

Transportation Electrification: The Plug-in Electric Vehicle Market, Environmental Impact, and Technology

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**Foro de Transporte Limpio en
Latinoamérica**

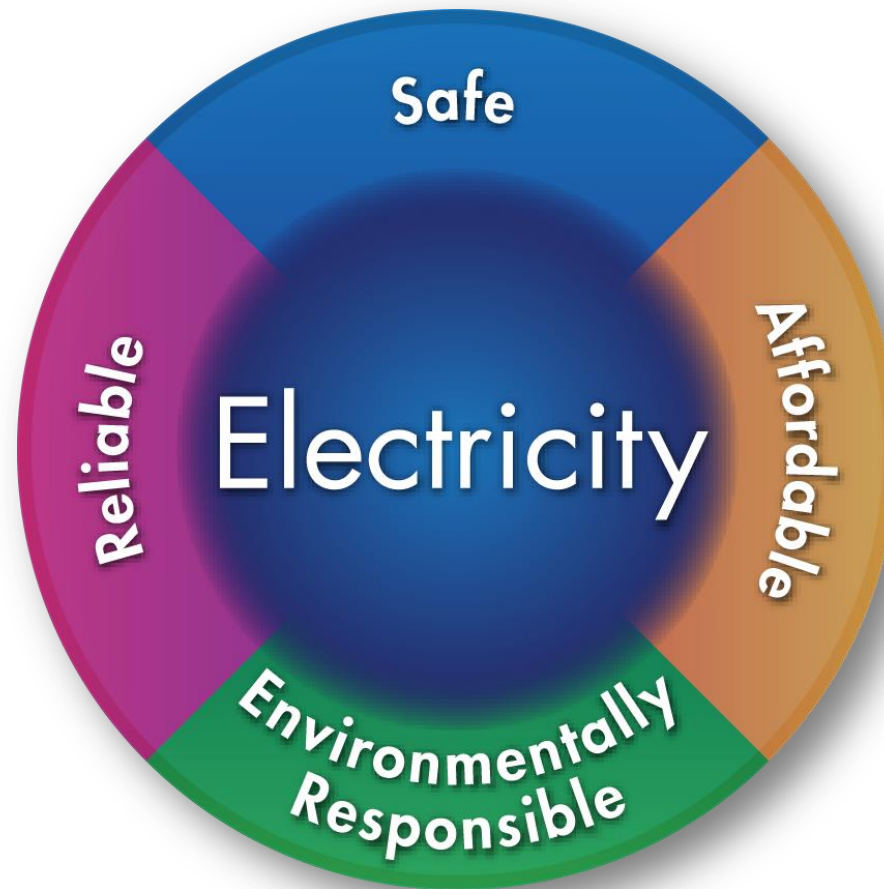
Bogotá, Colombia

22 September 2016

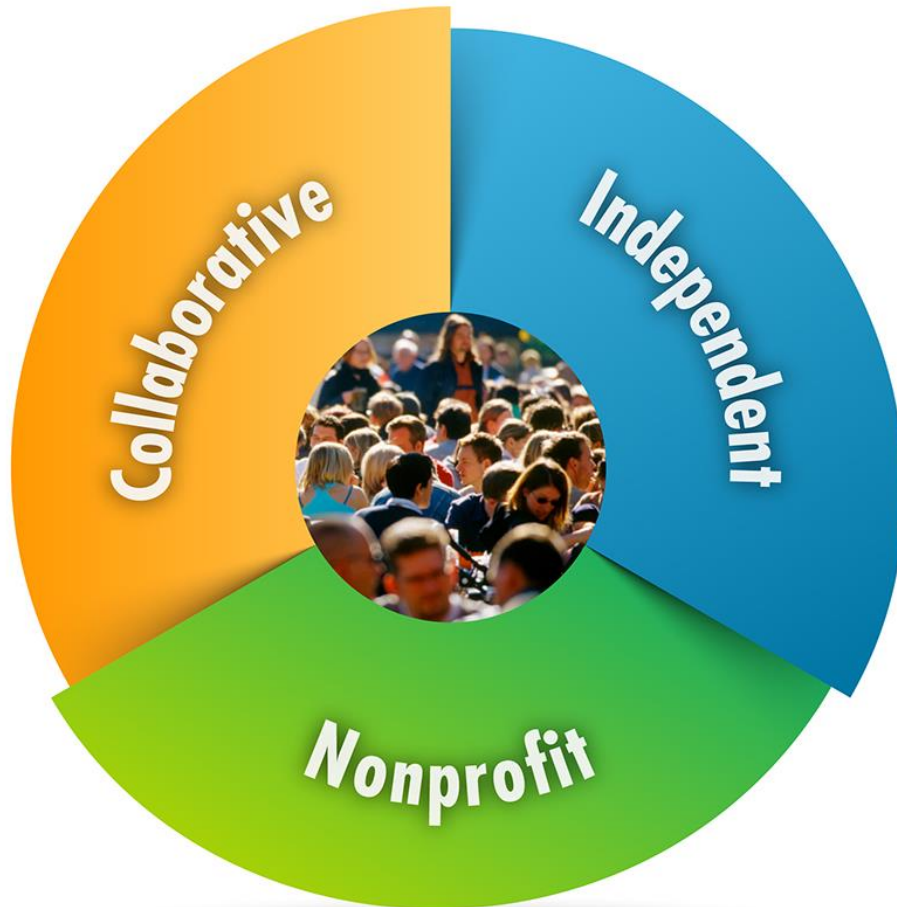


EPRI's Mission

Advancing **safe, reliable, affordable, and environmentally responsible** electricity for society through global collaboration, thought leadership, and science & technology innovation



