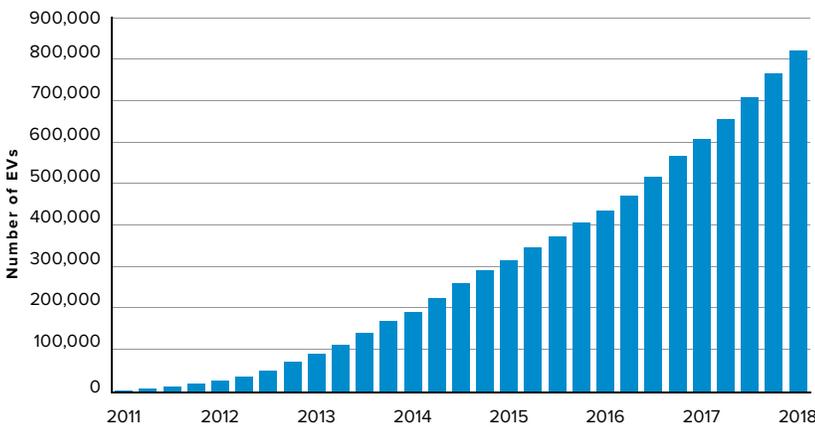


Electric Vehicle Trends & Key Issues

June 2018

ELECTRIC VEHICLES ON THE ROAD

840,000 EVs Are on the Road in the U.S.



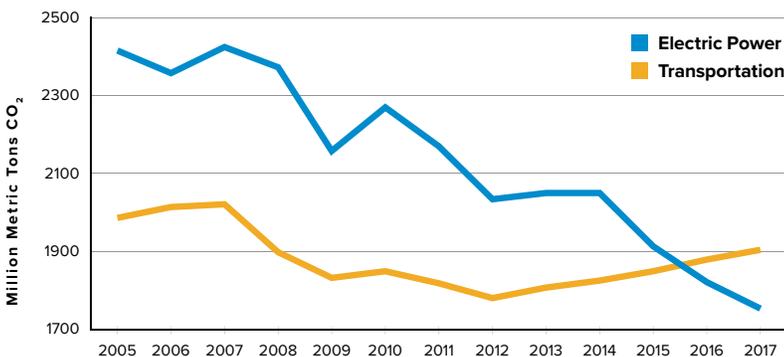
Source: InsideEVs.com and HybridCars.com

3 KEY FACTS

- About 840,000 EVs are on the road in the United States (through April 2018).
- 2018 sales are continuing the momentum: Q1 2018 sales increased 32% compared to Q1 2017.
- March 2018 was the best sales month ever, with more than 26,000 EVs sold.

TRENDS

Power Sector Carbon Emissions Now 8% Below Transportation Sector Emissions



Source: U.S. Energy Information Administration, Monthly Energy Review (March 2018)

3 KEY FACTS

- Carbon dioxide emissions from electricity generation were 27% below 2005 levels at the end of 2017.
- Carbon dioxide emissions for the electric power sector are now 8% below transportation sector emissions.
- Driving on electricity emits 54% fewer carbon dioxide emissions per mile than the average new gasoline car, based on U.S. EPA national electricity generation data.

POLICY UPDATE

STATE REGULATION

✓ Approval

On April 25, 2018, the Ohio PUC approved a \$10 million EV charging rebate program proposed by AEP Ohio. The rebate program allows AEP to offset equipment and installation costs for its customers for up to 300 Level 2 chargers at public locations, workplaces, and multi-unit dwellings, and 75 DC fast chargers at public locations. The program is funded through a new “Smart City Rider” that also includes a microgrid technology demonstration project. (Docket 16-1852-EL-SSO)

■ Proposal

On March 29, 2018, Hawaiian Electric filed an Electrification of Transportation (EoT) Roadmap with the Hawaii PUC that envisions most on-road vehicles being powered by electricity by 2045. The roadmap clearly defines the electric company's role in enabling this vision, including the buildout of charging infrastructure and the leveraging of grid modernization efforts. (Docket 2016-0168)

