



# **ENERGY STAR® Version 1.1 Electric Vehicle Supply Equipment (EVSE): Certifying your EVSE**

**April 8, 2021**





## Webinar Details

- Webinar slides and related materials will be available on the EVSE Product Development Web page:
  - [www.energystar.gov/RevisedSpecs](http://www.energystar.gov/RevisedSpecs)
  - *Follow link to "Version 1.1 is in Development" under "Electric Vehicle Supply Equipment"*
- **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 (951) 384-3421
    - Access Code: 832-904-065
  - Webinar ID: 449-231-075



## Webinar Agenda

- Final Specification released
  - Minor updates in final specification
  - Recertifying AC EVSE as 'connected capable'
- Marketing Efforts
- Apply to be an ENERGY STAR Partner
- Third Party Certification Process
  - Enrolling an in-house laboratory
  - Testing in a third party EPA-Recognized laboratory



## Introductions

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U.S. Environmental Protection Agency

**Brian Krausz**

U.S. Environmental Protection Agency

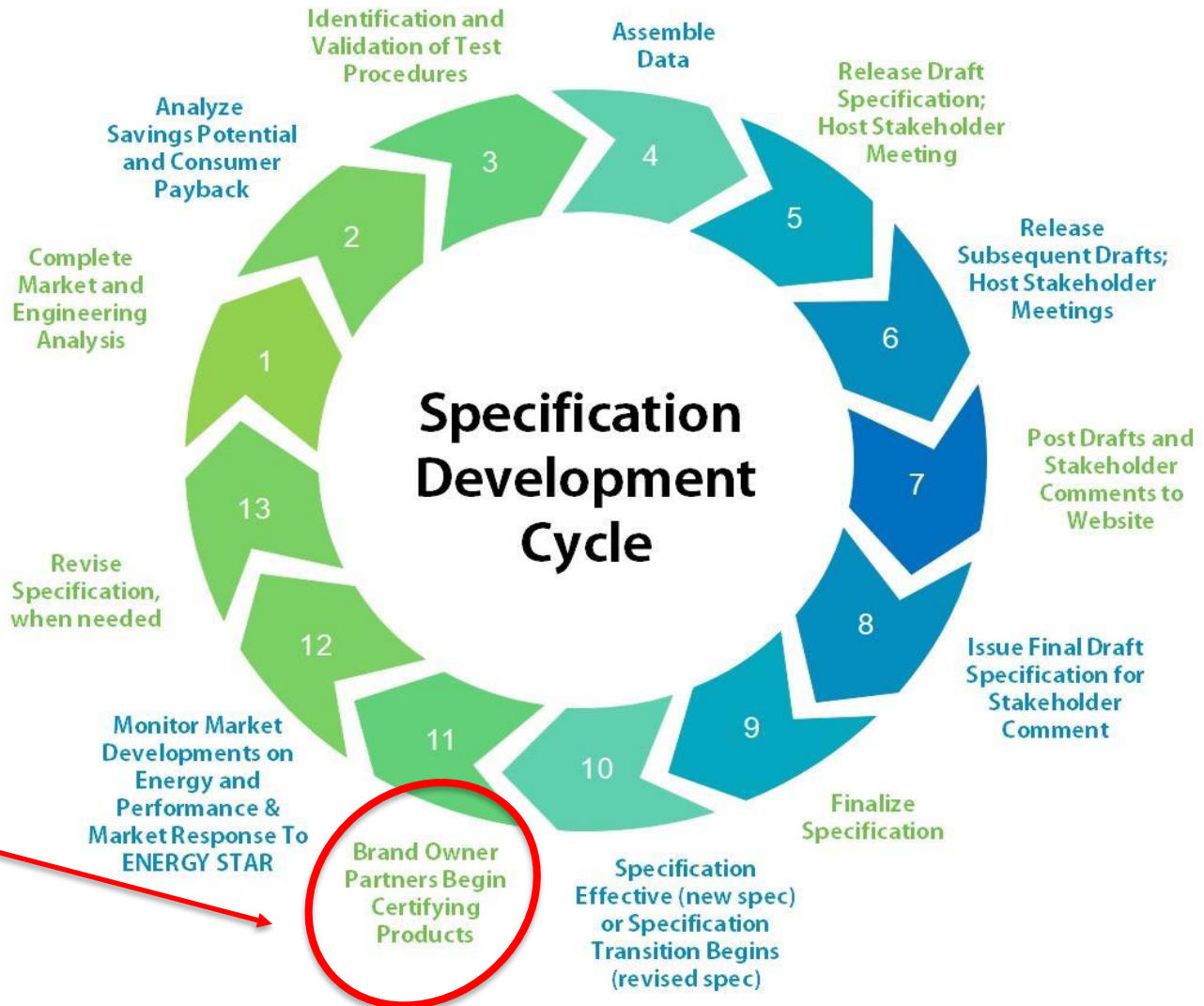
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# Specification Development Process