Three Key Aspects of EPRI



Independent

Objective, scientifically based results address reliability, efficiency, affordability, health, safety, and the environment

Nonprofit

Chartered to serve the public benefit

Collaborative

Bring together scientists, engineers, academic researchers, and industry experts

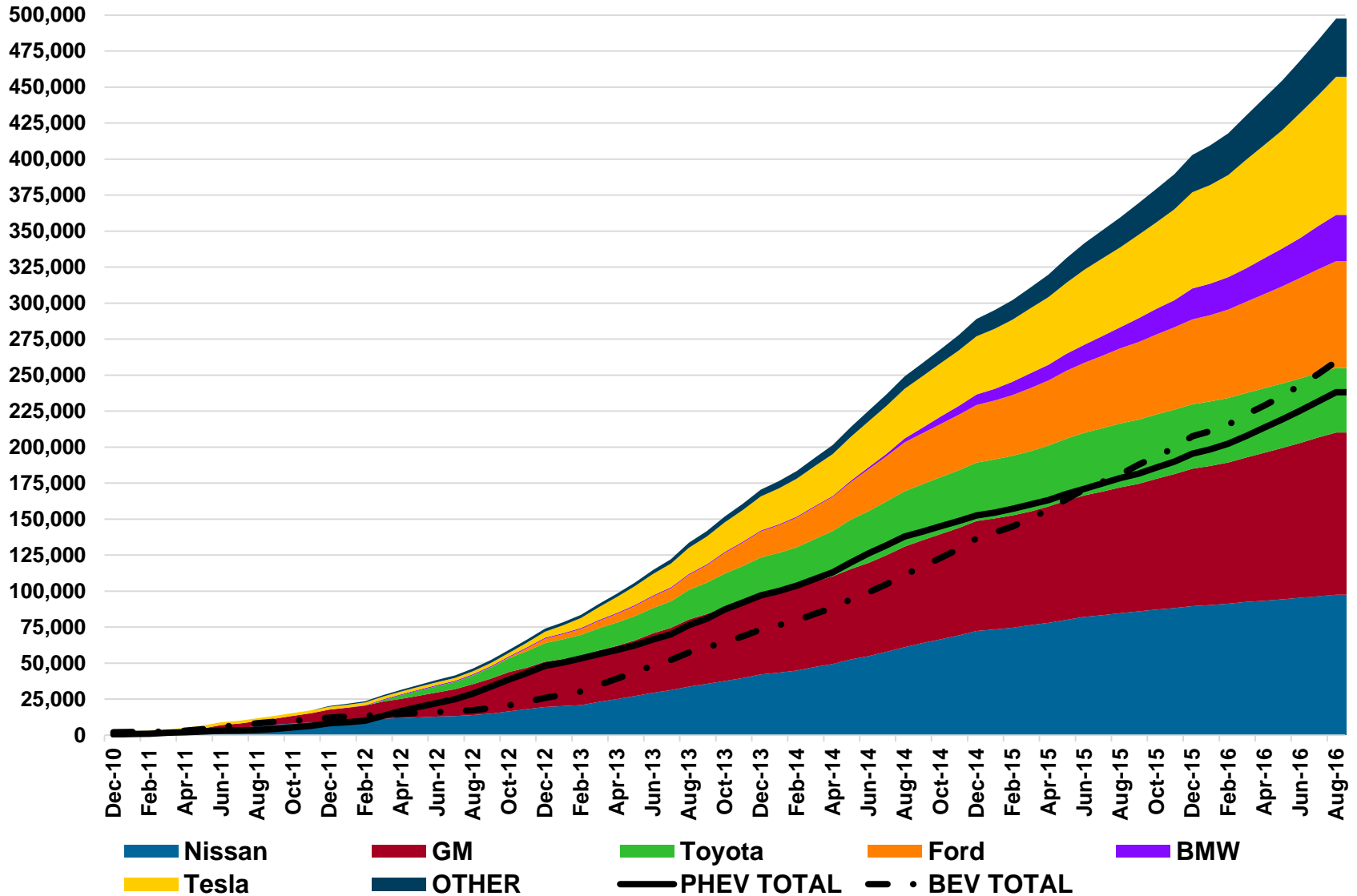
What is Electric Transportation? A Plug-in Electric Vehicle (PEV)?

