



# **ENERGY STAR Certified Electric Vehicle Charging Stations**

**Energy Efficiency Program Sponsors Webinar**

Peter Banwell, *U.S. EPA*

August 7, 2018

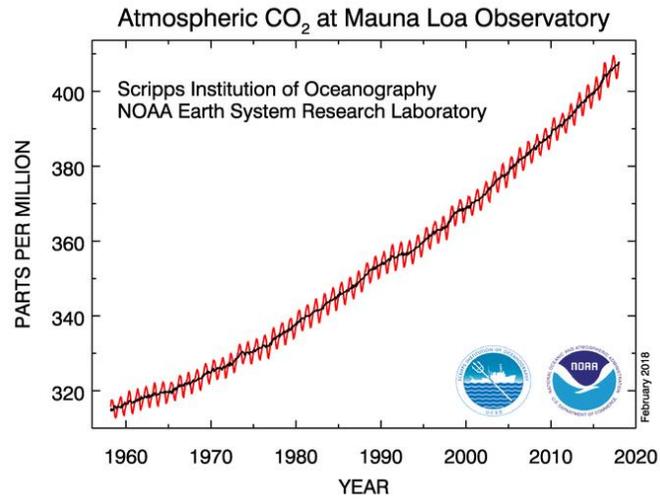


## Agenda

- Why Electric Vehicles
- Electric Vehicle Market Indicators
- What are the Energy Efficiency Opportunities
- What is the ENERGY STAR Specification Today
- What is Next for the ENERGY STAR Specification
- How can EEPS Benefit and Get Involved
- **Partner Highlight: EVBox**

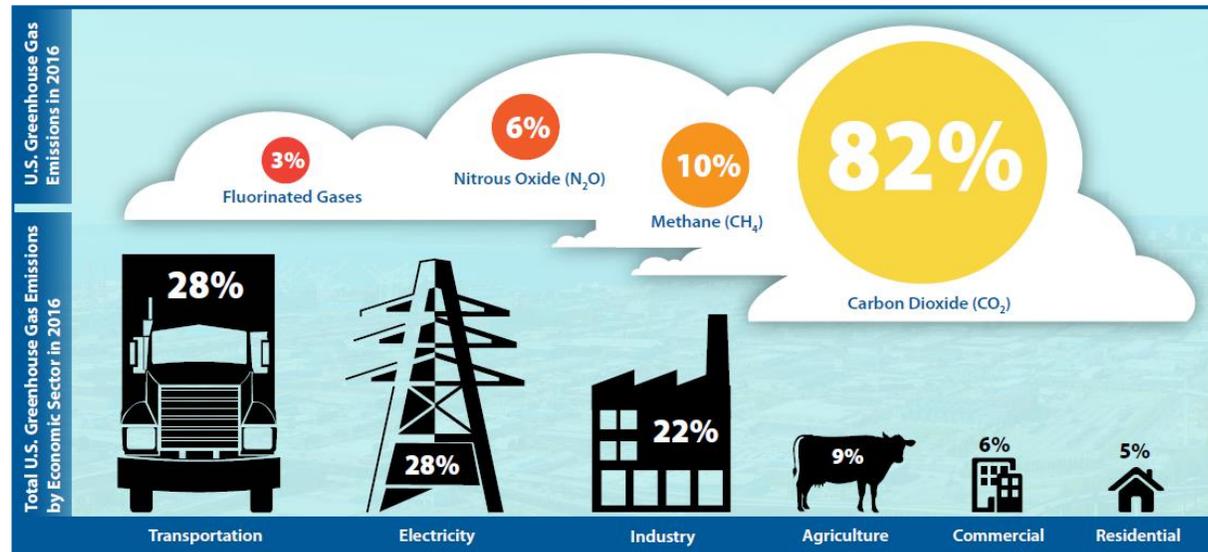
# Why Electric Vehicles

## Atmospheric CO<sub>2</sub> continues to climb



Source: NOAA

## Transportation is now the largest GHG source in the U.S.



Source: EPA, *Fast Facts from the Inventory of U.S. GHG Emissions and Sinks: 1990-2016*



## Electric Vehicle Market Indicators

### Participant Question

Q: Approximately how many plug-in passenger vehicles are on the road in the United States today?

- A. 250,000
- B. 500,000
- C. 855,000
- D. 1,000,000



## Electric Vehicle Market Indicators

### Participant Question

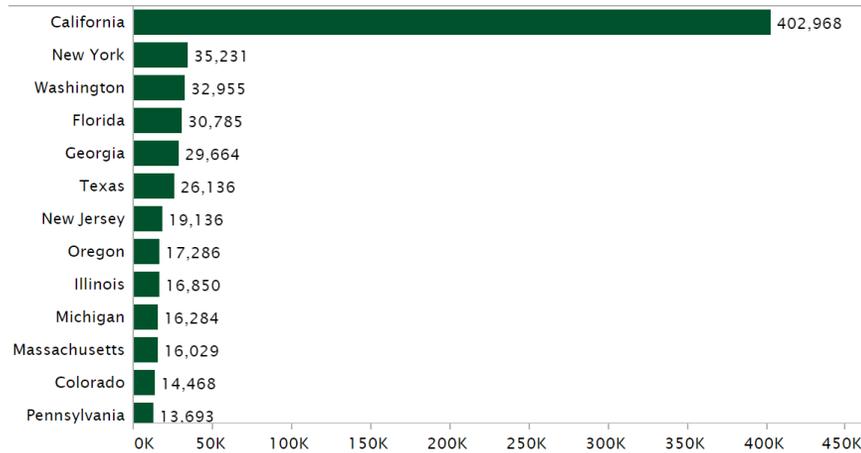
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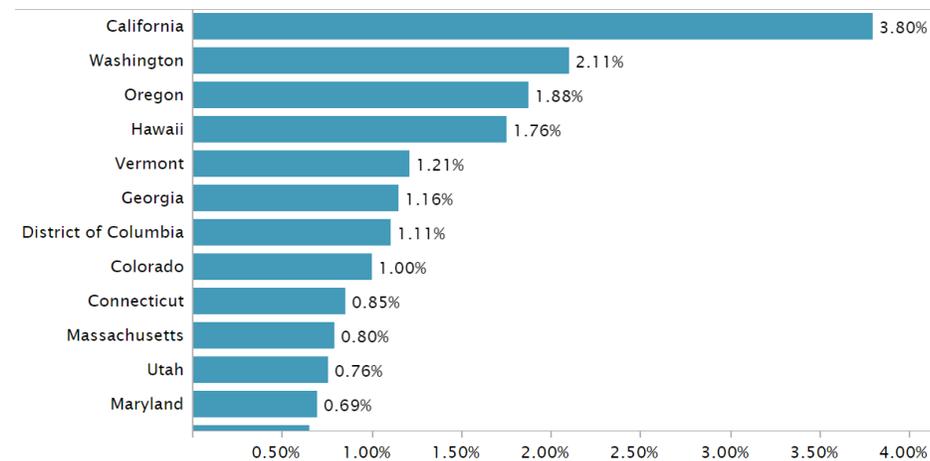


