



SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

ENERGY STAR®

Version 1.1 Electric Vehicle Supply Equipment (EVSE) Specification:

**Certifying your EVSE as Connected Capable**

**April 7, 2022**





SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Webinar Details

- Webinar slides and related materials will be available on the EVSE Product Development Web page:
  - [Electric Vehicle Supply Equipment Version 1.1 | ENERGY STAR](#)
- **To Use Computer Audio:**
  - Participants can use their computer mic & speakers (VoIP)
- **To Use Telephone:**
  - If you prefer to use your phone, you must select "Use Telephone" after joining the webinar and call in using the number and access code below:
    - United States: +1 (562) 247-8421
    - Access Code: 615-854-819
  - Webinar ID: 202-234-555



SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Introductions

### **Abigail Daken**

U.S. Environmental Protection Agency

### **Peter Banwell**

U.S. Environmental Protection Agency

### **James Kwon**

U.S. Environmental Protection Agency

### **Abhishek Jathar**

ICF

### **Kelly Schneider**

ICF

### **Emmy Feldman**

ICF



SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Webinar Agenda

- Connected Criteria development process review
- Why brands should obtain this designation
- Technical requirements
- Recertification process
- Open discussion



SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Review of Connected Criteria Development

- The Version 1.0 specification published in December 2016 set high-level connected criteria
- EPA updated this criteria in the Version 1.1 specification published in March 2021, with the goals of:
  - Making this designation more useful to utilities and other organizations
  - Including more actionable product capabilities for vendors
  - Aligning with industry standards



# EVSE Connected Criteria Overview



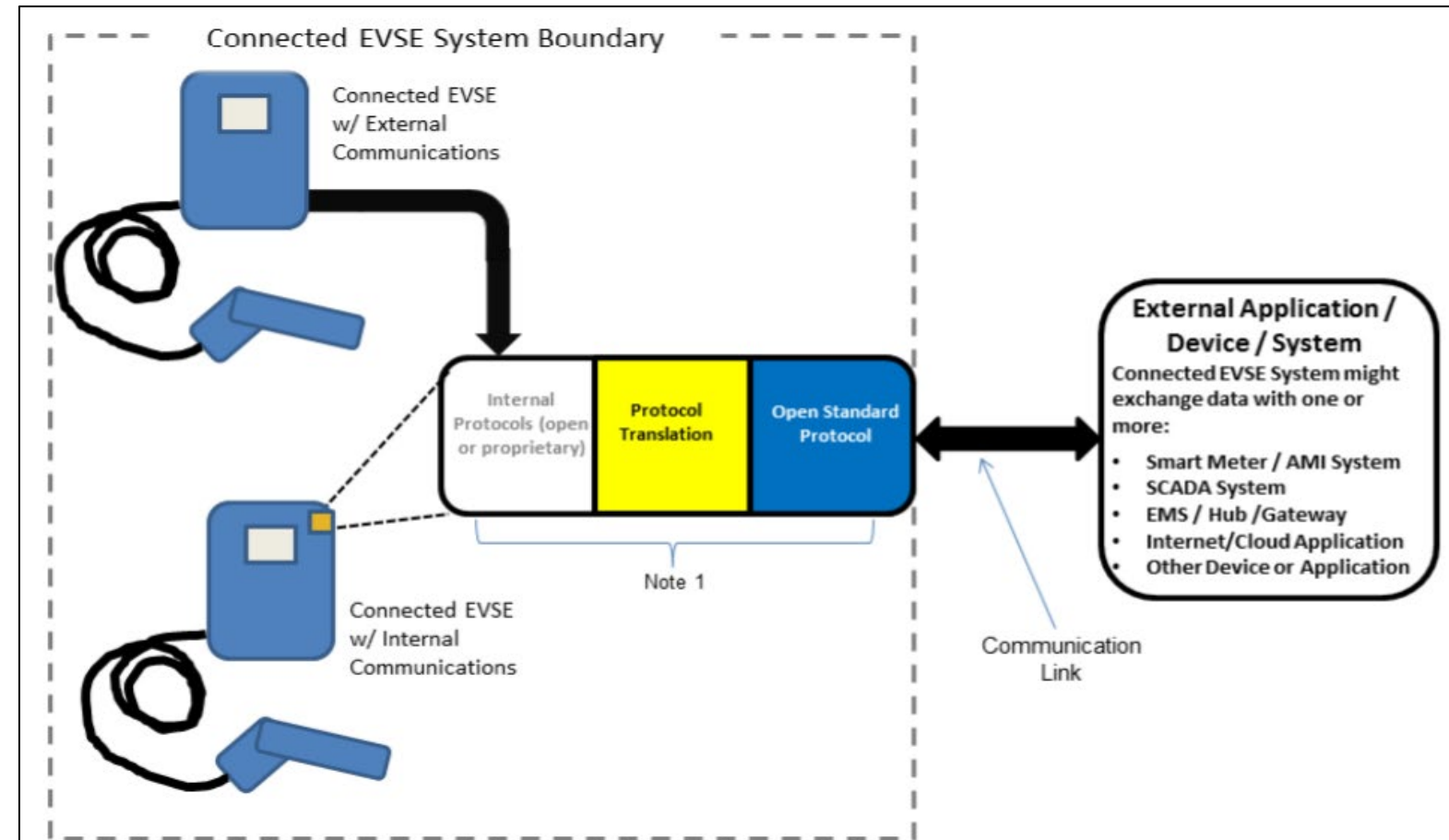
SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Connected Criteria