- Car
- Truck
- Bus
- Marine
- Airport
- Forklift
- Marine
- Motorcycle
- Scooter



Cumulative US Plug-in Car Sales to Date > 497,000

2016 YTD up 29% over 2015

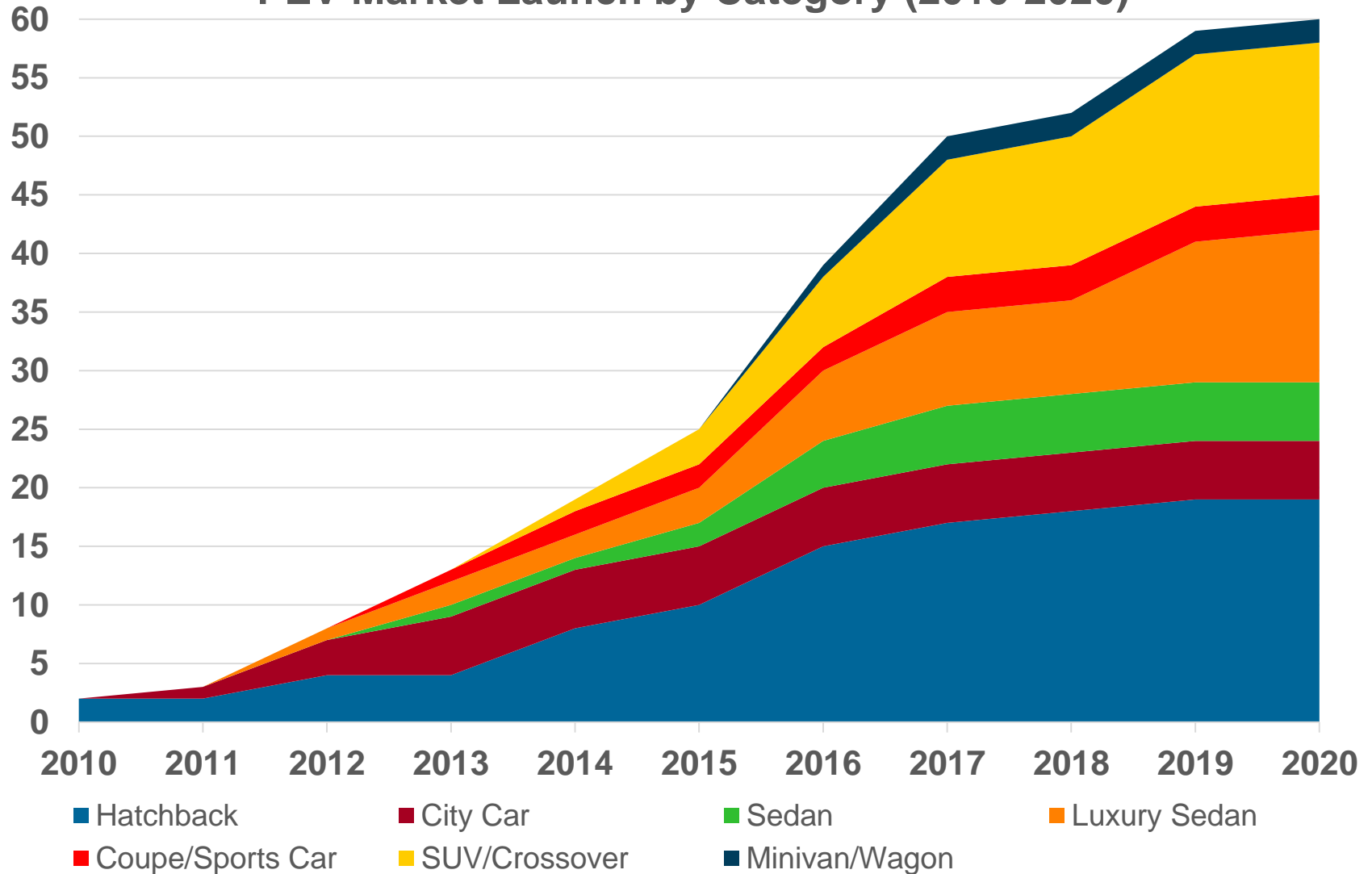


Customer choice is increasing ~38 new PEVs coming in 2016-2020