We are here





# High Level Overview of Final Specification Criteria

- Scope includes DC EVSE up to 350 kW
- Proposed criteria to recognize energy efficiency in DC EVSE:
  - Max Standby Losses with power allowances for a high-res display and a battery management system
  - Minimum Active Charging Efficiency of 93% (for up to 65 kW chargers)

Equation 4: Calculation of Maximum No Vehicle Mode Requirement for DC-output EVSE

$$P_{NO\_VEHICLE\_MAX} = (35.6 \times \ln(\text{Max Power})) - 54.3 + P_{DISPLAY} + P_{BMS}$$

Where:

- $P_{NO\_VEHICLE\_MAX}$  is the Maximum No Vehicle Mode Power Requirement, in watts;
- Max Power is the Nameplate Maximum Output Power, in kilowatts;
- $P_{DISPLAY}$  is the No Vehicle Mode power allowance for a High-Resolution Display enabled during testing listed in Table 4); and
- $P_{BMS}$  is the No Vehicle Mode power allowance for a battery management system in EVSE with integrated battery pack that cannot be disabled during testing.

Table 5: No Vehicle Mode Power Allowances for DC-output EVSE

Product Function	No Vehicle Mode Power Allowance (watts, rounded to the nearest 0.1 W for reporting)
In-use High Resolution Display ( $P_{DISPLAY}$ )	$[(4.0 \times 10^{-5} \times \ell \times A) + 119 \times \tanh(0.0008 \times [A - 200.0] + 0.11) + 6.0]$ <p>Where:</p> <ul style="list-style-type: none"> <li>• A is the Screen Area in square inches;</li> <li>• <math>\ell</math> is the Maximum Measured Luminance of the Display in candelas per square meter, as measured in Section 4) C) of the ENERGY STAR Test Method for DC-output EVSE</li> <li>• <math>\tanh</math> is the hyperbolic tangent function</li> </ul> <p><b>Example:</b> For a single-output EVSE with a maximum measured luminance of 300 candelas/m<sup>2</sup> and a 5×5-inch screen, the allowance for the in-use display would be 2.7 watts.</p>
Battery Management System ( $P_{BMS}$ )	15 W for DC EVSE with integrated battery that cannot be disabled.

**Minimum Average Loading-Adjusted Efficiency requirement for DC-output EVSE with output power ≤ 65 kW**

Minimum Average Efficiency (Eff <sub>AVG_MIN</sub> )
0.93



## DC EVSE with Integral Battery

- EPA removed the term 'portable' from describing DC-output EVSE with integrated batteries that cannot be disabled

Table 5: No Vehicle Mode Power Allowances for DC-output EVSE

Product Function	No Vehicle Mode Power Allowance (watts, rounded to the nearest 0.1 W for reporting)
In-use High Resolution Display ( $P_{DISPLAY}$ )	$[(4.0 \times 10^{-5} \times \ell \times A) + 119 \times \tanh(0.0008 \times [A - 200.0] + 0.11) + 6.0]$ <p>Where:</p> <ul style="list-style-type: none"> <li><math>A</math> is the Screen Area in square inches;</li> <li><math>\ell</math> is the Maximum Measured Luminance of the Display in candelas per square meter, as measured in Section 4) C) of the ENERGY STAR Test Method for DC-output EVSE</li> <li><math>\tanh</math> is the hyperbolic tangent function</li> </ul> <p><b>Example:</b> For a single-output EVSE with a maximum measured luminance of 300 candelas/m<sup>2</sup> and a 5×5-inch screen, the allowance for the in-use display would be 2.7 watts.</p>
Battery Management System ( $P_{BMS}$ )	15 W for DC EVSE with integrated battery that cannot be disabled.