- Criteria are optional
- Updates to the V1.1 connected criteria are applicable to **AC and DC EVSE**

### Use Case:

Criteria designed with long dwell time applications in mind (such as fleets and home/office charging), as these provide the most load flexibility resource

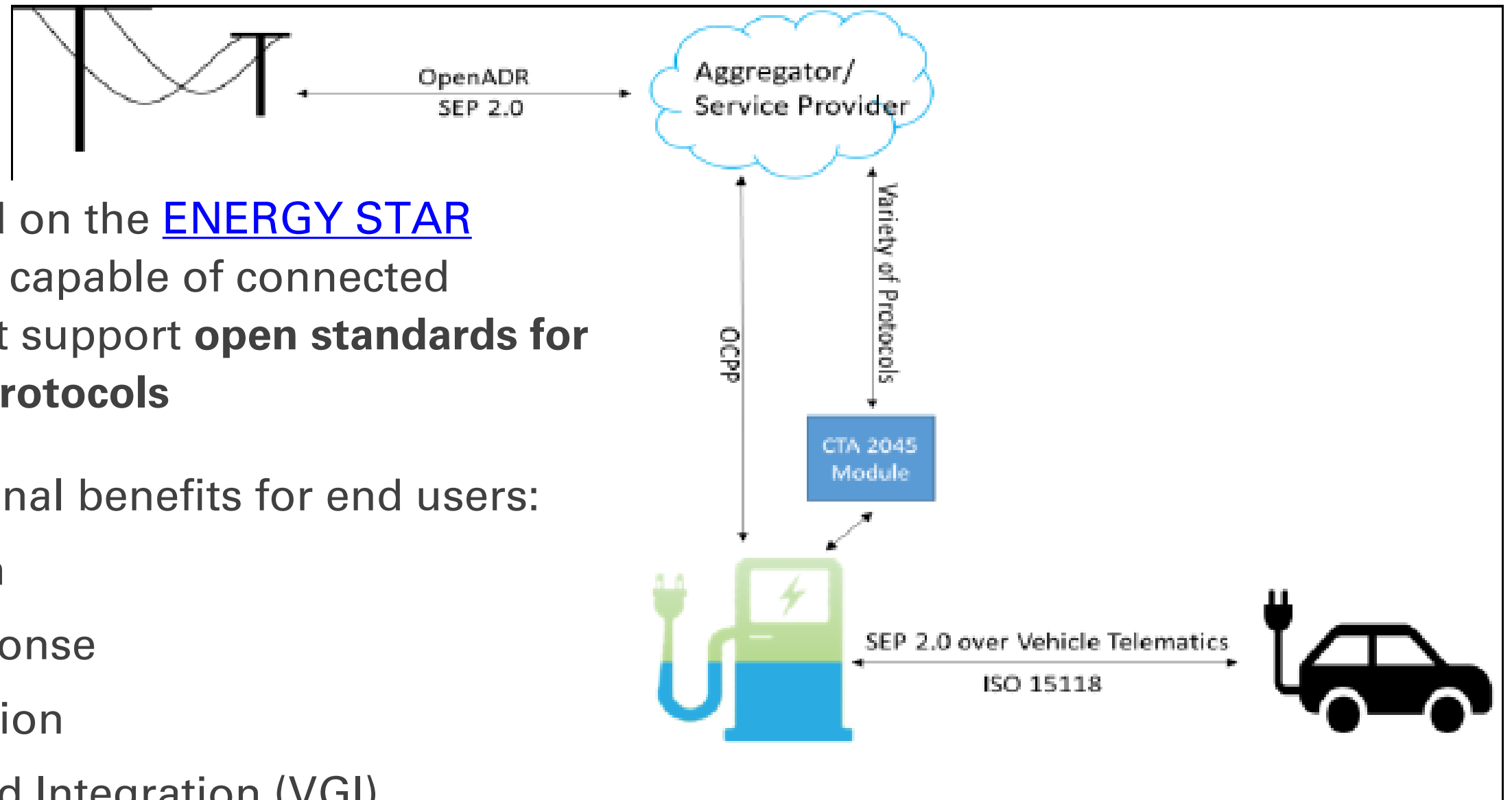




SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Version 1.1 Connected Criteria Benefits

- EV chargers listed on the [ENERGY STAR Product Finder](#) as capable of connected functionality must support **open standards for communication protocols**
- Potential operational benefits for end users:
  - Load dispatch
  - Demand-response
  - Price notification
  - Vehicle to Grid Integration (VGI)







SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Version 1.1 Connected Criteria

- **Grid Communication:** Communication link uses open standards and is capable of bi-directional data transfer
- **Open Access:** Enable interconnection with EVSE over communication link to enable DR
- **Consumer Override:** The vehicle, EVSE, or consumer may override a DR request

<p>The diagram shows a cloud labeled 'Aggregator' connected by bidirectional arrows to a charging station. Above the charging station is a box labeled 'CTA 2045 Module' with a bidirectional arrow connecting it to the station.</p>	<ol style="list-style-type: none"> <li>1. SEP 2.0 (IEEE 2030.5)</li> <li>2. OCPP 1.6, 2.0</li> <li>3. OpenADR 2.0*</li> <li>4. CTA-2045*</li> </ol> <p>*Used for Managed Charging Particularly</p>
<p>The diagram shows a charging station on the left connected by a bidirectional arrow to an electric vehicle on the right.</p>	<ol style="list-style-type: none"> <li>1. ISO/IEC 15118</li> <li>2. SEP 2.0 (IEEE 2030.5)</li> </ol>
