ENERGY STAR. The simple choice for energy efficiency.

ENERGY STAR® Certified Electric Vehicle Charging Stations

Peter Banwell, U.S. EPA

September 10, 2019

Electric Vehicle & Charging Basics

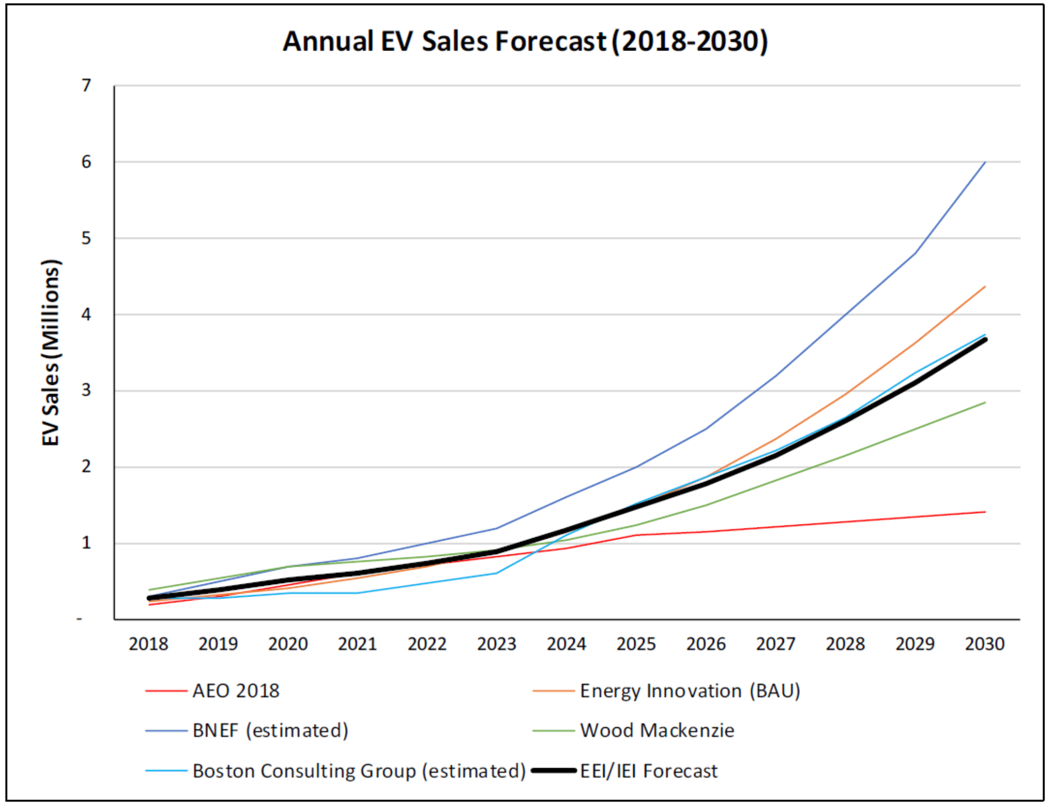
	Power Source	All-Electric Range*	Examples
Plug-in hybrid electric vehicle (PHEV)		10-50+ miles	Chevy Volt BMW i8 Prius Prime
All-electric or battery electric vehicle (BEV)		Up to 300+ miles	Tesla models Nissan Leaf BMW i3

**as of August 2019*

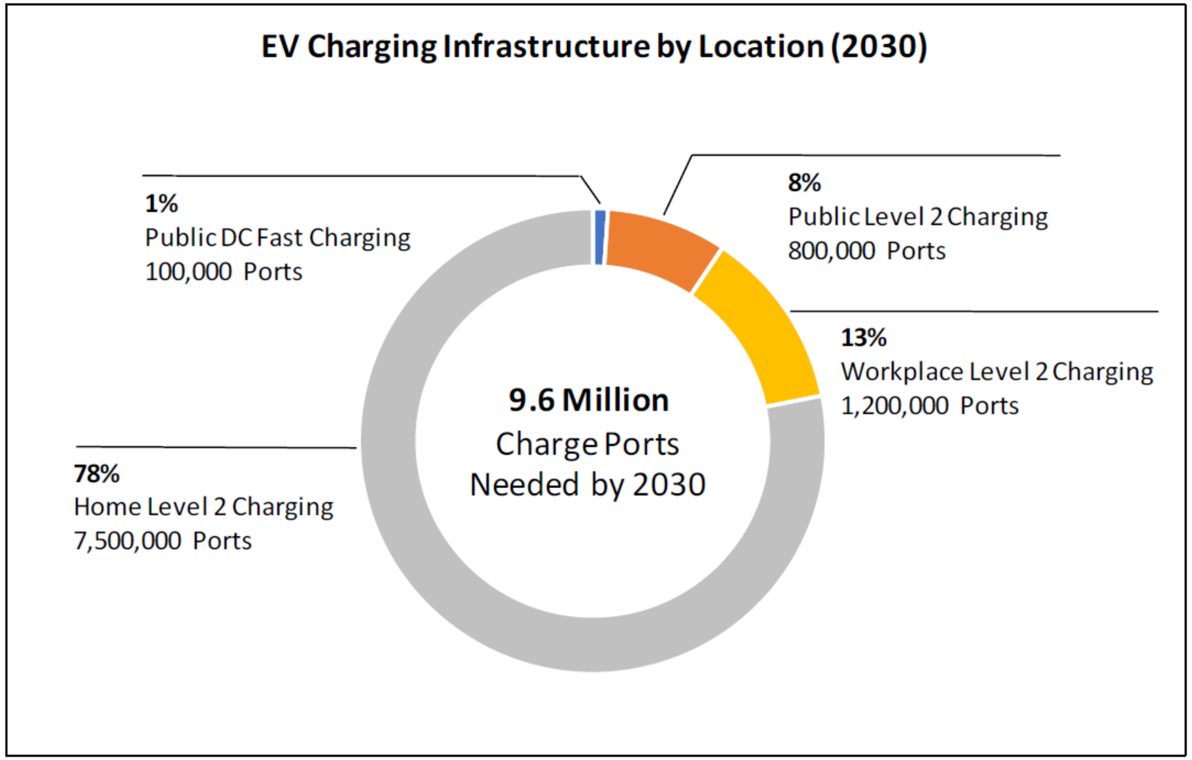
Electric Vehicle & Charging Basics

	Electric Current	Charging Rate	Connector(s)
Level 1	Alternating current (AC) 120 volt (V), 20 amp (A)	2 to 5 miles of range per hour of charging	J1772 
Level 2	AC 208/240V, 30A	10 to 20 miles of range per hour of charging	J1772 
DC Fast	Direct current (DC) 208/480V, 80-200A (and higher)	60 to 80 miles of range per 20 minutes of charging (for 50kW)	J1772 Combo (CCS)  CHAdeMO  Tesla 

Electric Vehicle Market Indicators



EEI and IEI say nearly 19 million EVs on the road by 2030…



…and more than 9.5 million charge ports needed to support them.

