ENERGY STAR®
Version 1.1 DC Electric Vehicle Supply Equipment (EVSE)

Draft 1 Specification and Final Test Method Webinar

June 29, 2020

ENERGY STAR Products Labeling Program

Webinar Details

- Webinar slides and related materials will be available on the EVSE Product Development Web page:
  - 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 (415) 655-0060
    - Access Code: 199-356-880

  - Webinar ID: 570-668-043

Webinar Agenda

- Introductions and Recap of ENERGY STAR specification development process
- Test Method
  - Room Illuminance Conditions
  - Operation Mode Loading Conditions
- Specification
  - Definitions
  - Data analysis and certification criteria
  - Connected functionality
- Third Party Certification
- Marketing Efforts
- Timeline

Introductions

Time	Topic
3:00–3:10	**Introductions and Specification Development Recap**
3:10–3:20	Final Test Method Updates
	• Automatic Brightness Control
	• Loading Conditions Table
3:20–4:25	Draft 1 Specification
	• Definitions
	• Data analysis and Certification Criteria
	• Connected Criteria Updates
	• Savings and Pass Rate
4:25–4:40	Third Party Certification
4:40-4:50	Marketing Efforts
4:50–5:00	Timeline and Questions

Introductions

James Kwon
U.S. Environmental Protection Agency

Peter Banwell
U.S. Environmental Protection Agency

Abigail Daken
U.S. Environmental Protection Agency

Brian Krausz
U.S. Environmental Protection Agency

Emmy Feldman
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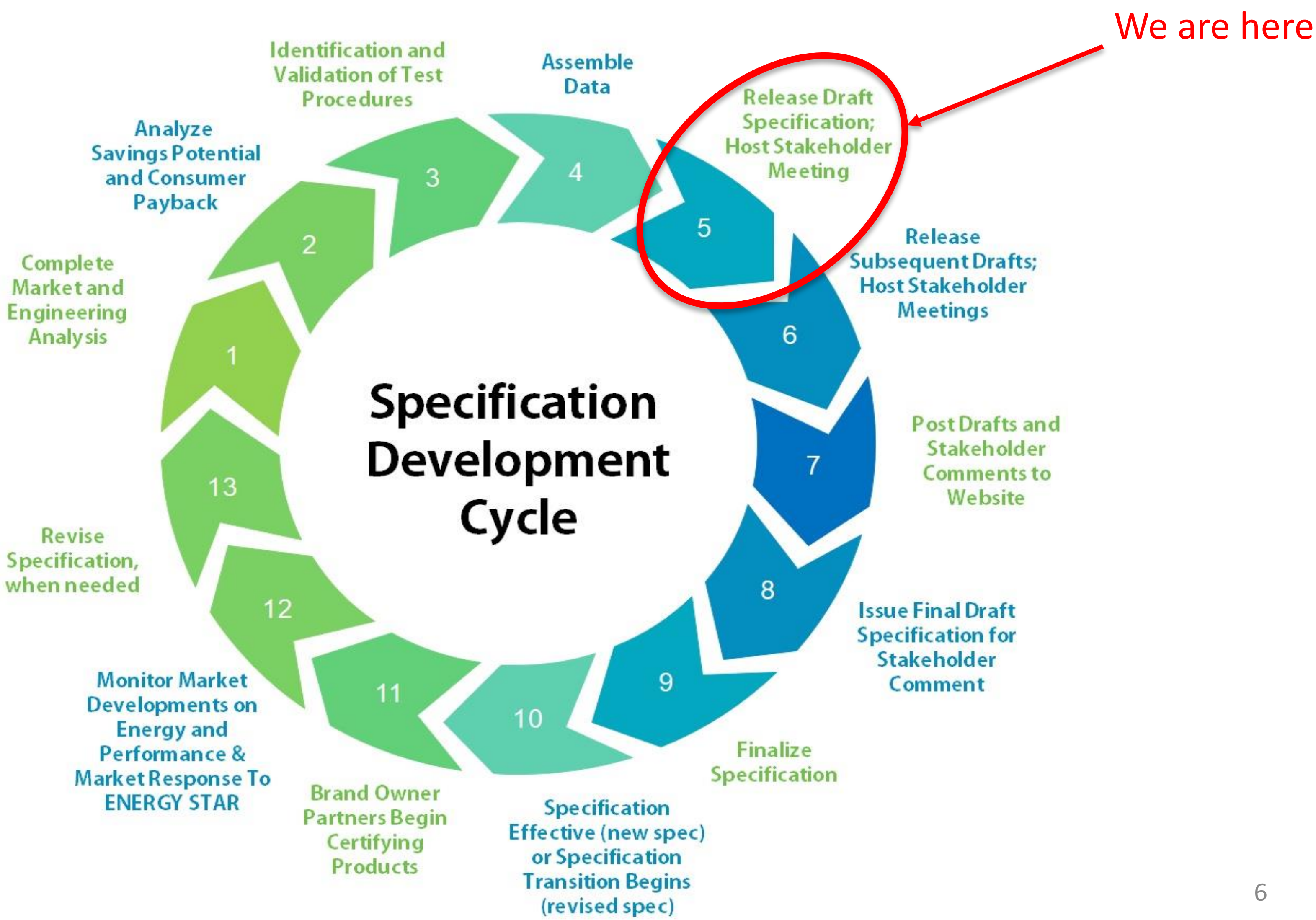
Recap of Specification Development Process



Version 1.1 DC EVSE Timeline

Event	Date
Discussion Guide Published and Webinar	*May/June 2018*
Test Method Working Session #1 and #2	*August and September 2018*
Draft 1 Test Method Published and Webinar	*November 2018*
Draft 2 Test Method Published and Webinar	*June 2019*
Final Draft Test Method Published and Data Assembly	*September 2019*
Draft 1 Specification and Final Test Method Published	**June 11, 2020**
Draft 1 Specification and Final Test Method Webinar	**June 29, 2020**
Draft 1 Specification Written Comments Due	**July 27, 2020**
Subsequent Drafts of Specification Published	September – December 2020
Version 1.1 Effective Date	January 2021*

* Given the current circumstances, EPA is extending normal comment period deadlines to allow stakeholders additional time to provide comments. This proposed effective date reflects that.

Final Test Method Updates

Time	Topic
3:00–3:10	Introductions and Specification Development Recap
3:10–3:20	**Final Test Method Updates**
	• **Automatic Brightness Control**
	• **Loading Conditions Table**
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Test Procedures – Automatic Brightness Control

A stakeholder recommended requiring the image that appears after the unit is configured in the field instead of the default image that appears as-shipped

EPA has accepted the proposal of requiring the image after the product is configured to appear during testing, instead of the default image, as this will still provide comparable results *and* be representative of real-world conditions

E) Room Illuminance Conditions for Products with ABC Enabled by Default: All products with ABC enabled by default shall be tested in No Vehicle Mode, Partial On Mode, and Idle Mode in two illuminance conditions—light and dark—to simulate daytime and nighttime conditions as specified below. To test products with ABC enabled by default in Operation Mode, the ABC sensor shall be disabled. If the ABC sensor cannot be disabled, the UUT shall be tested in an illuminance condition less than or equal to 1 lux. Following this initial set-up, all power testing shall be conducted with the image that appears after the unit is configured.

Test Procedures – Operation Mode Testing

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.

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 loading conditions which are representative of real-world conditions, while maintaining repeatability in testing.

