

Electrifying Transportation

Description:

As greenhouse gas (GHG) emissions from electricity generation continue to decline, transportation has surpassed the electric sector as the largest source of GHG emissions in the U.S. 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 emissions source 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. The GHG savings in states with cleaner electric power resources will be significant; in other states, the savings will not be as great.

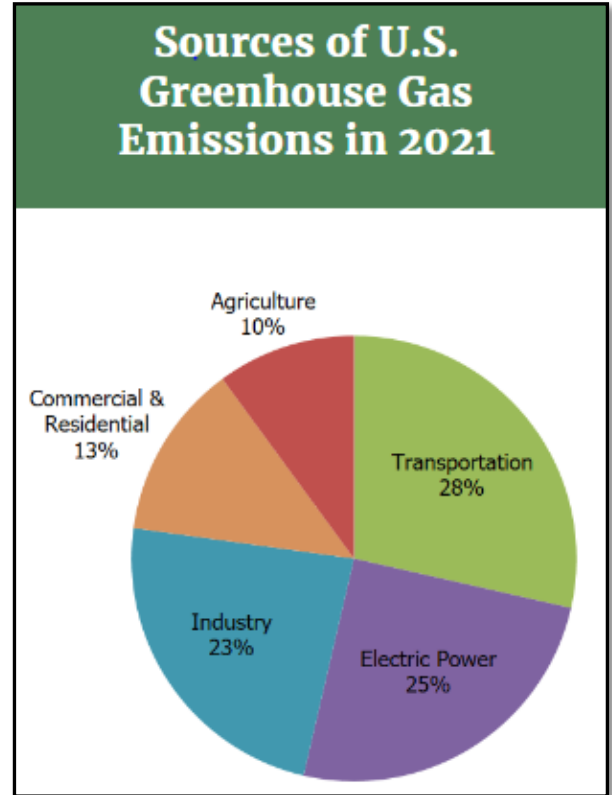
The relationship between the increased adoption of EVs and the availability of EV charging stations is complicated. On the one hand, consumer range anxiety creates a barrier to increased adoption of EVs. On the other hand, while greater availability of charging stations would ease this anxiety, the relatively small number of EVs on the road provides little incentive to install and make these stations publicly available.

The good news is that supportive policies for deploying charging infrastructure and advancements in battery technology are easing range anxiety. For instance, the [Infrastructure Investment and Jobs Act](#) of 2021 allocated [\\$7.5 billion](#) for a national network of 500,000 EV charging stations. In continuation of this effort, in February 2023, funding was granted to [seven projects](#) to develop medium- and heavy-duty EV charging corridors for heavily trafficked domestic freight routes. Additionally, the 2022 [Inflation Reduction Act](#) provides a [multitude](#) of tax credits and incentives to support the policies listed below.

Discussion:

States can incentivize EV adoption by ensuring that the use of an EV is as or more convenient than the use of a conventional vehicle. There are several policies that states can adopt:

1. **Coordination with Electric Utilities** – Programs that provide access to EV registration data by service territory can enable utilities to plan for shifting demand.
2. **Utility Investment in “Make-Ready” Infrastructure** – “Make-ready” means building and upgrading the infrastructure necessary for the installation of a charging station. RMI [recommends](#) that policies providing incentives for utilities to invest in make-ready infrastructure or charging infrastructure itself should be



Source: [U.S. EPA](#)

performance-based and encourage investments in locations that are unlikely to be targeted by the private sector, such as low-income and multi-unit dwellings.