Source: EEI and IEI, *Electric Vehicle Sales Forecast and the Charging Infrastructure Required Through 2030, November 2018*

Efficiency Opportunities in AC Charging

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

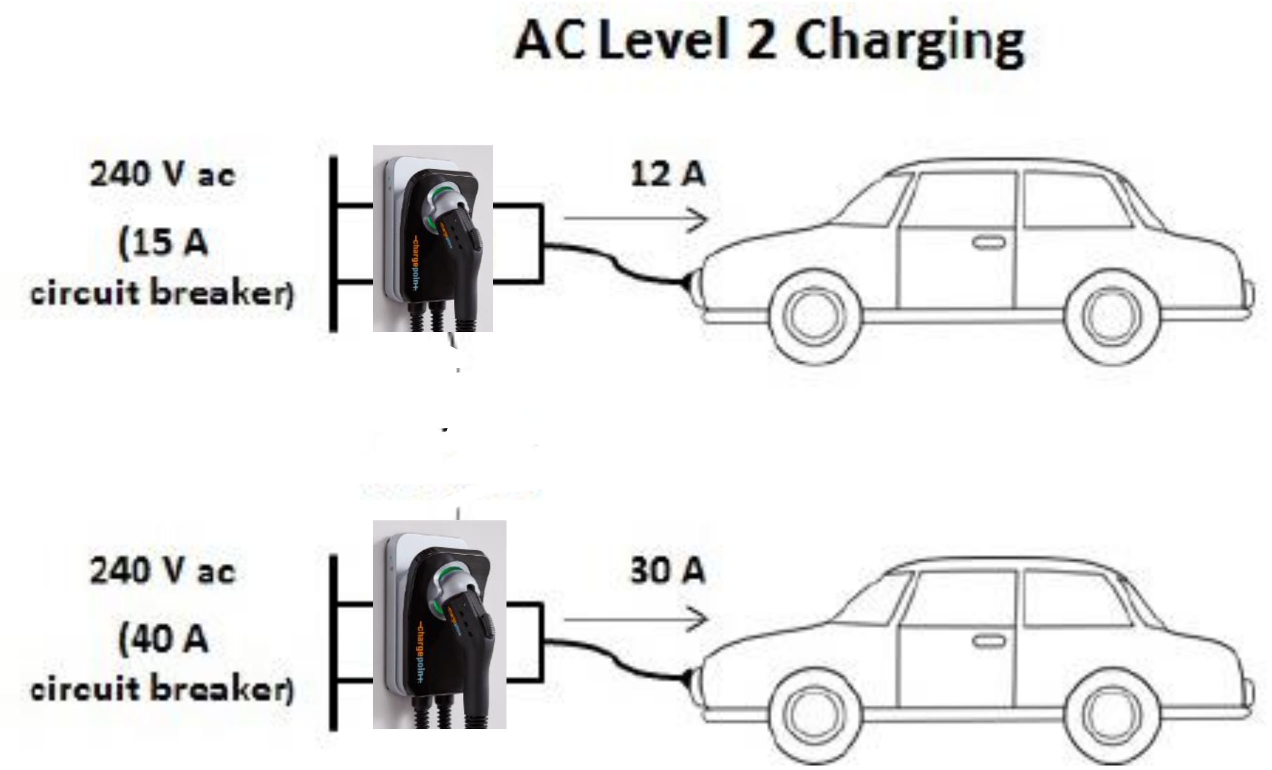
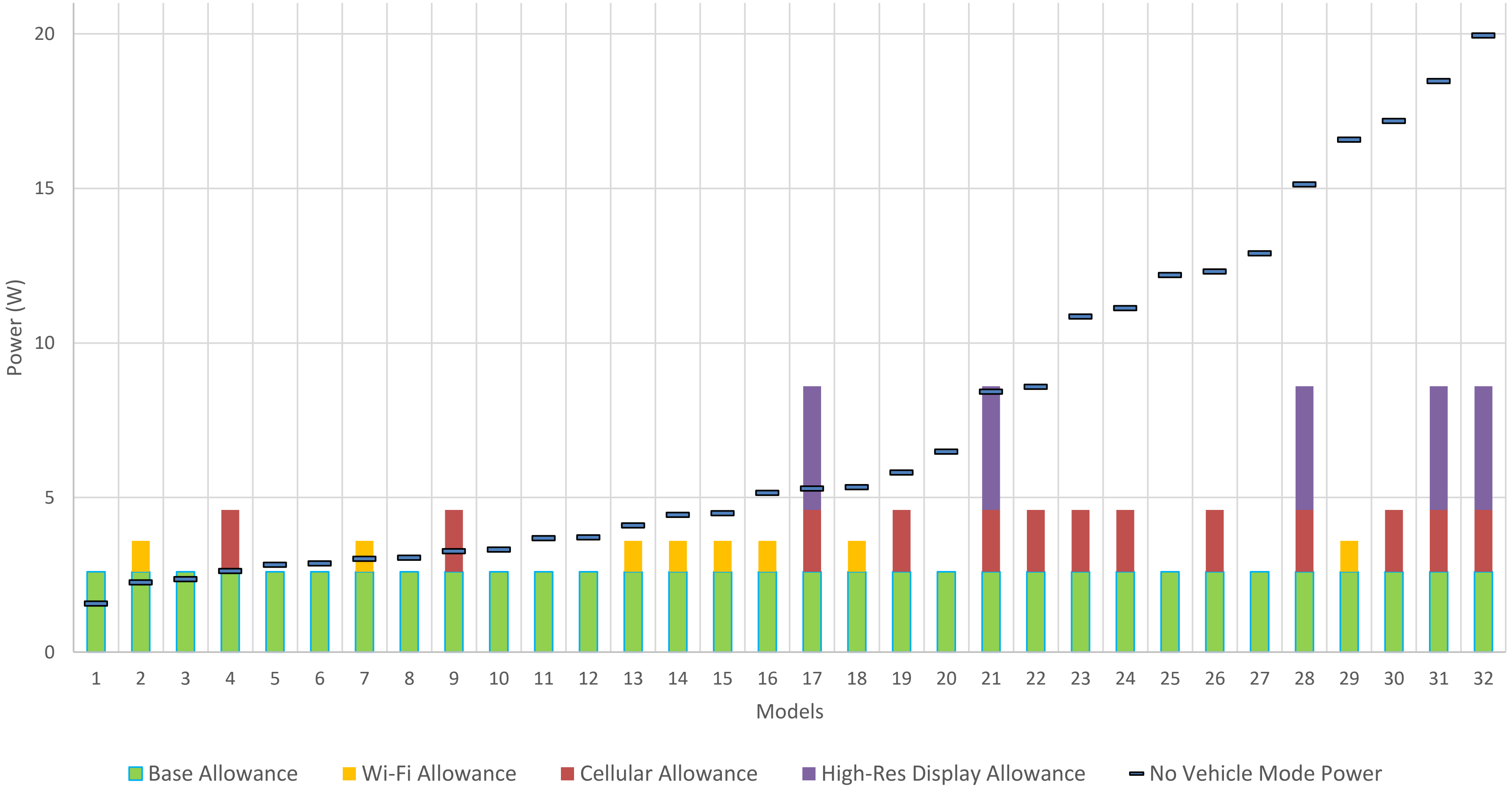


Image Source: National Research Council, *Overcoming Barriers to Deployment of Plug-in Electric Vehicles*, 2015

Efficiency Opportunities in AC Charging

Opportunity for energy savings in standby mode, when the vehicle is not actively charging



ENERGY STAR Version 1.0 Specification Today

Scope:

- ✓ AC Level 1
- ✓ AC Level 2
- ✓ AC Dual Input L1/L2

Key Features:

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

Communications Details:

- Grid Communications
- Open Access
- Consumer Override

Photo by Dennis Schroeder, NREL 39251

ENERGY STAR Charging Partners

blink

LiquidSky Technologies

SemaConnect

chargepoint

solaredge

EVBOX

eMotorWerks

Webasto

as of August 2019

Marketing Efforts

Guaranteed efficiency

Charging stations require energy — so at least make sure they're using it effectively. Every ENERGY STAR certified charging station promises to reduce energy waste during at least 85% of its lifetime. That means, when an EVBox station is not in use, neither is your energy.

