Electric Transportation -
Where are We Today?
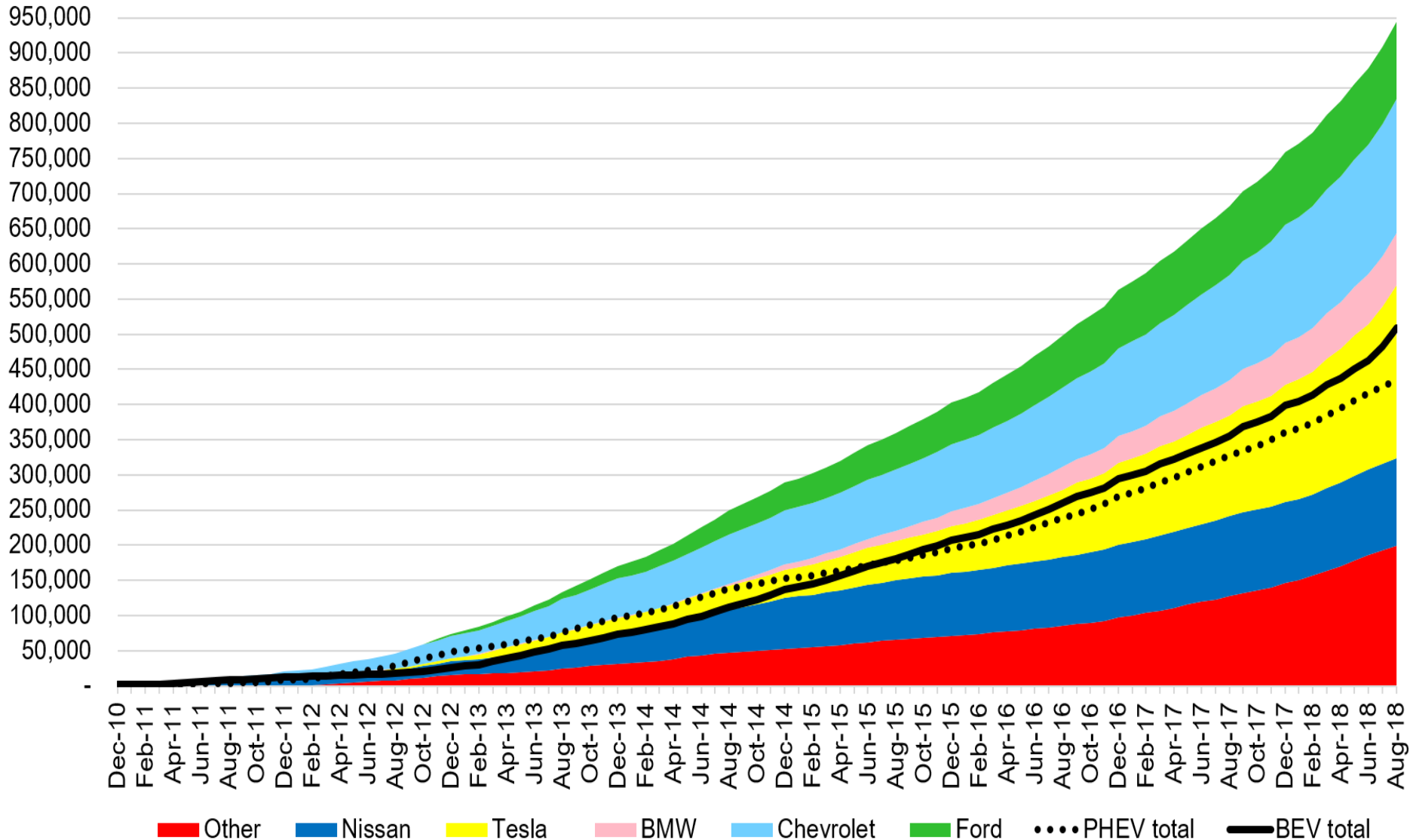
John Halliwell
Technical Executive