## Test Method Update

- Stakeholders requested that EPA allow for flexibility in the frequency allowed during testing to accommodate testing in in-house testing laboratories not located in the US.
- EPA updated the final ENERGY STAR DC-output EVSE Test Method to allow testing at either 50 or 60 Hz

**Table 1: AC-input Supply Requirements**

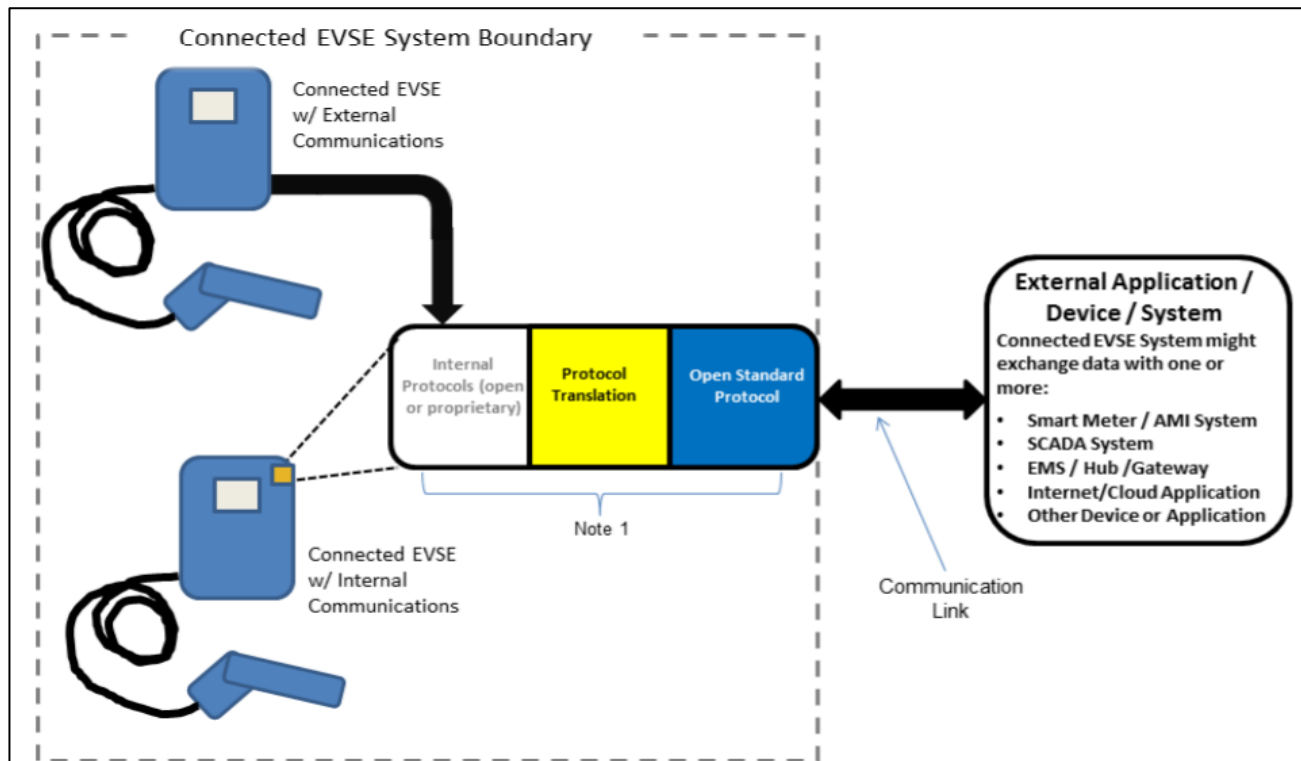
Voltage and Precedence	Frequency
1. 600 $\Delta$ V AC	60 Hz
2. 600Y/346 V AC	60 Hz
3. 480 $\Delta$ V AC	60 Hz
4. 480Y/277 V AC	60 Hz
5. 415 $\Delta$ V AC	60 Hz
6. 415Y/240 V AC	60 Hz
7. 400 $\Delta$ V AC	50 Hz
8. 400Y/230 V AC	50 Hz
9. 240 V AC	60 Hz
10. 208 V AC	60 Hz
11. 120 V AC	60 Hz