# Electric Vehicle Market Indicators

## Top States by EV Sales



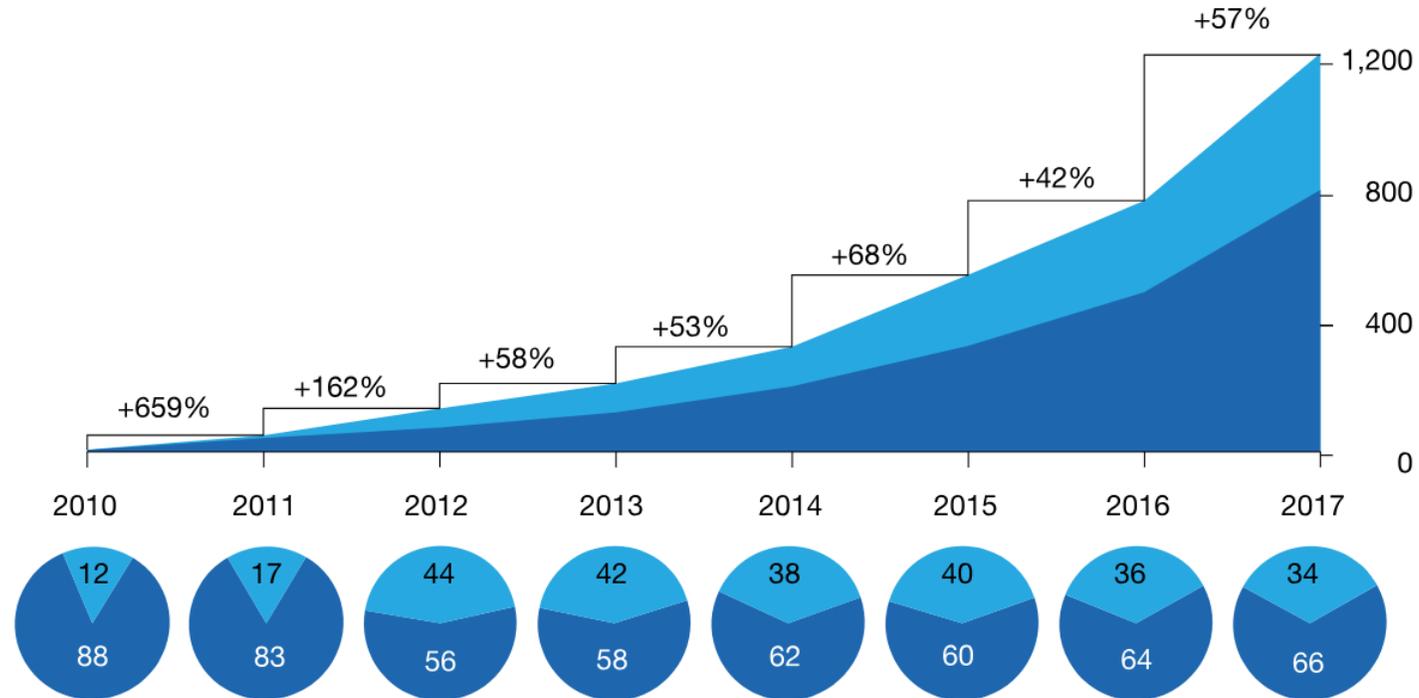
## Top States by EV Market Share



# Electric Vehicle Market Indicators

■ Plug-in hybrid-electric vehicle
 ■ Battery-electric vehicle

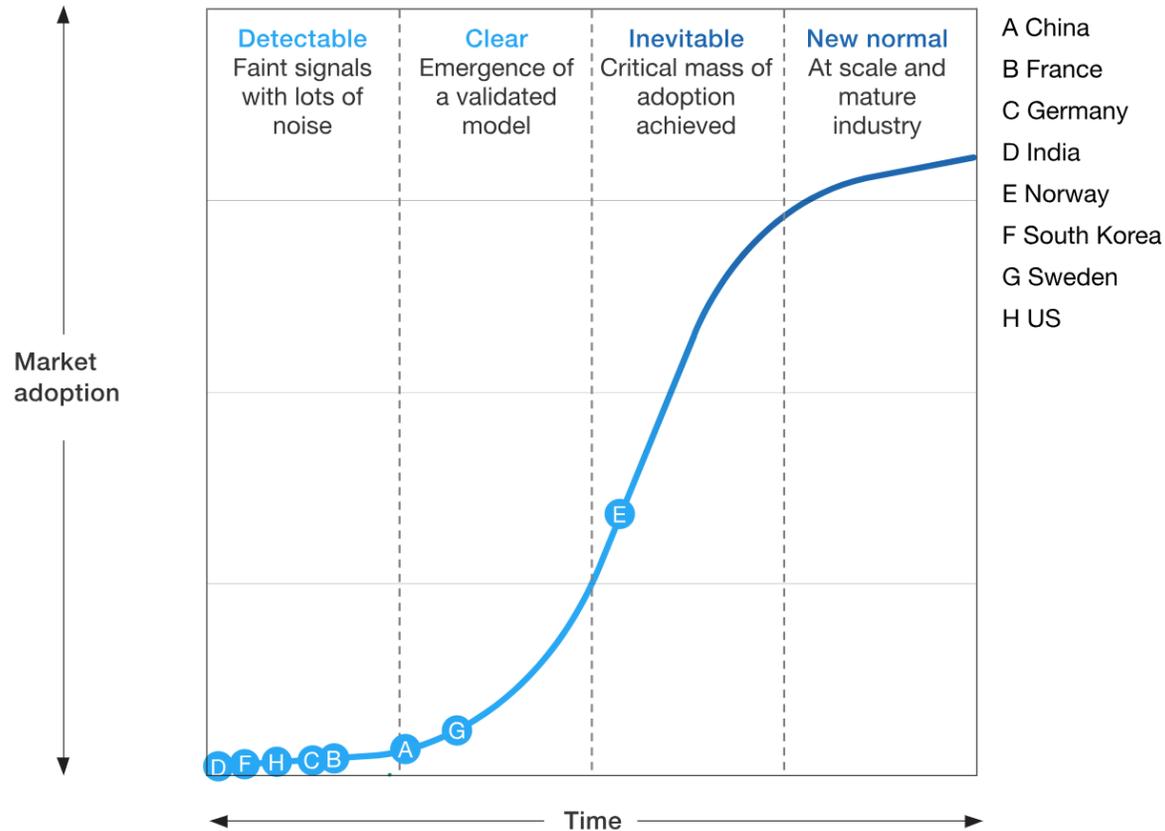