ESIG Fall Technical Workshop – Session 3B – Electric Transportation and ESI
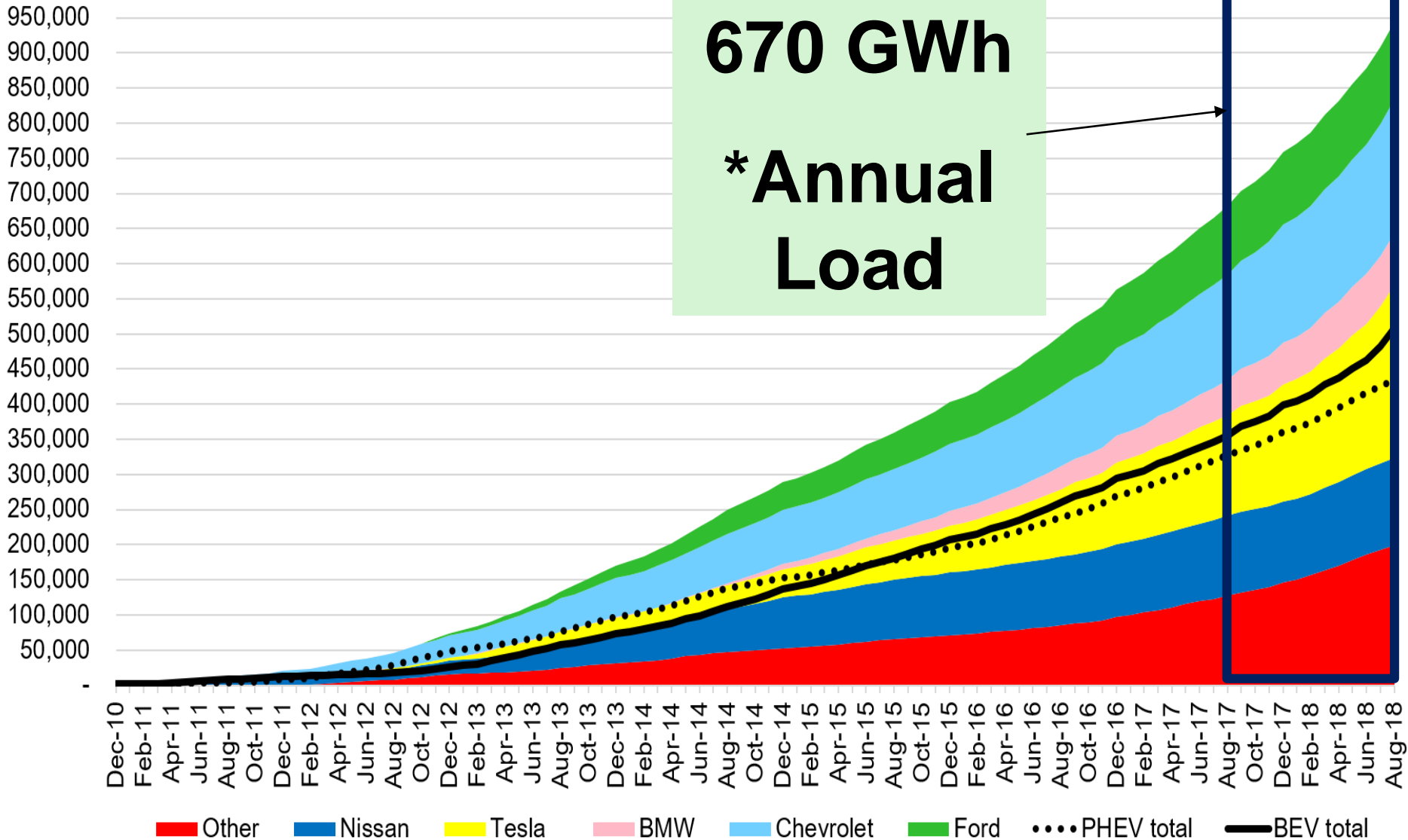October 2, 2018

90 GWh

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Cumulative Light Duty Plug-Ins – U.S. Market

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Cumulative Light Duty Plug-Ins – U.S. Market

670 GWh

*Annual Load

Legend: Other, Nissan, Tesla, BMW, Chevrolet, Ford, PHEV total, BEV total

*Assumes 2500kWh per vehicle per year

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EV Monthly Sales – Year over Year

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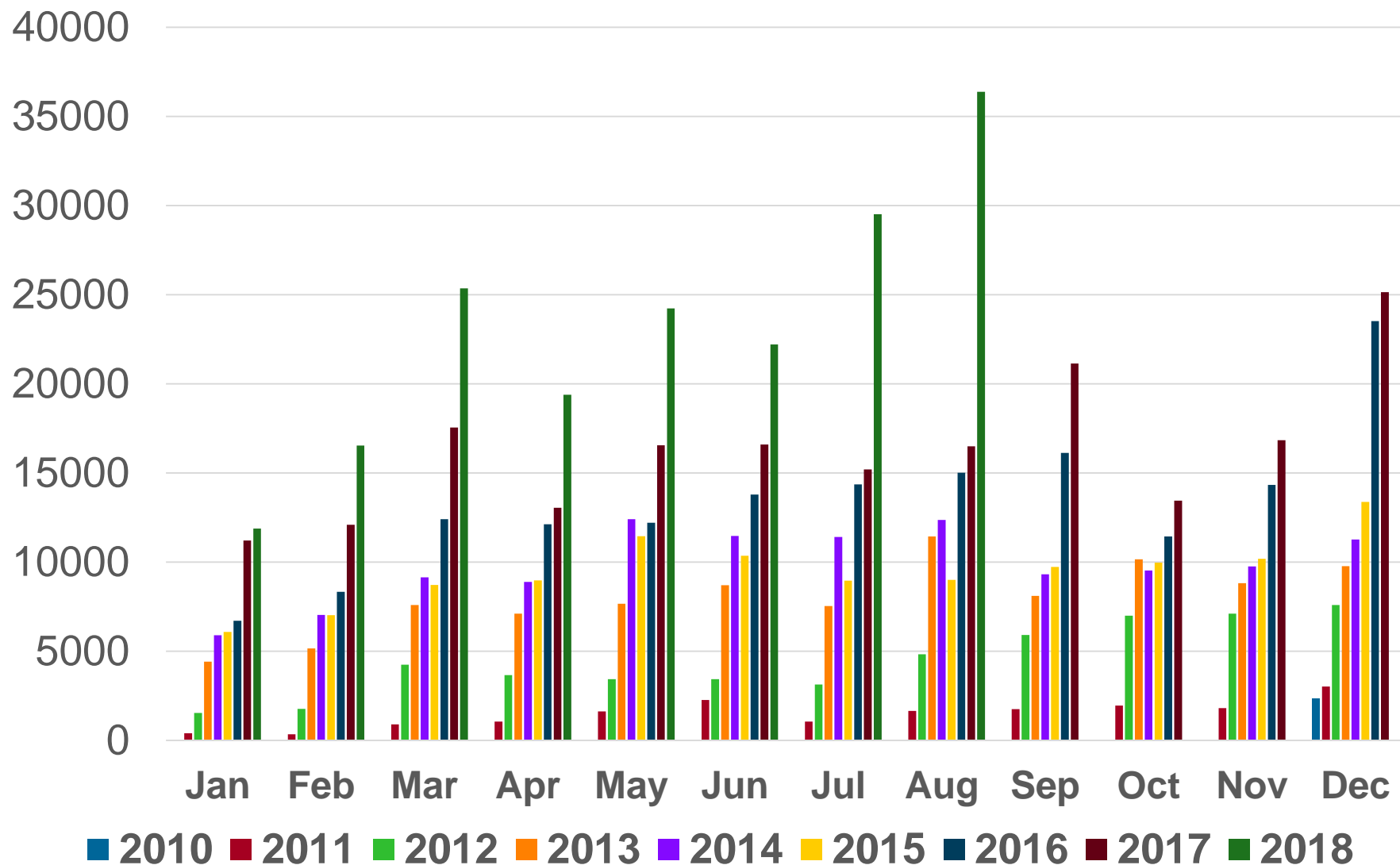
County-level EV sales (through June 2018)