Test Procedures – Update to Loading Conditions Table

Updated test voltage to 400 V from 350 V, per stakeholder feedback

Table 3: Loading Conditions for UUT

	Test Condition	Example for 150 kW capable UUT	Example for 50 kW capable UUT
Loading Condition 1	25% of Maximum Available Output Power ± 2% and 400 V ± 7 V	37.5 kW	12.5 kW
Loading Condition 2	50% of Maximum Available Output Power ± 2% and 400 V ± 7 V	75 kW	25 kW
Loading Condition 3	75% of Maximum Available Output Power ± 2% and 400 V ± 7 V	112.5 kW	37.5 kW
Loading Condition 4	50 kW ± 1 kW and 400 V ± 7 V	50 kW	N/A
Loading Condition 5	150 kW ± 3 kW and 400 V ± 7 V	N/A	N/A
Loading Condition 6	100% Maximum Available Output Power (determined in Section 7.4.B), above) ± 2% and 400 V ± 7 V	150 kW	50 kW

Draft 1 Specification

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Definitions – Minimum Dispenser Configuration

C) DC-output EVSE Product Configurations:

1) Cabinet/Dispenser Product Configuration: A DC-output EVSE that has its components in separate enclosures - one (or more) including power conversion equipment (i.e., cabinet) and one (or more) enclosure that connects to the vehicle and has the user interface (i.e., dispenser).

a) Minimum Dispenser Configuration: The configuration of a DC-output EVSE in which the minimum recommended number of dispensers are connected to a single cabinet.

EPA proposed this definition for Minimum Dispenser Configuration in order to describe the configuration that would be required for testing and certification purposes.

Definitions – Product Family

F) Product Family: A group of product models that are (1) made by the same manufacturer, (2) subject to the same ENERGY STAR certification criteria, and (3) of a common basic design. Product models within a family differ from each other according to one or more characteristics or features that either (1) have no impact on product performance with regard to ENERGY STAR certification criteria, or (2) are specified herein as acceptable variations within a Product Family. For EVSE, including both cabinet and dispenser for cabinet/dispenser configuration DC-output EVSE, acceptable variations within a Product Family include:

1) Color,
2) Output cable, and
3) Housing.

EPA has updated the Product Family definition to note that these acceptable variations apply to cabinet/dispenser configurations. EPA welcomes feedback on if this accurately reflects non-performance or non-energy related variations within a product family.

Certifying Product Families

- EPA is aware that EVSE manufacturers may offer a variety of configurations within a manufacturer model family and that, in certain cases, some of these configurations may not meet the ENERGY STAR criteria.
- EPA is adding the following model number identification requirement to assist consumers and utilities in identifying configurations that are ENERGY STAR certified.

> All units/configurations for which a Partner is seeking ENERGY STAR certification, must meet the ENERGY STAR requirements. However, for DC-output EVSE only, if a Partner wishes to certify configurations of a model for which non-ENERGY STAR certified alternative configurations exist, the Partner must assign the certified configurations an identifier in the model name/number that is unique to ENERGY STAR certified configurations. This identifier must be used consistently in association with the certified configurations in marketing/sales materials and on the ENERGY STAR list of certified products (e.g. model A1234 for baseline configurations and A1234-ES for ENERGY STAR certified configurations).
>
> Note: There may be cases—as described in the paragraph above—where not all units/configurations will meet ENERGY STAR requirements. If so, the worst-case configuration for test will be the worst-case certified configuration, and not one of the presumably even higher-energy consuming non-certified configurations.

Scope – Excluded Products

A stakeholder asked if products intended to connect directly to medium voltage (e.g., 13.2 kV) would be eligible for ENERGY STAR certification.

EPA observed that the performance of medium voltage products is significantly different compared to low voltage products, making it difficult to compare the efficiency. In addition, the equipment required for lab testing of medium voltage systems would also vary significantly. As a result, EPA excluded medium voltage products from scope.

2.2.2 The following products are not eligible for certification under this specification:

i. DC-output EVSE with power greater than 350 kW.

ii. Pantograph EVSE (chargers with an automated connection system, or ACS).

iii. Wireless/Inductive EVSE.

iv. Medium voltage AC input supply EVSE (13.2 kV).

v. Power electronic components inside the vehicle.

General Requirements

- Just as was applicable for AC EVSE in the Version 1.0 Specification, EPA has maintained that all EVSE submitted for ENERGY STAR certification be NRTL Listed for safety.

> 3.2.1 Each EVSE submitted for ENERGY STAR certification shall be Listed by a Nationally Recognized Testing Laboratory (NRTL) for safety.

Efficiency Criteria – Standby Modes

- No Vehicle Mode is defined as the condition where the EVSE is connected to external power and the product is physically disconnected from the vehicle (intended to be the lowest-power mode of the EVSE)
- Partial On Mode is defined as the condition where the EVSE is physically connected to the vehicle and provides at least one secondary function (e.g., communicating with vehicle, connected to network, etc.) but is not providing the primary function (i.e., current)

Table 1: Operational Modes and Power States

Operational Modes	Most closely related Interface State as Defined in SAE J1772	Further Description
No Vehicle Mode	State A	No Vehicle Mode is associated with State A, or where the EVSE is not connected to the EV. The EVSE is connected to external power.
Partial On Mode	State B1 or State B2	Partial On Mode is associated with State B1 or State B2 where the vehicle is connected but is not ready to accept energy. Sub-state B1 is where the EVSE **is not** ready to supply energy and sub-state B2 **is** where the EVSE is ready to supply energy.

Efficiency Criteria – Standby Modes

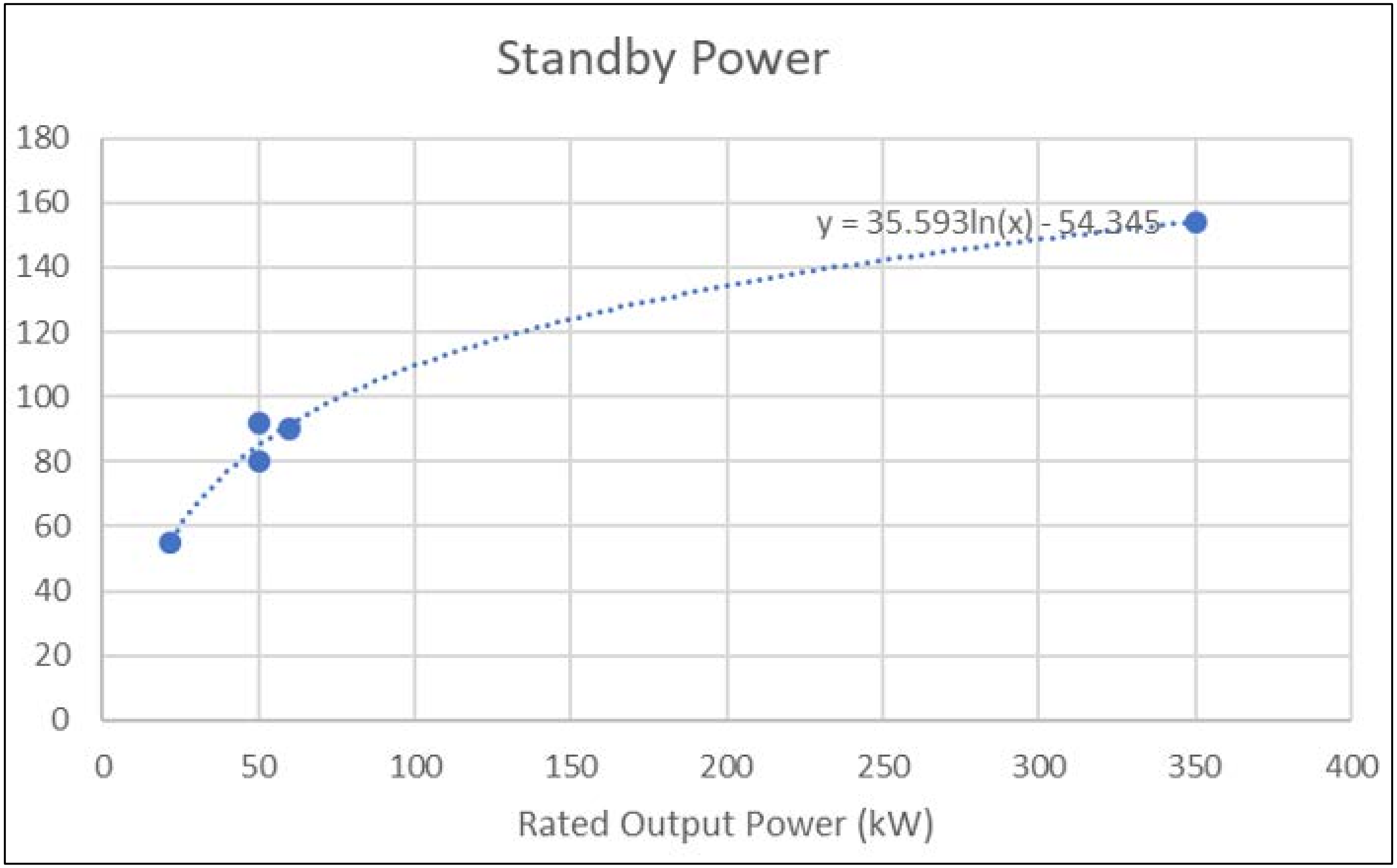
- Idle Mode is the condition during which the EVSE is connected to the vehicle and is not actively providing current but can promptly do so.