Global electric-vehicle sales, 2010–17, thousands, CAGR<sup>1</sup>





# Electric Vehicle Market Indicators

The 4 stages of a disruptive trend—focus on electric-vehicle market adoption

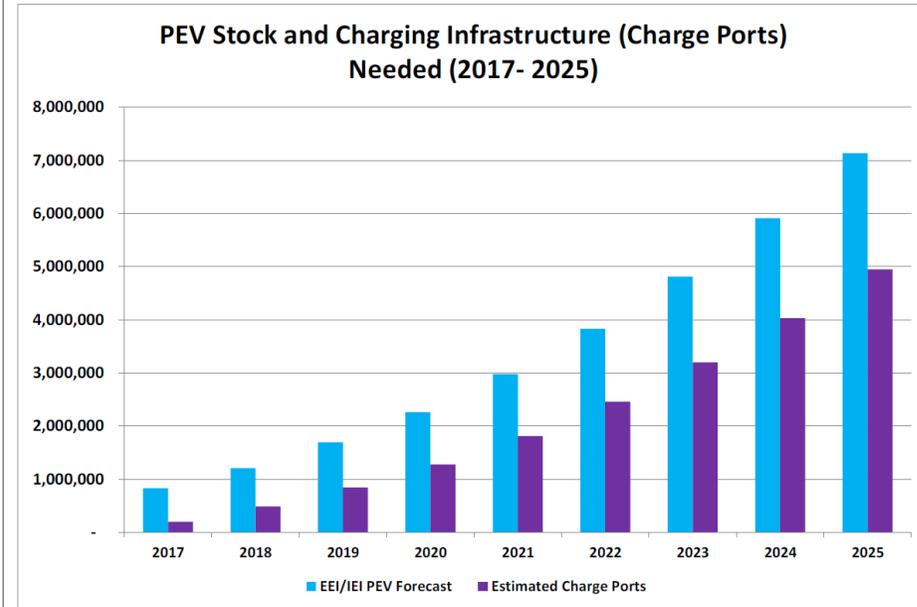
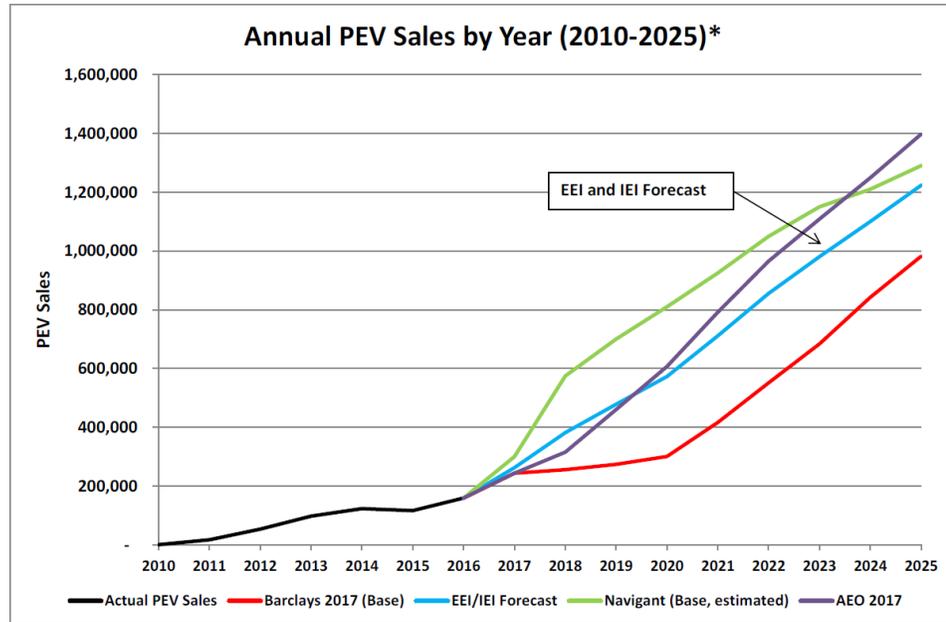