Increasing Brand Awareness + Visibility

- Label use by partners (e.g., EVBox)
- Industry media (e.g., CHARGED Magazine)
- Conference, webinar participation (e.g., Roadmap, EPA State & Local)
- Materials development (e.g., EV-ready homes bulletin)


THE INFRASTRUCTURE

HOW EV CHARGING STATIONS EARN ENERGY STAR CERTIFICATION

By Peter Banwell, Senior Manager, EPA

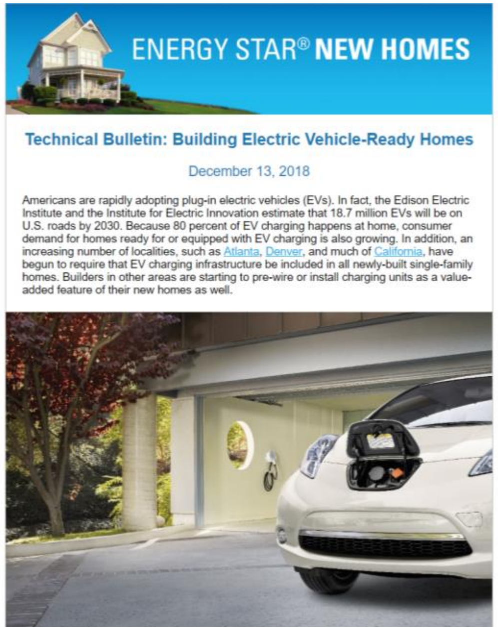
ENERGY STAR-certified charging stations use 40% less energy in standby mode, on average, than standard stations.

The EPA is now beginning the process for adding DC fast charging stations to the list of possible qualified products.

64 CHARGED

JAN/FEB 2018 65

66 CHARGED


ENERGY STAR® NEW HOMES

Technical Bulletin: Building Electric Vehicle-Ready Homes

December 13, 2018

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.

Partnerships & Collaborations

California Energy Commission

- California Electric Vehicle Infrastructure Project (CALeVIP)
- All Level 2 EV charging equipment must be ENERGY STAR certified

ENERGY STAR® Certification Process

Among the California Energy Commission's (CEC) core responsibilities are achieving energy efficiency and transforming transportation. The CEC is committed to ensuring that electric vehicle (EV) charging equipment installed under the California Electric Vehicle Infrastructure Project (CALeVIP) is energy efficient. By certifying your equipment with ENERGY STAR, you are taking an important step in helping the CEC make this commitment. That's why the CEC is requiring that all eligible vendors for CALeVIP provide proof of ENERGY STAR certification before they can have their equipment placed on the list of approved EV charging equipment.

If your equipment is not already ENERGY STAR certified, you can start the process now and your equipment will be added to the CALeVIP Eligible Equipment List when it receives certification, assuming that it meets all other equipment requirements. Follow the three steps outlined below to gain approval from the CEC.

Step One — Complete and submit the ENERGY STAR Partnership Agreement

A. To begin your application for ENERGY STAR, fill out an ENERGY STAR Partnership Agreement.
B. Once the Partnership Agreement is completed, obtain and fill out an ENERGY STAR Participation Form for Product Brand Owner document.
C. Email the completed forms to join@energystar.gov or mail to:

ENERGY STAR
c/o ICF International
1725 Eye Street, NW, Suite 1000
Washington, DC 20006

Partnerships & Collaborations

- **State Agencies** (additional examples)

- **Utilities** (examples)

ENERGY STAR Version 1.1 Specification

- Key topics that will be addressed in the specification:
  - **Criteria to recognize energy efficiency in DC EV charging stations:**
    - ✓ Active charging % efficiency
    - ✓ Minimizing heating and cooling
    - ✓ Standby losses – display, lighting, network

- Progress to date:
  - Draft 2 test method released June 2019


Source: Cnet

Collaboration Opportunities

- **Educate Others about ENERGY STAR EV Chargers**
  - link to resource, qualified products list (www.energystar.gov/products/other/evse)
- **Incorporate the ENERGY STAR into EV Programs**
  - procure ENERGY STAR EV chargers
  - highlight ENERGY STAR certified equipment on vendor lists, RFPs
- **Inform Program Developments**
  - Version 1.1 DC EVSE stakeholder process
    - Provide comments on test method
    - Contact evse@energystar.gov to be added to the distribution list

Contact the ENERGY STAR EV Charger Team with Questions

- Questions related to ENERGY STAR marketing/promotion:
  - Peter Banwell: Banwell.Peter@epa.gov
  - Stacy Noblet: Stacy.Noblet@icf.com

- Questions related to ENERGY STAR specification development:
  - James Kwon: Kwon.James@epa.gov
  - Emmy Feldman: Emmy.Feldman@icf.com

Photo by Kendall Septon, NREL 45635

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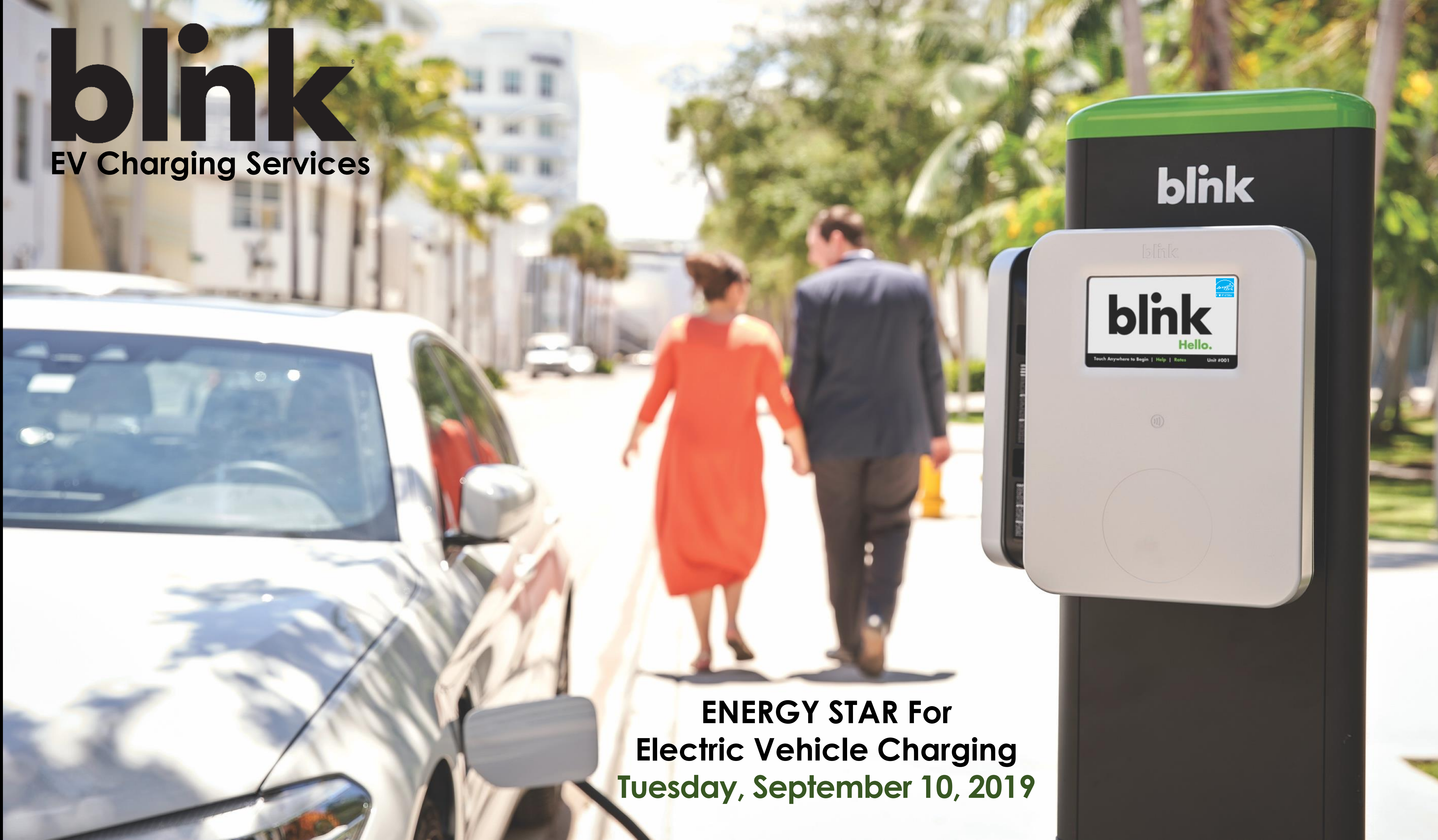
EV Charging Services