<p>The diagram shows a crossed wrench and screwdriver icon on the left connected by a bidirectional arrow to an electric vehicle on the right.</p>	<ol style="list-style-type: none"> <li>1. Vehicle Telematics (Proprietary Protocol)</li> <li>2. SEP 2.0 (IEEE 2030.5)</li> </ol>

Table 1: Open Standards Protocols for Managed EV Charging



SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Version 1.1 Connected Criteria (continued)

- **Additional Product Requirements**
  - Scheduling – set/modify charging schedule
  - Remote Management – receive/respond to remote requests
  - Consumer Feedback – provide energy consumption messages
  - Loss of Connectivity – EVSE acts in event of lost connection
- **Report** whether EVSE has the transceiver and/or necessary hardware to support smart charging for energy management using station to vehicle protocols: ISO 15118-2, SAE J1772, IEC 61851-1, CHADEMO 2.0





SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Version 1.1 Connected Criteria (continued)

### Demand-Response Requests

The EVSE must support the following open standard defined DR signals:

- Charge Now (Load Up): If vehicle plugged in not fully charged, begin charging
- Curtail Charge: Do not begin or continue charging at greater than 50% of maximum rated output power
- Delay Charge: Do not begin or continue charging
- Return to Normal Operation: Return to default mode

Check Appendix A for which commands to use for each request in each protocol

#### APPENDIX A: DEMAND RESPONSE MESSAGE MAPPING

This Appendix is informational only. It provides a useful framework for aligning the requirements in section 3.10 C and the signals identified in section 3.10.13 with the CTA-2045, OpenADR 2.0b, and OCPP operational states. Not every response listed below may be required.