Table 1: Operational Modes and Power States

Operational Modes	Most closely related Interface State as Defined in SAE J1772	Further Description
Idle Mode	State C	Idle Mode is associated with State C, where the vehicle is connected and ready to accept energy and the EVSE is capable of promptly providing current to the EV but is not doing so.

Efficiency Criteria – Standby Mode Power

- EPA analyzed the standby power of 5 models ranging from 22 kW to 350 kW



Efficiency Criteria – No Vehicle Mode, Partial On Mode

- Products with ABC enabled by default
  - The average No Vehicle Mode or Partial On Mode power measured in high and low illuminance conditions shall be used as the measured power in each mode
- Cabinet/Dispenser Configurations
  - Power is to be tested and reported only for the minimum dispenser configuration

C) DC-output EVSE Product Configurations:

1) Cabinet/Dispenser Product Configuration: A DC-output EVSE that has its components in separate enclosures - one (or more) including power conversion equipment (i.e., cabinet) and one (or more) enclosure that connects to the vehicle and has the user interface (i.e., dispenser).

   a) Minimum Dispenser Configuration: The configuration of a DC-output EVSE in which the minimum recommended number of dispensers are connected to a single cabinet.

Efficiency Criteria – No Vehicle Mode, Partial On Mode

- EPA believes that the Partial On Mode and the No Vehicle Mode power will, at most, scale linearly with the number of dispensers and hence requires testing in the minimum dispenser configuration to minimize test burden

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

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

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; and*
- $P_{DISPLAY}$ *is the No Vehicle Mode power allowance for a High-Resolution Display enabled during testing listed in Table 5.*

Efficiency Criteria – No Vehicle Mode, Partial On Mode

- In addition, EPA proposes providing an allowance for products with an in-use high resolution display

In-use High Resolution Display ($P_{DISPLAY}$)	$[(4.0 \times 10^{-5} \times \ell \times A) + 119 \times \tanh(0.0008 \times [A - 200.0] + 0.11) + 6.0]/n$ *Where:* • *A* is the Screen Area in square inches; • *ℓ* 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 • *tanh* is the hyperbolic tangent function; and • *n* is the number of outputs. **Example**: For a single-output EVSE with a maximum measured luminance of 300 candelas/m^2 and a 5×5-inch screen, the allowance for the in-use display would be 2.7 watts.

- Stakeholders may notify EPA and provide relevant supporting data to request allowances for widely used product features that consume additional power

Reporting Requirement – Idle Mode

- EPA currently does not have sufficient data to set Idle Mode requirements for DC-output EVSE
  - As a result, EPA has proposed a reporting requirement for Idle Mode

3.9 Additional Reporting Requirements

3.9.1 Report the measured Idle Mode Power for DC-output EVSE per the ENERGY STAR DC-output EVSE Test Method.

- EPA received stakeholder feedback that Idle Mode was relevant for long-dwell DC EVSE applications (e.g., fleets) so while EPA doesn't expect most DC EVSE to spend significant time in Idle Mode, it will still be reported for relevant purchasers.

Efficiency Criteria – Operation Mode

- The average loading-adjusted efficiency for DC-output EVSE with output power less than or equal to 65 kW is calculated with two equations that determine how the efficiency should be weighted based on test results:
  - At the three different ambient temperature conditions: 20 °F, 68 °F, and 104 °F
  - In four different loading conditions: 25%, 50%, 75%, and 100% of maximum available output power

Data Analysis – Temperature Test Weightings

- To develop the weighting factors, EPA analyzed typical meteorological year weather data (TMY3) for a total of six cities comprising one city in each Building America climate zone.

City	Weather File	Number	Climate Zone
Miami	Miami Intl AP	722020	Hot-Humid
Oklahoma City	Oklahoma City Tinker AFB	723540	Mixed-Humid
Phoenix	Phoenix Sky Harbor Intl AP	722780	Hot-Dry
Albuquerque	Albuquerque Intl Arpt	723650	Mixed-Dry
Albany	Albany County AP	725180	Cold
-	-	-	Very Cold
San Francisco	San Francisco Intl AP	724940	Marine

Data Analysis – Temperature Test Weightings

Temperature bin	Number of hours							Percentage of total hours
	San Francisco	Miami	Albany	Oklahoma City	Phoenix	Albuquerque	Total	
≤ 6.5	163	3	3577	2282	187	2444	8656	0.16
6.5 < x ≤ 30	8594	8118	5126	5736	5934	5890	39398	0.75
> 30	3	639	57	742	2639	426	4506	0.09

Equation 6: Calculation of Efficiency at Loading Condition *i*

$$Eff_i = 0.15 \times Eff_{i,20F} + 0.75 \times Eff_{i,68F} + 0.10 \times Eff_{i,104F}$$

Where:

- $Eff_{i,20F}$ *is the recorded efficiency at loading condition i at the 20°F ambient test temperature.*
- $Eff_{i,68F}$ *is the recorded efficiency at loading condition i at the 68°F ambient test temperature.*
- $Eff_{i,104F}$ *is the recorded efficiency at loading condition I at the 104°F ambient test temperature.*

Data Analysis – Loading Condition Weighting

- EPA analyzed the charging profiles of leading EVs in the market
  - All analyzed for % of charging time spent at each loading condition
  - 12 models analyzed

Electric Vehicle	~% of Total Charging Time at 100% loading conditic	~% of Total Charging Time at 75% loading condition	~% of Total Charging Time at 50% loading conditio	~% of Total Charging Time at 25% loading conditio
Model 1	72	5	10	2
Model 2	75	5	10	1
Model 3	52	16	15	15
Model 4	52	18	22	6
Model 5	68	19	23	0
Model 6	86	9	5	0
Model 7	62	15	13	5
Model 8	82	3	0	0
Model 9	78	2	8	0
Model 10	76	5	7	0
Model 11	82	3	5	0
Model 12	71	7	15	0
~ Average % Time at Each Loading Condition	**71**	**9**	**11**	**2**

Data Analysis – Loading Condition Weighting

- The result of this analysis are the loading condition weighting factors in Equation 7.

Equation 7: Calculation of Average Loading-Adjusted Efficiency

$$Eff_{AVG} = 0.02 \times Eff_{25\%} + 0.11 \times Eff_{50\%} + 0.09 \times Eff_{75\%} + 0.78 \times Eff_{100\%}$$

Where:

- $Eff_{25\%}$ *is the efficiency at the 25% loading condition (Loading Condition 1 per Table 3 of the ENERGY STAR Test Method), expressed as an integer from 0 to 1, calculated per Equation 6;*
- $Eff_{50\%}$ *is the efficiency at the 50% loading condition (Loading Condition 2 per Table 3 of the ENERGY STAR Test Method), expressed as an integer from 0 to 1, calculated per Equation 6;*
- $Eff_{75\%}$ *is the efficiency at the 75% loading condition (Loading Condition 3 per Table 3 of the ENERGY STAR Test Method), expressed as an integer from 0 to 1, calculated per Equation 6; and*
- $Eff_{100\%}$ *is the efficiency at the 100% loading condition (Loading Condition 6 per Table 3 of the ENERGY STAR Test Method), expressed as an integer from 0 to 1, calculated per Equation 6.*

Data Analysis – Operation Mode Efficiency

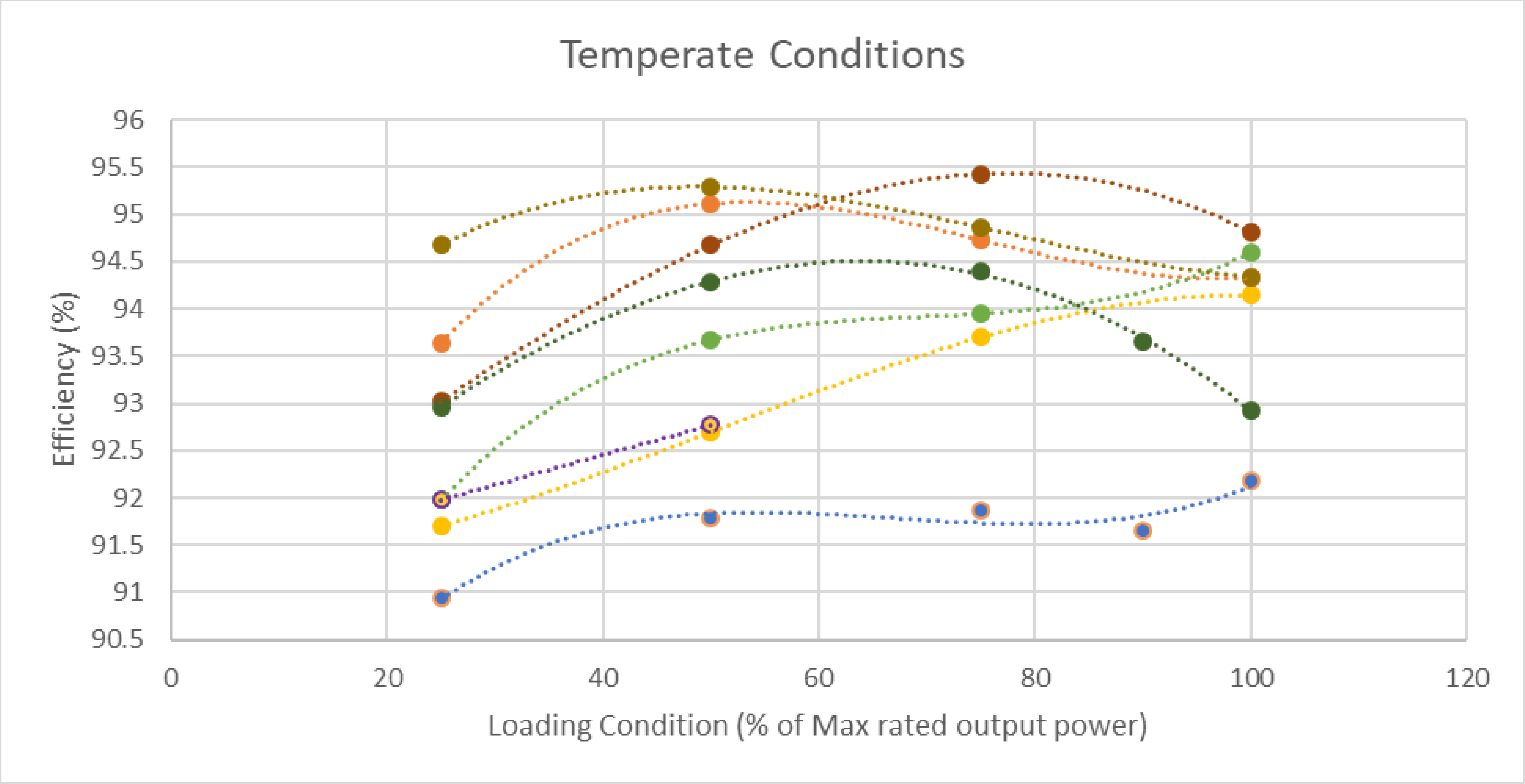
- Test data received for 4 models under 65 kW
- EPA observed that the manufacturer claimed datasheet efficiency was very close to the test data for 100% loading condition for these models

Manufacturer Claimed Datasheet Efficiency	No of products
98	1
95	5
>94	4
94	4
>93	2
93	2
>92	3
>90	2
Total	23

Rated output (kW)	Calculated Efficiency (%)
25	94.44
50	93.90
50	94.82
50	92.08
Total	4

Data Analysis – Operation Mode Efficiency

- Efficiency test data at the temperate temperature condition at a variety of loading conditions



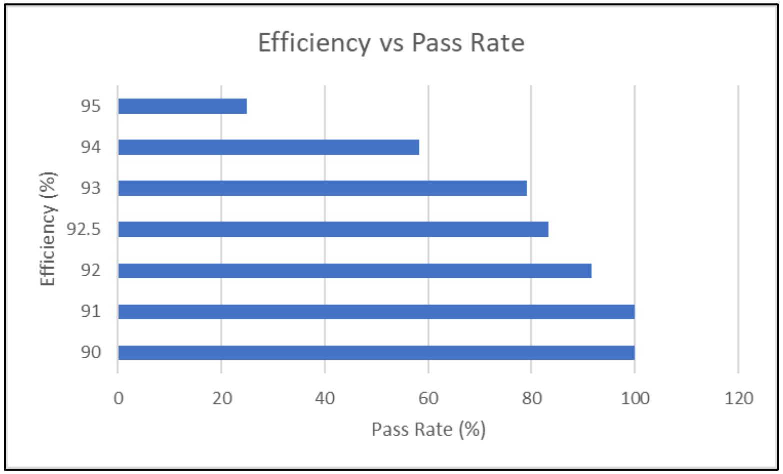
Efficiency Criteria – Operation Mode

- EPA was able to included 24 models from 12 different manufacturers to determine a Minimum Average Loading-Adjusted Efficiency requirement for DC-output EVSE with output power ≤ 65 kW

Minimum Average Efficiency (Eff_{AVG_MIN})
0.93

Savings and Pass Rates

On Mode Efficiency	Number of models above this efficiency	% of models above this efficiency	Operation Mode Energy Loss (kWh/yr)	Savings per unit (kWh/yr)
90	24	100	4866.7	0.0
91	24	100	4331.9	534.8
92	22	92	3808.7	1058.0
92.5	20	83	3551.4	1315.3
93	19	79	3296.8	1569.9
94	14	58	2795.7	2070.9
95	6	25	2305.3	2561.4