B) AC-input Power: Due to limitations in testing capacity, the UUT can be tested at any rated voltage and frequency combination listed in Table 1. However, it is preferred that the UUT be operated at the first (highest) rated voltage and rated frequency combination specified in Table 1, if possible. The voltage and frequency used for the test shall be reported.



## Optional Connected Criteria

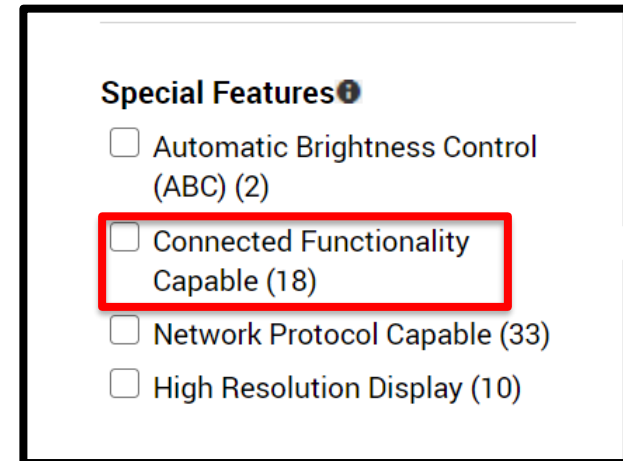
- Updates to the V1.1 connected criteria are applicable to **AC and DC EVSE**
- Goal of the Revisions
  - Make connected criteria more useful and add clarity
  - Criteria designed with long dwell time applications in mind, as these provide the most load flexibility resource





## Updating Current AC EVSE Listings

- The changes reflected in Version 1.1 will not affect currently certified AC EVSE products, *except with respect to the optional connected requirements.*
- These updates propose more prescriptive requirements (e.g., remote management and scheduling capabilities, as well as defined DR signals).
- As a result of the changes to these criteria, manufacturers that have AC EV chargers certified as connected capable on the ENERGY STAR website will need to work with their certification body to update their listings to reflect if the charger meets these updated requirements





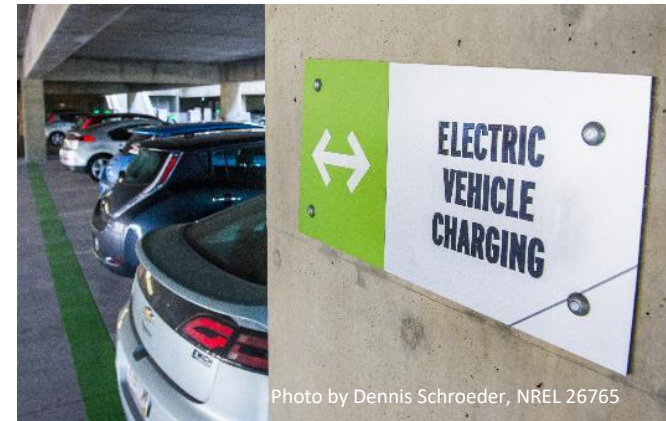
## Connected Criteria – Update to Final Specification

- EPA received stakeholder feedback that the requirement to report compliance with ISO-15118 was vague and other standards should be considered.
- EPA updated the reporting requirement to emphasize advanced energy management functionality with the goal to evaluate these protocols as they evolve over time.
- As a result, the criteria allows reporting of additional protocols beyond ISO 15118, such as SAE J1772, IEC 61851-1, CHAdeMO 2.0.

It is mandatory to report whether the EVSE has the transceiver and/or necessary hardware to support smart charging for energy management (i.e., beyond simple managed charging with pulse width modulation or CAN bus) using any of the following station-to-vehicle protocols: ISO 15118-2 or later, SAE J1772, IEC 61851-1 or CHADEMO 2.0.