Category	Sub-type	Demand Response Messaging	Response Result	ANSI/CTA (2045)	OpenADR (2.0b)	OCPP
Signals	Curtail Charge	General Curtailment	Don't begin or continue charging above 50% rated output power	Shed <sup>10</sup>	oadrDistributeEvent: CHARGE_STATE <sup>11</sup>	SetChargingProfile <sup>12</sup>
	Charge Now	Load Up	Begin charging immediately (if possible)	End device should run and continue as possible without wasting energy. Opposite of Shed <sup>10</sup>	oadrDistributeEvent: LOAD_DISPATCH	ReserveNow <sup>12</sup>
	Run Normal	Return to Normal Operation	Return to Standby mode	End Shed / Run Normal <sup>10</sup>	oadrDistributeEvent: CANCELLED.	Reset <sup>12</sup>
	Delay Charge	Delay Charge	Delay charging	Pending Event Time	oadrDistributeEvent: LOAD_CONTROL	NotifyEventRequest <sup>12</sup>
		Off Mode	Turn off (if possible)	Grid Emergency	oadrDistributeEvent: SIMPLE level 3.	CancelReservation <sup>12</sup>
	Real Time / Device Load	Real Time System Load	Use / do not use energy when	Request for Power Level [8.2.1]		GetChargingProfiles <sup>12</sup>



