

Vehicle cost, lack of consumer information hinder purchases of plug-in electric vehicles

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Vehicle cost, current battery technology, and inadequate consumer knowledge are some of the barriers preventing widespread adoption of plug-in electric vehicles, says a new congressionally mandated report from the National Research Council. Developing less expensive, better performing batteries is essential to reducing overall vehicle cost, and a market strategy is needed to create awareness and overcome customer uncertainty. The report recommends a range of incentives that the federal government can offer to address these and other barriers.

The report focused on battery [electric vehicles](#) and plug-in hybrid electric vehicles, both of which can charge their batteries by plugging into the electric grid. The difference is that battery electric vehicles operate solely on electricity stored in the battery, while plug-in hybrid electric vehicles also have an internal combustion engine that turns on when the battery is depleted and can extend the vehicle range. The report distinguishes four classes of plug-in electric vehicles based on their all-electric range: long-range and limited-range battery electric vehicles; range-extended plug-in hybrid electric vehicles; and minimal plug-in hybrid electric vehicles. Despite the notion that range limitation is a problem for plug-in electric vehicles, the total range for each class—except for the limited-range battery electric vehicle—is similar to that of a conventional vehicle using one tank of gas.

The study found that the home is the most important location for charging infrastructure, followed by the workplace, in and around cities, and, least important, on interstates. The vehicle fleet spends a vast

majority of time parked at home, and most early adopters of plug-in vehicles satisfy their charging needs there. Charging at workplaces—where vehicles are also parked for a substantial amount of time—provides an additional opportunity to encourage plug-in vehicle adoption and increase the amount of miles fueled by electricity. The report says that local governments should streamline permitting processes and adopt building codes that require new construction to be capable of supporting future charging installations, and should encourage workplaces to consider investments in charging infrastructure.

Through regulatory action, the [federal government](#) should eliminate the proliferation of incompatible plugs and ensure that all drivers can charge their vehicles and pay at all public charging stations using a universally accepted method, just as conventional vehicles can be refueled at any gas station. But the report recommends that the federal government refrain from additional direct investment in the installation of public charging infrastructure until more research has been done to understand the role of public infrastructure in encouraging broader adoption and use of plug-in electric vehicles. Specifically, the government should fund research to determine how much public infrastructure is needed and where it should be sited to persuade more people to purchase and use such vehicles. It should also continue to invest in fundamental and applied research to expedite the development of low-cost, high-performance batteries to increase the all-electric range and reduce vehicle cost.

At the anticipated rates of consumer adoption, vehicle charging is expected to have a negligible effect on the electricity distribution system, the report says. However, economic factors such as high electricity costs, regional variability in electricity costs, or rate structures that do not incentivize charging at off-peak hours could discourage ownership. Rate structures that encourage owners to charge vehicles when the cost of supplying energy is low would also be of benefit to the utility.

Existing federal financial incentives to purchase plug-in electric vehicles should continue beyond the current production volume limit, the report says. The federal government should consider converting the federal income tax credit offered to purchasers of plug-in electric vehicles into a point-of-sale rebate, and should work with state governments to adopt a policy in which plug-in vehicles remain free from special roadway or registration surcharges for a limited time. The government should re-evaluate the case for incentives after a suitable period, considering advancements in vehicle technology and progress in reducing production costs, total costs of ownership, and vehicle emissions.

More research should be conducted on the variety of other consumer incentives that have been offered by states and local governments to determine which, if any, have proved effective in promoting deployment of plug-in electric vehicles. The federal government should also make use of its Ad Council program, particularly in key markets, to provide accurate information about federal tax credits and other incentives and the value of vehicle ownership.

More information: Report: www.nap.edu/catalog/21725/over...in-electric-vehicles

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