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Publication Date

2024-02-01

DOI

10.7922/G2DV1H7C

Impacts of the Federal Tax Credit on the Decision to Lease or Purchase a Plug-in Electric Vehicle

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February 2024

Issue

To mitigate climate change and air pollution, multiple US states and other countries have been setting and adjusting goals and policies aimed at shifting sales from conventional, fossil-fuel-powered vehicles to plug-in electric vehicles (PEVs), defined as plug-in hybrid and battery electric (all-electric) vehicles. For example, US policies have offered federal tax credits for the purchase of PEVs, with limits set on how many PEVs from a single manufacturer, which PEVs, and which consumers qualify. A key to developing or adjusting these policies is understanding how financial incentives affect consumers' decisions to purchase or lease PEVs.

Much of the existing research on incentives explores their impact on vehicle purchasing but not on leasing. However, leasing is important to the PEV market for several reasons. Leasing can lower the up-front cost of PEV acquisition since consumers receive the credit regardless of their tax liability and at the point of payment rather than when filing taxes; it allows consumers to try a PEV over a set time, which could lower the perceived uncertainties of PEV adoption; and it increases the turnover of PEVs on the road, creating a supply of used PEVs faster than purchasing could.

To better understand the impact of financial incentives on PEV leasing and purchasing, researchers at the University of California, Davis analyzed survey responses from approximately 2,800 California PEV owners. The survey asked: If the federal tax credit were not available would you: purchase or lease the same PEV, switch to a different PEV, switch to a conventional or hybrid (non-plug in) vehicle, or not acquire a vehicle at all?

Key Research Findings

In the absence of the federal tax credit, PEV purchasers and lessees are more likely to acquire a conventional vehicle or choose not to acquire any vehicle at all. Mathematical simulation (modeling) showed that as the size of the federal tax credit hypothetically increases as a proportion of MSRP or lease cost, the more likely it is that, if that tax credit were unavailable, PEV purchasers and lessees would choose a conventional vehicle or forego getting any vehicle at all.

PEV lessees may be more impacted than purchasers by a lack of federal tax credit.

If the federal tax credit were not offered, a smaller proportion of lessees than purchasers would obtain the same PEV (Figure 1, top pair of bars) and a larger proportion of lessees than purchasers would switch to a conventional vehicle (Figure 1, fourth pair of bars).

The higher the MSRP, the less likely purchasers and lessees are to change to a conventional vehicle if the tax credit were not available.

This suggests that the impact of financial incentives on sales and leasing is greater for lower-priced than for higher-priced PEVs. Similarly, for purchasers, a longer range on a battery electric vehicle, which raises the price, makes them less likely to change to a conventional vehicle or another PEV in the absence of the tax credit.

In the absence of the tax credit, purchasers and lessees who rent instead of own their home are more likely to choose a conventional vehicle over a PEV.

This finding echoes other research showing that home ownership and access to charging at home is associated with PEV adoption.

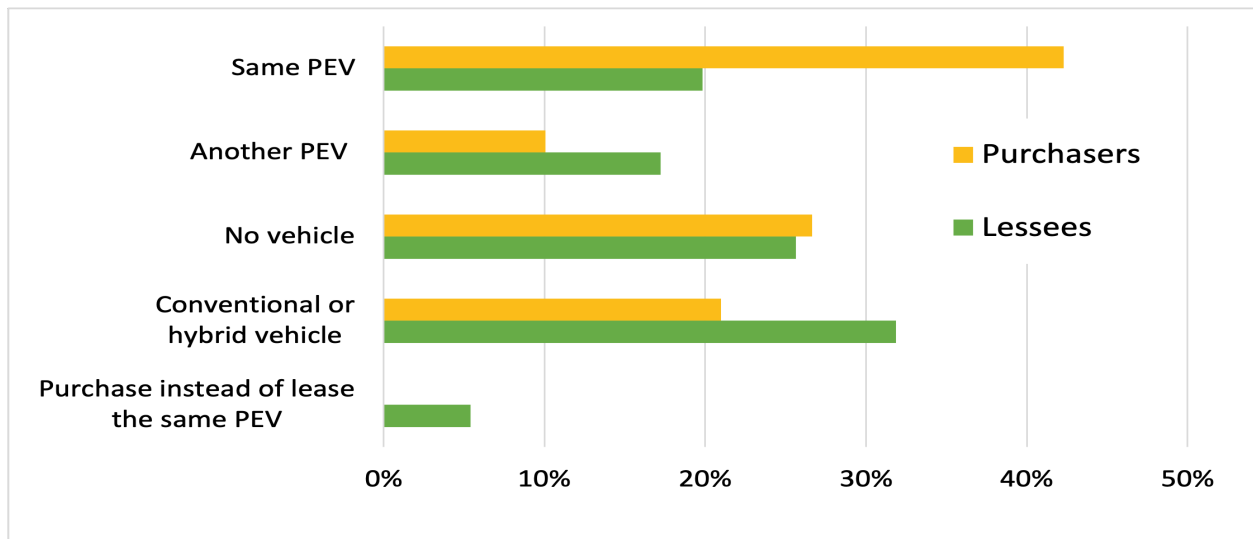


Figure 1. Distribution of responses to what purchasers and lessees would do in the absence of a federal tax credit for PEVs.

Policy Implications

The study described here reinforces findings from earlier research and provides new insights, especially related to leasing PEVs, that can inform policies supporting the transition from conventional vehicles to PEVs. While the findings of this study were specifically related to the tax credit they may more generally apply to other financial incentives.

1. The larger the tax credit relative to the MSRP or lease price, the more important the incentive is in persuading purchasers and lessees to choose a PEV.
2. Because the tax credit appears to have a greater impact on leasing than on purchasing decisions, it is important to inform potential lessees about incentives and to have eligibility criteria for leased vehicles less stringent than for purchased vehicles.
3. For vehicles with higher MSRP and electric range, the tax credit is less important to consumer decisions, suggesting that incentives should be directed towards less expensive battery electric vehicles, regardless of range—as has been done with MSRP caps.

4. The tax credit is more important for consumers who rent rather than own homes, probably because charging tends to be less convenient and more expensive for renters. This echoes studies showing the importance of making charging more widely accessible, including in multi-unit homes. Additional incentives to specifically defray the cost of charger installation or public-charging could also help with the transition to PEVs.

More Information

This policy brief is drawn from “Exploring the Impact of the Federal Tax Credit on the Decision to Lease or Purchase a PEV in California” a report from the National Center for Sustainable Transportation, authored by Kelly Hoogland, Scott Hardman, Debapriya Chakraborty, and David S. Bunch of the University of California, Davis. The full report can be found on the NCST website at <https://ncst.ucdavis.edu/project/analysis-decision-lease-electric-vehicle-and-impact-incentives-electric-vehicle-lease>.

For more information about the findings presented in this brief, contact Kelly Hoogland at kmhoogland@ucdavis.edu.

The National Center for Sustainable Transportation is a consortium of leading universities committed to advancing an environmentally sustainable transportation system through cutting-edge research, direct policy engagement, and education of our future leaders. Consortium members include the University of California, Davis; California State University, Long Beach; Georgia Institute of Technology; Texas Southern University; the University of California, Riverside; the University of Southern California; and the University of Vermont.

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