## ENERGY STAR Benefits

- EPA is speaking with numerous utilities, state/local organizations, and others to discuss the benefits of ENERGY STAR certified charging stations:
- **Save Energy**
  - Incentivize purchase of ENERGY STAR-certified stations
    - Leverage ENERGY STAR's label awareness - more than 90% recognize the ENERGY STAR label
- **Confidence in Safety Requirement**
- **Identify Products that use Open Standards for Grid Communication**





# Opportunities to Leverage ENERGY STAR Resources

Home > Energy Efficient Products > Electric Vehicle Chargers

## ELECTRIC VEHICLE CHARGERS


The number of plug-in electric vehicles on the road in the United States is increasing. Fully electric cars produce no tailpipe emissions. While charging the battery may increase pollution at the power plant, total greenhouse gas emissions associated with driving them are still typically less than those for gasoline cars – particularly if the electricity is generated from renewable energy sources. For every mile driven, the average cost to drive an electric car is typically less than half what it costs to drive a standard gasoline vehicle. Using an energy-efficient, ENERGY STAR-certified electric car charger adds to the environmental benefits and cost savings.

**Why ENERGY STAR?**


If all EV chargers sold in the U.S. met ENERGY STAR requirements, the savings in energy costs would grow to more than \$1.7 billion and 200 million pounds of greenhouse gas emissions would be avoided.

**ABOUT ELECTRIC VEHICLES**


**ELECTRIC VEHICLE CHARGERS BUYING GUIDANCE**




Research Available Electric Vehicle Models



**Product Finder**  
Our products can help you to save energy.  
**Explore Models**



Find public EV charging stations across the country and download a station locator app for use on the go.  
Visit the Alternative Fuels Data Center Station Locator.



Research incentives on electric vehicles and plug-in electric vehicles.  
**LEARN MORE >**

**Electric Vehicle Charging Resources for Businesses and Government**

- FOR BUSINESS/PROPERTY MANAGERS**
- FOR FLEET MANAGERS**
- FOR ELECTRIC UTILITIES**
- FOR GOVERNMENT AGENCIES**
- FOR HOMEBUILDERS**

## Consumer Facing Resources

- Electric Vehicle Finder
- Charging Station Locator
- Incentives Search
- Emissions Calculator

## Utility, Business, Gov Resources

- One Pagers for:
  - Commercial Buildings
  - Home Builders
  - Utilities
- Additional Guidance for:
  - Fleet Managers
  - Government Agencies

### Building Electric Vehicle-Ready Homes

Americans are rapidly adopting plug-in electric vehicles (EVs). In fact, the Edison Electric Institute and the Institute for Electric Innovation estimate that 16.7 million EVs will be on U.S. roads by 2025. Because 46 percent of EV charging happens at home, consumer demand for homes ready for an equipped with EV charging is also growing. In addition, an increasing number of utilities, such as **Southwestern**, and most of **California**, have begun to require that EV charging infrastructure be included in all newly built single-family homes. Builders in other areas are starting to pre-wire or install charging units as a value-added feature of their new homes as well.

**What Does EV Ready Mean for Homebuilders?**

An EV ready home provides consumers with safe access to a dedicated 200V power supply for the faster Level 2 EV charging. Pre-wiring new homes for EV charging during construction can save a homeowner hundreds of dollars later. By pre-wiring, builders can offer a future-proof product.

There are two paths to make a home EV-ready:

1. **Pre-wire a panel:** Designate enough space and capacity on the main electrical panel or garage sub-panel for at least a 40 amp, 200V dedicated branch circuit. Install conduit before the electrical panel on the future location of the EV charger, near where cars will be parked (garage, driveway, etc.).
2. **Wire a Level 2 ready panel:** In addition to the pre-wire steps, install a 200V grounded alternating current receptacle, allowing a homeowner to purchase a plug-in Level 2 EV charger without the extra wiring expense. EV chargers are available for a range of auto types, including the popular NEMA 14-50.