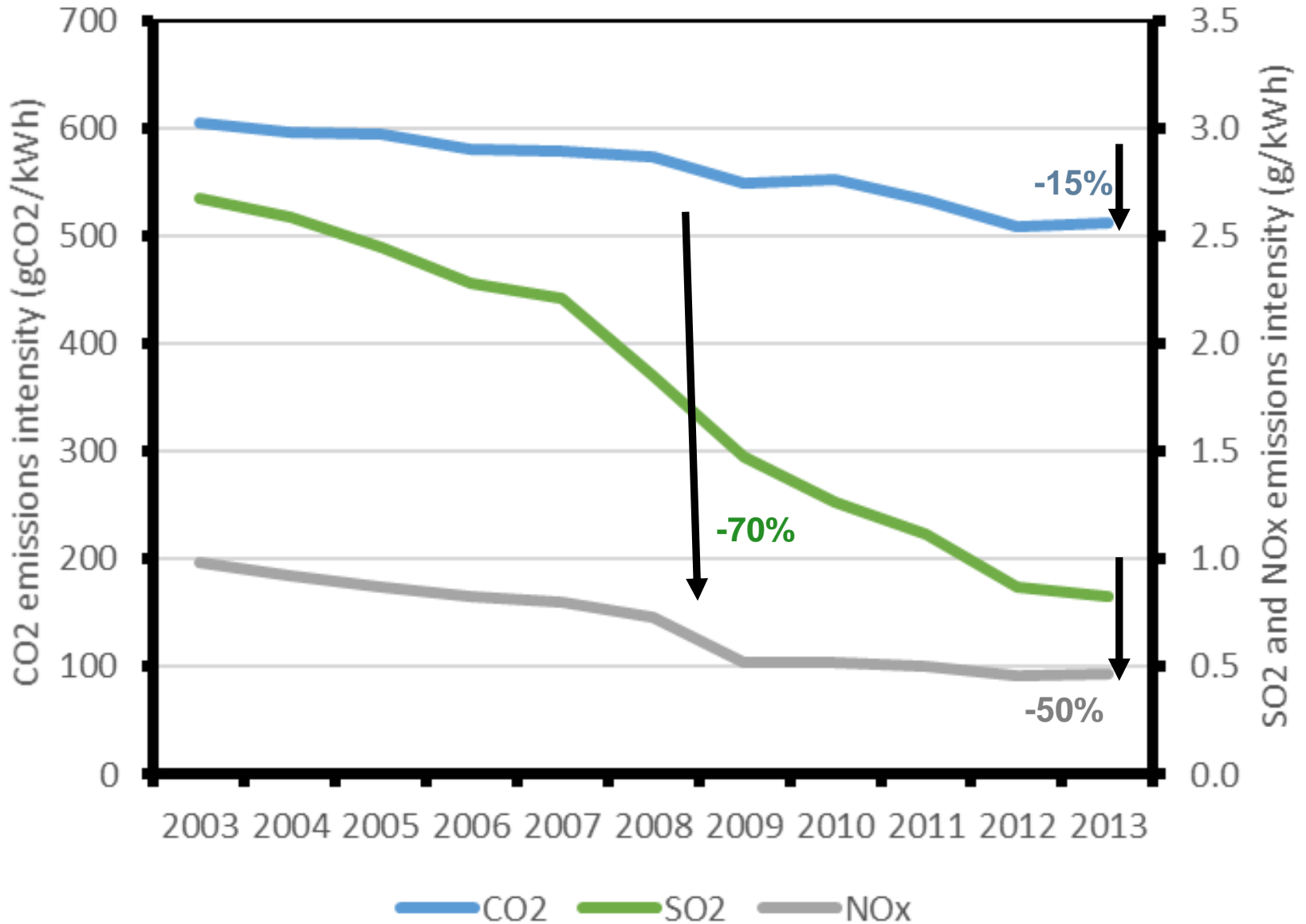


Customer choice increasing with 38 PEVs announced to hit market from 2016 – 2020

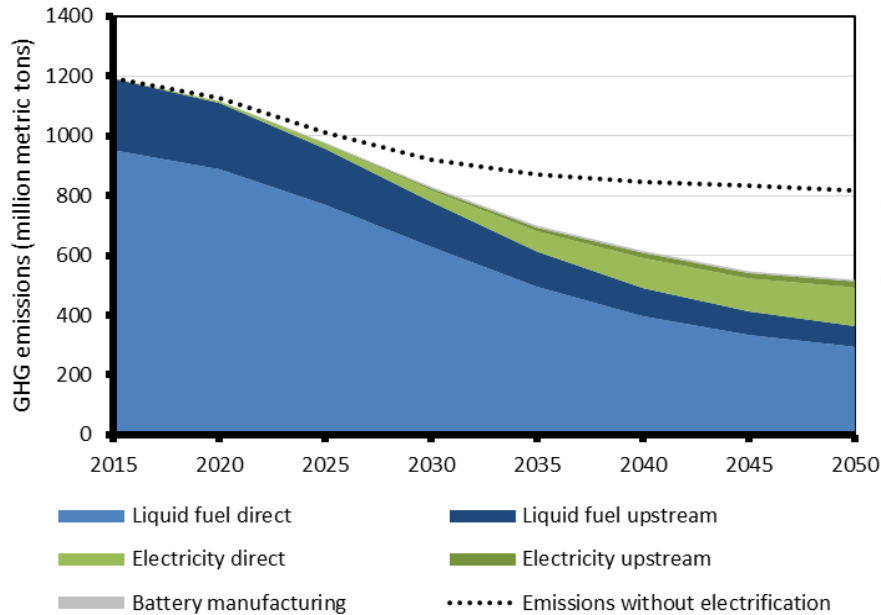
PEV Market Launch by Category (2010-2020)