3. **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 EV charging equipment. In some states, enabling legislation might be required to direct or authorize a public utilities commission to allow regulated utilities to recover the costs of providing these incentives.
4. **Charging Infrastructure Plans** – Locating charging infrastructure is different from locating conventional fueling stations. While some drivers will need to charge more quickly, others will refuel when they are parked for longer periods of time, for example, when shopping at the mall or going to work. Charging infrastructure plans should attempt to pair the appropriate level of charging (level 2 or direct current fast charging) with a reasonable amount of time a person will be at that location. Legislation can direct a state agency to develop an infrastructure plan through a public input process. States with existing registration fees for EVs might use a portion of this revenue to fund charging infrastructure planning and development efforts.
5. **Parking Infrastructure Requirements** – To complement the development of a statewide plan, legislation might set requirements for EV parking infrastructure. Some states have adopted permitting standards for parking lots. [Hawaii](#), for instance, requires that for every 100 parking spaces, there must be at least one EV charging space. States and local governments are also updating building standards and codes to require that new buildings are EV-ready, meaning that all conduit and wiring can accommodate EV charging equipment. 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.
6. **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 these organizations to avoid restrictions that would inhibit the installation of charging equipment.
7. **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 reducing the up-front costs of EVs and EV charging equipment. 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 usually removed in time from the purchase.¹ Some states have adopted other financing programs and financial incentives, including low-interest loans, grants, vouchers, and rebates. A handful of states include charging equipment as an eligible improvement 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.
8. **HOV and HOT 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 a particular license plate; others also limit eligibility to certain types of vehicles or to a certain number of vehicles.
9. **Fleet Mandates** – Some states require state agencies to acquire a fixed or growing percentage of electric, hybrid, and/or alternative fuel vehicles. A City of Seattle [study](#) found that the city could save millions by switching to EVs. [Massachusetts](#) required that its state fleet be no less than 50% hybrid or alternative fuel vehicles by 2018 and set the following [state fleet targets for zero emission vehicles \(ZEVs\)](#): 5% by 2025; 20% by 2030; 75% by 2040; and 100% by 2050.

¹ A [study](#) by the Congressional Research Service suggests that tax credits are important tools for ensuring increased adoption of alternative fuel vehicles.

10. **California ZEV Program** – To ensure that automakers research, develop, and market EVs and other alternative fuel vehicles, California’s [Zero Emission Vehicle \(ZEV\) program](#) requires that automakers sell an increasing percentage of ZEVs within the state. Managed by the California Air Resources Board (CARB), the program’s target is five million ZEV sales in the state by 2030. The program allows manufacturers to trade credits among regional markets (western and eastern) and permits a variety of classifications of vehicles to count toward the target. Thirteen states² have adopted California’s program.
11. **Federal Congestion Mitigation and Air Quality (CMAQ) Funds** – [CMAQ funds](#) (almost \$2.6 billion in fiscal year 2023) are available to states to assist them in meeting Clean Air Act requirements. State funds can be used to deploy EV charging infrastructure. There may be a unique opportunity to pair a request for CMAQ funds with a commitment from utilities to invest in charging infrastructure as a public/private partnership that would leverage the federal investment.
12. **Invest in the Workforce** – Increasing electrification of the transportation sector brings with it new opportunities for a broad sweep of workers. Companies report a lack of workers who possess necessary skills to help with expanding electrification efforts. States can remediate this workforce gap with training and education programs related to professions involved in the development, manufacture, repair, and installation of EV infrastructure. As part of this process, states can remove barriers to training and education by expanding opportunities to underrepresented workers by covering the costs of public transportation for students, as well as expanding broadband to underserved communities. States may also expand existing electrician training and mentorship programs to encourage more young people to enter the industry.

Example State Programs:

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

- EV Connecticut:
<https://portal.ct.gov/DEEP/Air/Mobile-Sources/EVConnecticut/EVConnecticut---Incentives>
- Massachusetts Offers Rebates for Electric Vehicles (MOR-EV):
<https://mor-ev.org>
- Nevada’s Electric Vehicle Supply Equipment (EVSE) Demonstration Program Requirements:
<https://afdc.energy.gov/laws/11856>
- New Jersey’s Electric Vehicle Incentive Programs:
<https://njcleanenergy.com/ev>
- Go Electric Oregon:
<https://goelectric.oregon.gov/incentives-rebates>
- Electric Drive Washington:
<http://www.commerce.wa.gov/growing-the-economy/energy/electric-vehicles/>

² Colorado, Connecticut, Maine, Maryland, Massachusetts, Nevada, New Jersey, New York, Oregon, Rhode Island, Vermont, Virginia, and Washington.