Source: Chris Bradley, Martin Hirt, and Sven Smit, *Strategy Beyond the Hockey Stick*, McKinsey, 2018

Source: McKinsey, "The global electric-vehicle market is amped up and on the rise," May 2018



# Electric Vehicle Market Indicators

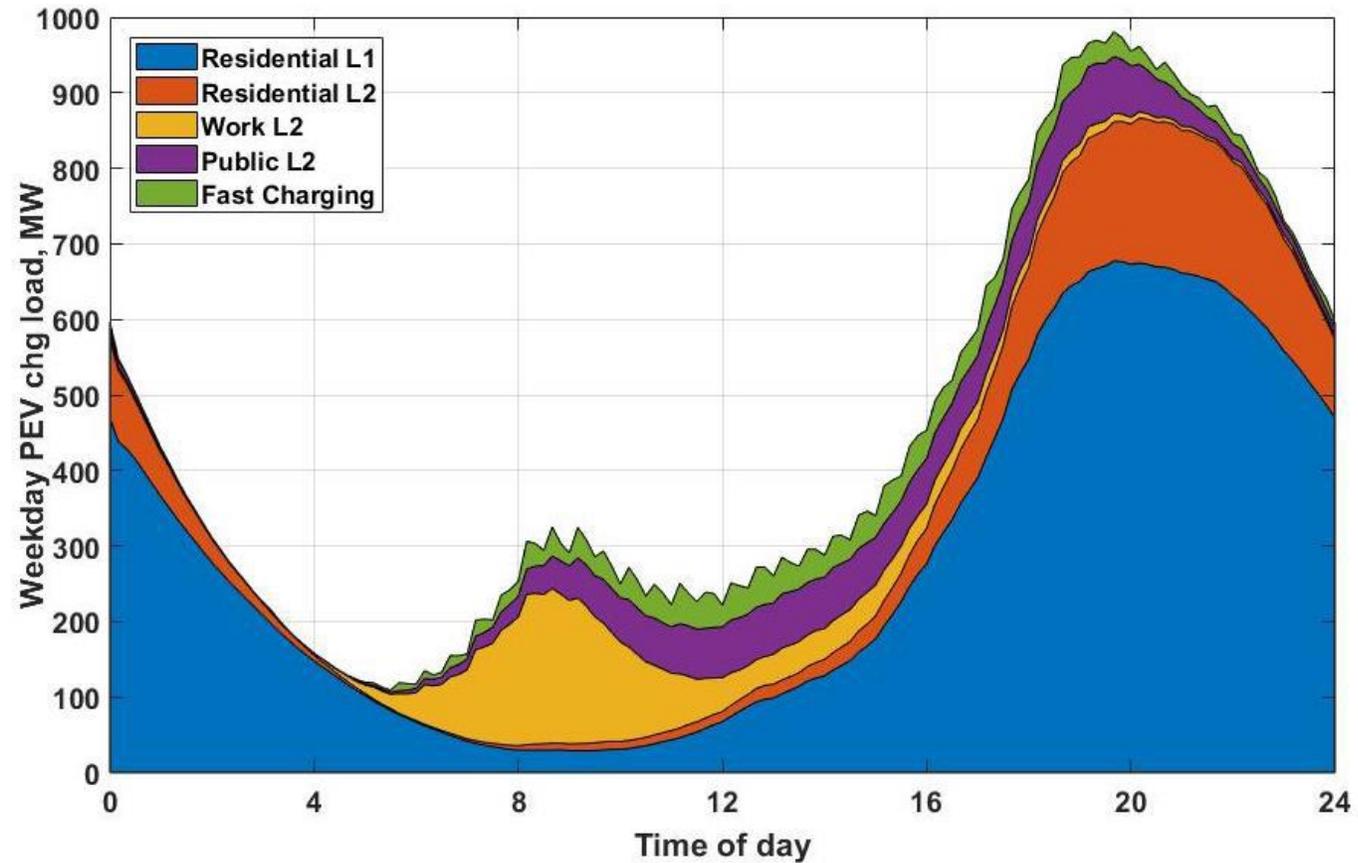


\*Includes battery electric vehicles and plug-in hybrid electric vehicles