ENERGY STAR For Electric Vehicle Charging

Tuesday, September 10, 2019

What We Do

Design, manufacture, sell and deploy Blink EV charging stations, creating destinations for EV drivers

Own, operate, and maintain a nationwide network of EV charging stations under long-term agreements with property partners and have deployed over 15,000 units

Generate revenue by charging EV drivers to power their cars, selling EV charging hardware, and providing network connectivity and payment processing for our property partners

Nationwide Locations

Open to All Drivers

- Governmental
- Entertainment
- Retail
- Hospitality
- Realty
- Education
- Healthcare
- Energy
- Corporate
- Transportation

Nearly 100,000 registered Blink members

15,000+ EV charging stations deployed throughout the U.S.

Blink Locations

Every Parking Space is an Opportunity

84% of consumers prefer to buy from environmentally conscious businesses.

Cone Communications/Ubiquity Global CSR Study

77% of renters report that it is important their building is green.

Green Renters Survey, HD Supply Facilities Management

43% of electric car drivers are likely to return each week to retail locations with EV charging.

Blink Charging Co. Network Data

92% of people looking for a new job would rather work for a company that is perceived as 'environmentally friendly'.

Monster.com

Types of Charging Stations - US

AC Charging Stations

AC Level 1:

- 120 Volts AC Single Phase
- Up to 16 Amps
- Up to 1.9 kW Charge Rate
- Typically Limited to 12 Amps
- ~4 miles Per Hour of Charging

AC Level 2:

- 208/240 Volts AC Single Phase
- Up to 80 Amps
- Up to 19.2 kW Charge Rate
- Typically 32, 40, or 80 Amps
- ~25 to 55 miles Per Hour of Charging

DC Fast Charging Stations (DCFC)

- 208 or 480 Volts AC 3-Phase In

DC Level 1:

- 200-450 Volts DC Out
- Up to 80 Amps
- Up to 36 kW Charge Rate
- ~80% Charge in 50 minutes

DC Level 2:

- 200-450 Volts DC Out
- Up to 200 Amps
- Up to 90 kW Charge Rate
- ~80% Charge in 30 minutes

DC Level 3:

- 200-600 Volts DC Out
- Up to 400 Amps
- Up to 240 kW Charge Rate

Sources:
https://www.deltaww.com/Products/
https://www.tesla.com/supercharger

Family of New Generation 2 Products

RESIDENTIAL

Level 2

HQ 100
Home Charging Unit

COMMERCIAL

Level 2

Advanced | Kiosk | Smart

IQ 200 Commercial Charging Units

Pedestals

DC Fast Charger

DC Fast Commercial Charging Units

A New Generation of Level 2 Charging Stations

Blink IQ 200 Level 2 AC EV Charging Station Family

- Network connected charging stations
- Fastest Level 2 charging available:
  up to 80 Amps (19.2kW)
- Designs to suit different needs:
  Advanced, Kiosk, and Smart
- Tracks energy usage
- Flexible Installation: Wall or Pedestal Mount
- Blink OCPP and OCPP 1.6J support
- Flexible installation on any size circuit breaker from 15 to 100 Amps with 80% output at the port
- **ENERGY STAR Certified**

Load Sharing / Management Capabilities

If a site has only 80A of service available, the current can be shared between multiple units.

Policies:

- Uniform Distribution
- FIFO
- Priority
- Others in Future

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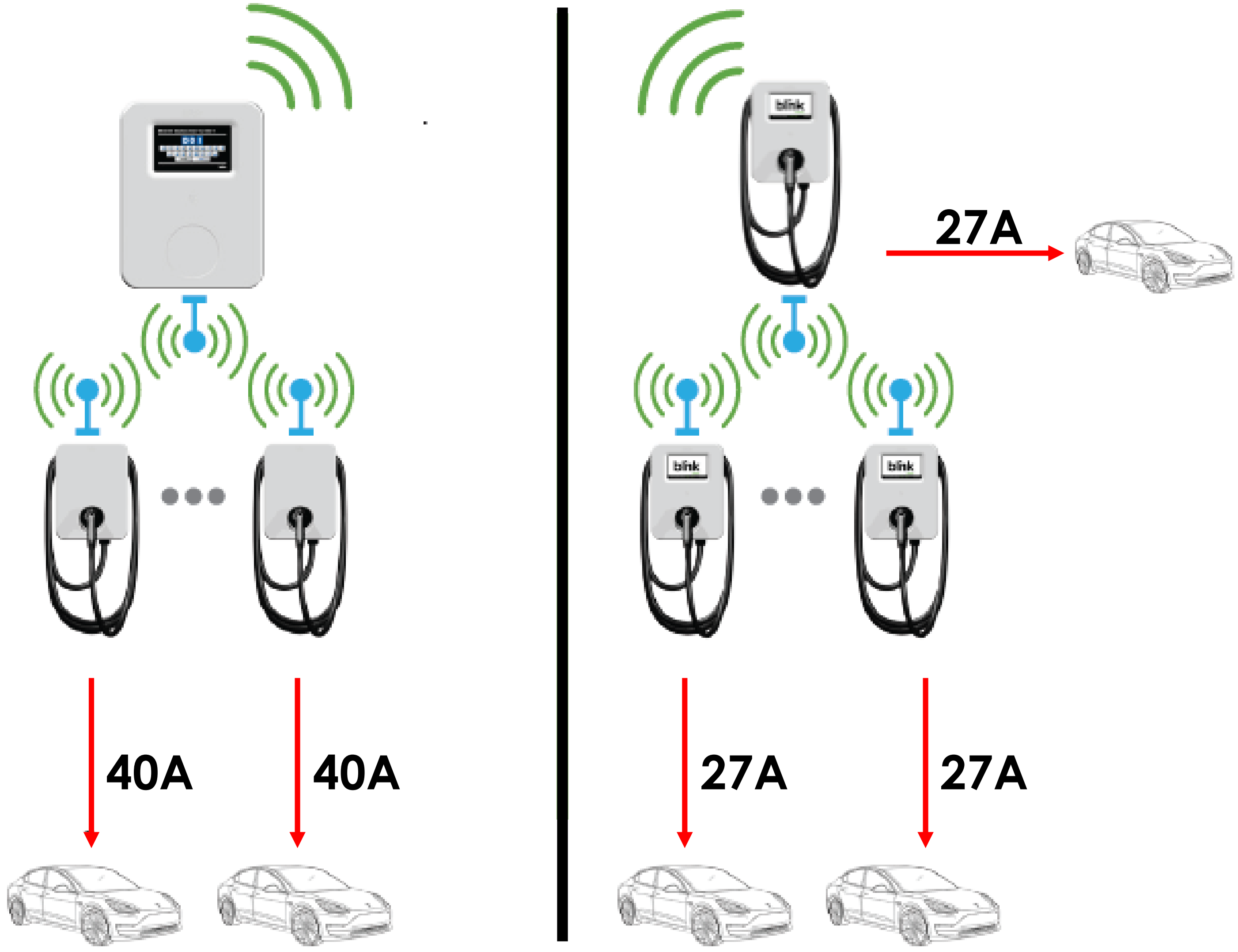
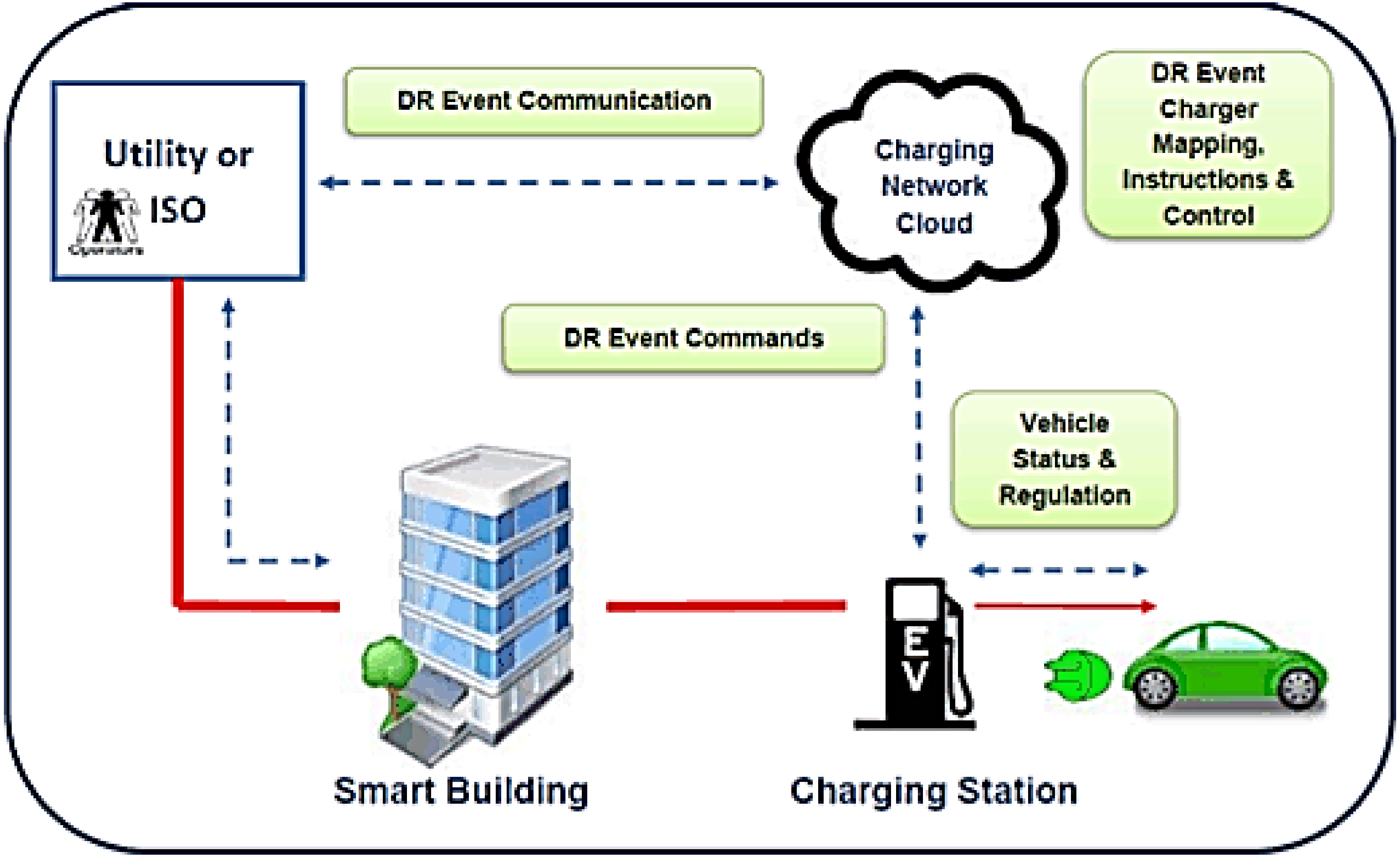