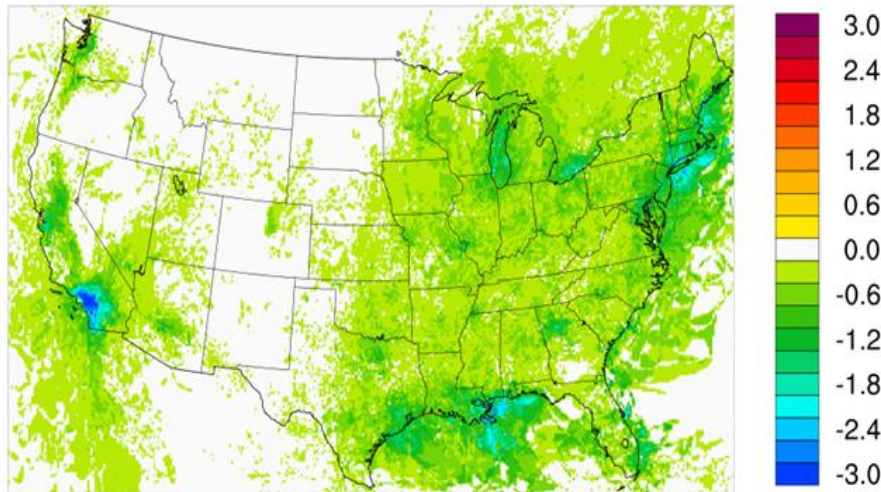
The electric grid is clean and getting cleaner – 15, 70, 50



Electricity is also a clean transportation fuel

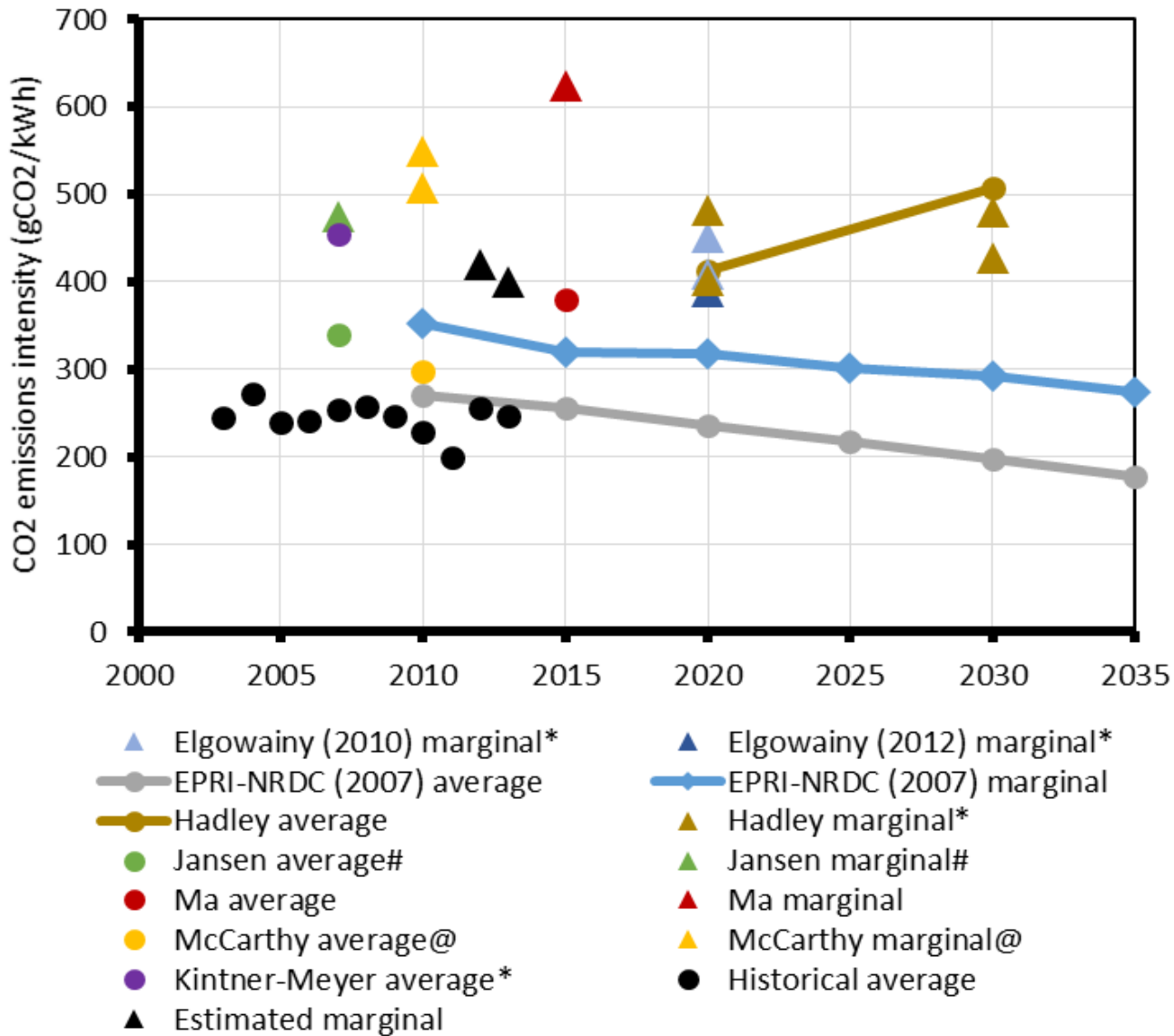


Reduction in GHG due to electrifying transportation through 2050



Improvements to air quality (human health) due to electrifying transportation through 2030

But what about those headlines that claim electric vehicles are bad for the environment?