**EEI and IEI say 7 million EVs on the road by 2025...**

**...and 5 million charge ports needed to support them.**

## The Utility Risks of Waiting to Take Control of the Load



## What are the Efficiency Opportunities in AC Charging

- Level 2 EV chargers are 98%+ efficient during steady state charge

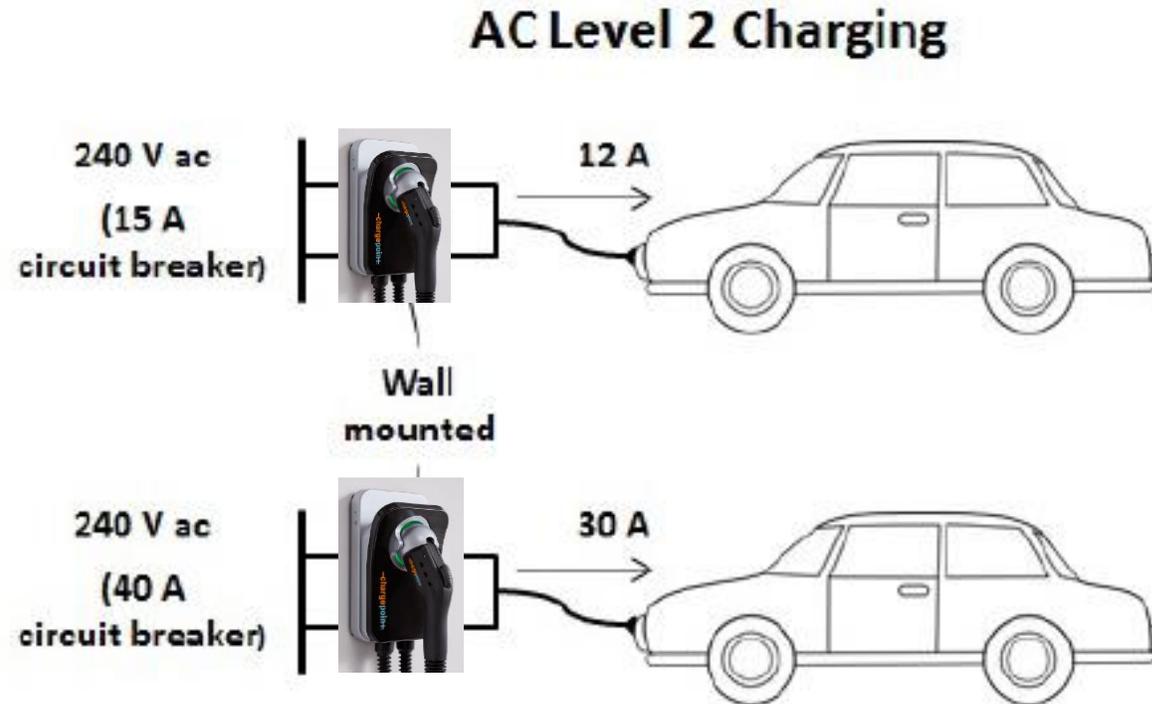
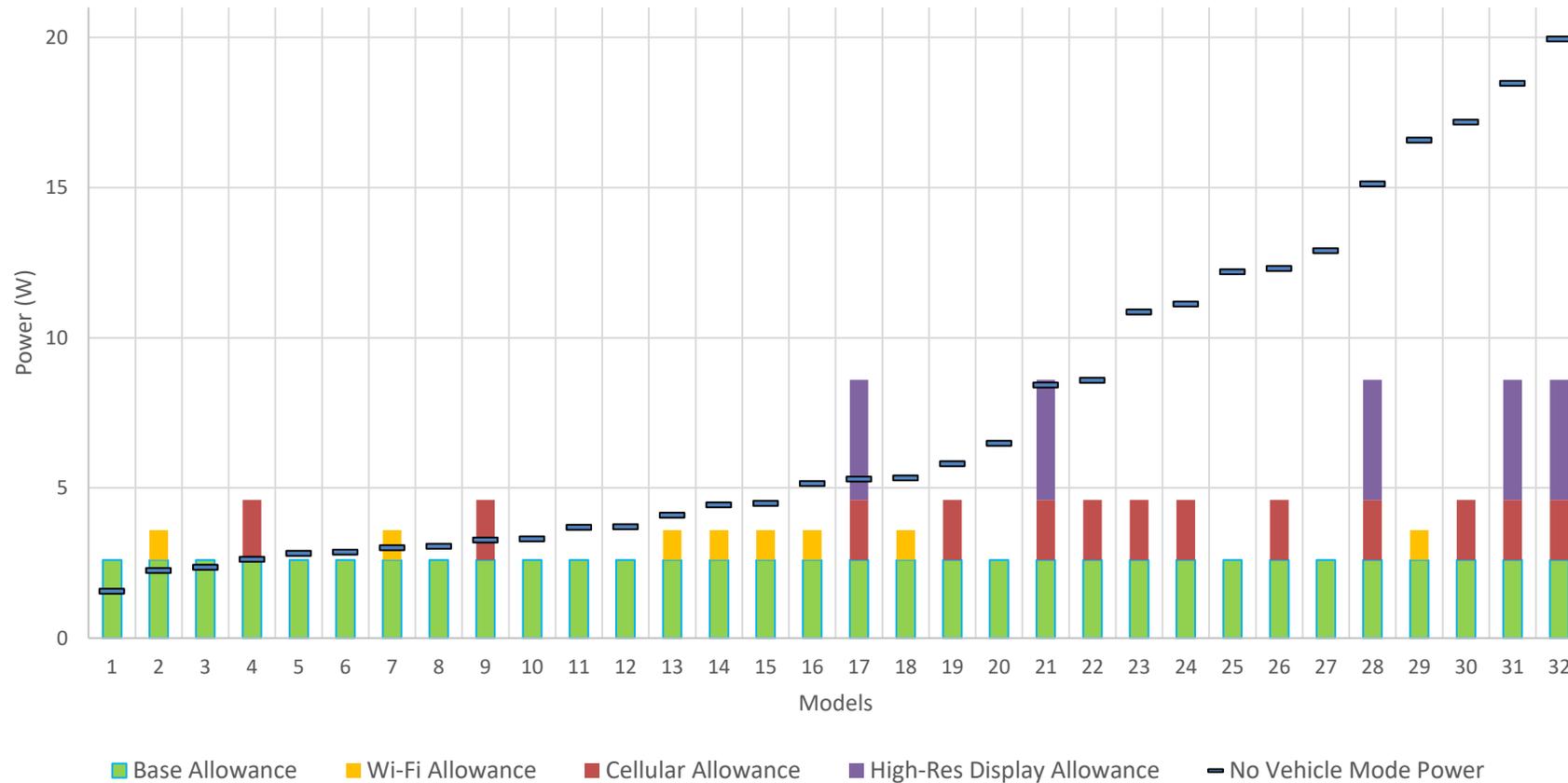