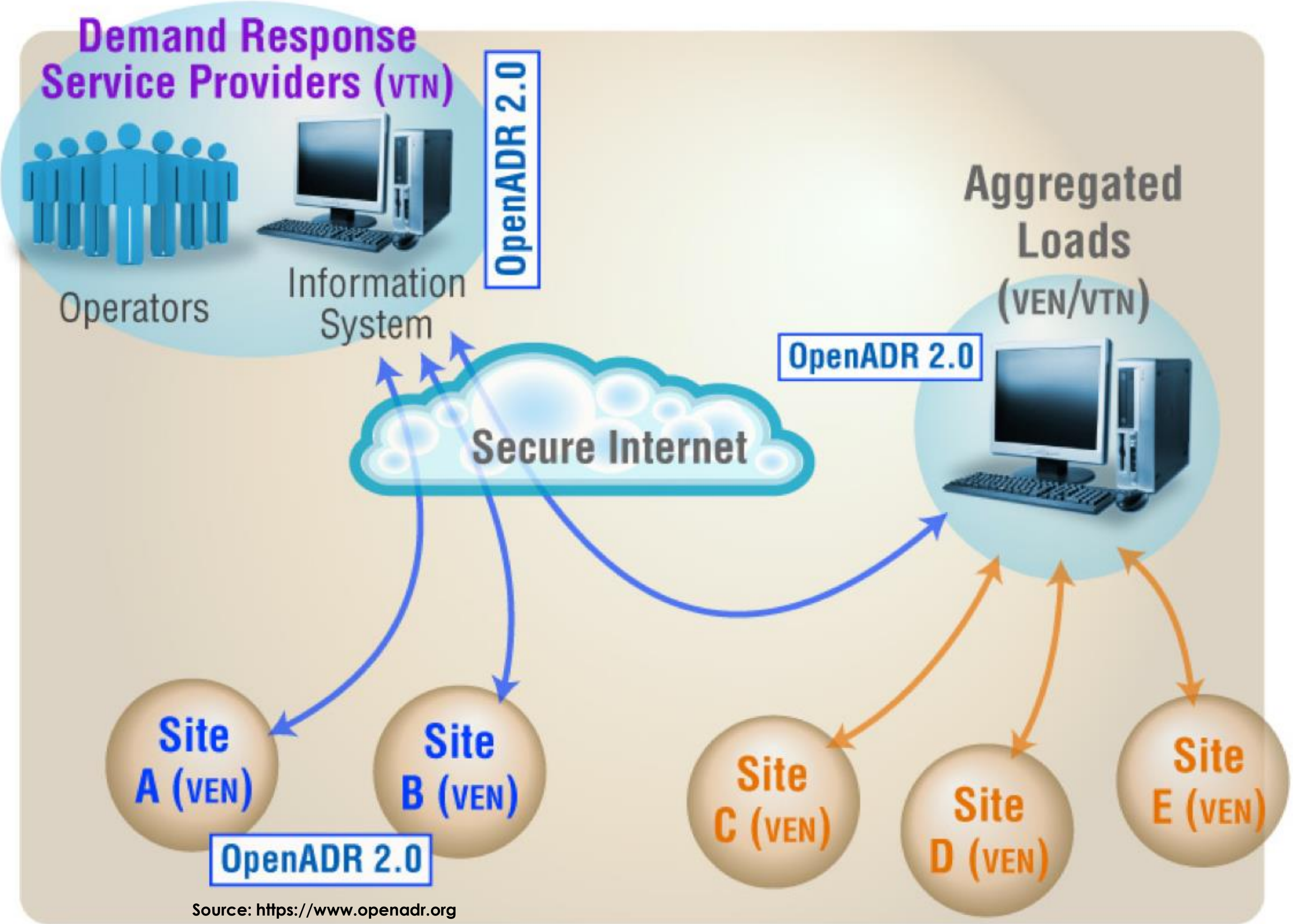
Working With Utilities



Standard Energy Flow / Availability
Modified Energy Flow
Communication

Source: https://jointventure.org/initiatives/mobility/ev-infrastructure-group/ev-use-case

