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

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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

- Nissan
- Tesla
- GM
- Toyota
- Ford
- BMW
- OTHER
- PHEV TOTAL
- BEV TOTAL
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.
PEV charging infrastructure is increasing
But most public charging networks remain fragmented
To help the PEV market scale, need to make the complex both simple and easy for the customer.
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