

Electrifying Transportation

Description:

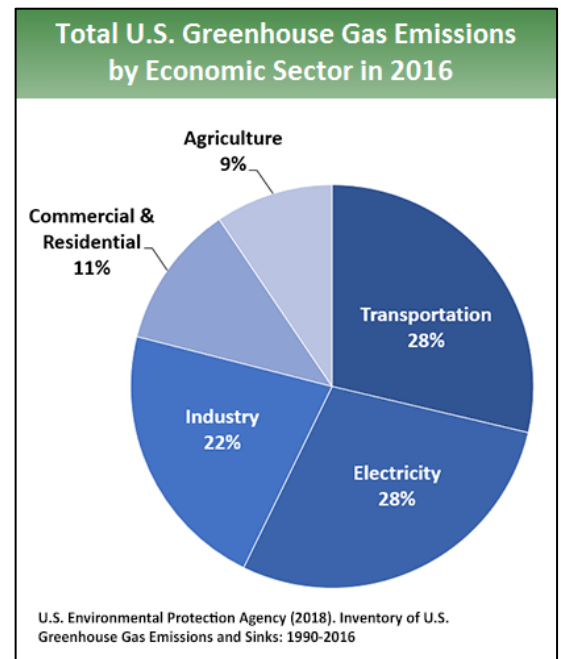
As greenhouse gas (GHG) emissions from electricity generation are declining, indications are that the transportation sector has or will soon surpass the electric sector as the greatest source of GHG emissions in the U.S. (see figure). There is some debate regarding the impact of electric vehicles (EVs) on GHG emissions. In many cases, it depends on the state. EVs move the emissions profile from mobile sources (individual vehicles) to the stationary source emissions of the power plants providing the electricity. As these emissions get cleaner, the associated emissions of vehicles will also get cleaner. Thus, low GHG emissions associated with the electric sector will result in corresponding low vehicle emissions, and the GHG savings in such states will be significant; in other places, the savings will not be as great.

The relationship between the increased adoption of EVs and the availability of EV charging stations is complicated. On the one hand, consumer range anxiety creates a barrier to increased adoption. On the other hand, while greater availability of charging stations would ease this anxiety, the relatively low numbers of vehicles on the road provides little incentive to install and make these stations available to the public. The good news is that both supportive policies for developing charging infrastructure and advancements in technology have eased range anxiety. Bloomberg New Energy Finance [estimates](#) that 55% of new car sales will be electric by 2040. A key part of building a modernized grid involves designing infrastructure that will facilitate easy connection of EVs to the grid.

Discussion of the Policy:

EV adoption can be spurred by ensuring that the use of an EV is as or more convenient than the use of a conventional vehicle. There are a number of policies that states can adopt.

1. **Coordinating with electric utilities is key.** Programs that provide access to vehicle registration data by service territory can enable utilities to plan for shifting demand.
2. **Charging Infrastructure Plan** – Locating [charging infrastructure](#) is different from locating conventional fueling stations. For the most part, EVs are cars used for commuting and local trips. Furthermore, while a driver of a conventional vehicle stops only briefly at a gas station for the specific purpose of filling up, a driver of an EV is generally looking to refuel when they are parked for a longer period of time, for example when going shopping, going to a restaurant, or going to work. Charging infrastructure plans should target these types of locations and attempt to pair the appropriate level of charging infrastructure with a reasonable amount of time a person will be at that location. Legislation could direct a state agency to develop such a plan through a stakeholder process. States with existing registration fees for EVs could use a portion of these fees to help fund planning and charging infrastructure development efforts, as [Washington](#) has done.