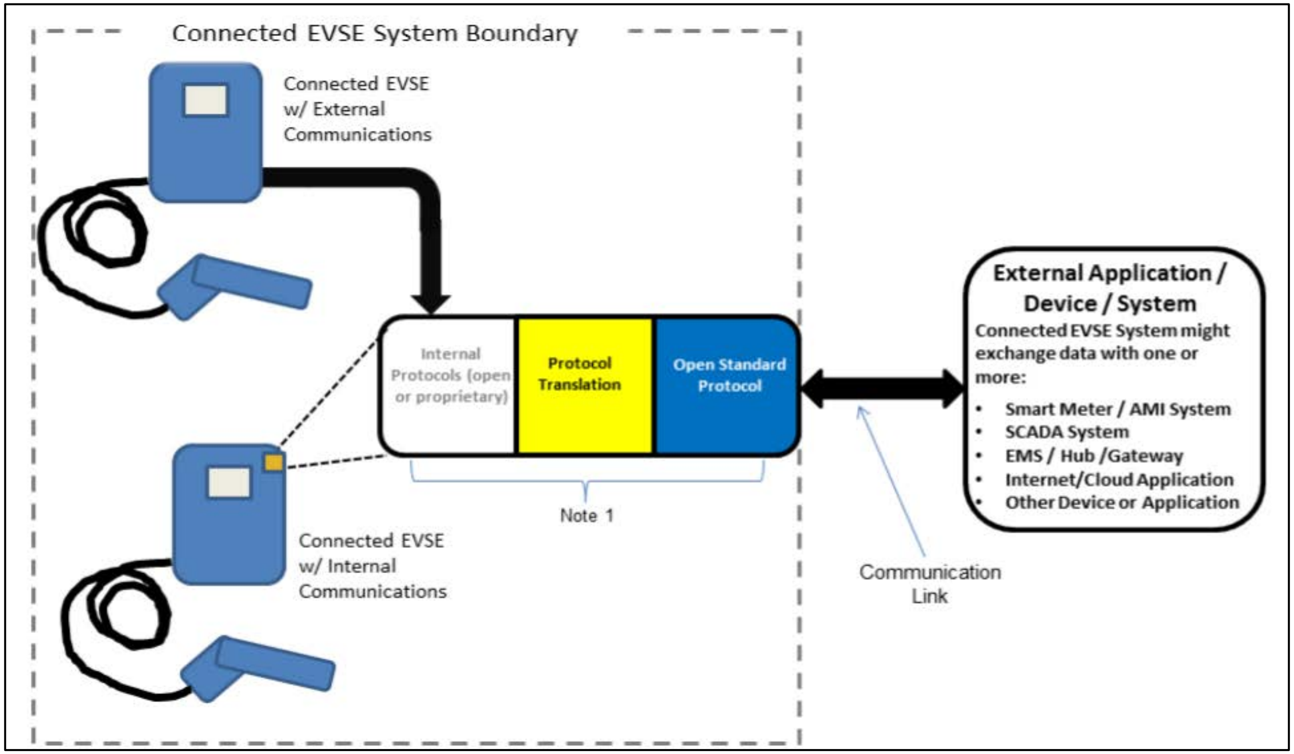


- Approximate savings worth 500 kWh/year with every 1% increase in efficiency per unit

*Savings/losses based on a 50kW station and a 10% utilization, assuming a 90% efficiency is baseline

Optional Connected Criteria

- Goal of the Revision
  - 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



Context for Connected Criteria

- Optional: *EVSE do not need to meet these criteria to be certified*
  - Those that do meet will be identified as "connected"
- Architectures for connected EVSE:
  - EVSE service provider aggregates load flexibility from groups of chargers and sells load control as a service
    - For this, the service provider knows what it needs the EVSE to do
  - 3rd party aggregates load control from groups of chargers and sells load control as a service
    - Uniform responses from chargers of various brands makes it easier to integrate chargers, giving customers broader choice of charger brands
  - Utility controls groups of chargers directly
    - Uniform responses from chargers of various brands makes it easier to integrate chargers, giving customers broader choice of charger brands
- ENERGY STAR Connected criteria intended to support the last two cases since standardization isn't needed for the first

Optional Connected Criteria

- **Grid Communications**
  - Open Standard Communication required through use of Open Charge Point Protocol (OCPP), SEP 2.0, CTA-2045A, or OpenADR 2.0
- **Product Requirements**
  - Scheduling – ability for consumers to set and modify a charging schedule
  - Remote Management – capability to receive and respond to consumer authorized remote requests
  - Consumer Feedback – ability to provide at least two types of messages relevant to optimizing energy consumption
  - Consumer Override – capability of vehicle, EVSE, or consumer to override a DR request

Optional Connected Criteria

Demand-Response Requests – the EVSE must support the following open standard defined DR signals:

- **Charge now (Load Up):** If a vehicle is plugged in and it is not fully charged, EVSE will begin charging the vehicle, continuing as normal until the vehicle is fully charged. For use in a case where the scheduling of charging occurs outside of the product, the EVSE service provider has no control over the charging schedule. Both immediate events and events scheduled in advance will be supported.
- **Curtail Charge:** The EVSE will not begin or continue charging at greater than 50% of its maximum rated output power. Both immediate events and events scheduled in advance will be supported.
- **Delay Charge:** The EVSE will not begin or continue charging. Both immediate events and events scheduled in advance will be supported.
- **Return to Normal Operation:** The EVSE will return to default standby mode.

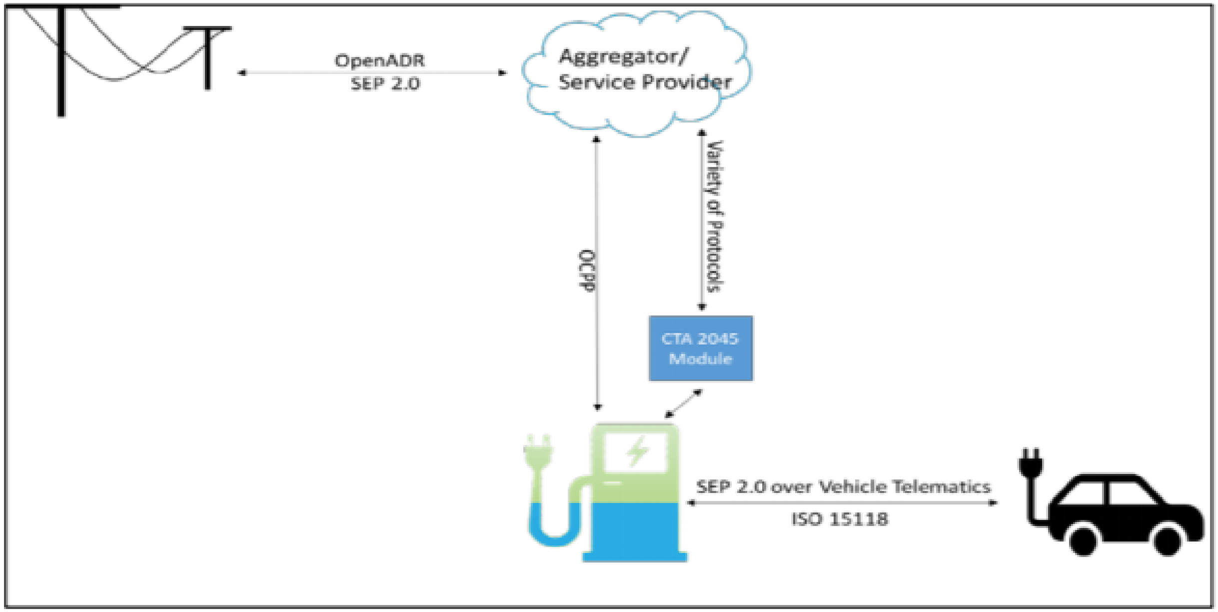
- Appendix A intended to provide a useful framework for aligning these requirements with CTA 2045-A, OpenADR 2.0b, and OCPP

- Are these DR signal appropriate for long dwell time use cases?
- Appropriate percentage level of maximum rated output power to restrict curtailed charge signal?

Informational Appendix – EVSE Communication

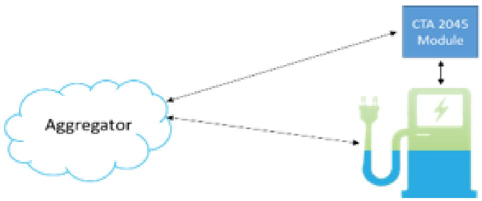
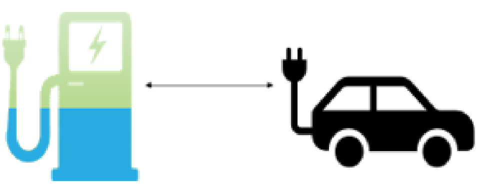
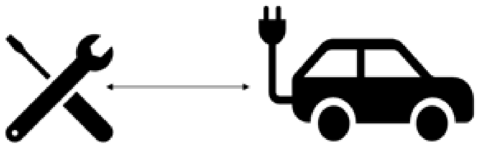
There are different entities involved in the managed charging infrastructure. These include the following:

1. Utility
2. Smart Meter
3. Network Service Provider/ Aggregators
4. Electric Vehicle Supply Equipment
5. Electric Vehicle



Informational Appendix – EVSE Communication

The table below shows some of the open standard messaging protocols that can be used between different entities. Please note that this table is for representative purposes only. EPA encourages the use of different architectures for enhanced savings.

