric vehicle (EV) Distributed Energy Resource (DER) industry participants, together pursuing information standards to enable plug & play system interoperability. SunSpec standards address operational and financial aspects of solar PV, energy storage, and EV charging systems on the smart grid—including residential, commercial, and utility-scale systems—thus reducing cost, promoting technology innovation, and accelerating industry growth.

SunSpec was prime recipient for the successful CEC EPIC 14-036 project (standardizing smart inverters for CA Rule 21) and was a sub-recipient on the EPRI-led 15-313 project where our role was to develop the Public Key Infrastructure (PKI) to support the data network security needs of CA Rule 21 systems. SunSpec was also prime recipient for the U.S. Department of Energy "Orange Button" initiative to establish a financial- and operational data interchange for the DER industry standard and is currently working with the Society of Automotive Engineers (SAE) to develop the communication interface for the SAE J3068 charging standard for Medium Duty and Heavy Duty EVs.

SunSpec was recently appointed as a sub-recipient for a five-year, \$39M project, funded by the National Science Foundation and run by the University of California San Diego (UCSD), called DERConnect. The goal of DERConnect is to implement and operate a large-scale microgrid testbed consisting of hundreds of EV chargers (and EVs), multiple DER solar PV and energy storage systems, and campus building energy loads. SunSpec is both capable and well prepared to support this project.

### **Interoperability Programs Based On Best Practices**

We advise the CEC to design its EV interoperability program using industry best practices. For example:

- Each program should be based on a single, well-formed protocol standard.
- The standard should be supported by one or more "application profiles." An application profile is a document that specifies the functions and features of the standard that are used in a given use case and also provides performance and duty cycle requirements that are allowed, but are not specified, in the standard.

- The standard should be supported by a compliance certification program where in all devices or components that use the communication protocol are confirmed to have applied the standard according the application profile in a correct manner. These certification programs are typically administered by a non-profit trade alliance such as OpenADR (for OpenADR), Open Charge Alliance (for OCCP), or SunSpec Alliance (for IEEE 2030.5 and SunSpec Modbus).
- The standard should be supported by a software developer community that is properly motivated and engaged in the endeavor of multi-vendor interoperability. These developer communities are aligned with and accessed through the trade alliances.
- The standard should be supported by testing tools that are designed to uncover non-compliance to standards and the absence of interoperability. The trade alliance may provide a test tool and/or rely on third-party providers.

Lacking any of these elements, achieving a high degree of interoperability is difficult.

### **How the CEC Interoperability Proposal Stacks Up**

In comparison to the best practices described above, the CEC proposal has these attributes:

- Calls for at least three different protocol standards.
- Two of the standards lack application profiles (i.e. OpenADR and ISO 15118).
- Two omitted standards (IEEE 2030.5 and SunSpec Modbus) are likely required in the EV domain given their inclusion in the CA Rule 21 regulation for DER interconnection and in the Society of Automotive Engineering (SAE) standard for Medium Duty and Heavy Duty (MDHD) EV charging standard respectively.
- Of the protocols referenced, four have compliance certification programs but only one (OCCP) has an official compliance program that is related to the EV- or EVSE industries.
- The software development communities for the referenced protocols are just now beginning to focus on issues pertaining to the U.S. EV- and EVSE industries.
- Test tool coverage for the referenced protocols is uneven.

With these factors in mind, an interoperability budget of \$350K per year for a single standard may be feasible but is insufficient to support three or more standards.

### **Where the U.S. EV- and EVSE Industries Stand**

Due to uneven growth of the global electric transportation industry, followed by a rapid near-term market expansion in the U.S., focus on the data communication aspects of EV technology in every region has lagged. Communication protocols in use are either proprietary (as in the case of Tesla vehicles and its charging infrastructure) or have their greatest support in European Union markets (e.g. ISO 15118 and OCCP). Nearly all communication standards deployment efforts to date have focused on the passenger vehicle sector.

In the U.S., the SAE is in the process of updating its SAE J3072 charging standard to include adoption of the IEEE 2030.5 communication standard. IEEE 2030.5 is the default communication protocol standard



for CA Rule 21 and one of three standard communication protocols specified in the IEEE 1547 national standard for Distributed Energy Resources (DER).