Charging infrastructure is not like getting gas, but more like charging your phone or laptop



Public



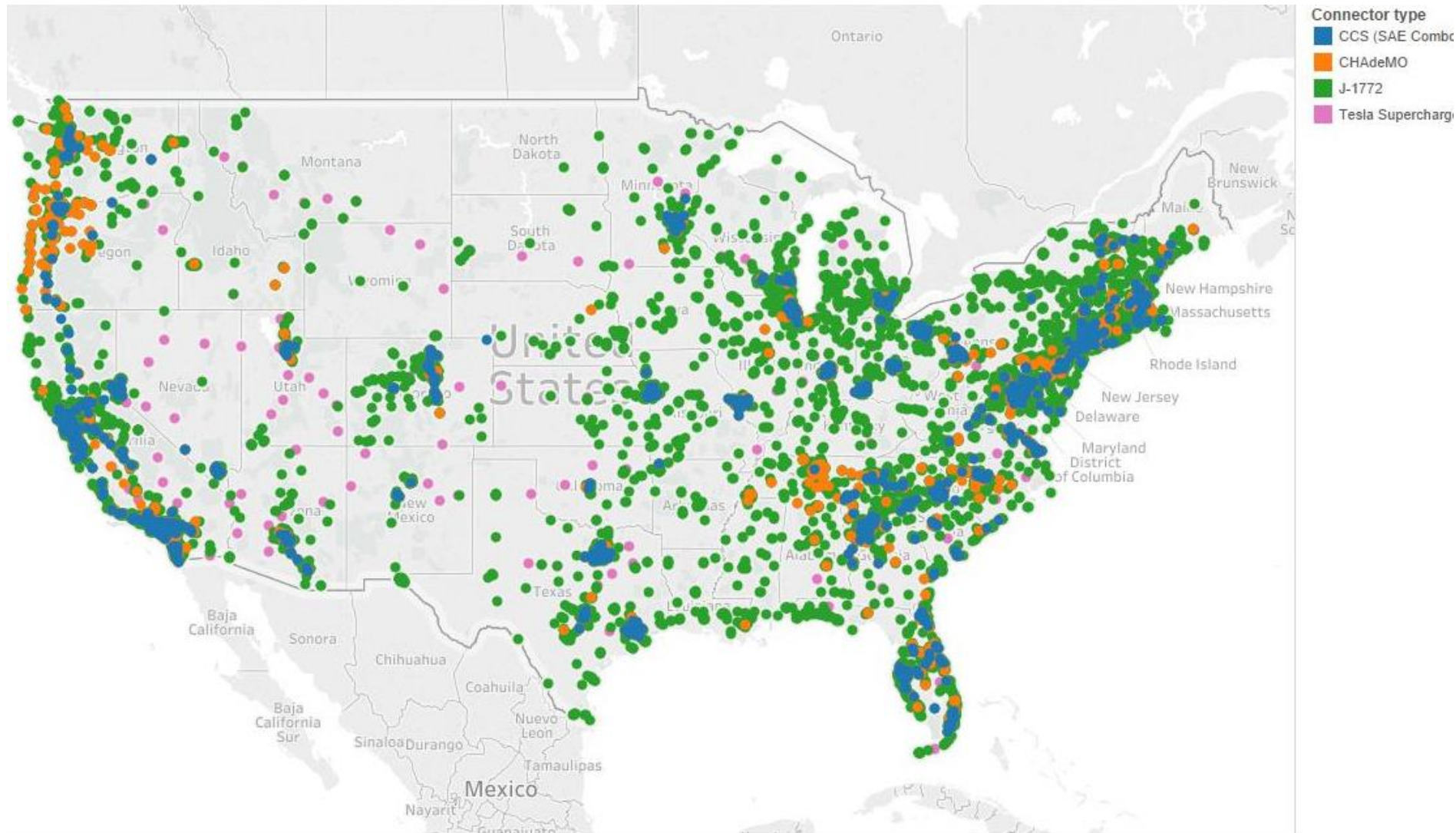
Workplace
or Retail



Residential



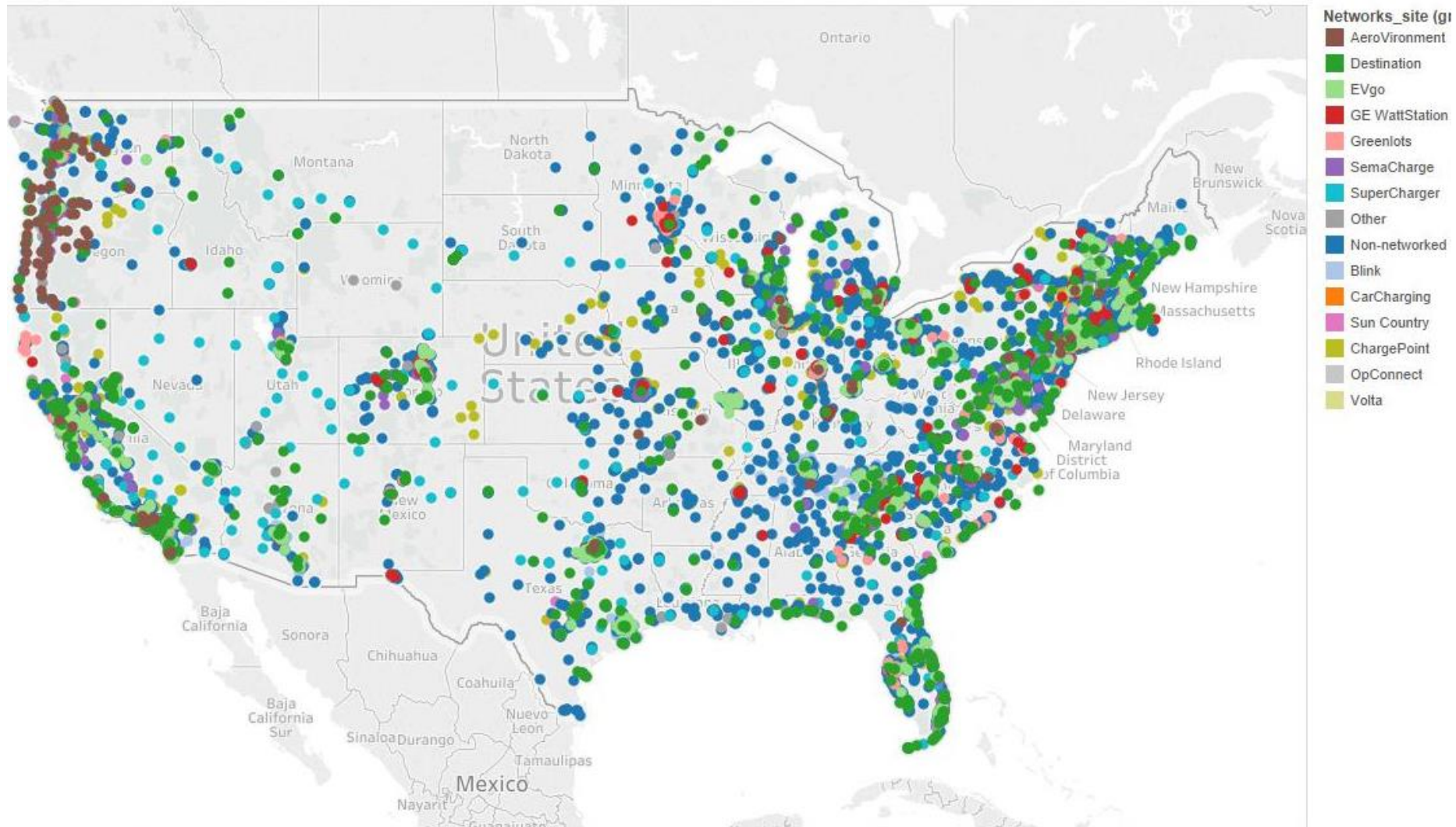
PEV charging infrastructure is increasing



Connector type
■ CCS (SAE Combo)
■ CHAdeMO