white = 1.36%
(national average)

PEV Market Share

14.8%

0.0%
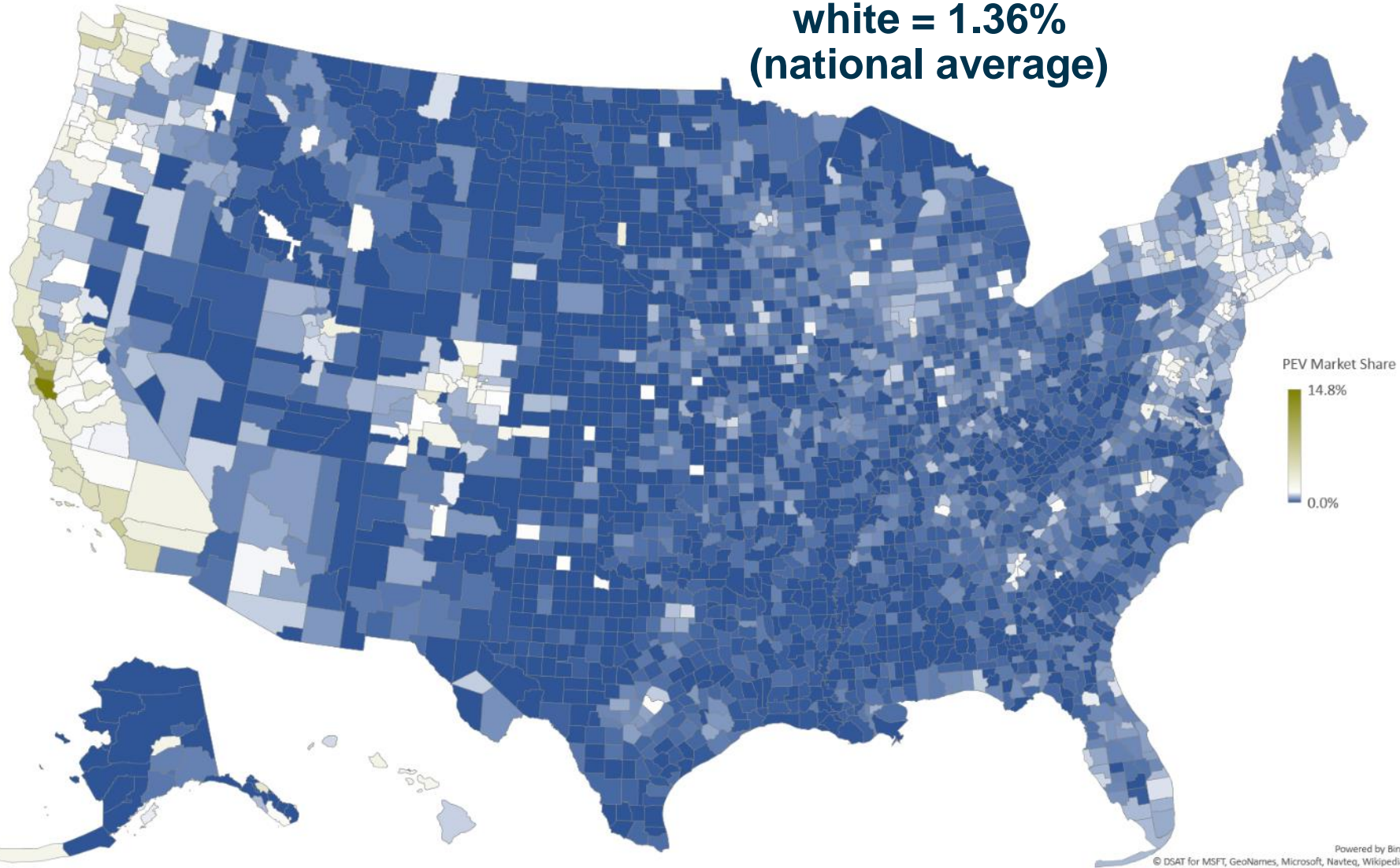
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What's missing from this picture?