Working With Utilities



Source: https://www.openadr.org

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EV Charging Station Market Drivers

- The cost of energy vs. the cost of fuel
- The availability and accessibility of incentives
- Education of potential hosts and drivers regarding infrastructure incentives and the benefits of electric vehicles
- The availability of affordable electric vehicles with longer ranges (200+ miles)
- Faster charging capabilities
- Interoperability between charging station providers

EV Charging Station Deployment Challenges

- State legislation and policies
- Standardized payment systems
- Permitting and approvals for load sharing designs
- The cost of energy
- Load management education
- Demand charges for high-power and highly-utilized charging stations
- Competing DC Fast Charging standards (CHAdeMO, CCS, and Tesla)

Benefits of ENERGY STAR Certified Products

- Access to purchase and installation incentives
  - CALeVIP Program (California Energy Commission)
  - $51M Budget
  - Up to $7,500 per connector for Level 2 AC Charging Stations
  - Up to $80,000 per charger for DC Fast Charging
- Energy-efficient products that are aligned with the climate change and the cost savings goals of the electric vehicle and infrastructure industry
- Increased confidence from site-hosts and drivers regarding the long-term standby energy costs to operate electric vehicle charging stations
- Improved product reliability

stay plugged in

blink®

NASDAQ:**BLNK**

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Web: www.blinkcharging.com

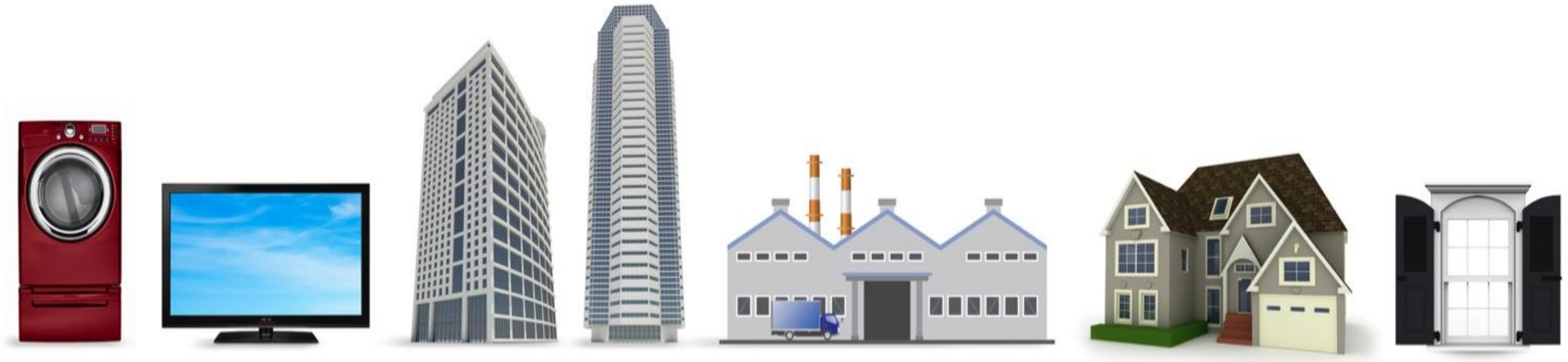
NC Transportation Electrification

Lisa Poger, Electric Transportation Manager

DUKE ENERGY®

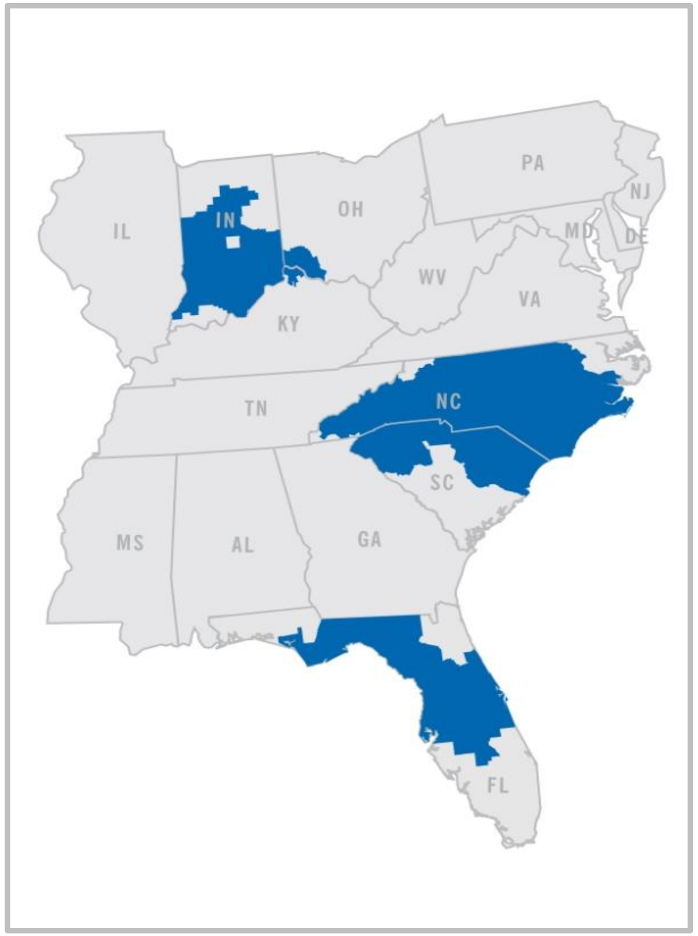
Duke's Engagement with ENERGY STAR

- ENERGY STAR Partner since 1997
- Duke participates in the ENERGY STAR Homes, Buildings, and Products program
  - Residential/commercial product rebates available in retail stores, on the online marketplace, and in midstream markets



Utility Role

- Inform
- Encourage
- Demonstrate
- Foundational Infrastructure



Infrastructure Programs

Rebates

- **Residential** charging stations
- **Fleet** charging stations

School Buses

- **School bus** charging infrastructure and battery

Transit Buses

- **Transit bus** charging infrastructure

Public Charging

- **Multi-family** charging
- **Public** Level 2 charging
- **Public** fast charging network

Duke Energy Florida

DUKE ENERGY.

Florida Future

MENU

Implementation

- Marketing
- Qualification
- Site Survey
- Vendor Quote
- Site Host Agreement
- Installation
- Commissioning
- Monitoring

DUKE ENERGY®

Florida Electric Vehicle Charging Infrastructure Program Application

Before you begin the application, please keep the following in mind as you may not be able to return to the point where you left off once you close the browser. You will be able to download a PDF of your completed application upon submission.

Review the Site Host Agreement. This will provide you with the terms and conditions for participation in the program prior to applying. You will be asked to sign and submit at a later point. Allow 20 minutes to complete the application as you may not be able to return to the same point once your browser is closed. Have your Duke Energy account number on hand. Have the addresses of each site you are proposing for charging stations on hand.