3. **Parking Infrastructure Requirements** – In tandem with the development of a statewide plan, legislation could set requirements for EV parking infrastructure. Some states have adopted permitting standards for parking lots, requiring, for instance, that for every 100 parking spaces, there must be at least one EV charging space. Legislation could also incentivize utilities to develop [make-ready locations](#). These locations supply power to the point where a utility or third-party developer might install an EV charging station. Many states and local governments are updating building standards and codes to provide for the installation of charging equipment. Building codes might also be updated to require either higher voltage pre-wiring or the installation of charging infrastructure.
4. **Rental Properties and HOAs** – Legislation can also make it easier for lessees, renters, and members of a homeowners' association (HOA) to install charging equipment. Typically, lessors are directed to allow lessees, at their own cost, to install charging systems. In some cases, lessees are required to maintain additional insurance for the system. Legislation related to HOAs typically directs them to avoid restrictions that would inhibit the installation of charging equipment.
5. **Financing and Financial Incentives** – Providing financial incentives and innovative financing options can help increase market penetration of EVs. Sales, property, and income tax credits are some of the simplest methods for addressing the up-front costs of EVs and EV supply equipment (EVSE). While sales tax credits are typically applied at the time of purchase, property and income tax credits may do less to address upfront cost barriers as receipt of the credit is typically removed in time from the purchase.¹ Some states have adopted other financial incentives including low-interest loans, grants, vouchers, and rebates. A handful of states qualify EVSE under their property assessed clean energy (PACE) programs. A simple solution is to increase and expand existing tax credits to incentivize commercial, publicly available charging stations.
6. **HOV, HOT, and Parking Incentives** – Allowing EVs to use high-occupancy vehicle (HOV) or high-occupancy toll (HOT) lanes regardless of number of passengers and without paying the toll may make EV ownership more attractive. Most states require that EVs using these lanes display a decal or particular license plate; others limit eligibility to certain types of vehicles or to a certain number of vehicles. States can also implement programs to provide parking incentives for owners of EVs. Typically, these programs provide access to carpool parking, preferential spaces, reduced fees, and/or access to charging stations.
7. **Utility-Run Programs** – Charging rate incentives and time of use rates can reduce the cost of electricity used for charging. Eligibility for a charging rate incentive may be limited to users with separate or advanced metering systems. Some utilities also offer financial incentives for the purchase of EVs or EVSE. In some states, enabling legislation may be required to direct or authorize a public utilities commission to allow regulated utilities to offer and recover the costs of providing these incentives.
8. **California ZEV** – To ensure that automakers research, develop, and market EVs, the Zero Emission Vehicle (ZEV) program in California requires automakers to sell an increasing percentage of electric cars within the state. Managed by California Air Resources Board (CARB), the program aims for 1.5 million ZEV sales in the state by 2025, as outlined in this [Action Plan](#). As of May 3, 2018, [nine states](#)² have committed to coordinated action to ensure the successful implementation of ZEV programs. By adopting California's program, these states require that manufacturers sell a certain number of ZEV vehicles in the state. The program makes it easier for manufacturers by allowing tradeable credits among regional markets (western and eastern) and a variety of classifications of vehicles that count toward the standard in varying degrees. Together, the members of the [Multi-state ZEV Task Force](#) have set a goal to reach 3.3 million ZEVs on the road by 2025.

¹ A [study](#) by the Congressional Budget Office however suggests that tax credits are important tools for ensuring increased adoption of alternative-fueled vehicles.

² These states are California, Connecticut, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont.

9. **The Volkswagen (VW) Settlement** – In October 2016, the VW settlement for violating vehicle emissions rules was finalized. In addition to the \$10 billion in direct customer rebates, \$2.7 billion was allocated to states to reduce emissions. Of these funds, 15% can be earmarked for EV infrastructure investments (the rest are targeted at NOx reductions in the medium- and large-duty vehicle fleet markets).

Another [\\$2 billion will be distributed nationally by VW](#), with \$800 million going directly to California. The first investment category includes planning, installation, operation, and maintenance of the following types of ZEV infrastructure, which must be available to all vehicles, utilizing non-proprietary connectors:

- Level 2 charging at multi-unit dwellings, workplaces, and public sites;
- DC fast charging facilities;
- Later generations of charging infrastructure; and
- Hydrogen fueling stations.

