

Topic	Subtopic	Stakeholder Comment	Suggested EPA Response
General		<p>A stakeholder supported EPA's effort to develop a test procedure and specification that measure and evaluate DC EVSE energy efficiency.</p> <p>Two stakeholders recommended that EPA consider further harmonization with industry standards. One suggested harmonization with the SAE J2894 and for EPA participation in the related working group. The other stakeholder urged harmonization with the National Institute of Standards and Technology Handbook 44 Section 3.40 related to EV fueling systems.</p>	<p>EPA has harmonized the DC EVSE Test Method terminology with relevant SAE standard definitions. The SAE J2894 standard contains definitions that are out of scope of the ENERGY STAR specification because they cover the entire EVSE/EV system, taking into account EV onboard charging efficiency. In contrast, this specification encompasses only the EVSE. EPA would be happy to participate in the working group to determine if there are any other areas for harmonization. EPA reviewed the NIST Handbook 44 and did not see opportunities to harmonize. For example, ENERGY STAR definitions are intentionally harmonized with SAE J1772, where applicable, per request from multiple stakeholders. The temperature conditions specified in NIST are extreme conditions, where ENERGY STAR is targeting temperatures that are typical in various climates in the United States.</p>
Definitions		<p>A stakeholder recommended that EPA remove the definition for wireless/inductive charging for simplicity as it is not used in the draft test.</p>	<p>EPA retained the definition for wireless/inductive charging because it is listed as a product that is excluded from scope and as a result, this definition is intended to add clarity.</p>
Scope		<p>A stakeholder agreed with the proposal to include all products less than or equal to 350 kW in scope. However, they recommended that active charging efficiency criteria be developed for models up to 150 kW (if data are available) since there are currently over 5,700 DC EVSE installations with a rating between 50 kW and 150 kW, with an additional 700 units planned to be installed in the next several years.</p> <p>A stakeholder suggested limiting the scope to DC EVSE rated at 50 kW or less since systems with a higher rating are relatively new to the market and it may inhibit innovation.</p> <p>Lastly, another stakeholder asked if products intended to connect directly to medium voltage (e.g., 13.2 kV) would be eligible for ENERGY STAR certification since only low voltage options are considered in Table 1: AC-input Supply Requirements.</p>	<p>EPA appreciates these stakeholder comments and concerns. EPA chose to group these products into distinct categories with fewer requirements for higher power DC EVSE in response to stakeholder feedback that they are newer to market, not as commoditized and more customizable, and there is a lack of data on efficiency for these products. EPA agrees that operating efficiency is a key metric for consumers and hopes to include criteria for the products with output power greater than 65 kW and up to 350 kW in a future revision of the specification, once data is available. At this time, EPA is still requiring that operation mode test results be reported on the Certified Product List in order to provide consumers with this information.</p> <p>In response to stakeholder feedback and concerns regarding scope throughout the development of the Version 1.1 Test Method, EPA has limited the scope of this effort to exclude DC-output EVSE with an output power greater than 350 kW. In addition, EPA has proposed to limit the criteria for models over 65 kW to standby modes and only report efficiency during active charging.</p> <p>The goal for the ENERGY STAR DC EVSE test method is to work with stakeholders to determine an appropriate procedure for measuring the energy efficiency of DC EVSE. There is no industry test method to measure DC EVSE energy efficiency, so EPA hopes this will allow purchasers to be able to more easily compare products that are tested to the same procedure, and lead to the design of future generations of products for improved efficiency.</p> <p>ENERGY STAR is a voluntary program and certification is not mandatory. However, as the DC EVSE industry grows, EPA is hopeful that this effort will encourage energy efficiency to be one design criterion, while continuing to allow innovative product design. The ENERGY STAR program has been successful in achieving these goals for numerous product categories.</p> <p>EPA observed that the performance of medium voltage products is very different compared to low voltage products, making it difficult to compare efficiency of such different products. In addition, the equipment required for lab testing of medium voltage systems also varies drastically. As a result, EPA excluded medium voltage products from scope.</p>