■ J-1772
■ Tesla Supercharger

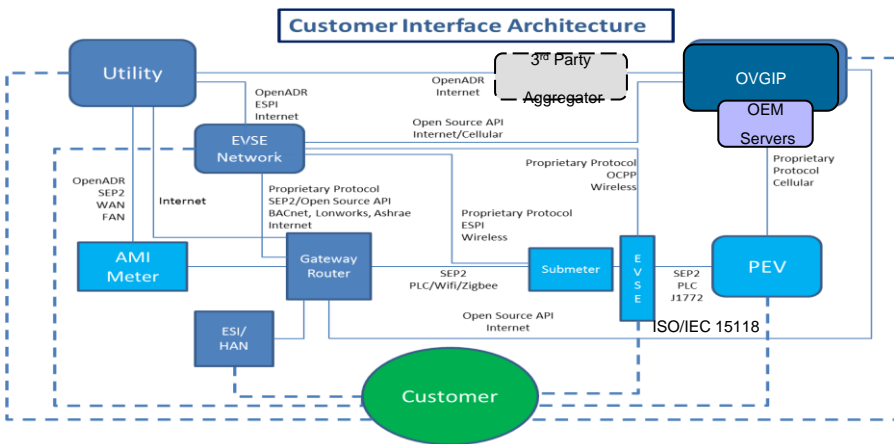
n Longitude and Latitude. Color shows details about Connector type. Details are shown for # locations. The data is filtered on Country, which keeps US. The view is filtered on pe, which keeps CCS (SAE Combo), CHAdeMO, J-1772 and Tesla Supercharger.