	1. SEP 2.0 (IEEE 2030.5) 2. OCPP 1.6, 2.0 3. OpenADR 2.0* 4. CTA-2045-A* *Used for Managed Charging Particularly
	1. ISO/ IEC 15118 2. SEP 2.0 (IEEE 2030.5)
	1. Vehicle Telematics (Proprietary Protocol) 2. SEP 2.0 (IEEE 2030.5)

Third Party Certification

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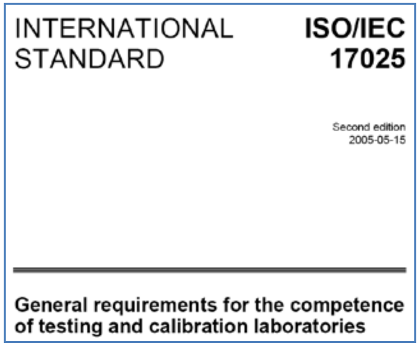
Third Party Certification

- 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.

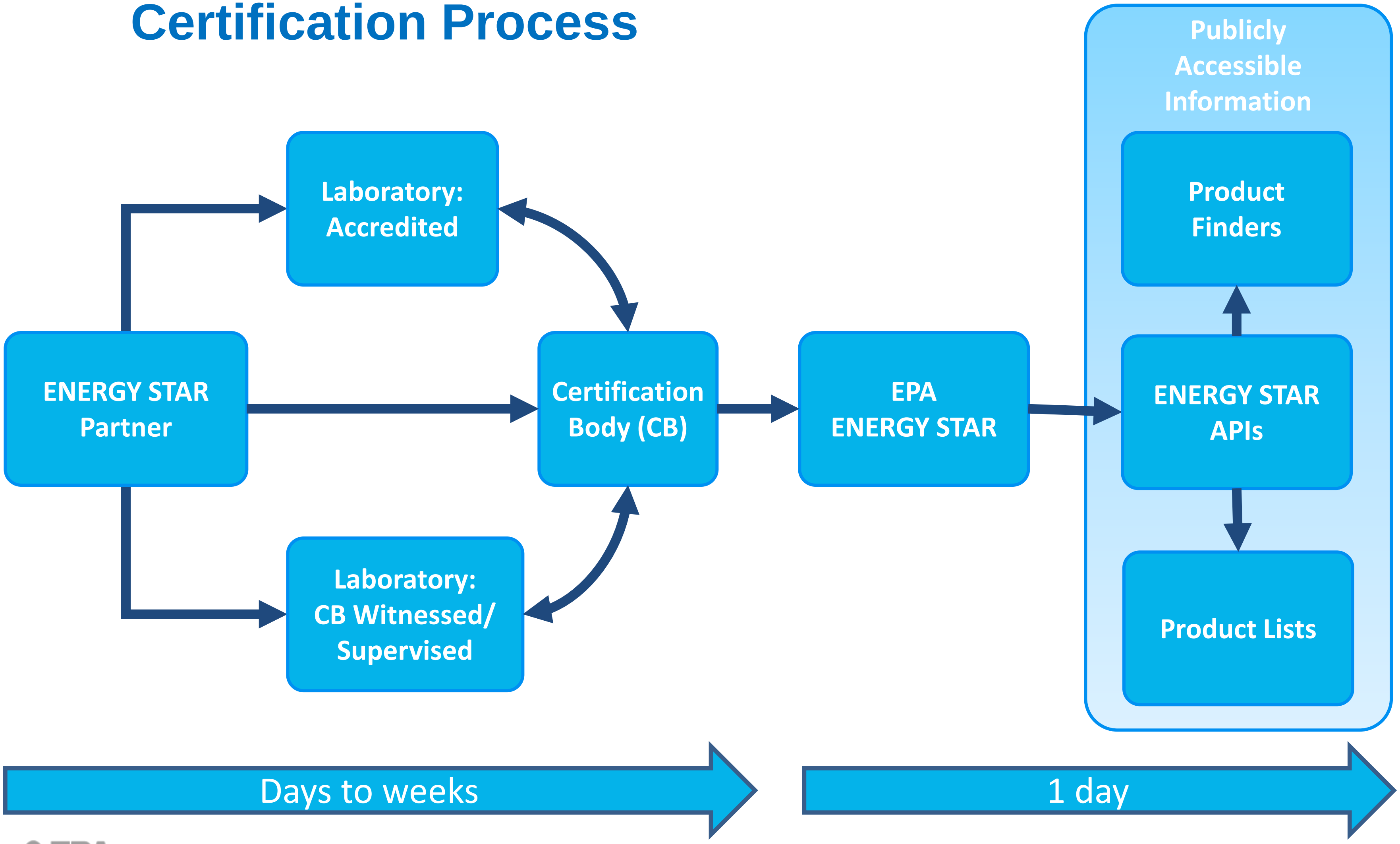

INTERNATIONAL STANDARD

ISO/IEC 17025

Second edition
2005-05-15

General requirements for the competence of testing and calibration laboratories

Certification Process



In-house Laboratory Testing

- As of March 2020, EPA understands that third-party laboratories may lack capacity to test higher-powered DC EVSE
- Now that the ENERGY STAR DC EVSE Test Method is final, 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.

ENERGY STAR EVSE Recognized Bodies for Certification

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

Certification Body	
Org ID	***Name***
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)

Marketing Efforts

Time	Topic
3:00–3:10	Introductions and Specification Development Recap
3:10–3:20	Final Test Method Updates
	• Automatic Brightness Control
	• Loading Conditions Table
3:20–4:25	Draft 1 Specification
	• Definitions
	• Data analysis and Certification Criteria
	• Connected Criteria Updates
	• Savings and Pass Rate
4:25–4:40	Third Party Certification
4:40-4:50	**Marketing Efforts**
4:50–5:00	Timeline and Questions

ENERGY STAR Charging Partners

SemaConnect

blink

LiquidSky Technologies

solaredge

chargepoint

ClipperCreek, Inc.

Webasto

EVBox

LITEON

enel x

Nuvve

Tellus Power Green

loop ev charging network

flo

BTCPower

as of April 2020

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 consumers to purchase ENERGY STAR-certified stations
    - Leverage ENERGY STAR's label awareness - more than 90% recognize the ENERGY STAR label
  - Procure ENERGY STAR EV chargers (e.g., workplace charging, utility owned/operated networks)
- **Confidence in Safety Requirement**
- **Identify Products that use Open Standards for Grid Communication**