Test Setup		<p>A stakeholder suggested including an artificial mains network (AMN) in the test procedure to provide a defined impedance of the unit under test. This AMN should be connected in accordance with the applicable product standard, for example IEC 61851-21-2.</p> <p>A stakeholder recommended establishing a minimum cable length for testing Cabinet/Dispenser configurations to best represent real world installations. Another suggested that EPA note "shortest cable possible, sized according to manufacturer's recommendation".</p>	<p>EPA heard from testing laboratories that requiring an AMN will require a significant investment, which will result in increased test burden. EPA agrees that using an AMN will prevent interference from the utility connection but since the impacts of not using one will most likely be minimal and since the test burden would be increased significantly, EPA is not including use of an AMN in the Final Test Method for DC EVSE.</p> <p>EPA will continue to require that Cabinet/Dispenser configurations be tested with the shortest cable length possible because of conversations during the second working session, in which stakeholders agreed that testing the Cabinet/Dispenser configuration with the shortest cable will allow for the fairest comparison between this configuration and the All-in-One configured products.</p> <p>EPA understands that this is not how Cabinet/Dispenser configured products will be installed in real world applications but it will allow for comparison of efficiency between the varying configurations. Also, cable losses can be calculated for specific</p>
Test Setup	Input Supply Requirements	A stakeholder requested that EPA consider if a product can operate at both 50 Hz and 60 Hz and exhibits no variation in performance and efficiency between these frequency - can the manufacturer determine to conduct their test at either supply frequency?	EPA understands that if all other test conditions remain the same, the power electronic losses with the system operating at 50 Hz and 60Hz will be negligible. However, EPA recommends UUTs that are not compatible with any of the combinations listed in Table 1 shall be connected to the highest rated voltage and frequency combination appropriate for the intended market, since that will be most representative of how they are used.
Test Setup	Temperature Testing	A stakeholder noted that they support the updates to test all DC EVSE under cold, temperate, and hot temperature conditions regardless of whether or not they have active cooling or heating.	EPA appreciates these stakeholder comments.
Test Setup	Relative Humidity	A stakeholder recommended that EPA include clarification that relative humidity shall remain between 10% and 80% for temperate and hot test conditions only because of the impracticality of obtaining valid relative humidity conditions at -7°C.	EPA analyzed the weather data across different regions in the United States and came to the conclusion that it is possible to have relative humidity greater than 80% even in cold conditions. At this time, EPA has maintained the relative humidity requirement of remaining between 10% and 80%.
Test Conduct	Automatic Brightness Control Configuration	<p>A stakeholder recommended testing all units with ABC under consistent (enabled) conditions in all modes of operation. They noted that if products are tested with ABC disabled in operation mode, the results may be inconsistent since EVSE with ABC disabled may result in higher screen energy use than those with ABC enabled but tested under dark conditions.</p> <p>They also recommended requiring the image that appears after the unit is configured instead of the default image that appears as-shipped because it may provide more comparable results since each unit is likely to be configured in the field.</p> <p>This stakeholder supports the changes to the accuracy requirements and believes they provide clarity.</p>	EPA has accepted the proposal of requiring the image after the product is configured instead of the default image as this will provide comparable results and be representative of real world conditions. EPA maintained that products with ABC will only be tested with it enabled during standby modes since it will have the most significant impact on the power consumption in the less consumptive modes. Since the Operation Mode testing requires use of a temperature chamber, which may have space constraints, testing laboratories may have a difficult time fitting the equipment required for the ABC testing. Also, EPA believes that during Operation Mode the impact of screen luminance on power consumption will be much less significant than the power required to charge and so it will have a minimal impact on the results.