Regional Collaborations:

Regional collaborations around the U.S. are coordinating the development and deployment of EV charging infrastructure.

- In September 2021, five states³ signed the Regional EV Midwest Coalition (REV Midwest) [Memorandum of Understanding](#) (MOU). The goal is to collectively accelerate vehicle electrification in the region. The MOU ensures that the Midwest will be able to compete for new private investments in and federal funding for transportation electrification.
- In July 2020, 15 states⁴ and the District of Columbia signed the Multi-State Medium- and Heavy-Duty Zero Emissions Vehicle [MOU](#). The aim of the MOU is for signatory states to work together to advance and accelerate the market for electric medium- and heavy-duty vehicles with a goal that 100% of all new medium- and heavy-duty vehicles sales will be electric by 2050.
- In May 2018, 12 states⁵ and the District of Columbia released the [Northeast Corridor Regional Strategy for Electric Vehicle Charging Infrastructure](#). These states 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 states⁶ signed the Regional EV West (REV West) [MOU](#) to create an Intermountain West EV Corridor. The goal is to develop best practices and voluntary minimum standards for charging stations, expand access to new EVs, and create consistent charging experiences across the region. In December 2019, all eight states signed an MOU [recommitting](#) to the plan and to building on progress to date, which includes over 100 built and 75 planned quick charging stations along routes in the Intermountain West.
- In 2016, the U.S. Department of Transportation established the [Alternative Fuel Corridors](#) network, which is comprised of 49 states and the District of Columbia. Designated corridors are priority areas for EV and natural gas fueling infrastructure under the [CMAQ program](#).
- Established in 2010, the [Transportation and Climate Initiative](#) (TCI) is a regional collaboration of 13 states⁷ and the District of Columbia to promote the use of alternative fuels and create an [EV Corridor](#). Several member states have worked together to explore regional policy solutions to reduce transportation sector emissions.
- The [West Coast Green Highway](#) is an initiative between California, Oregon, and Washington to promote cleaner fuels by installing alternative fueling stations along the Interstate 5 corridor. The effort aims to create a clean, green, and smart highway as a “Corridor of the Future.”

³ Illinois, Indiana, Michigan, Minnesota, and Wisconsin.

⁴ California, Connecticut, Colorado, Hawaii, Maine, Maryland, Massachusetts, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington.

⁵ Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia.

⁶ Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

⁷ Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Vermont, and Virginia.

More Information:

- Alternative Fuels Data Center (AFDC): <https://afdc.energy.gov/>
- American Council for an Energy-Efficient Economy (ACEEE) State Fleets Database: <https://database.aceee.org/state/fleets>
- International Energy Agency (IEA), Policies to Promote Electric Vehicle Deployment: <https://www.iea.org/reports/global-ev-outlook-2021/policies-to-promote-electric-vehicle-deployment>
- The GridWise Alliance, EVs - Driving Adoption, Capturing Benefits: <http://gridwise.org/evs-driving-adoption-capturing-benefits/>
- Plug-In America and Sierra Club: AchiEVe: Model State & Local Policies to Accelerate Electric Vehicle Adoption: <https://www.sierraclub.org/sites/www.sierraclub.org/files/program/documents/AchiEVeModelToolkit2020.pdf>
- RMI: From Gas to Grid – Building Charging Infrastructure to Power Electric Vehicle Demand: <https://rmi.org/wp-content/uploads/2017/10/RMI-From-Gas-To-Grid.pdf>
- U.S. Department of Transportation (U.S. DOT): Bipartisan Infrastructure Law: Electric Vehicles: <https://www.fhwa.dot.gov/bipartisan-infrastructure-law/evs.cfm>
- U.S. DOT: Charging Forward: A Toolkit for Planning and Funding Rural Electric Mobility Infrastructure: <https://www.transportation.gov/rural/ev/toolkit>
- U.S. Department of Energy (U.S. DOE): Clean Cities Program: <https://cleancities.energy.gov/>