Applicant Information:

Required*

Company Name*	
Account Number*	
Primary Contact First Name*	
Primary Contact Last Name*	
Primary Phone*	
Primary E-mail*	
Secondary Contact*	
Secondary Phone*	
Secondary Email*	

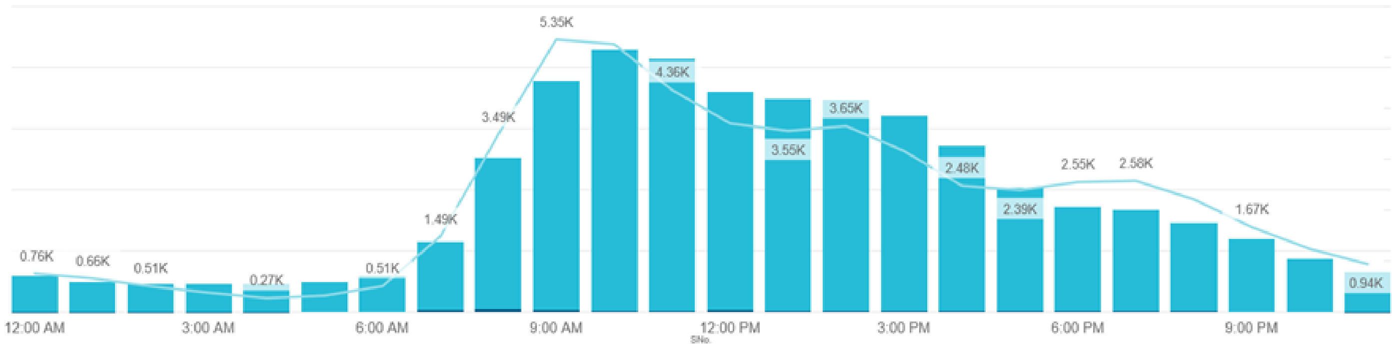
Equipment Requirements

- Revenue-grade metrology
- Wi-Fi, Cellular, or other communications to central server
- Open Charge Point Protocol (OCPP) Version 1.6 or later
- Certified OpenADR 2.0b
- Remote monitoring
- Load management capability

Load Profiles

- Active from 6am – 9pm
- Peak between 9am – 3pm
  - In-Route
  - Destination
  - Workplace

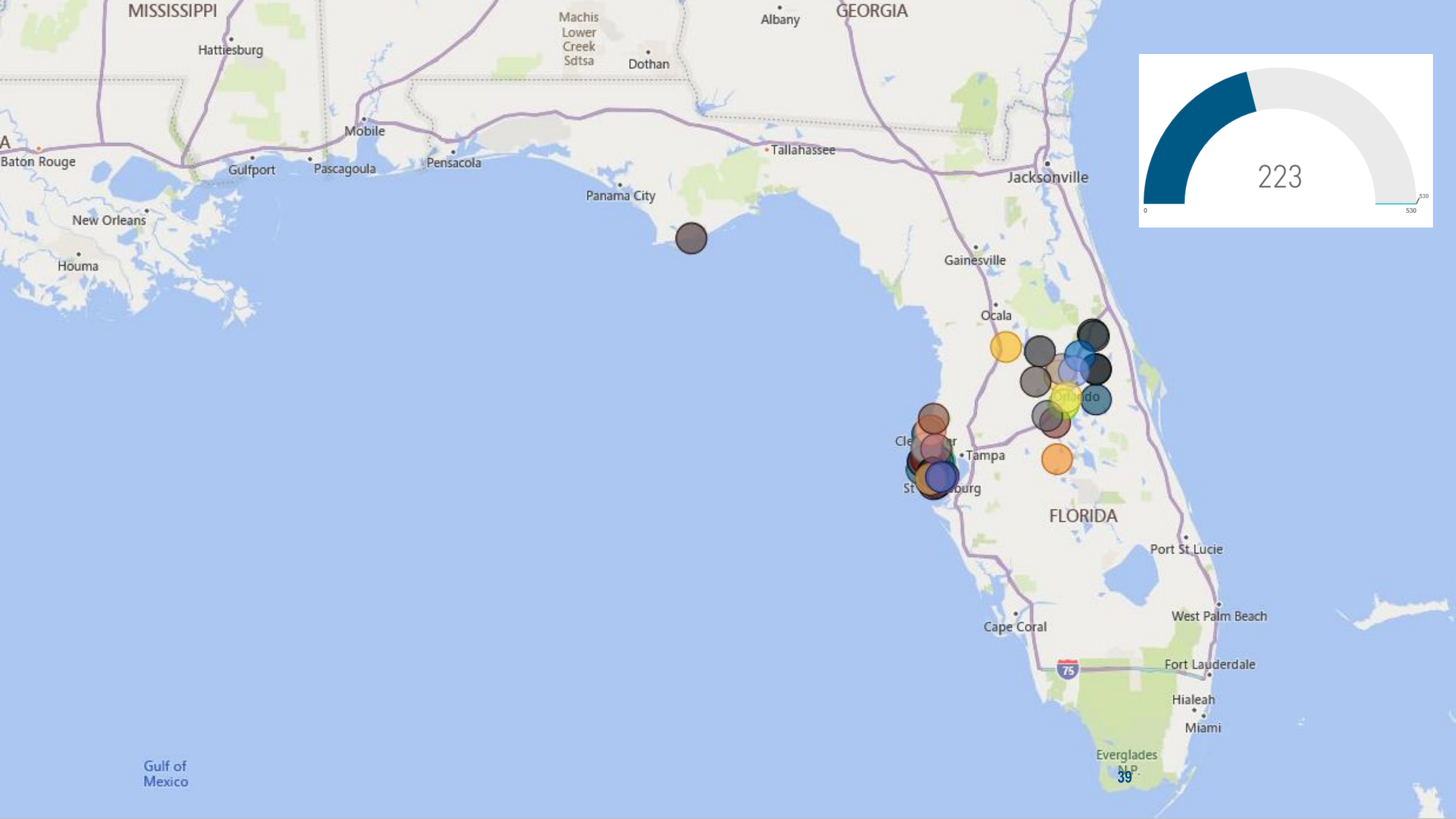
Florida Public Charging Data



6:00am 9:00am 3:00pm 9:00pm

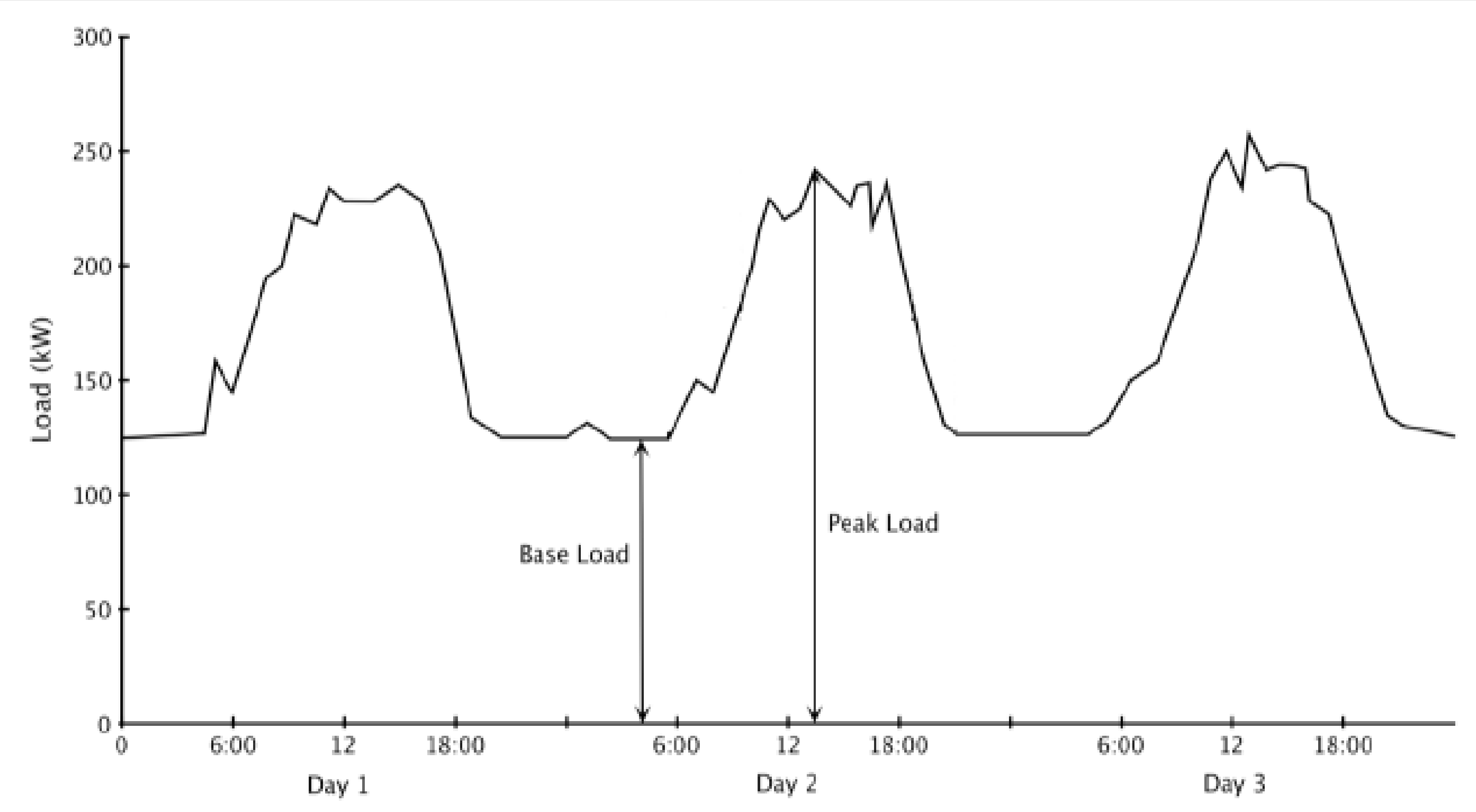
Deployment Status (Florida)