Image Source: National Research Council, *Overcoming Barriers to Deployment of Plug-in Electric Vehicles*, 2015



# What are the Efficiency Opportunities in AC Charging



## What is the ENERGY STAR Specification Today

### Key Features:

1. Energy Savings, 40% in Standby Modes
2. Safety
3. Open Communications

### Communications Details:

- Grid Communications
- Open Access
- Consumer Override





## Which EV Chargers are Qualified Products

### Brand Name ⓘ

- AeroVironment, Inc. (3)
- Blink (2)
- ChargePoint (7)
- EV-Box North America Inc (1)
- LiquidSky Technologies, Inc. (3)

16 products

See the latest:

[www.energystar.gov/productfinder/product/certified-evse/results](http://www.energystar.gov/productfinder/product/certified-evse/results)

# What is Next for the ENERGY STAR Specification

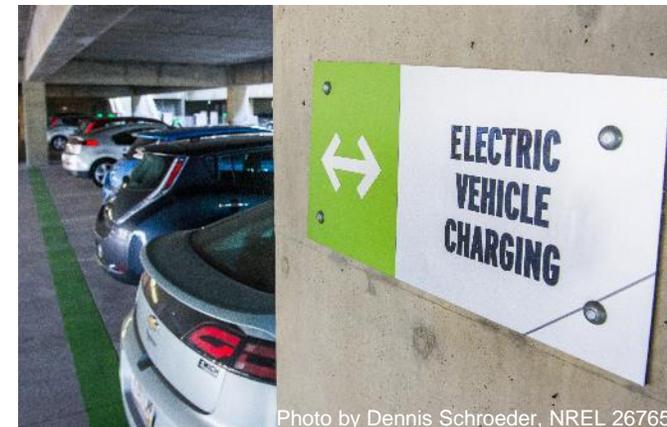


## Efficiency Opportunity:

- Active Charging % Efficiency
- Minimizing heating and cooling
- Standby Losses – display, lighting, network

## How Can EEPS Benefit

- **Save Energy**
  - incentivize consumer ENERGY STAR purchases
  - procure ENERGY STAR EV chargers (e.g., workplace charging)
- **Inform Program Developments**
  - Version 1.1 stakeholder process
- **Educate Consumers**
  - energy efficient product options
  - EV-related best practices



## How Can EEPS Benefit

- **Leverage Resources**
  - [www.energystar.gov/products/other/evse](http://www.energystar.gov/products/other/evse)
    - buying guidance, links to tools, incentives search
    - best practices for home builders, building managers (*coming soon*)
- **Learn from Others**
  - incentive program elements
    - *Example: Indiana Michigan Power*
  - electricity rate design
    - *Example: Tucson Electric Power*





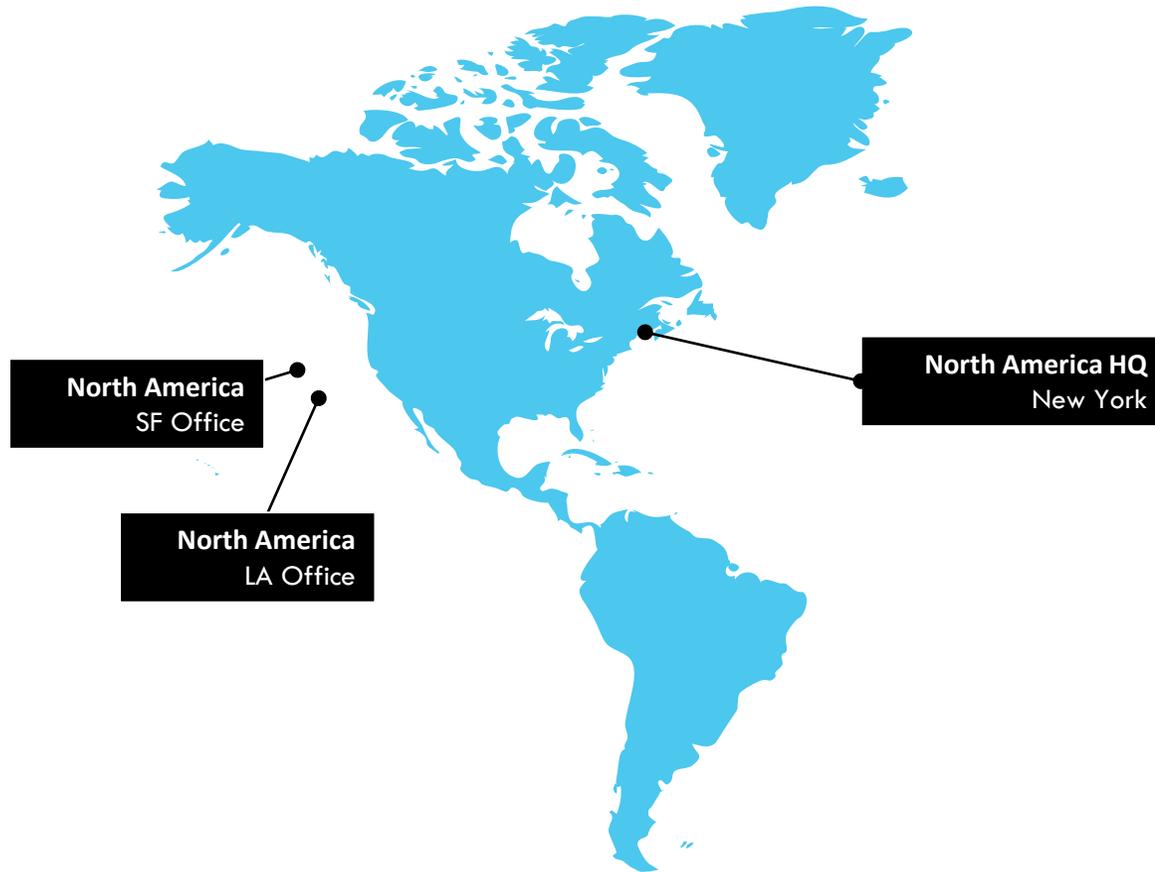
# Partner Highlight: EVBox



Meet EVBox



# EVBox in North America



**+60K**  
charging  
points  
worldwide

**+45**  
Countries  
equipped

**+36M**  
kWh charged  
in 2017

**+35**  
Distribution  
partners in North  
America

# Our charging solutions



# Our portfolio

Modular, smart & future-proof.