Customer choice increasing with ~~108~~ 111 EVs by 2023

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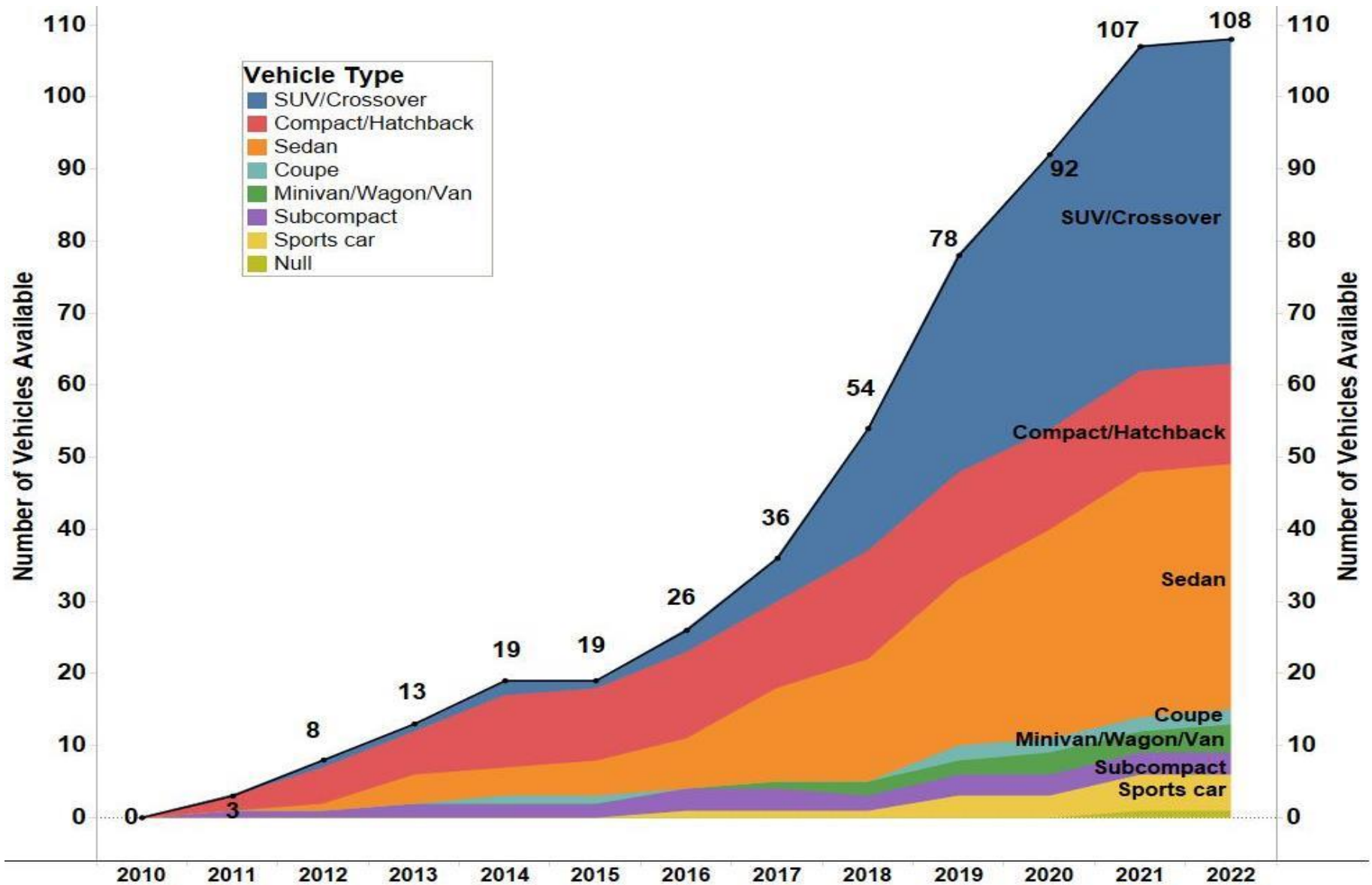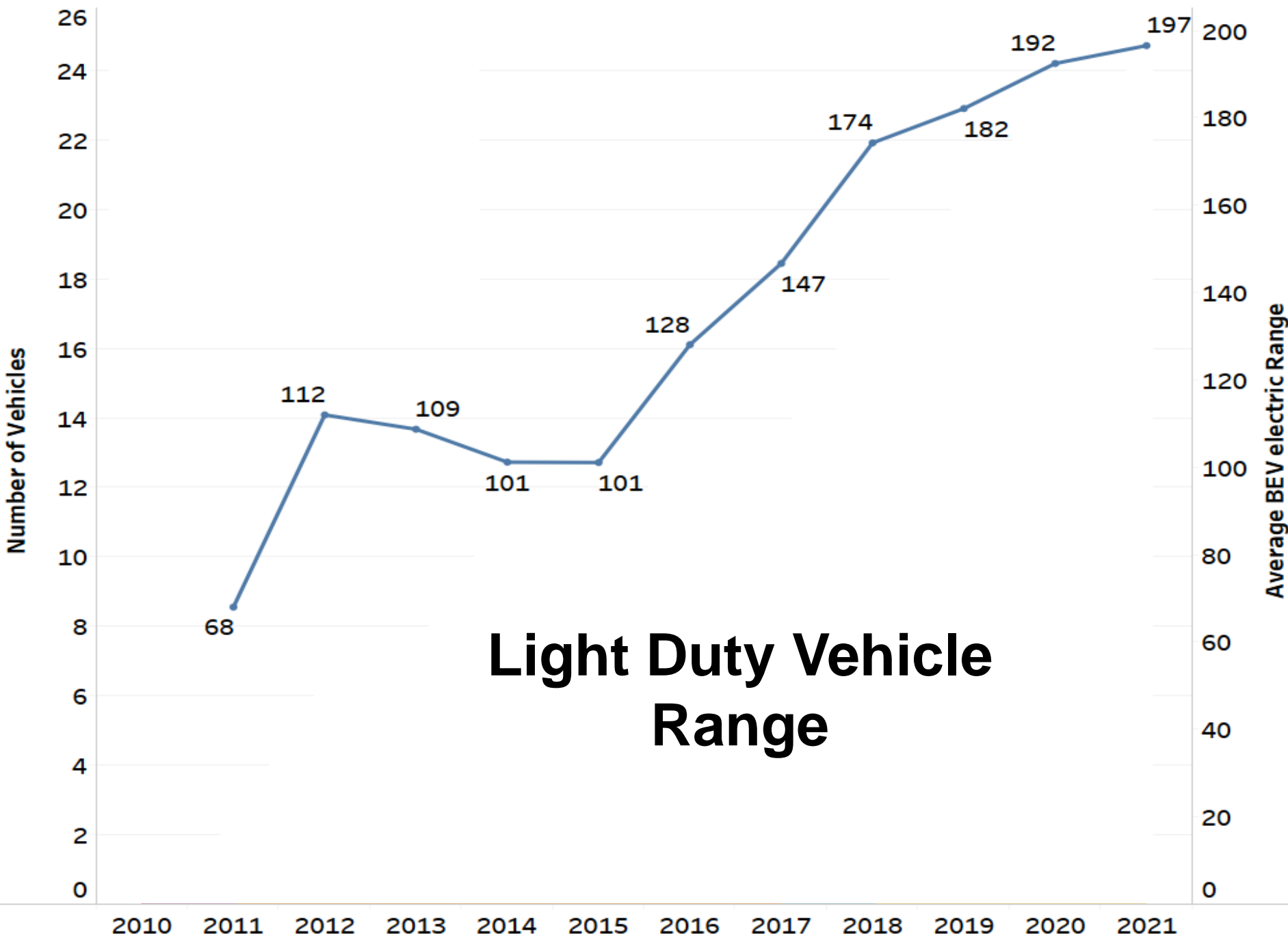
Light Duty Vehicle Range

