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Economic Perspectives on Electric Vehicle Tax Credits

P.L. 119-21, commonly known as the One Big Beautiful Bill Act (OBBBA), terminated three tax credits for plug-in electric vehicle (EV) purchases: the used clean vehicle credit (UCVC), the credit for qualified commercial clean vehicles (CQCCV), and the clean vehicle credit (CVC). This In Focus provides background information on the economic, environmental, and distributional impacts of EV tax credits. It describes studies examining the degree to which EV tax credits boost EV sales, reduce greenhouse gas (GHG) emissions, and change the distribution of income in the United States.

Legislative Background

The UCVC and the CQCCV were enacted as part of the Inflation Reduction Act of 2022 (IRA; P.L. 117-169). The CVC was enacted under the Energy Improvement and Extension Act of 2008 (P.L. 110-343) and was modified in the IRA. The UCVC provides a credit of up to $4,000 for individuals purchasing used EVs costing $25,000 or less; the CQCCV provides a credit of up to $40,000 (or $7,500 for light-duty vehicles) for businesses purchasing EVs that are leased to customers or used in the ordinary course of business; and the CVC provides a credit of either $3,750 or $7,500 for individuals purchasing new EVs, subject to certain income, price, and domestic content requirements. These three credits and their qualifying criteria are described in greater detail in CRS In Focus IF12600, *Clean Vehicle Tax Credits*.

P.L. 119-21 terminated the EV tax credits for vehicles acquired after September 30, 2025. The repeal of the three credits is projected to reduce federal deficits by $190 billion over the 10-year budget window (FY2025-FY2034).

Marginal vs. Inframarginal Tax Credit Recipients

The efficiency of EV tax incentives depends, in part, on the degree to which they induce *marginal* EV buyers or accrue to *inframarginal* EV buyers. Marginal EV customers are those whose decisions to purchase or not purchase an EV are directly impacted by the existence of a tax incentive. Put differently, they are on the fence (or margin) with regard to their decision. In contrast, inframarginal buyers are those who have decided to purchase an EV regardless of the tax credit. The tax credit may cause inframarginal buyers to purchase a more expensive EV (albeit without violating any price limitations in the relevant credit), but it does not motivate a decision to purchase an EV.

The distinction between marginal and inframarginal purchases is important when examining EV sales data. According to Argonne National Laboratory, EV purchases have increased more than five-fold in recent years, from 1.9% of light-duty vehicle sales in 2018 to 9.8% in 2024. The stock of EVs on the roads has similarly increased from 0.4% of light-duty vehicle registrations in 2018 to 1.7% by 2023, according to the Department of Energy. Not all of the increase in sales can be attributed to the EV credits.

While the precise estimates differ, the literature on EV tax credits suggests that most tax credit recipients would have purchased an EV without the credit. For such individuals, the credit represents a financial windfall.

Studies of the IRA-reformed credits suggest that roughly 7 out of 10 EV tax credit recipients are inframarginal. Allcott et al. (2024) estimate an inframarginal share of 67% to 77%; the Congressional Budget Office (CBO) (2023) estimates a share of 68%; and shortly after the IRA's passage, the Brookings Institution (2023) projected that 73% of EV tax credit recipients would be inframarginal.

These estimates align with studies of other EV tax credit programs. Xing et al. (2021) and Tal and Nicholas (2016) estimate that for the previous version of the CVC—that which predated the IRA—70% and 71.5%, respectively, of tax credit recipients were inframarginal. Similarly, Chandra et al. (2010) found that in Canada, 74% of consumers receiving a rebate for hybrid vehicle purchases would have bought a hybrid without the rebate. Finally, when the German government abruptly and unexpectedly eliminated a $4,900 EV subsidy, year-over-year EV sales fell 26.6%, consistent with roughly three-quarters of subsidy recipients being inframarginal.

Environmental Impact: Displaced Vehicles and Their Emissions

EV credits may increase economic efficiency by addressing the spillover costs imposed on society (also known as *negative externalities*) when one person's actions create costs for other people. Driving gas-powered cars can create negative externalities, harming individuals who breathe polluted air or suffer through heat events attributable to climate change. EV tax credits may lower the usage of gas-powered cars, thereby decreasing air pollution, greenhouse gas emissions, and other externalities. Tax credits will prove more effective at shifting consumers away from gas-powered cars and toward EVs if consumers are sensitive to reductions in the after-tax-credit prices of EVs.

Research into the environmental effects of EVs and gas-powered cars has not yielded precise, consistent results. However, such research indicates that EVs generally produce less pollution than gas-powered cars, especially when EVs use electricity produced from sources such as wind, solar, or nuclear power, among others. Analyses of lifecycle GHG emissions—emissions associated with manufacturing, driving, and even scrapping a vehicle—indicate that for model year 2019, battery-electric vehicles (BEVs) produce 1.8-3.5 tons of carbon dioxide equivalent per year, whereas gas-powered cars produce 4.1-14.7 tons.

These findings are discussed in greater detail in CRS Report R46420, *Environmental Effects of Battery Electric and Internal Combustion Engine Vehicles*.

While the estimates in the previous section indicate that roughly 70% of EV tax credit recipients are inframarginal, they also imply that the OBBBA's repeal of the credits will cause a 25%-30% decline in EV sales. Estimates of the *price elasticity of demand* for EV sales generally range from 1.4 in Allcott et al. (2024) to 2.67 in Xing et al. (2021). A price elasticity greater than 1 indicates that a 1% decrease in the after-tax-credit price of EVs increases overall EV purchases by more than 1%. These estimates indicate that although some EV buyers receive windfall gains from the credits, a dollar in credits induces more than a dollar of EV purchases. If higher EV sales lead to fewer purchases of gas-powered cars, GHG emissions may fall as a result.

Comparisons between average gas-powered cars and average EVs may overstate the environmental benefits of EV credits. Xing et al. (2021) indicate that EV tax credits disproportionately decrease purchases of other fuel-efficient vehicles, including hybrids. Tal and Nicholas (2016) find that many marginal tax credit recipients would not have bought any car in the absence of EV tax credits; for such cases, EV tax credits increase air pollution and GHG emissions. While these factors are not so significant as to erase the environmental benefits of EV credits, Xing et al. (2021) report that "ignoring the non-random replacement of gasoline vehicles would result in overestimating emissions benefits of EVs by 39 percent."

Hahn et al. (2024) suggest that the environmental benefits per dollar of EV tax credits are lower than for other climate subsidies. The researchers find that EV subsidies are least effective when they include hybrid vehicles and are more effective when they are limited to BEVs. (The current tax credits split this difference by including BEVs and plug-in hybrids while excluding conventional hybrids.)

As a point of comparison, the IRA's increased spending on clean electricity tax credits (CETCs) is estimated to have cost three times as much as increases to the EV tax credits, while the Rhodium Group found that the CETC changes would have reduced emissions by 9 to 51 times as much as the EV credit changes. These findings suggest that the repeal of the EV tax credits in the OBBBA will have fewer environmental impacts per dollar of deficit reduction than the OBBBA's phaseout of the CETCs, which subsidize electricity generation from zero-emissions sources such as solar, wind, nuclear, and geothermal power.

Distributional Effects

Economic theory suggests that the people benefiting from tax credits are not always the people who receive them. For example, if the government creates a new $1,000 tax credit for buying EVs, and if this credit increases demand for EVs such that car dealers are able to raise prices by $700, then consumers are only $300 better off. On paper, it appears that consumers receive a $1,000 EV tax credit, but economists would note that consumers receive 30% of the credit's *incidence*, whereas car dealers receive 70%.

However, studies of tax credits for EVs and hybrids find that consumers reap most of the benefits. Sallee (2011), Gulati et al. (2017), Muehlegger and Rapson (2022), and Barwick et al. (2023) find that tax credit recipients capture 70% to 100% of the incidence of EV or hybrid tax credits.

Drawing upon such findings, Borenstein and Davis (2025) use tax filing data from 2009-2021—prior to the enactment of the IRA—to study the distributional impact of EV tax credits, under the assumption that credit recipients capture 100% of credit incidence. They estimate that taxpayers in the top 5% of the income distribution reaped 50% of all EV tax credit benefits, whereas taxpayers in the bottom 60% of the income distribution received less than 3% of benefits.

The distributional effects of the IRA-reformed EV tax credits may differ from the pre-IRA credits studied by Borenstein and Davis (2025). Three reasons for this are as follows:

- The IRA created the UCVC. Because the credit applies to used vehicles, which are cheaper than new vehicles, it may be claimed by low-income taxpayers at a higher rate than the CVC. However, the credit has experienced low take-up, with 28,000 taxpayers claiming the UCVC in 2023, as opposed to 488,000 claiming the CVC.
- The IRA disallowed the CVC for single taxpayers with incomes above $150,000 and for married couples with incomes above $300,000 in back-to-back years. However, an "exception" or "loophole" in the IRA allows high-income taxpayers to benefit from EV tax credits when leasing instead of buying EVs, and leases are now half or more of the EV market. This leasing exception is described in CRS In Focus IF12603, *The Tax Credit Exception for Leased Electric Vehicles*.
- The IRA disallowed the CVC for light-duty EVs costing more than $55,000 and for heavy-duty EVs costing more than $80,000—the types of higher-priced EVs that may be bought disproportionately by affluent taxpayers. These restrictions are easily evaded due to the exception for leased vehicles described above.

Another change enacted by the IRA was the creation of the CQCCV. The interaction of the CQCCV and the CVC allows for the leased EVs loophole, which is regressive, but comprehensive analyses of the credit's total distributional impact have not been published to date.

Two changes have been more unambiguously progressive. First, IRS regulations made the CVC and UCVC fully refundable starting in 2024, so long as taxpayers "transfer" the tax credits to car dealers in exchange for a cash payment or a reduced price on the vehicle. In effect, this allowed low- and middle-income EV purchasers to reap the full value of EV tax credits, whereas previously their credits could not exceed their income tax liabilities. Second, the price differential between gas-powered cars and EVs has narrowed in recent years. This may have increased EV purchases among low- and middle-income taxpayers.

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