**Install ENERGY STAR® Certified EV Chargers**

For builders interested going beyond EV-ready to installing EV chargers, consider using ENERGY STAR certified units. **ENERGY STAR certified EV chargers use 40 percent less energy than**

### GET YOUR BUILDING READY FOR ELECTRIC VEHICLES

By the year 2025, there may be as many as 18 million plug-in electric vehicles (EVs) on the road in the U.S., representing a market share of 4%. When not at home, drivers spend the most time parked at workplaces and destinations such as stores and will increasingly require charging infrastructure at those locations. In addition, many drivers do not have access to charging where they live. EV drivers bring in multi-unit dwellings, for example, and EVs with an street parking will benefit from charging at workplaces and other destinations. **With effective EV charging implementation, commercial building owners and managers can add value to properties, increase the convenience and availability of driving EVs for tenants and employees, and show leadership in adopting advanced, sustainable technologies.**

**Recommendations for EV-Ready Commercial Buildings**

1. **Assess the need for EV charging.** Conduct a survey of building tenants to assess the current need for charging. Plan for the future – assume that demand will increase and that charging system expansion will be needed.
2. **Determine power availability and the number of EV chargers needed.** Talk with your building engineer and the local electric utility to determine power availability for charging installations at the facility. Take steps to maximize either the capacity on the main electric supply cabinet to allow for future expansion, since the number of chargers needed will grow.
3. **Work through additional project steps.** Contact EV charger providers, and for energy efficient, ENERGY STAR certified models and discuss your project needs. Work with a certified electrical contractor to carry out the installation of EV charging at your facility according to local and National Electric Code requirements. If possible, ask meter your EV chargers for meter 600V according to ENERGY STAR Portable Manager. Consider whether you want chargers that you can control and monitor remotely.
4. **Market your EV charging commitment.** Advertise charging station availability to current tenants as well as prospective new tenants on a key attribute of the building.

**Learn from Others**

- **Southco** has installed EV charging stations at 14 of their corporate offices across the country.
- **GEICO** is increasing the number of EV charging stations for employees at their South San Francisco campus.

Edison Electric Institute and the Institute for Electric Innovation, Electric Vehicle Data Forecast and the Charging Infrastructure Report #100 November 2014

ENERGY STAR® is the simple choice for energy efficiency. For more than 20 years, ENERGY STAR programs have America's resources for saving energy and protecting the environment. Join the million-making a difference at any scale you can.



# ENERGY STAR Partnership Application

## 1. Determine Partnership Eligibility

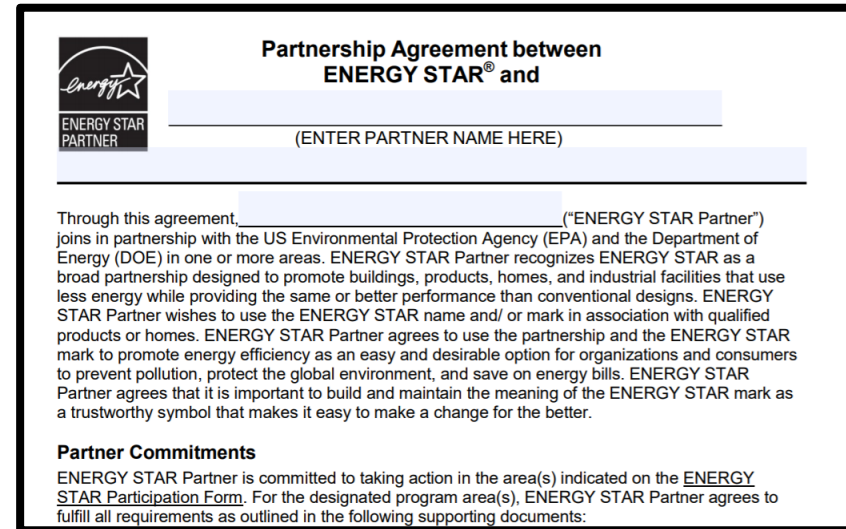
- a. EPA partners with brand owners that wish to sell products in the U.S and/or Canada. Product Brand Owner partners may be both a manufacturer and a brand owner, or solely own the brand.