~43,000 AC Ports - Seventeen Charging Networks

AC

June 2018 – Data
Courtesy of Plugshare
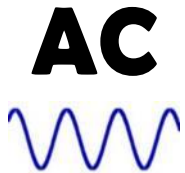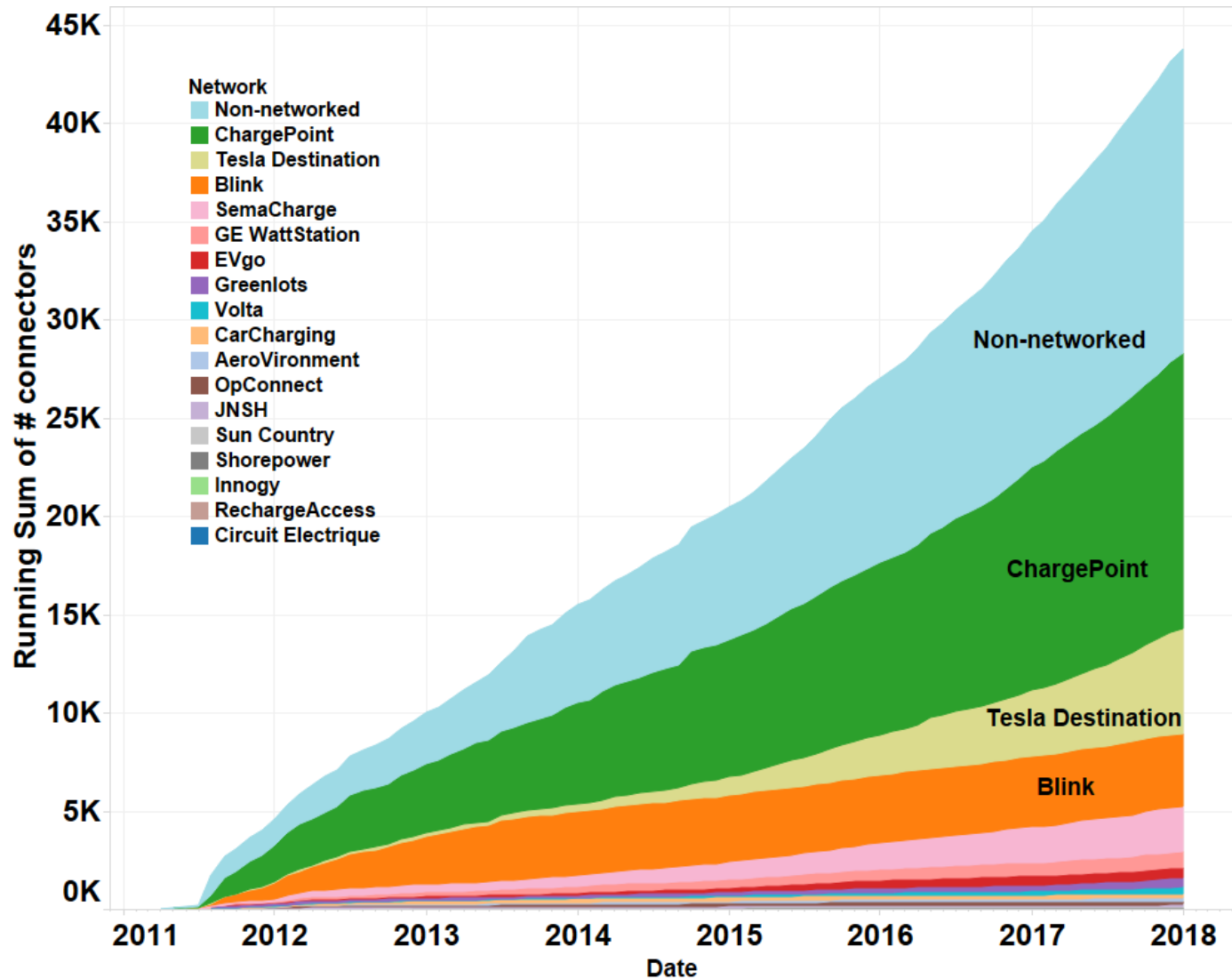
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~ 7,500 DC Ports – Three Connector Types