NETWORK SERVICES



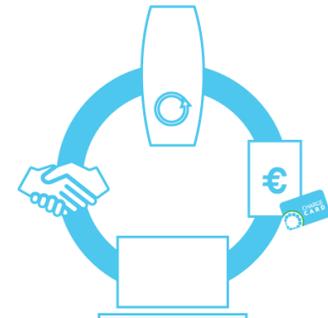
CHARGING MANAGEMENT

NA CHARGING STATIONS FOR  
HOME AND BUSINESS



CHARGING STATIONS

INSTALLATION & MAINTENANCE  
PUBLIC CHARGING & OCPP



E-MOBILITY SERVICES



# BusinessLine



Up to 7.4kW



Wall or pole mount



1 or 2 ports



3G



Fixed cable



Smart Charging



RFID reader



Open Charge Point Protocol (OCPP)



NEMA 3R rated



**RoHS  
Compliant**



32A /7.4kW output / OCPP 1.2-1.5-1.6 compliant, Open ADR-enabled



# What is OCPP?

and why you should care

- The Open Charge Point Protocol (OCPP) is an open application protocol which allows EV charging stations and central management systems from different vendors to communicate with each other.
- Charging station owners, or hosts, are less vulnerable to vendor lock-in. This allows you to choose the network option that works best for you.
- **OCPP makes sure that you can switch between hardware and software providers without your investment becoming obsolete.**

## You're flexible

- Choose between any hardware and software provider

## You're in charge

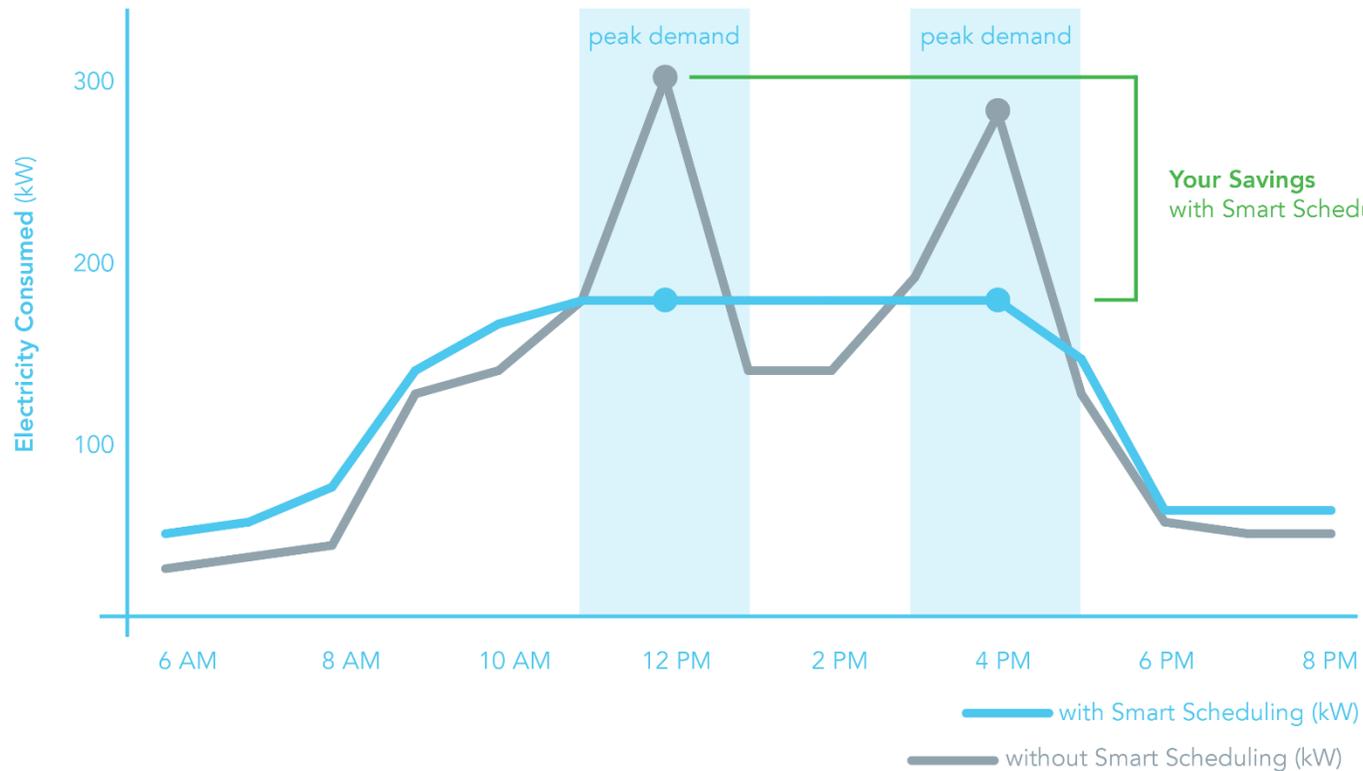
- Switch between service providers at any time

## You're smart

- Competition between service providers drives down prices while promoting innovation



# Smart Charging



EVBox Smart Charging services optimize our charging stations by creating and distributing the available power in an energy-efficient and flexible manner.