✓ Approval

On February 27, 2018, the Oregon PUC approved a \$4.6 million pilot proposed by PacifiCorp to install and own up to seven EV charging sites, each made up of multiple DC fast chargers and Level 2 chargers, as well as to conduct outreach and education activities and to create an electric transportation demonstration grant program for workplace charging, fleet electrification, and other non-residential charging infrastructure projects. (Docket UM 1810)

■ Rulemaking

The California Air Resources Board is in the process of implementing the Electric Vehicle Charging Station Open Access Act that was signed into law in 2013. The rulemaking addresses how EV drivers access public EV charging stations, including standards for payment and communicating pricing information. As the largest EV market in the U.S., the rule could have national implications. (California SB 454, 2013)

FEDERAL REGULATION AND POLICY

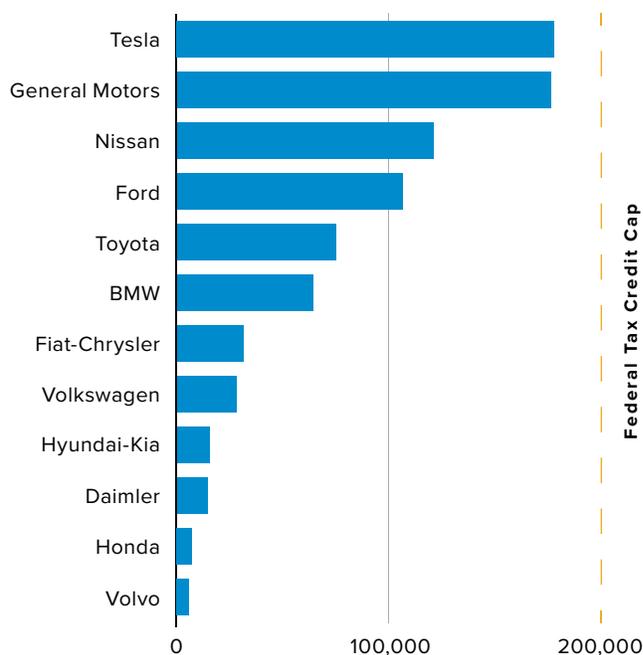
■ Vehicle Standards

Eighteen states, including California, petitioned the D.C. Circuit Court to review the U.S. EPA's Final Determination in its Mid-Term Evaluation process of greenhouse gas (GHG) emissions standards for model year 2022-2025 light-duty vehicles. EPA reversed the determination made by the prior administration on January 12, 2017. A rulemaking process is expected soon that will propose modifications to the standards. (More detail: [EPA](#))

■ Tax Credit

The federal tax credit of up to \$7,500 for EVs has a cap of 200,000 vehicles per manufacturer—after which the credit phases out over a year. Tesla and General Motors are the closest to hitting the cap, having sold about 180,000 EVs each. At current rates, these automakers likely would hit their caps sometime this fall.

EV Sales by Automaker



Source: InsideEVs.com and HybridCars.com

OUR TAKE

ELECTRIC TRUCKS ARE COMING

Recent announcements suggest a major shift toward electrification is underway in the medium- and heavy-duty truck sector. Large corporate fleets are evaluating opportunities to electrify their operations. Some recent announcements include:

- Volvo Trucks will sell an electric medium-duty truck in Europe starting in 2019 that is intended for urban delivery and waste management ([Autoblog](#)).
- Daimler, parent of Mercedes-Benz, will invest \$3.2 billion in research and development in electric trucks over the next two years ([Reuters](#)). Daimler subsidiary Mitsubishi Fuso is demonstrating its eCanter electric delivery truck in major markets, including New York, with the aim of entering large-scale production in 2019 ([Daimler](#)). Mercedes-Benz also has announced an electric version of its Sprinter commercial van for sale in Europe by 2019 ([Autoblog](#)).
- UPS announced a collaboration with Workhorse Group to deploy 50 electric delivery trucks that the company claims are comparable in cost to conventionally fueled trucks ([UPS](#)).
- Volkswagen will invest \$1.7 billion in electric truck and bus technology by 2022 ([Reuters](#)). The company is partnering with truck manufacturer Navistar to bring to market an electric medium-duty truck for North America by 2019 ([Reuters](#)). The alliance also will produce an electric school bus as early as 2019 ([PRNewsire](#)).
- Engine manufacturer Cummins showed off an all-electric Urban Hauler Tractor concept ([GreenCarReports](#)) and announced a partnership with bus manufacturer Gillig to develop an electric bus ([Cummins](#)).
- Tesla has continued to receive reservations for its electric Semi truck from major fleets including UPS, PepsiCo, J.B. Hunt, and Walmart ([Business Insider](#)).

INFRASTRUCTURE KEY TO UNLOCKING EV RIDESHARING

EVs are a great option for drivers who earn money in ride-hailing through Transportation Network Companies (TNCs) like Uber and Lyft. However, public charging infrastructure availability is key to making this a viable option. Here's what you need to know:

- Drivers can increase earnings. The operational savings of EVs result from reduced fuel and maintenance costs. Since TNC drivers cover their own vehicle costs, increasing operational savings means more profit. An analysis from [Rocky Mountain Institute](#) shows how TNC drivers who drive an EV 50+ hours per week can save more than \$5,000 a year.
- Access to public charging infrastructure is key for TNC applications. General Motors' car-sharing program, Maven Gig, allows drivers to rent a car on a weekly basis and use it to earn fares through a TNC network. Relying on public DC fast charging stations limited Maven's ability to integrate EVs into the program. Now, Maven and the charging network company [EVgo](#) are working together to build DC fast chargers dedicated to Maven users in the locations that Maven operates.
- Electric companies deploying public DC fast chargers, such as PacifiCorp (see policy section), are helping to support personal-use vehicles, as well as those who use EVs for ride-hailing jobs.

"Access to public charging infrastructure is key to making EVs work for ride-hailing."

DRIVING THE MARKET: MEMBER SPOTLIGHT ON SHARED-USE EVS

PACIFIC POWER SUPPORTS COMMUNITY EV CAR SHARING



Three all-electric Honda Fits are available to Hacienda Community Development Corporation (CDC) through a peer-to-peer car sharing program that premiered in 2017 in Portland, Oregon. The project demonstrates the economic and environmental benefits that electric vehicles—and car sharing—provide. As a partner in the pilot, Pacific Power provided \$10,000 to support the purchase and installation of Level 2 charging infrastructure to serve the electric vehicles. The cars will be available to Hacienda CDC staff and to clients to share for doctor appointments, job interviews, or other trips. Hacienda CDC provides

affordable housing, after-school programs, financial education, parenting support, small business development, and homeownership support to a predominantly Latino population in the Portland area.

ELECTRIC COMPANIES SUPPORT EV RIDE-SHARING

Electric companies are partnering with TNCs like Uber and Lyft to support EV driving for ride-sharing. Portland General Electric, Duquesne Light Company, and Rocky Mountain Power are among the companies to announce collaborations focused on educating TNC drivers about the benefits of EVs and facilitating charging infrastructure to ensure that more of the miles driven are electric. For example, [Rocky Mountain Power](#) (pictured), is helping to facilitate the build-out of public DC fast charging stations by leveraging a U.S. Department of Energy grant.



XCEL ENERGY PARTNERS WITH CAR-SHARING SERVICE

Xcel Energy is working with HourCar, a local nonprofit car-sharing program that allows members to rent cars by the hour in the Minneapolis-St. Paul area, to plan for integrating EVs into the fleet. The initiative aims to transition the car-sharing fleet from 60 conventional vehicles today to at least 100 EVs by 2020. Xcel also is helping to enable HourCar users to take one-way trips to designated “hubs.” ([HOURCAR](#))