DC

June 2018 – Data
Courtesy of Plugshare
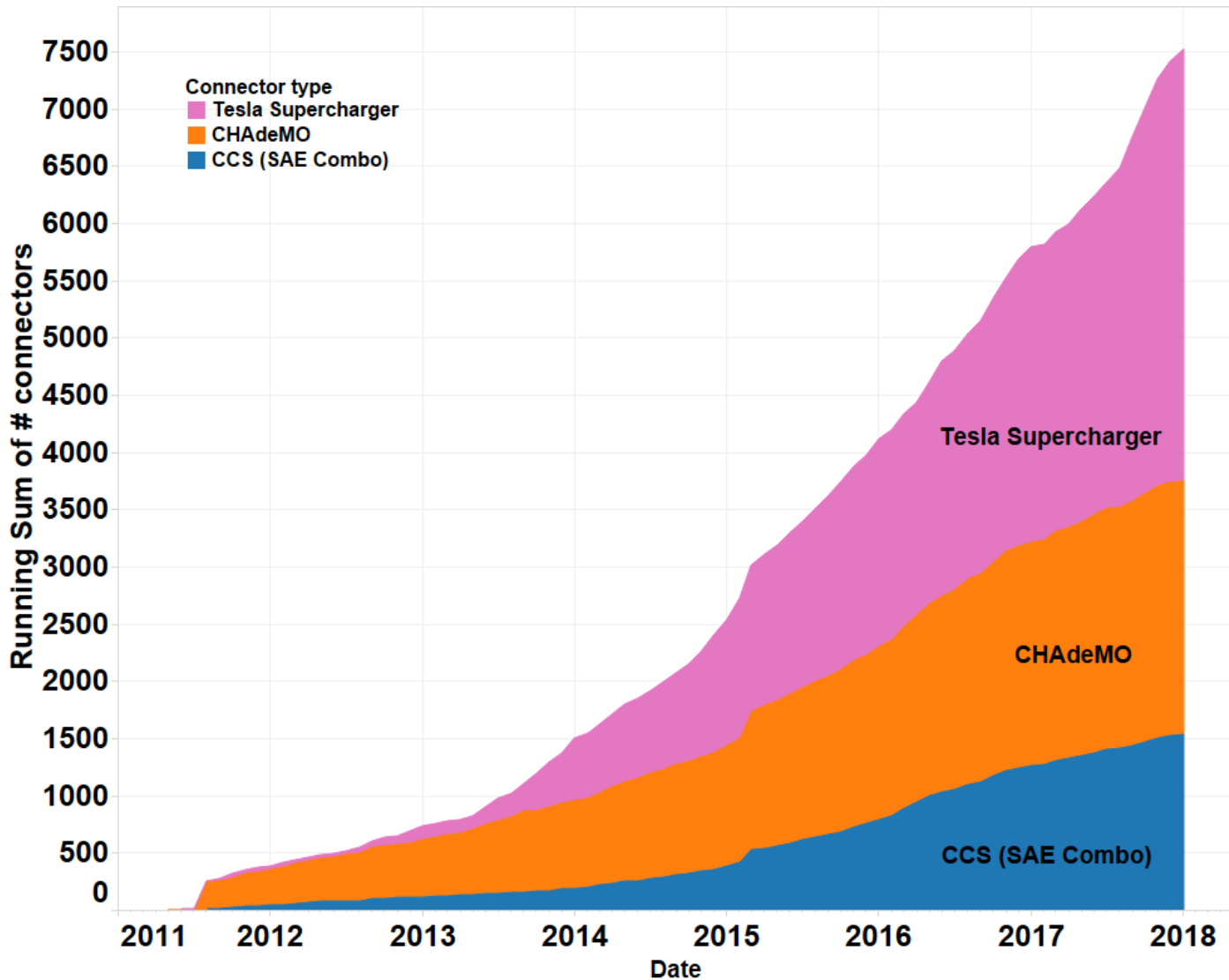
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Most DC ports are on a network