Charging Port Level Tracking							
Site Host Type	Requested Ports	Preliminary Approved Ports	Approved Ports	Final Installed Ports	Waitlisted Ports	Withdrawn or Rejected Ports	Commisssion Goals
DC Fast Chargers	51	25	19	11		4	50
MUD (Multi-Unit Dwelling)	304	238	195	65	16	18	210
Public Level Two	141	176	134	81	14	22	130
Workplace	163	154	141	66	5	11	140
Total	**659**	**593**	**489**	**223**	**35**	**55**	**530**


MISSISSIPPI
GEORGIA
Hattiesburg
Machis Lower Creek Sdtsa
Dothan
Albany
Mobile
Baton Rouge
Gulfport
Pascagoula
Pensacola
Tallahassee
Jacksonville
Panama City
New Orleans
Houma
Gainesville
Ocala
Orlando
Tampa
FLORIDA
Port St Lucie
West Palm Beach
Cape Coral
Fort Lauderdale
Hialeah
Miami
Everglades N.P.
Gulf of Mexico
75
223
0
530
530

Grid Benefits

- Managed Loads
- Demand Response
- Distributed Storage
- Vehicle-to-Grid



ENERGY STAR EV Charging

Find and Compare Products

Languages: English | Français

Access to ENERGY STAR API, Data Set or Excel File

Find product models that have earned the ENERGY STAR and compare features, savings and more to optimize your purchase.

1. Select a product category of interest to you.
2. Get details on specific qualifying models.
3. Make informed purchasing decisions.

ENERGY STAR Certified

Electric Vehicle Supply Equipment

Visit the Electric Vehicle Supply Equipment page for usage tips and buying guidelines.

CHANGE product category

LiquidSky Technologies, Inc. - WattZilla Series Uno ☑ Compare

Level 2

Partial On Mode Input Power (W): 1.75

No Vehicle Mode Input Power (W): 1.62

Idle Mode Input Power (W): 8.86

ChargePoint - CPH25 ☑ Compare

Level 2

Partial On Mode Input Power (W): 1.9

No Vehicle Mode Input Power (W): 1.8

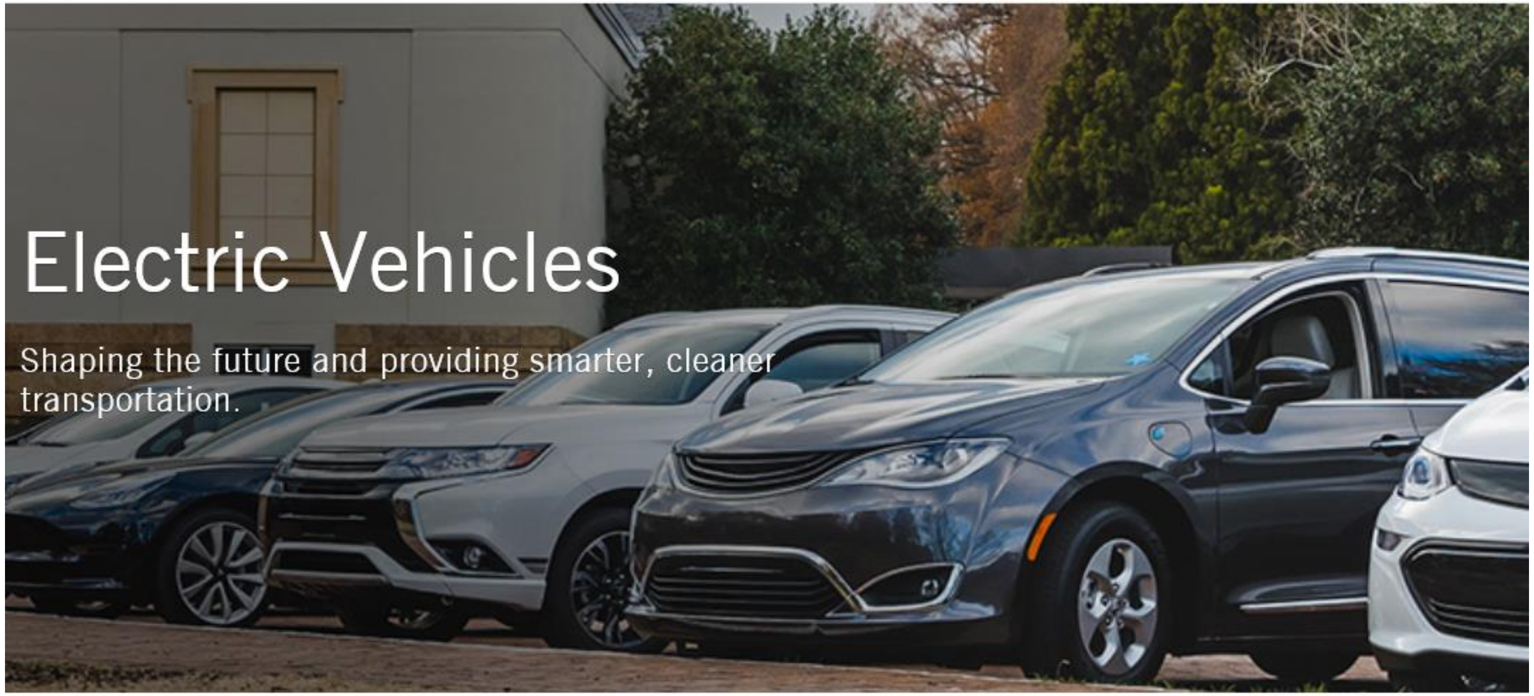
Idle Mode Input Power (W): 2.0

- ENERGY STAR certified EV chargers save 40% vs a standard model when in standby mode (typically 85% of the time)
- Some ENERGY STAR certified EV charger models have Wi-Fi technology
  - Remote monitoring
  - Controlled charging

Educational Resources

DUKE ENERGY.

Energy Savings & Efficiency



BENEFITS OF EVS | CHARGING YOUR EV | CHOOSING YOUR EV | EV INITIATIVES

Electric Vehicle Savings Calculator

Use this EV Fuel Savings Estimator to calculate your potential fuel savings from driving an EV.

Current Driving Information

Daily Miles Driven

37

0 50 100

Miles Per Gallon: 24

Gas Price: 2.80

Savings

$3.15	$1151.14	$94.61
Daily	Yearly	Monthly

Significant additional savings can come from a reduction in maintenance costs as EVs do not require oil changes and have far fewer moving parts. How it's calculated.

Take Charge. Drive Electric

www.duke-energy.com

DUKE ENERGY®