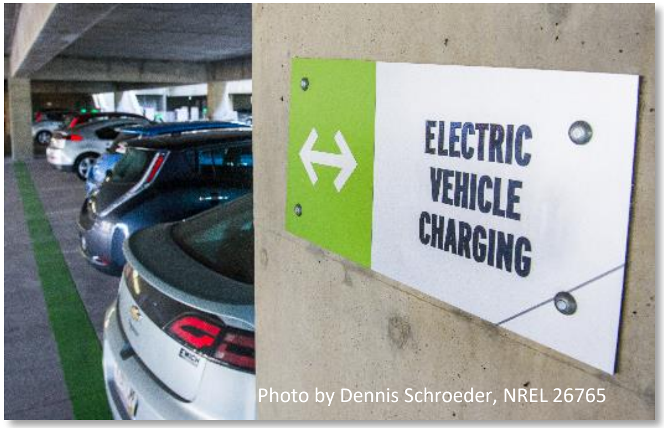


Photo by Dennis Schroeder, NREL 26765

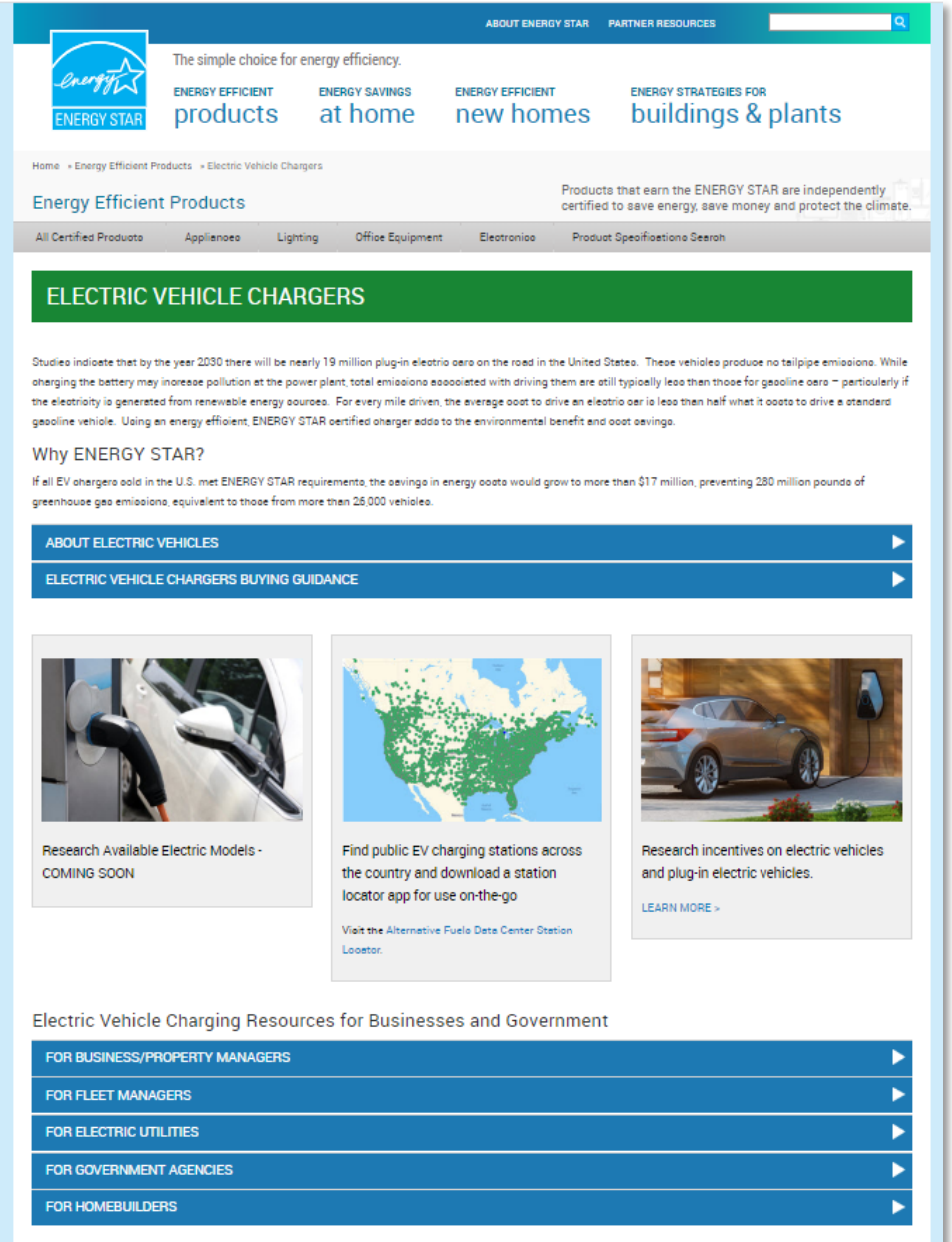
Opportunities to Leverage ENERGY STAR Resources

- **Provide resources and link to the ENERGY STAR EV Chargers Website**
  - Consumer Buying Guidance (Includes link to Qualified Products List)
  - Online Tools:
    - Incentives List for Electric and Plug-in Hybrid Vehicles
    - Locator Tool for Public EV Charging Stations
  - One-pagers for EV-ready Commercial Buildings, Homes, and Charging EVs with Green Power
  - Procurement Language for Fleet Managers
  - COMING SOON: Available Research of Electric Models

- **Incorporate ENERGY STAR into EV Programs**
  - Procure ENERGY STAR EV chargers
  - Highlight ENERGY STAR certified equipment on vendor lists, RFPs

- EPA has engaged with a wide range of stakeholders and encouraged participation in this Version 1.1 process to include DC EVSE into scope

ENERGY STAR. The simple choice for energy efficiency.



ABOUT ENERGY STAR | PARTNER RESOURCES

ENERGY STAR

The simple choice for energy efficiency.

ENERGY EFFICIENT products | ENERGY SAVINGS at home | ENERGY EFFICIENT new homes | ENERGY STRATEGIES FOR buildings & plants

Home » Energy Efficient Products » Electric Vehicle Chargers

Energy Efficient Products

Products that earn the ENERGY STAR are independently certified to save energy, save money and protect the climate.

All Certified Products | Appliances | Lighting | Office Equipment | Electronics | Product Specifications Search

ELECTRIC VEHICLE CHARGERS

Studies indicate that by the year 2030 there will be nearly 19 million plug-in electric cars on the road in the United States. These vehicles produce no tailpipe emissions. While charging the battery may increase pollution at the power plant, total 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 less than half what it costs to drive a standard gasoline vehicle. Using an energy efficient, ENERGY STAR certified charger adds to the environmental benefit 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 $17 million, preventing 280 million pounds of greenhouse gas emissions, equivalent to those from more than 26,000 vehicles.

ABOUT ELECTRIC VEHICLES

ELECTRIC VEHICLE CHARGERS BUYING GUIDANCE

Research Available Electric Models - COMING SOON

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

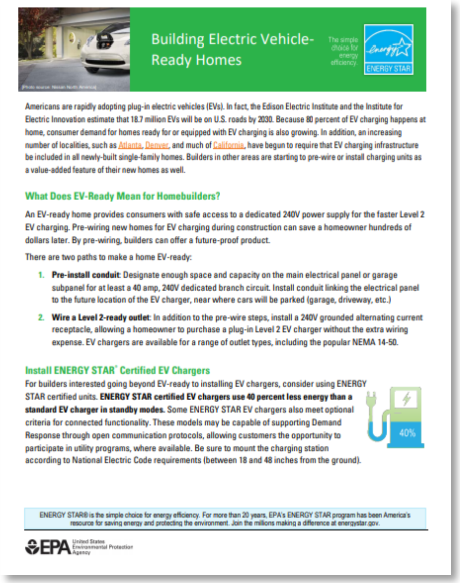
FOR BUSINESS/PROPERTY MANAGERS

FOR FLEET MANAGERS

FOR ELECTRIC UTILITIES

FOR GOVERNMENT AGENCIES

FOR HOMEBUILDERS



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 18.7 million EVs will be on U.S. roads by 2030. Because 80 percent of EV charging happens at home, consumer demand for homes ready for or equipped with EV charging is also growing. In addition, an increasing number of localities, such as Atlanta, Denver, and much 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 240V 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-install conduit**: Designate enough space and capacity on the main electrical panel or garage subpanel for at least a 40 amp, 240V dedicated branch circuit. Install conduit linking the electrical panel to the future location of the EV charger, near where cars will be parked (garage, driveway, etc.)
2. **Wire a Level 2-ready outlet**: In addition to the pre-wire steps, install a 240V 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 outlet 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 a standard EV charger in standby modes.** Some ENERGY STAR EV chargers also meet optional criteria for connected functionality. These models may be capable of supporting Demand Response through open communication protocols, allowing customers the opportunity to participate in utility programs, where available. Be sure to mount the charging station according to National Electric Code requirements (between 18 and 48 inches from the ground).