Only ~ 7% of DC ports are non-networked

DC

June 2018 – Data
Courtesy of Plugshare

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Medium and Heavy Duty

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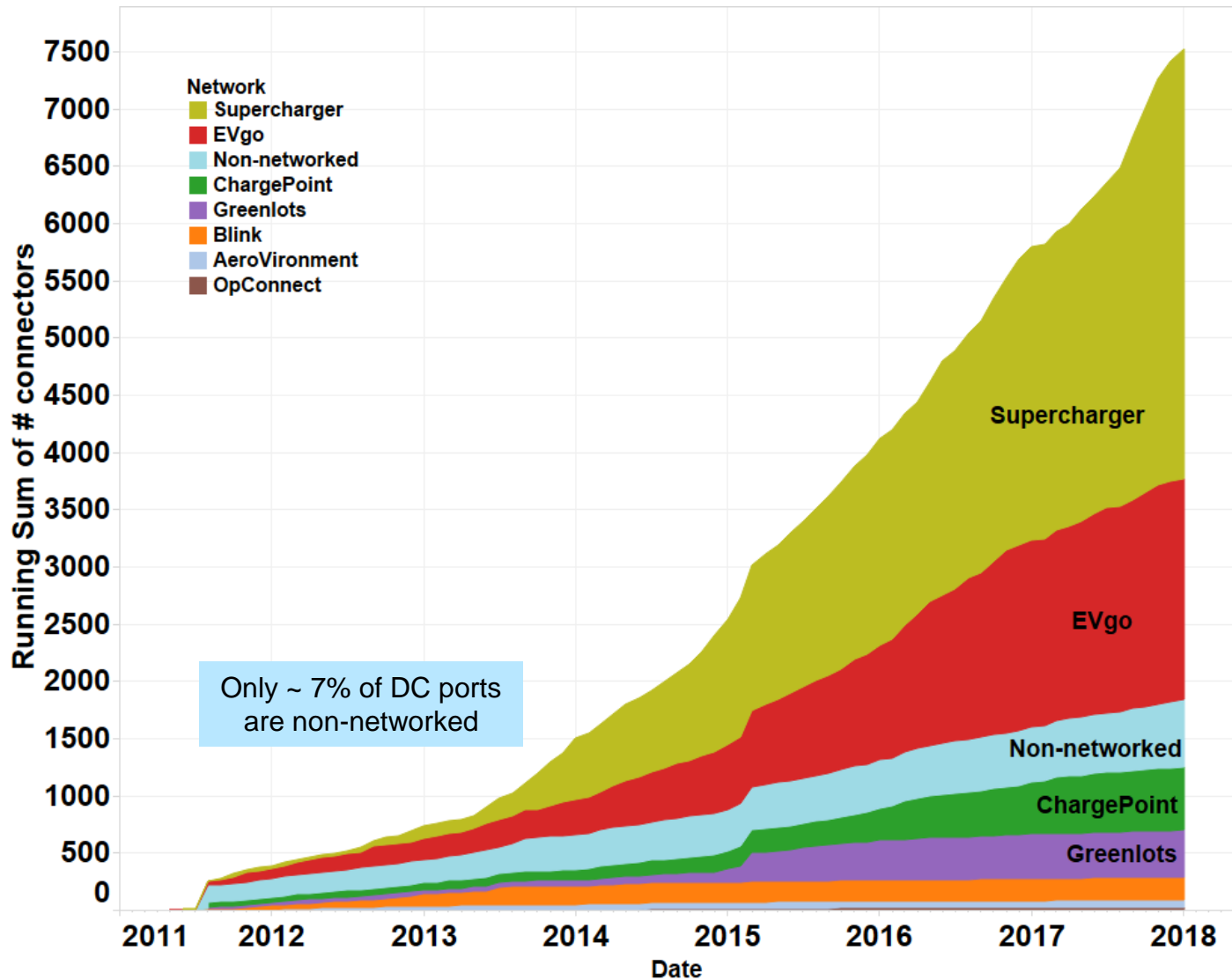
Electrified Aviation

