

INTERNATIONAL EV POLICY COUNCIL

Driving the Market for Plug-in Vehicles: Understanding Reoccurring Incentives

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Key Takeaways

Reoccurring incentives continually reinforce the value of plug-in electric vehicles (PEVs) to consumers and have been shown to have a positive impact on the market. A well-designed package of reoccurring incentives will:

1. Introduce as many incentives as possible to ensure PEVs achieve market growth.
2. Use carpool, transit and bus lanes, parking incentives, toll waivers, congestion charge zones, annual vehicle license or tax waivers, and gasoline price increases.
3. Introduce incentives in as many regions as possible to have the greatest impact.
4. Be transparent, meaning consumers should be aware of how long incentives will be in place.
5. Pair these incentives with financial purchase incentives, with all incentives should being clearly communicated to consumers.
6. Be continually evaluated to ensure they are successful and to understand when the incentives should be removed.
7. Not remove incentives suddenly without notice, a gradual phase-out of incentives once PEVs have gained a stable foothold on the market will be the least disruptive.
8. Different incentives between battery electric vehicles (BEVs), and plug-in hybrid electric vehicles (PHEVs) with short driving ranges ensuring vehicles with the best environmental performance and promoted.

Introduction

Plug-in electric vehicles (PEVs) are more efficient and less polluting than internal combustion engine vehicles (ICEVs). For PEVs to have the most significant impact on urban air pollution, energy consumption, and climate change they need to be deployed in large numbers. To achieve high market penetration of PEVs, incentives are needed. Incentives are especially important during the early market years, to help raise consumer awareness and encourage consumers to purchase PEVs.

This policy guide explores reoccurring incentives for PEVs. It complements another guide that explores financial purchase incentives available [here](#) [1]. Unlike financial purchase incentives, which occur at the point of sale, reoccurring incentives are offered to consumers throughout their ownership of a PEV. Reoccurring incentives can be financial or non-financial, and offered during any timeframe. Not all consumers take advantage of these incentives. This policy guide outlines the effectiveness of reoccurring incentives in promoting PEV sales, and describes how these incentives should be implemented to have the greatest impact on PEV sales.

Lessons from Academic Research and Empirical Data

Academics have undertaken research to analyze whether different reoccurring incentives are effective in promoting PEV sales. The findings of these studies are explored below and are presented in detail in the literature review available [here](#) [2].

PEV Charging Infrastructure

The development of PEV charging infrastructure may be the most important consideration for policy makers. Developing public, workplace, and corridor

charging has been found to increase rates of PEV adoption [3,4]. A lack of infrastructure will deter consumers from purchasing a PEV.

The development of PEV charging infrastructure may be the most important consideration for policymakers. Developing public, workplace, and corridor charging has been found to increase rates of PEV adoption [3,4]. A lack of infrastructure will deter consumers from purchasing a PEV.

In locations with long dwell times—where people stop for several hours—slower charging infrastructure can be installed. In locations with short dwell times, DC fast charging infrastructure should be installed. Policymakers should explore funding mechanisms to support the construction of both public and home location charging infrastructure in urban areas, at workplaces, on travel corridors, and at travel destinations. Charging infrastructure development is explored in another policy brief available [here](#) [5].

Carpool, Bus and Transit Lanes

Allowing PEVs to access carpool or high-occupancy-vehicle (HOV), transit, or bus lanes is effective in encouraging consumers to purchase a PEV [6]. There is some evidence, however, that this incentive may encourage consumers to purchase low-range plug-in hybrid electric vehicles (PHEVs) over battery-electric vehicles (BEVs) [6]. This incentive is especially effective in congested regions. It may have little impact in uncongested regions.

This incentive may be a short-term measure because once PEVs have gained a significant market share the lanes could become congested. It continues to be successful in regions with high PEV sales, notably California (HOV lanes) and Norway (bus lanes).

Parking Incentives

Allowing BEVs and PHEVs to park for free, at discounted rates, or at preferential locations is effective in encouraging consumers to purchase the vehicles [7,8].

Parking incentives are most effective when paired with charging infrastructure. Free parking may be a short-term intervention due to lost revenue, however, surcharges for highly polluting ICEVs could offset the lost revenue. Preferential parking does not negatively impact revenue.

Toll Waivers

Toll waivers have been introduced in only a few regions globally. Research shows that they are effective in increasing PEV sales [9,10]. These waivers have been applied to bridge, road, tunnel, and ferry tolls.

As with parking, toll waivers may be a short-term policy due to their reduced revenue effects. Higher fees for ICEVs could help offset those revenue losses. Additionally, PEVs could receive discounts, rather than full waivers, after they have begun to be purchased in significant numbers.

Congestion Charge Zones

A small number of large cities have established urban zones where ICEVs are required to pay a fee to enter (e.g. London and Madrid). PEVs may enter these zones for free, a policy that has encouraged PEV adoption [11,12]. It also alleviates congestion and improves air quality.

Annual Vehicle Tax Discounts

Providing discounts or exemptions to annual vehicle tax or licensing fees is effective in encouraging PEV adoption [9]. This is especially true when annual fees

for ICEVs are high. An increasing tax on ICEVs can be used to fund the exemptions for PEVs.

Gasoline Price

The price of gasoline has been found to be related to PEV sales. High gasoline prices are correlated to increased sales of PEVs. An incrementally increasing tax on gasoline and diesel fuel can be used to increase fuel prices. This would encourage consumers to purchase more efficient vehicles, including PEVs.

Number of Incentives

Studies have found that the number of incentives in place is related to PEV market growth. Introducing more incentives will have a greater impact on PEV sales. Infrastructure investments are a must-have policy measure. HOV, transit and bus lanes, parking incentives, toll waivers, congestion charge zones, annual tax waivers, and gasoline price increases are all effective means in promoting PEV sales. The combined impacts of these incentives will be greater than their individual impacts. Consumers are motivated by different incentives, and sometimes desire many incentives. Any incentive that reduces the cost or increases the convenience of owning a PEV in comparison to an ICEV will be effective in promoting PEV market growth.

Education and Awareness

Any policy measure cannot achieve its full efficacy without consumers being aware of it. Policymakers should seek to initiate education and awareness campaigns to promote the available incentives. Education and awareness is explored in full in a policy brief available [here](#) [13].

Interactions with Public Transit

Some regions have high levels of public transit use

and are working to further increase its use. In these regions policymakers should consider the potential impact of incentivizing PEV use on rates of public transit use, and seek to maintain transit use while increasing PEV adoption.

Complementary measures that make it easier and cheaper to access public transit hubs—for example, parking and charging incentives for PEVs at public transit hubs—can benefit both transit and PEVs. Likewise, places commuters travel to (e.g. inner-city work areas) should have fewer incentives than transit hubs, thereby encouraging consumers to drive to transit hubs and not to urban areas.

Incentives and vehicle types

Reoccurring incentives should be targeted so that BEVs and long-range PHEVs (>30 miles electric range) receive similar incentives. These vehicle types achieve a similar number of electric miles, meaning they have similar energy, climate, and air pollution benefits. Short-range PHEVs should have fewer incentives available to them. PHEVs with ranges of <30 miles do not achieve many electric vehicle miles therefore have lower efficiencies and worse environmental performance [14].

Acknowledgements

The International Electric Vehicle Policy Council is coordinated by the Plug-in Hybrid & Electric Vehicle Research Center at UC Davis, and is funded by ClimateWorks Foundation.

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Further Reading

This policy brief is part of a series of briefs. Each brief concentrates on a specific aspect of PEVs.

The following briefs are available:

1. Regulatory Mechanisms and Implementation
2. Financial Purchase Incentives
3. Non- financial and in use incentives
4. Information, Education and Outreach
5. Electricity Grids and PEV Infrastructure

Briefs are available at: <https://phev.ucdavis.edu/international-ev-policy-council-policy-briefs/>

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