The SAE J3068 standard for MDHD EVs is being defined with SunSpec Modbus as its communication interface. Work to define the SAE J3072 application profile, the J3068 standard, and a supporting compliance certification program is being performed jointly by SAE and the SunSpec Alliance. These developments are significant in that they will align the SAE J3072 and J3068 standard with the IEEE 1547 standard for DER.

### **Recommendations To The CEC**

Given this context, SunSpec Alliance makes the following recommendations to the CEC:

- Shift CEC funding focus from interoperability testing to establishing “default” standards and application profiles for the U.S. EV- and EVSE industries. The specification of a “default communication protocol standard” will ensure broad adoption of the chosen standard while giving the option to allow other interfaces as needed. As highlighted in this document, multiple standards options exist in each functional segment of the network (i.e. local EV control, utility-to-EVSE integration, utility-to-EV integration, and backend charging station management) so the invention of new standards is not required.
- Mandate the certification of default EV communication interfaces. This step will put the industry on the path to interoperability.
- Provide funding to the industry to accelerate development of communication protocol interface certification.

Within 18 months of starting this work, introduce an interoperability testing program. We recommend that the program have these attributes:

- Make sure that interoperability is grounded in cybersecurity principles. As highlighted in a ChargePoint whitepaper on this topic (<https://www.chargepoint.com/about/news/chargepoint-statement-iso-15118-white-paper/>), the development of a Public Key Infrastructure (PKI) strategy is essential.
- Define one standard per application domain to be the subject of interoperability testing. At present, it appears that there are at least three application domains—local EV control, utility-to-EVSE integration, utility-to-EV integration—that are within the purview of regulation. Backend charging station management is likely an area that is out of scope.
- Engage with the trade alliances and standards development organizations associated with each of the protocols to ensure requirements are aligned globally.
- Provide funding of \$1M per protocol per year, for a period of three years, to foster an interoperability testing environment. CEC funding should be met with a cost match from industry of \$10,000 to \$50,000 per participant. Cost-matching rules should allow for time spent by industry personnel to develop, test, debug, and certify communication interfaces, and should also cover logistics costs associated with physical demonstrations.



## SunSpec's Position

The SunSpec Alliance, its members, and its partners including UCSD, stand ready to assist in the implementation of any or all the above. SunSpec Alliance's 125+ members and 1,000+ collaborating/adopting organizations are leaders in solar, energy storage, DER communications, and EVSE industries. Due to SunSpec's partnership with the SAE, and due to the convergence of DER and EVs in the electrical grid, EV manufacturers are becoming one of SunSpec's most important constituencies.

SunSpec and its personnel have decades of experience developing the world's most popular communication protocols including TCP/IP, X.500 (directory services) and related application standards. This experience both connects us with the technical communities engaged in these endeavors and provides us with insight about standards development and deployment that few organizations possess.

SunSpec's certification program for DER products state of the art. To date, SunSpec and its network of authorized testing labs have certified 107 product lines representing more than 500 discrete products. Given the national IEEE 1547 mandate requiring that DERs support a standard communication interface, we expect this number to double with the next 18 months.

SunSpec is also an expert in cybersecurity. Working with Sandia National Laboratories, the SunSpec/Sandia Cybersecurity Working Group operated for nearly four years and has a following of 700 individuals. This group has published an array of documents on DER cybersecurity issues that are applicable to the electric vehicle industry. In addition, SunSpec operates the world's only open public key infrastructure (PKI) for DER systems supporting the IEEE 2030.5 standard. This PKI will expand support for other DER and EV protocols in the future and is respected in the industry.

SunSpec has established multi-protocol, multi-vendor compliance certification testing platform (SunSpec SVP) to support any-to-any device interoperability testing. This new platform, called Non-Stop Interop™, will first enable DER competitors to test their wares and compete for the title of "most interoperable" in a technical arena that allows both full openness and the protection of individual identities. Non-Stop Interop is inherently multi-protocol, supporting IEEE 2030.5, SunSpec Modbus, and IEEE 1815 now, and has plans to support other protocols that the DER and EV industries demand.

If you have any question about our commitment, please contact me at 831-227-1073 or [tom@sunspec.org](mailto:tom@sunspec.org).

Sincerely,

A handwritten signature in black ink, appearing to read 'Tom Tansy', written in a cursive style.

Tom Tansy  
Chairman  
SunSpec Alliance

cc: Byron Washom, UCSD