## 2. Download and review the [ENERGY STAR Partnership Agreement](#)

## 3. Download and complete the [ENERGY STAR Participation Form Product Brand Owner](#)

## 4. Return the Partnership Agreement and Participation Form

- a. Return the completed forms to [join@energystar.gov](mailto:join@energystar.gov)

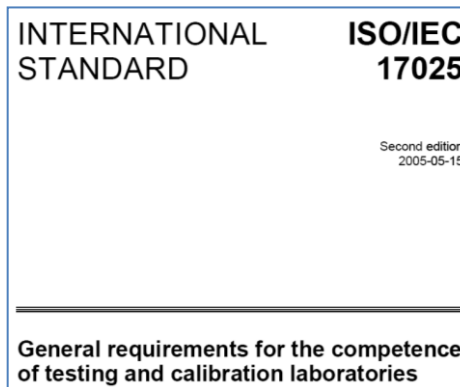


[Join ENERGY STAR as a Brand Owner Partner](#)



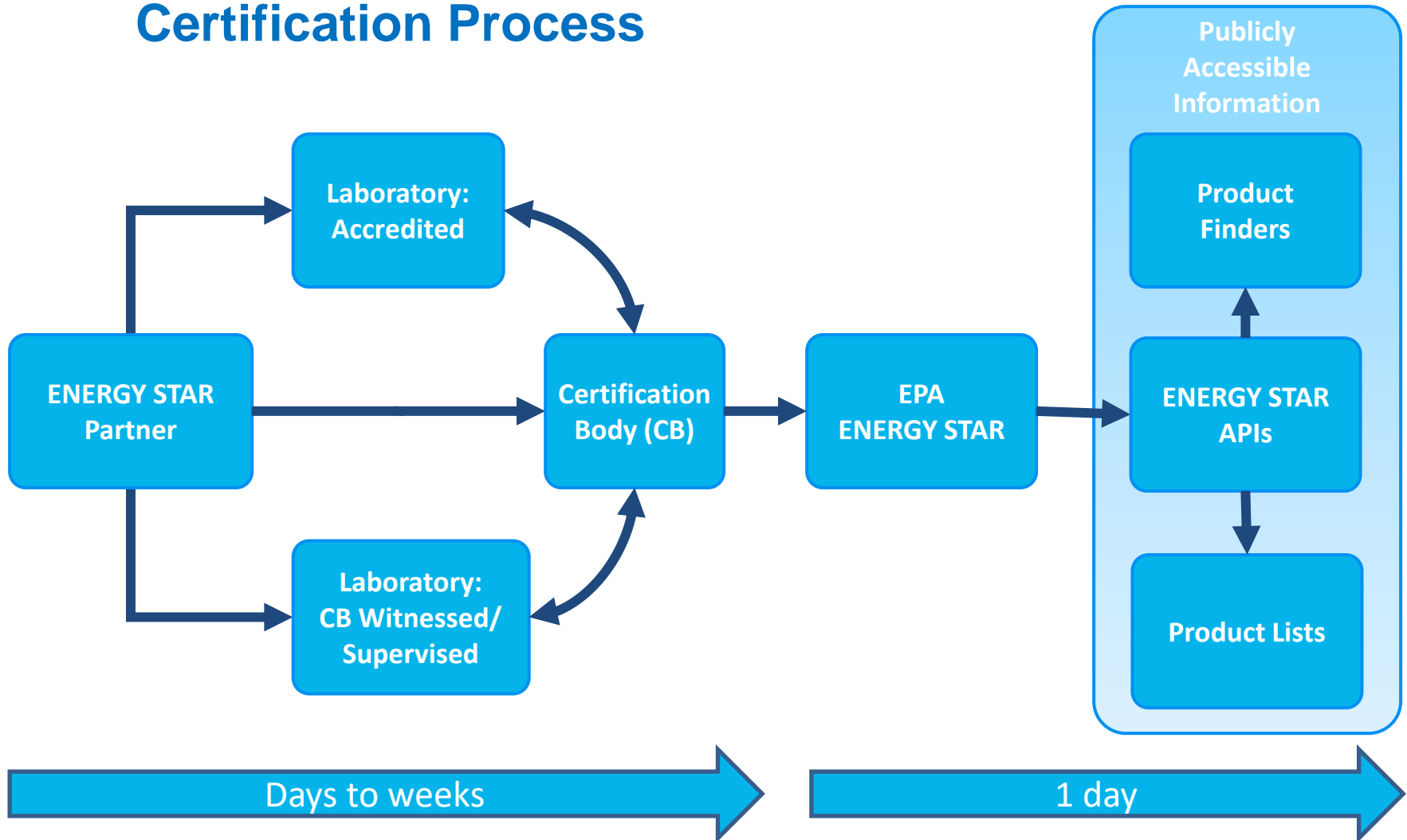
## Third Party Certification

- To earn the ENERGY STAR label, products must be certified by an EPA-recognized certification body (CB) based on testing in an EPA-recognized laboratory.
- This third-party certification program is now in effect for over 75 ENERGY STAR product categories.
- EPA-recognized laboratories test products according to the test methods referenced in ENERGY STAR specifications.
- EPA provides recognition to laboratories that are either accredited to ISO/IEC 17025 by an EPA-recognized accreditation body or participate in a CB's witnessed or supervised manufacturers' testing laboratory (W/SMTL) program for the relevant ENERGY STAR test methods.





# Certification Process







## Option #1: In-house Laboratory Testing

- Manufacturers can enroll an in-house lab as a witnessed/supervised manufacturer test lab through a recognized CB
- Currently, the recognized CBs for EVSE with approved W/ SMTL programs are:
  - UL Verification Services Inc.
  - TUV SUD America, Inc.
  - Intertek Testing Services NA
- ***Laboratories planning to apply for EPA recognition for DC EVSE are encouraged to work with these CBs and/or have their scopes of accreditation updated to include the final test method as soon as possible***



## How can a manufacturer's lab gain EPA recognition?

- If your lab is accredited to ISO/IEC 17025:
  - Inquire with your accreditor about adding the ENERGY STAR DC EVSE test procedure to your scope of accreditation.
  - With an acceptable scope of accreditation, EPA will review lab applications within one week.
- If your lab is not accredited to ISO/IEC 17025:
  - Contact an EPA-recognized certification body about enrolling in their witnessed or supervised test lab (W/SMTL) program.