But most public charging networks remain fragmented



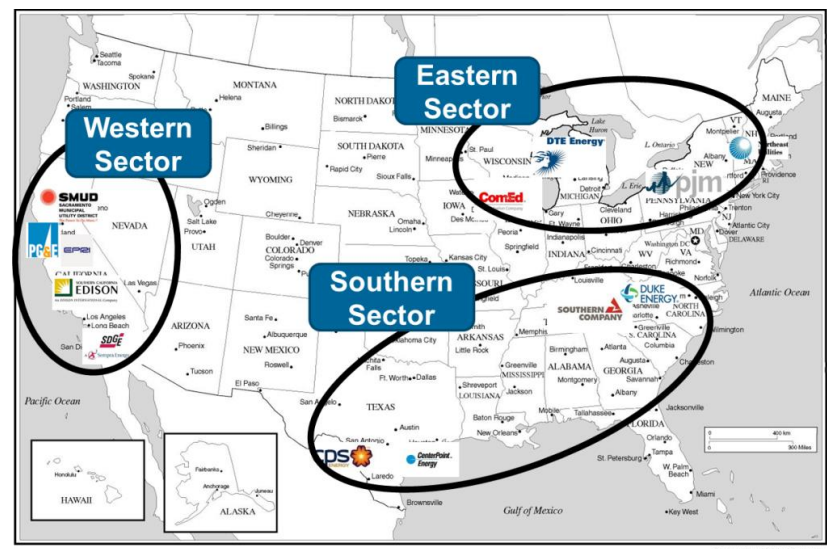
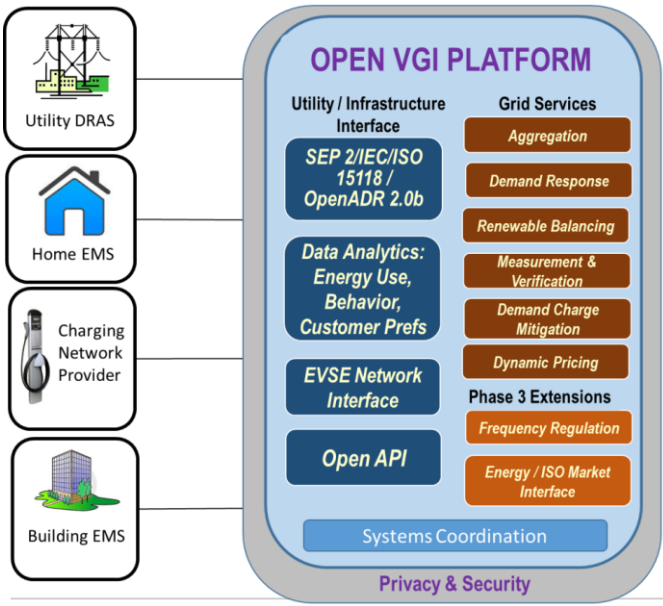
...d on Longitude and Latitude. Color shows details about Networks_site (group). Details are shown for # locations. The data is filtered on Connector type, Network and Country. The r type filter keeps CCS (SAE Combo), CHAdeMO, J-1772 and Tesla Supercharger. The Network filter keeps 20 of 20 members. The Country filter keeps US.

To help the PEV market scale, need to make the complex both simple and easy for the customer



Interface to Customer can be Smart Phone APP, Website, In-Home Display, EVSE Display, or In-Vehicle Display

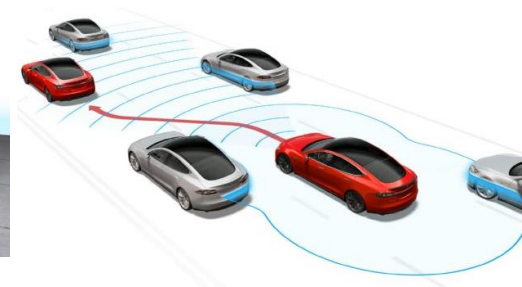
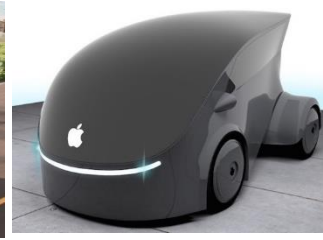
OVGIP Intends to Resolve Business and Operational Rules with Multiple Stakeholders



What's next?

Now and in the future

- Autonomous driving
 - Tesla, Apple, Google
- High power charging
 - Current 50 kW; future 150 kW; goal 350 kW
- Long-distance (~200 mile) mass-market battery electric vehicles
 - Chevy Bolt
 - Tesla Model 3
 - Gen 2 Nissan LEAF
- Ownership Models / Transportation On-Demand
 - Car share /
 - Lyft / Uber





Together...Shaping the Future of Electricity