Joby Aviation

ZUNUM Aero

Lilium

Eviation Aircraft
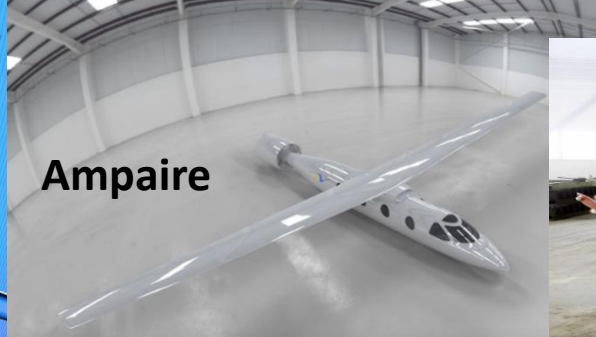
Ampaire

Equator Aircraft

Airbus

Wright Electric

Kitty Hawk Flyer

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Power versus Time

DC "FAST" CHARGING — **Up to 350+ kW**

AC Level 2 CHARGING — **Up to 19.2 kW**

Wireless CHARGING

AC Level 1 CHARGING — **Up to 2 kW**

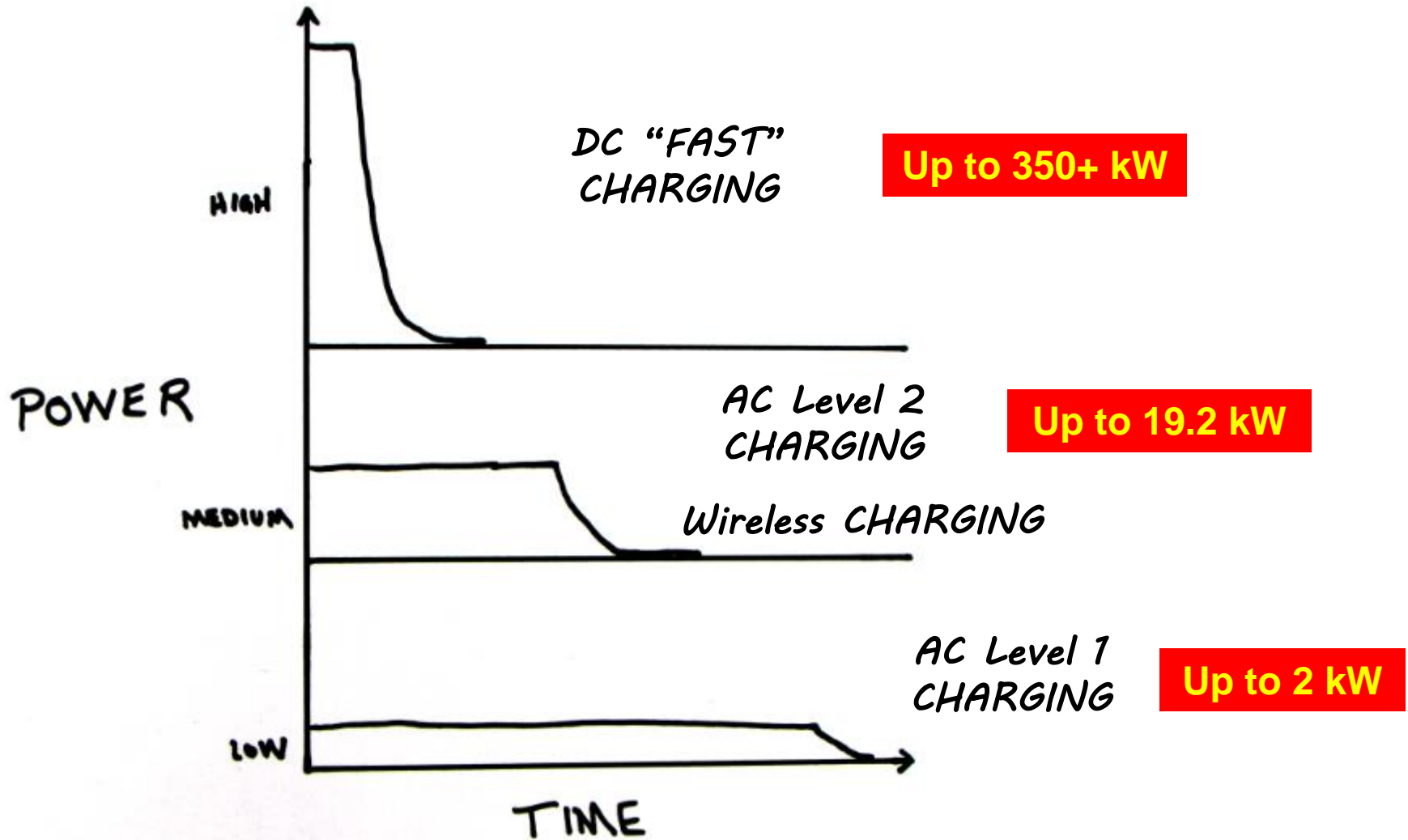EPRI | ELECTRIC POWER RESEARCH INSTITUTE

With ~ 950,000 Plug-in Electric Vehicles in the US

- The sky hasn't fallen
  - Minimal grid impacts seen to date
- Many of these vehicles are in California

From 6th Joint IOU Electric Vehicle Load Research Report, December 2017:

As of October 31, 2017, the IOUs estimate there are over 277,365 PEVs within the three service territories. Of the 277,365 vehicles estimated to be currently on the road, only 460 or 0.16%, have required a service line or distribution system upgrade solely to support the PEV load at their residential charging location. In all but 69 instances, the standard allowance for residential service upgrades was sufficient to cover the portion of the service upgrade cost that is assigned to the utility.

http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/58313041D51345AF88258099007234A5/$FILE/R1311007-Joint%20IOU%20EV%20Load%20Research%20Report.pdf

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Maintenance

Branded

Owner   Repair

Upkeep

Utility-Role ?

Operator   Management

Energy-Provider

Make-Ready

Together…Shaping the Future of Electricity

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