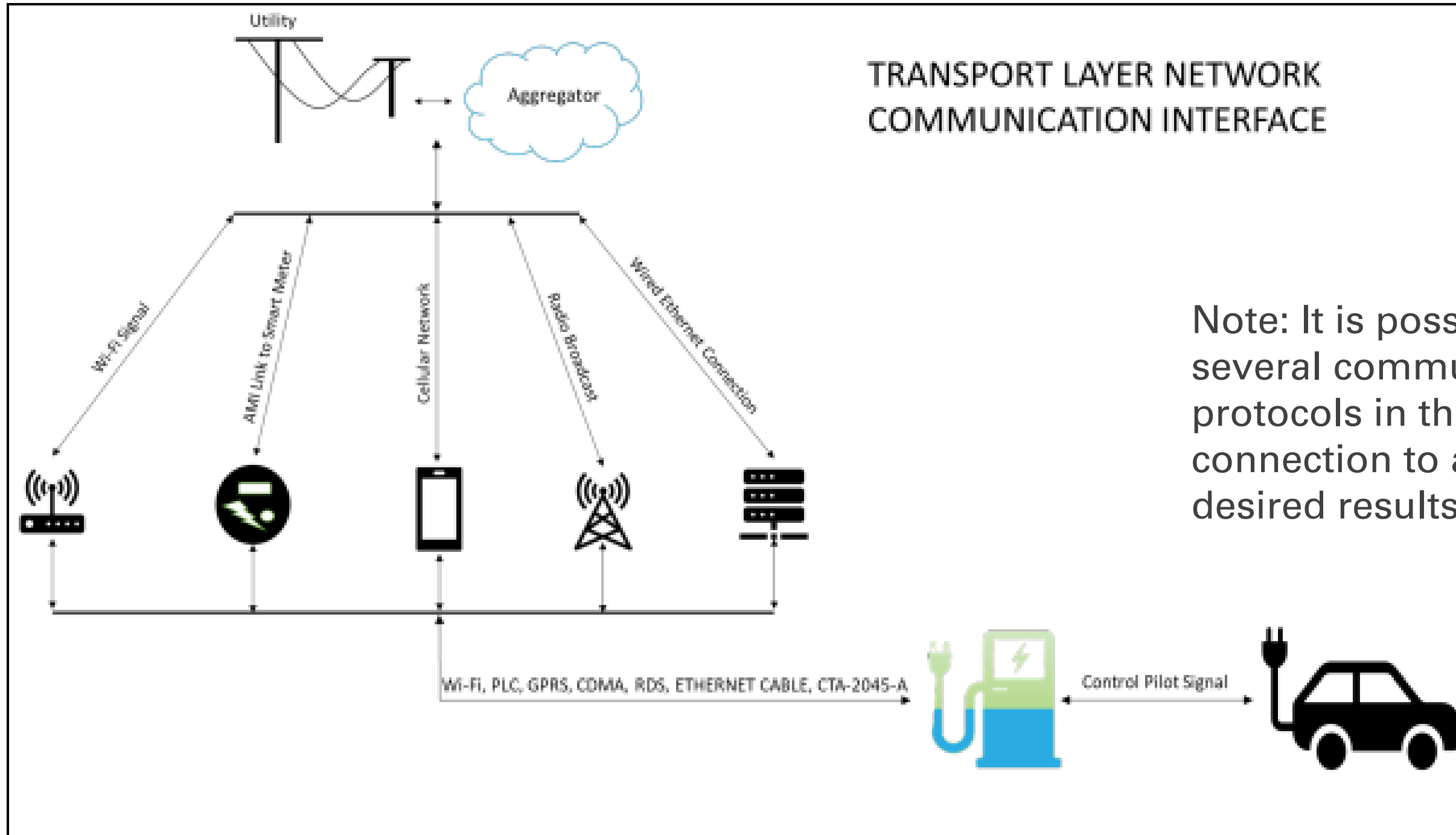


SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## EVSE Communication (Informational Appendix)

Managed charging involves communication between different entities and requires a combination communication protocols. Each protocol can (but doesn't necessarily) include each "layer":

- Application layer protocols (a.k.a. messaging protocols): Carries specific instructions to the individual entities but are independent of how they are carried. **Example: 'Charge only if the battery State of Charge (SOC) drops below 50%'.**
- Transport layer protocols: ensure the delivery of a message from one point to another over a specific medium such as cellular or internet.
- There are multiple options for each layer, covering various links
- Messaging protocols can be proprietary or open standard based the communication chain – EPA requires the use of open-standards



TRANSPORT LAYER NETWORK  
COMMUNICATION INTERFACE

Note: It is possible to use several communication protocols in the same connection to achieve desired results.

Figure 2: EV Charging Infrastructure Network Communication Interface Options



## **Certifying EVSE as 'Connected Capable'**





SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## National Green Building Program Adopts ENERGY STAR “Connected”

- LEED v4.1 specifically calls for ENERGY STAR Connected requirements for buildings.
- LEED certifies 2.8 million square feet of commercial space per day.
- LEED has registered over 100,000 commercial buildings worldwide.
- Version 4.1 requirements remain in beta testing as of early 2022. Public comment and ballot by USGBC members are anticipated later in 2022.





SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Utility Program Requirements

- Over the past several months, a number of utilities across the country have adopted ENERGY STAR certification as a requirement for participating in their rebate and incentive programs
  - Highlighting energy efficiency and safety as key components of their programs.

Utility/Program Sponsor	State
<a href="#"><u>AEP SWEPCO</u></a>	Louisiana, Texas
<a href="#"><u>Public Service Company of Oklahoma</u></a>	Oklahoma
<a href="#"><u>Potomac Edison</u></a>	Maryland
<a href="#"><u>El Paso Electric</u></a>	Texas
<a href="#"><u>Snohomish PUD</u></a>	Washington
<a href="#"><u>Xcel Energy</u></a>	Minnesota
<a href="#"><u>Public Service Company of New Mexico (PNM)</u></a>	New Mexico
<a href="#"><u>Energy Trust of Oregon</u></a>	Oregon





SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

## Steps to Certify Connected Criteria

Steps manufacturers and certification bodies (CBs) must take to ensure that products are listed as connected functionality capable:

Step #	Manufacturer/Certification Body (CB) Responsibility	Action Required
1	Manufacturer	Check if your EVSE meets the connected criteria in Section 3.10 of the specification
2	Manufacturer	If your EVSE meets the criteria, ask your EPA-recognized CB to update the listing
3	CB	Request documentation required to determine compliance (e.g., spec sheet, manual, OCPP compliance certificates, etc.)
4	Manufacturer	Provide CB-requested documentation to verify compliance
5	CB	Upon receiving required information, certify the product as 'Yes' to the Connected Functionality field via the XML web service submission process and fill out any other fields required if connected functionality is 'Yes'.



SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

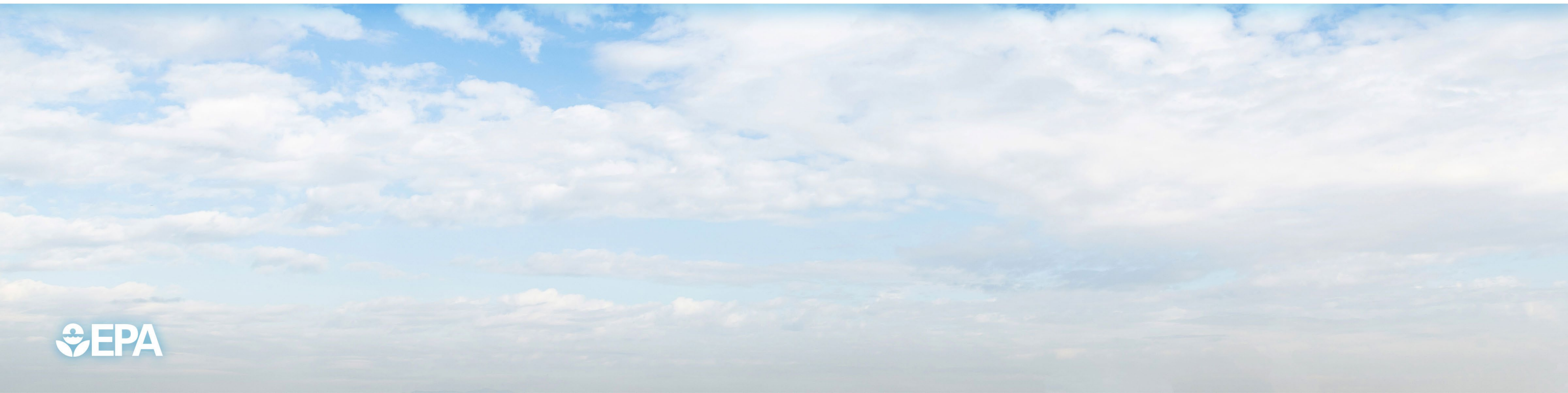
## Certification Bodies Recognized for EVSE

EPA-Recognized Certification Bodies
<a href="#"><u>Bay Area Compliance Laboratories Corp. (BACL)</u></a>
<a href="#"><u>Bureau Veritas Consumer Products Services, Inc. (BVCPS)</u></a>
<a href="#"><u>Eurofins Electrical and Electronic Testing NA, Inc.</u></a>
<a href="#"><u>Intertek Testing Services NA</u></a>
<a href="#"><u>TUV SUD America, Inc.</u></a>
<a href="#"><u>UL Verification Services Inc.</u></a>





## Open Discussion





SAVE TODAY. SAVE TOMORROW.  
SAVE FOR GOOD.

# Thank you!

To be added to EPA's stakeholder distribution list to receive specification updates, please email [EVSE@energystar.gov](mailto:EVSE@energystar.gov)

For questions specific to **ENERGY STAR Connected Criteria**, email Abi Daken at [Daken.Abigail@epa.gov](mailto:Daken.Abigail@epa.gov).

For questions specific to the **ENERGY STAR EVSE specification**, email James Kwon at [Kwon.James@epa.gov](mailto:Kwon.James@epa.gov) or [Emmy.Feldman@icf.com](mailto:Emmy.Feldman@icf.com)

For questions specific to **ENERGY STAR EVSE marketing**, email Peter Banwell at [Banwell.Peter@epa.gov](mailto:Banwell.Peter@epa.gov)

[www.energystar.gov/productdevelopment](http://www.energystar.gov/productdevelopment)