Test Procedures	Partial On/Idle Modes	<p>A stakeholder requested clarity on the definitions of Idle and Partial On Modes. They also stated that it would be helpful for EPA to clarify the necessity for testing in these modes. If these modes represent a small percentage of the product's duty cycle, they recommended removing them from the test procedure.</p>	<p>EPA included a definition for No Vehicle, Partial On, and Idle Modes in the Draft 1 Specification and has proposed that the Maximum No Vehicle Mode and Partial On Mode Power Requirements be a logarithmic function of the nameplate maximum output current. EPA offers a power allowance for in-use High Resolution Displays. EPA believes that Partial On Mode may be a relevant mode for fleet applications, or longer-dwell time applications (as well as Idle Mode to a lesser extent). For Idle Mode, EPA did not include requirements in the Draft 1 Specification due to a lack of sufficient data to set Idle Mode requirements for DC-output EVSE. As such and due to the fact that EPA expects these products to spend little time in idle mode, EPA has proposed a reporting requirement only for idle mode.</p>
Test Procedures	Operation Mode	<p>A stakeholder recommended a longer testing period for actively cooled units to capture the power overhang until the unit returns to the power draw that occurred prior to the test initiation. In response to EPA's concern that this would increase test duration and thus testing burden, they asked EPA to rely on data to determine if power overhang is significant enough to justify longer testing and whether this is overly burdensome. They also recommended more stringent tolerances at each loading condition (e.g., +/- 1 kW at 50 kW, +/- 3 kW at 150 kW, or +/- 7kW at 350 kW) because it will dictate the input and output power, which determine efficiency.</p> <p>A stakeholder suggested that EPA set the voltage in loading condition 6 to 350 V, instead of the mid-point of the available output voltage range, as it is listed in loading conditions 1 - 5 since 350 V is close to the majority of charging voltages for vehicles now on the market. They believe this will be more useful for consumers since it would be more representative of real-world conditions and because a good charger design will increase efficiency at operation points that the charger will be operating at for more of its lifetime. They also noted that a 50 kW charger with a mid-point current of 275 V will only be able to achieve an output power of 34 kW for loading condition 6.</p> <p>Several stakeholders suggested that Operation Mode testing be conducted at 400 V as it was difficult to achieve rated output power for 50 kW chargers at 350 V. This will also enable the charger to operate at the maximum current for each of the respective loading conditions.</p>	<p>EPA appreciates this stakeholder input and understands the reasoning for achieving thermal stability between Operation Mode tests. However, EPA is concerned that waiting for complete stability or steady state conditions between tests for each loading condition will increase test duration by a significant amount of time and may result in an overly burdensome test procedure. Also, EPA believes that as a result of ordering the loading condition tests from low to high power, any power overhang that would result from a cooling system being engaged from one test to the next would be acceptable because the next test would be at a higher power and would inevitably require the cooling system to engage if the one prior required it.</p> <p>These loading conditions are intended to measure unit performance across the loading profile of a given DC EVSE. As long as the tester can get within the tolerance of the loading conditions listed, EPA believes this will be an accurate representation of the charge profile. Any difference in the loading condition within the allowed tolerance won't result in variations in efficiency because the calculation of efficiency (output/input) will include the exact value of output power that was achieved during testing and will thus still be representative of the efficiency of the product. Testing laboratories have indicated that the specified tolerances are achievable with current equipment.</p> <p>EPA has accepted the proposal to update the Operation Mode loading conditions to 400 V. EPA believes that a good charger design will increase efficiency at the operation points, which are representative of real-world conditions, while maintaining repeatability in testing.</p>
Test Procedures	Battery Storage	<p>A stakeholder supported EPA's intent to provide education for EVSE paired with battery storage systems. They encouraged EPA to educate companies that market EVSE with battery storage products about the need to obtain interconnection permits from their local utility.</p>	<p>EPA appreciates these stakeholder comments and is planning to address this in educational materials associated with the specification.</p>

<p>Certification</p>		<p>A stakeholder suggested that EPA allow self-testing and self-certification at manufacturer in-house testing facilities because DC EVSE are normally custom-engineered, large, and complex systems that cannot easily be shipped without burdens associated with time, cost, and logistics.</p>	<p>To ensure consumer confidence in the ENERGY STAR label and to protect the investment of ENERGY STAR partners, EPA requires all ENERGY STAR products to be third-party certified. All products must be tested in an EPA-recognized laboratory and reviewed by an EPA-recognized certification body before they can carry the label.</p> <p>However, EPA understands these stakeholder concerns, which are common for larger ENERGY STAR product categories, like Commercial Food Service products and Data Center products. 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. For large product types, such as DC EVSE, a witnessed or supervised test in an accredited manufacturer laboratory is a popular choice for ENERGY STAR certification to cause minimal burden and disruption to product development.</p> <p>EPA is also hoping that testing for ENERGY STAR can be integrated into safety testing that is already being conducted for new products.</p>
<p>Timeline</p>		<p>A stakeholder requested that EPA extend the timeline of the development of the Version 1.1 test method and specification because these products are complex, modular, and have a wide variety of use-cases.</p> <p>Another stakeholder stated that they are committed to ENERGY STAR testing but would like an extension on providing data to inform the ENERGY STAR Draft 1 Specification.</p>	<p>As EPA develops the test method to measure efficiency and subsequent specification to recognize products that are achieving energy efficiency, all stakeholder feedback is welcomed. If stakeholders have specific recommendations on how to improve the specification, EPA wishes to hear from stakeholders and is committed to working with stakeholders to resolve technical issues before proceeding. The main goal for this effort are to develop an appropriate method to recognize DC-output EVSE that take efficiency into consideration in their design. EPA looks forward to continuing to address technical concerns, with input from stakeholders, during this process.</p>