Our Smart Charging services include many top technologies such as **Load Balancing, Smart Queue, and Hub / Satellite.**



# Full future product family



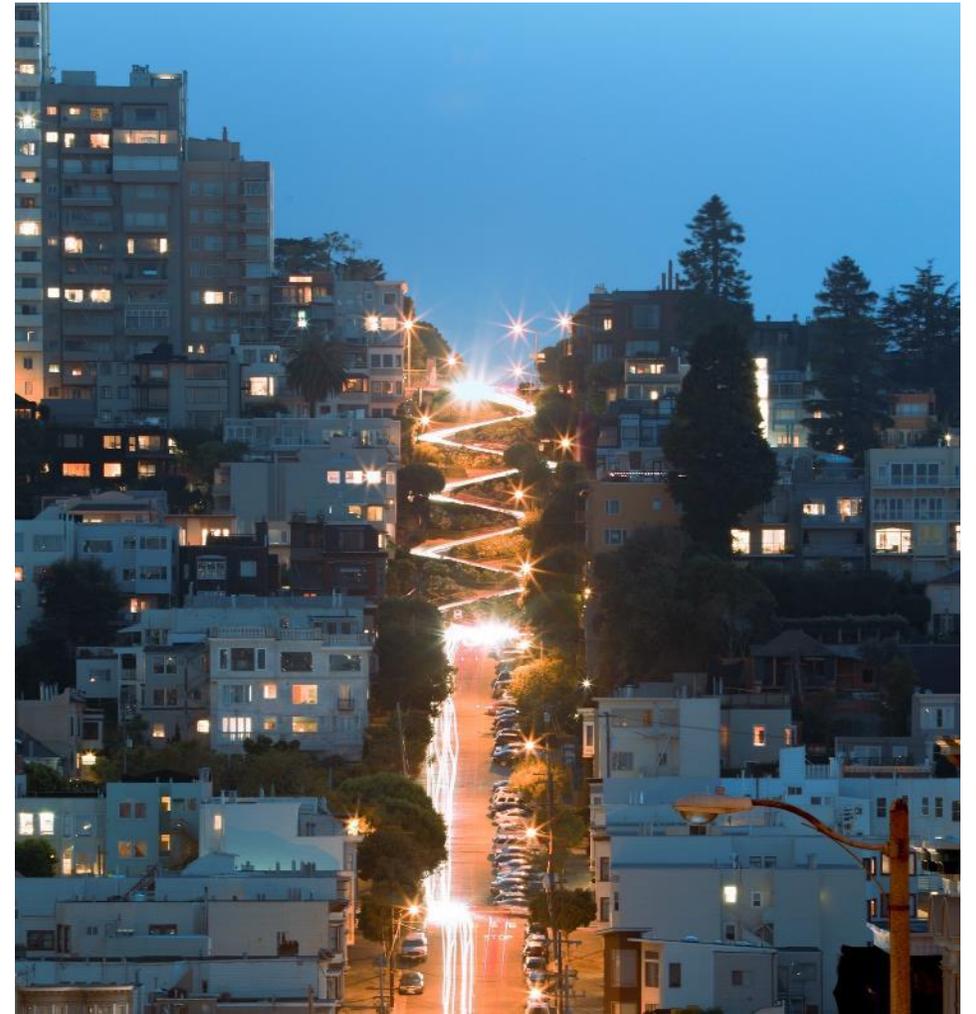


# EV Charge Network from PG&E

Pacific Gas and Electric (PG&E) released an EVSE incentive program called the EV Charge Network in 2017, and EVBox was selected to provide 2760 EVSEs for the program in which the utility retains ownership of the stations.

## A few reasons why:

- Years of experience working with utilities
- Hardware approved for major utility programs
- Hardware is open standard
- Smart Charging features = Low operational cost
- Open ADR compliant
- Strong financial backing (acquired by Engie)
- Feature rich product at a mid-market price





# EVBox and ENERGY STAR®

- **What ENERGY STAR® means to end users**
  - Proven efficiency standard – educated purchase
  - Use available energy responsibly – saves money
  - Enhance brand image – bolsters public perception
- **What ENERGY STAR® means to EVBox**
  - Recognized as energy efficient – brand alignment
  - Improves image as a sustainable partner – competitive advantage
  - Widely recognized product certification – builds customer trust





# Acronyms

- **BEV:** Battery Electric Vehicle
- **EV:** Electric Vehicle
- **EVSE:** Electric Vehicle Supply Equipment
- **EVCS:** Electric Vehicle Charging Station
- **ICE:** Internal Combustion Engine
- **kWh:** Kilowatt-Hour
- **PEV:** Plug-in Electric Vehicle
- **PHEV:** Plug-in Hybrid Electric Vehicle
- **Port:** Plug
- **ZEV:** Zero-Emission Vehicle
- **OCPP:** Open Charge Point Protocol
- **ADR:** Automated Demand Response



# Contact EVBox



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Drive electric, charge everywhere.

[evbox.us](https://evbox.us)



## Thank You!

For more information on the specification or to see the products that qualify, go to: [energystar.gov/products/other/evse](https://energystar.gov/products/other/evse)

Please see the information and contacts below for:

- ENERGY STAR EEPS Resources, [https://www.energystar.gov/index.cfm?c=reps.pt\\_reps](https://www.energystar.gov/index.cfm?c=reps.pt_reps)
- ENERGY STAR-certified EV chargers, contact Peter Banwell ([Banwell.Peter@epa.gov](mailto:Banwell.Peter@epa.gov), 202-343-9408)
- EVBox, contact Megha Lakhchura ([megha.lakhchaura@ev-box.com](mailto:megha.lakhchaura@ev-box.com), 310-309-7775)