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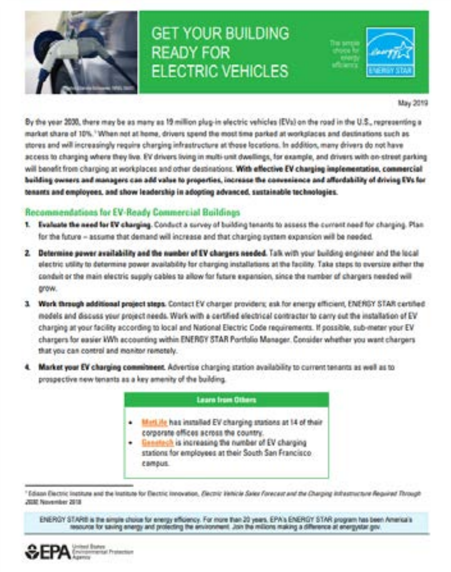
EPA United States Environmental Protection Agency



GET YOUR BUILDING READY FOR ELECTRIC VEHICLES

May 2019

By the year 2030, there may be as many as 19 million plug-in electric vehicles (EVs) on the road in the U.S., representing a market share of 10%.[1] 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 living in multi-unit dwellings, for example, and drivers with on-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 affordability of driving EVs for tenants and employees, and show leadership in adopting advanced, sustainable technologies.**

Recommendations for EV-Ready Commercial Buildings

1. **Evaluate 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 oversize either the conduit or the main electric supply cables to allow for future expansion, since the number of chargers needed will grow.
3. **Work through additional project steps.** Contact EV charger providers; ask 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, sub-meter your EV chargers for easier kWh accounting within ENERGY STAR Portfolio 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 to prospective new tenants as a key amenity of the building.

Learn from Others

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

[1] Edison Electric Institute and the Institute for Electric Innovation, *Electric Vehicle Sales Forecast and the Charging Infrastructure Required Through 2030*, November 2018

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EPA United States Environmental Protection Agency

EPA

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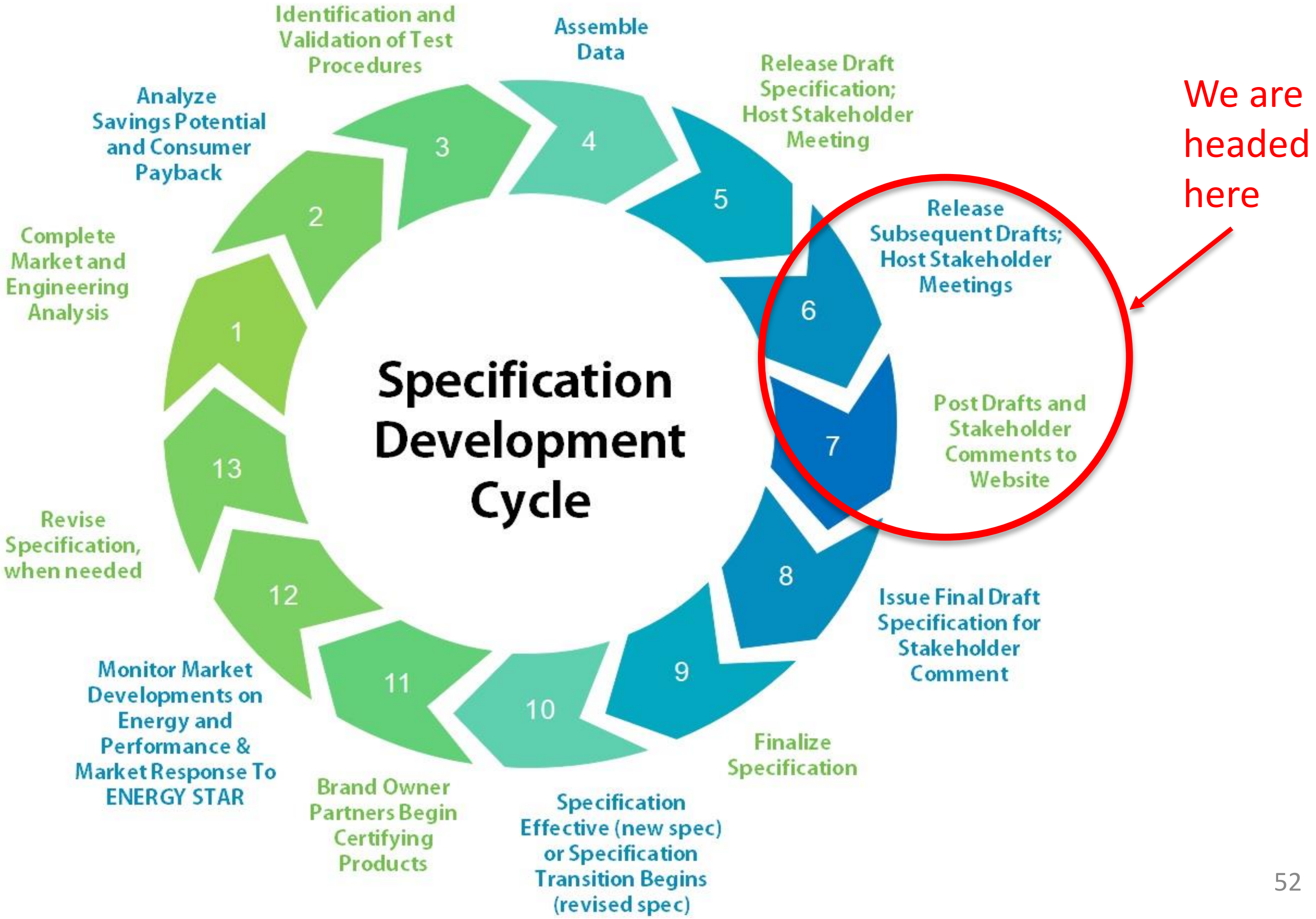
Next Steps


Specification Development Cycle
1
Complete Market and Engineering Analysis
2
Analyze Savings Potential and Consumer Payback
3
Identification and Validation of Test Procedures
4
Assemble Data
5
Release Draft Specification; Host Stakeholder Meeting
6
Release Subsequent Drafts; Host Stakeholder Meetings
7
Post Drafts and Stakeholder Comments to Website
8
Issue Final Draft Specification for Stakeholder Comment
9
Finalize Specification
10
Specification Effective (new spec) or Specification Transition Begins (revised spec)
11
Brand Owner Partners Begin Certifying Products
12
Monitor Market Developments on Energy and Performance & Market Response To ENERGY STAR
13
Revise Specification, when needed
We are headed here

Next Steps

Event	Date
Discussion Guide Published and Webinar	*May/June 2018*
Test Method Working Session #1 and #2	*August and September 2018*
Draft 1 Test Method Published and Webinar	*November 2018*
Draft 2 Test Method Published and Webinar	*June 2019*
Final Draft Test Method Published and Data Assembly	*September 2019*
Draft 1 Specification and Final Test Method Published	June 11, 2020
Draft 1 Specification and Final Test Method Webinar	June 29, 2020
Draft 1 Specification Written Comments Due	**July 27, 2020**
Subsequent Drafts of Specification Published	**September – December 2020**
Version 1.1 Effective Date	**January 2021***

* Given the current circumstances, EPA is extending normal comment period deadlines to allow stakeholders additional time to provide comments. This proposed effective date reflects that.

Comments

- Again, comments and data are due on **July 27, 2020.**
- Please send all comments to:

EVSE@energystar.gov

- Unless marked as confidential, all comments will be posted to the EVSE product development page at www.energystar.gov/products/spec/electric_vehicle_supply_equipment_pd
- Accessible through www.energystar.gov/NewSpecs and clicking on “Version 1.1 is in development” under “Electric Vehicle Supply Equipment”

Thank you!

- To be added to EPA's stakeholder distribution list to receive specification updates, please email EVSE@energystar.gov

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