  - The CB will conduct its own assessment of your lab to the requirements of 17025 and may ask to witness the test procedure conducted at your facility.
  - Upon meeting the CB's requirements for its W/SMTL program, the CB will submit your lab's information to EPA directly. EPA will review the information and offer recognition within one week.



## Option #2: Testing in a Third Party Laboratory

- EPA-recognized laboratories test products according to the test methods referenced in ENERGY STAR specifications.
- Manufacturers must also confirm with an EPA-recognized certification body (CB) that the laboratory is acceptable under the CB's program for that product type.
- In order for EPA-recognized certification bodies (CBs) to certify a product as ENERGY STAR, the test results for that product must come from an EPA-recognized laboratory. EPA provides recognition to laboratories that are either accredited to ISO/IEC 17025 by an EPA-recognized accreditation body (AB) or participate in a CB's witnessed or supervised manufacturers' testing laboratory (W/SMTL) program for the relevant ENERGY STAR test methods.



# ENERGY STAR EVSE Recognized Bodies for Certification

<b>Accredited Laboratory</b>	
<b>Org ID</b>	<b>Name</b>
1112381	Bay Area Compliance Laboratories Corp. (Sunnyvale)
1136810	UL LLC Fremont Laboratory
1140337	Intertek Testing Services NA, Inc. Plymouth Township

<b>Certification Body</b>	
<b>Org ID</b>	<b>Name</b>
1105795	MET Laboratories, Inc
1105798	UL Verification Services Inc.
1105800	Bureau Veritas Consumer Products Services, Inc. (BVCPS)
1105801	Intertek Testing Services NA
1106847	TUV SUD America, Inc.
1109527	Bay Area Compliance Laboratories Corp. (BACL)

All EPA recognized test labs and certification bodies for EVSE can be found [here](#).



## Certification Questions?

- Manufacturers with questions regarding the ENERGY STAR certification process for EVSE should contact:
- [certification@energystar.gov](mailto:certification@energystar.gov), or
- Brian Krausz ([Krausz.Brian@epa.gov](mailto:Krausz.Brian@epa.gov))



# Thank you!

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

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