10. **Federal Congestion Mitigation and Air Quality (CMAQ) Funds** - CMAQ funds are available to states and can be used to deploy EV charging infrastructure. There may be a unique opportunity to pair a request for CMAQ funds with the VW Settlement money and a commitment from utilities to invest in charging infrastructure as a public/private partnership that would leverage the federal investment.

11. **Alternative Fuel Corridors** - In 2016, the U.S. Department of Transportation established the [Alternative Fuel Corridors](#) network. The program is intended to:

- Provide the initial opportunity for a formal corridor designation now and in the future on a rolling basis, without a cap on the number of corridors;
- Ensure that corridor designations are selected based on criteria that promote the build-out of a national network;
- Develop national signage and branding to help catalyze applicant and public interest;
- Encourage multi-state and regional cooperation and collaboration; and
- Bring together a consortium of stakeholders including state agencies, utilities, alternative fuel providers, and car manufacturers to promote and advance alternative fuel corridor designations in conjunction with the Department of Energy.

Example State Programs:

States, local governments, and electric utilities offer a variety of incentives to support EVs.

- Colorado EV Plan:
https://www.colorado.gov/governor/sites/default/files/colorado_electric_vehicle_plan_-_january_2018.pdf
- EV Connecticut:
http://www.ct.gov/deep/cwp/view.asp?a=2684&q=527866&deepNav_GID=1619
- Electric Drive Washington:
<http://www.commerce.wa.gov/growing-the-economy/energy/electric-vehicles/>
- Hawaii's EV Parking Infrastructure Requirements:
http://www.capitol.hawaii.gov/session2012/bills/GM1190_PDF
- Regional collaborations around the U.S. are emerging to coordinate the development and deployment of EVs and EV charging infrastructure.

- In May 2018, 12 states³ and the District of Columbia released the [Northeast Corridor Regional Strategy for Electric Vehicle Charging Infrastructure](#). The states in this region, from D.C. to Maine, will collaborate to invest in public EV charging infrastructure, promote EV sales across the region, and develop complementary policies and programs. Part of this strategy includes a [public-private partnership](#) with automakers.
- In October 2017, eight states⁴ signed the Regional EV West (REV West) [memorandum of understanding](#) to create an Intermountain West EV Corridor. The goal is to develop best practices and voluntary minimum standards for stations, expand access to new EVs, and create consistent charging experiences.
- Established in response to the Energy Policy Act of 1992, the U.S. Department of Energy's (DOE) [Clean Cities](#) program supports efforts to reduce the transportation sector's reliance on petroleum. Among other activities, the program provides technical support, information resources, and infrastructure and vehicle acquisition support.

More Information:

- The Rocky Mountain Institute (RMI): From Gas to Grid – Building Charging Infrastructure to Power Electric Vehicle Demand:
https://www.rmi.org/insights/reports/from_gas_to_grid/
- RMI: Electric Vehicles as Distributed Energy Resources:
<https://rmi.org/insight/electric-vehicles-distributed-energy-resources/>
- Alternative Fuels Data Center (AFDC), Hybrid and Plug-In Electric Vehicles:
<https://www.afdc.energy.gov/vehicles/electric.html>
- Plug-In America homepage:
<https://pluginamerica.org/>
- National Association of State Energy Officials (NASEO) and the National Association of Clean Air Agencies (NACAA): VW Settlement Clearinghouse:
<https://vwclearinghouse.org/>
- ZEV Program Implementation Task Force, Multi-State Zero Emission Vehicle Action Plan:
www.nescaum.org/documents/multi-state-zev-action-plan.pdf
- U.S. Department of Transportation, Federal Highway Administration: U.S. Electric Vehicle Corridors:
https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/maps/

For additional information on this topic, please review Chapters 3.2: Advanced Vehicle Incentives and 3.3: Electric Vehicle Charging Infrastructure in the *Clean Energy Policy Guide for State Legislatures* available at:

<http://cnee.colostate.edu/cleanenergypolicyguide/>

This information, along with additional resources, is also available on the Clean Energy Legislative Academy Resources page at: <http://cnee.colostate.edu/academyresources/>

³ Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia

⁴ Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming