

Impact of China's Plug-In Electric Vehicle Subsidy Reduction

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Introduction

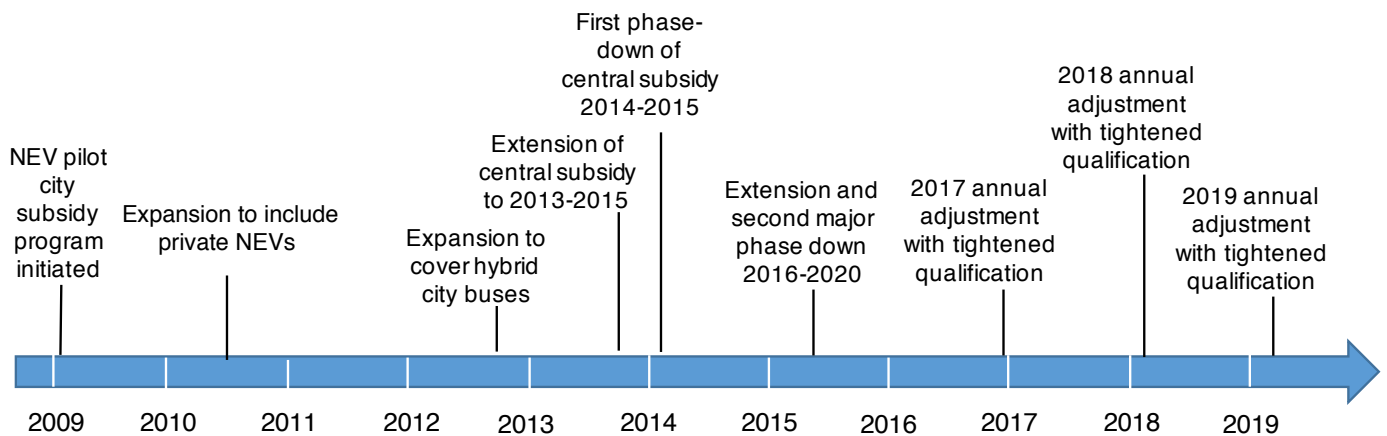
China, the world's largest emitter of carbon dioxide, has set ambitious climate goals. These include reducing the carbon intensity of its 2005 gross domestic product (GDP) by 40-45% by 2020 and by 60-65% by 2030 (Xu, Chen, and Chen 2017). A key component of the country's overall plan to reduce its carbon emissions is its New Energy Vehicle (NEV) policy. Battery electric vehicles (BEVs), which run solely on electricity, and plug-in hybrid electric vehicles (PHEVs), which run on electricity and gasoline or diesel, are a major component of China's NEV policy and market. The policy is aimed at increasing the market shares of BEVs and PHEVs. It is as much a tool to help reduce carbon emissions and local air pollution as it is an industrial policy to help China leapfrog other countries in the plug-in electric vehicle (PEV, which includes both BEVs and PHEVs) manufacturing space. Japan, Germany and the United States (U.S.) continue to be leaders in internal combustion engine vehicle (ICEV) manufacturing, and China sees PEV manufacturing as a way to propel itself forward in the automotive manufacturing sector.

PEV subsidies are one of the most commonly used policy levers for encouraging PEV purchases globally, including in China. They reduce the high up-front purchase price of PEVs relative to comparable ICEVs, one of the major barriers to PEV adoption. Since 2009, PEVs qualify for substantial rebates (up to US\$9,000) from both the central and local Chinese governments (ICCT 2017a; Hancock 2019). Furthermore, in several big cities such as Shanghai and Shenzhen, PEVs are exempt from new vehicle registration fees (ICCT 2017b). These PEV support policies have led to significant PEV market share growth in recent years, with PEVs accounting for more than 4% of new vehicle sales in 2018 (IEA 2019). However, PEV subsidies are scheduled to be cut from June 26, 2019 (Kharpal 2019) by roughly 45% to 60% (Hancock 2019; Kharpal 2019).

Why the Subsidy Cuts?

Figure 1 shows the evolution of the Chinese PEV subsidy program. The recent subsidy cuts are aligned with the 2017-2020 subsidy cut plan implemented in 2017. Aside from the subsidy cuts, the technological requirements for subsidy qualification are getting increasingly more stringent. For example, subsidies have been eliminated for PEVs with ranges below 250 kilometers per charge (Kharpal 2019). In fact, poor product quality and subsidy fraud are the two major reasons for the on-going changes in the subsidy amounts and design (ICCT 2017a, 2019). A typical form of fraud was manufacturers overstating their NEV sales volumes to obtain higher subsidies (ICCT 2017a). Moreover, testing whether the PEV market has matured enough to stand on its own feet is central to the on-going changes in China's subsidy policy. The original intention of the subsidy program was to increase the PEV market share to such a level that manufacturers could utilize economies of scale to bring down costs. Perhaps Chinese policymakers believe the time has come to test this?

Figure 1: Evolution of China's PEV subsidy program.



Source: ICCT 2019.

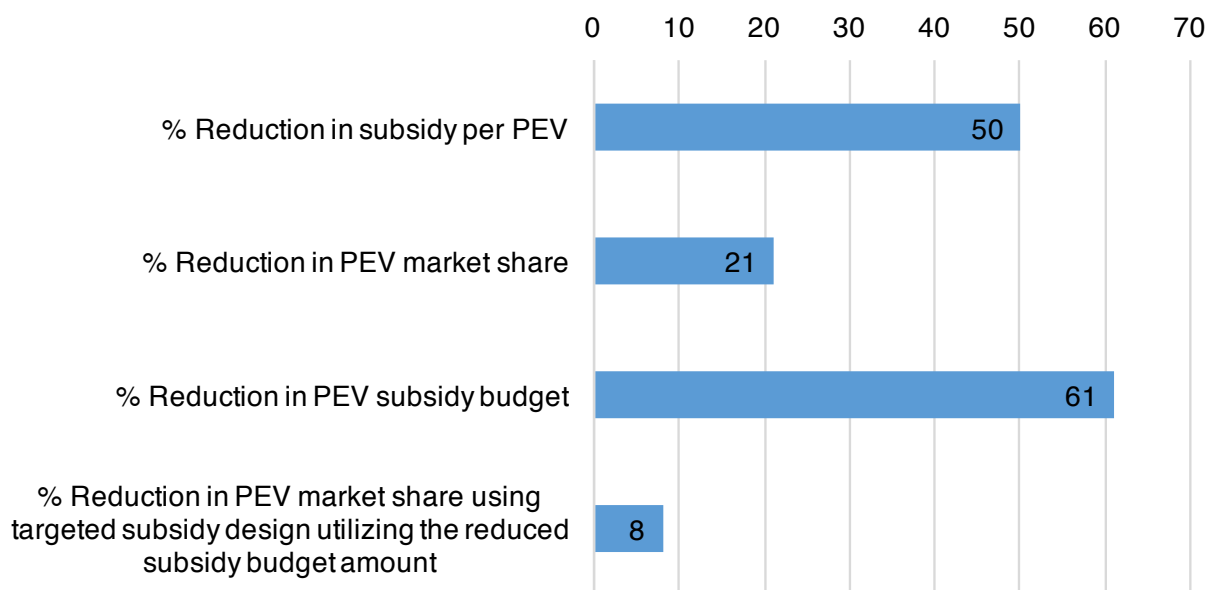
Impact of the Subsidy Cuts on PEV Adoption

We used a vehicle choice model of Chinese new vehicle buyers, using 2017 data, to investigate how much the PEV market share would have declined had the PEV subsidy been halved without any countervailing measures. Such tests are commonly known as counterfactual simulations. We also simulated the PEV market share if the reduced subsidy budget was targeted only at low-income consumers, a subsidy design used in California (Sheldon and Dua 2019), among other jurisdictions.

Our simulation results suggest that the PEV market share in China would have declined by 21% had the subsidy been halved without any countervailing measures. Halving the PEV subsidy would have cut the overall PEV subsidy budget by 61%. Using the same reduced budget, had zero PEV subsidies been given to high-income consumers and higher subsidies been given to low-income consumers, the PEV market share would have declined by only 8%. Targeted subsidy designs for PEVs have also had a greater impact than blanket subsidies in the U.S. (Sheldon and Dua 2018).

It is worth noting that Chinese policymakers have adopted countervailing measures in the form of supply-side mandates such as the annual NEV targets (ICCT 2018). The NEV targets mandate automakers to achieve a minimum number of annual NEV credits by producing or importing NEVs.

Figure 2: Impact of China’s plug-in electric vehicle subsidy reduction and targeted subsidy design on PEV market share



Source: KAPSARC analysis.

What Happens Next?

Targeted subsidy designs have been shown to be effective policy instruments. It is possible that the next iteration of Chinese PEV subsidy cuts might involve subsidy phase-outs based on consumer demographics. However, given that the Chinese PEV subsidy program is already plagued with fraud concerns, appropriate measures would have to be put in place to prevent manufacturers from overstating PEV sales to low-income consumers. Moreover, it is important to note that such targeted subsidy designs also have the potential to distort the used car market. It is possible for highly subsidized consumers to purchase a new PEV and sell it on the secondary market at a higher price than they paid, thereby earning a profit. Thus, if China adopts a targeted subsidy design, appropriate measures would have to be put in place to avoid such unintended consequences.

There could be some merit for governments in car-importing Gulf countries that are increasingly interested in high-energy efficiency vehicles, such as the United Arab Emirates, Bahrain and Saudi Arabia, to wait and observe the experiences of other countries' PEV subsidy support policies. If PEV manufacturing countries believe that economies of scale in PEVs have achieved cost competitiveness with ICEVs, enough to discontinue PEV subsidies, then PEVs may be cheap enough for Gulf countries not to have to subsidize them.

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