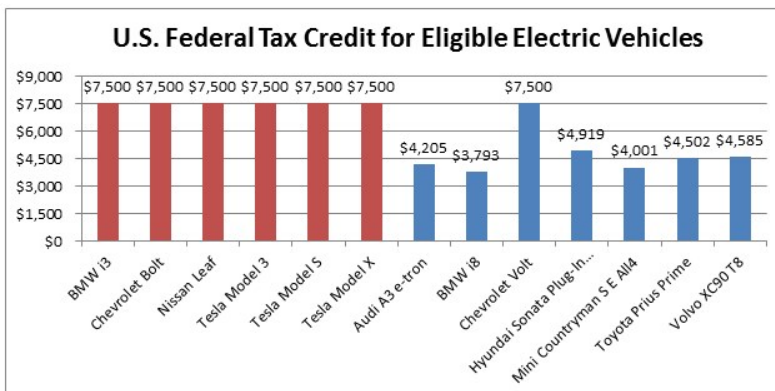


February 16, 2018

Will Electric Vehicle Demand Drop After Tax Credits Expire?

In an effort to encourage consumers to drive electric vehicles (EVs), the US government issues an income tax credit, called the Plug-In Electric Drive Vehicle Credit. This tax credit effectively reduces the cost of the vehicle in an indirect way; the money does not come off of the top of the purchase price, but it comes in the form of reduced tax liability to the US Internal Revenue Service (IRS). The goal of the tax is the aid the emerging EV market in the US while the technology matures and scales, lowering prices to competitive levels with internal combustion engine (ICE) vehicles. The credit applies to battery electric vehicles (BEVs) that do not have an ICE component and to plug-in hybrid electric vehicles (PHEVs) and is worth up to \$7,500, varying on the vehicle's battery capacity.

It is worth noting that the credit is not payable, meaning that if an individual's tax assessment is less than \$7,500, assuming their vehicle carries the maximum credit, the individual does not receive money back from the IRS. The tax credit will cover incurred liability to the IRS and will be fully used without a rollover option. The credit must be applied toward the tax liability of the year in which the vehicle was purchased. The tax credit is structured with a base amount of \$2,500 and a variable \$417 per kilowatt hour of capacity above 5 kWh within the vehicle. Below is an example of eligible vehicles. This is not a complete list. BEVs (highlighted in orange) receive the maximum tax credit, while PHEVs (blue) vary.



Source: US Department of Energy

For leased vehicles, the tax credit goes to the manufacturer that is offering the lease, and technically owns the vehicle, not to the lessee. Market forces will likely drive the manufacturer to push some of that savings to the consumer, but it is unlikely that the full value will be passed along. The tax credit is tied to the number of vehicles sold by automotive manufacturer with the credit going through a “sunset” process after 200,000 electrified vehicles, a “phase-out period” as the U.S. IRS calls it. Over a one year period that starts with the second calendar quarter after the quarter in which the 200,000th EV was sold by a given OEM.

The total entire process can take up to 18 months to unwind. Vehicles will receive 50% of their eligible credit amount for the first 2 quarters of the phase-out period, and then the credit is reduced to 25% of full value for the third and fourth quarters. For example, if the 200,000th EV is sold in January 2020, all EVs that the OEM sells in January through the end of June of

2020 will receive a full tax credit. The phase-out period begins on July 1, 2020, with 50% of the credit being awarded through the end of 2020. For the first half of 2021, eligible EVs from that OEM will receive 25% of their total allotted credit.

Phase-Out Process Example:

U.S. Federal Electric Vehicle Tax Credit Phase-Out (Example Year Starts in 2020)					
Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
- 200,000th EV sold: Full Tax Credit	Eligible Full Tax Credit	Eligible for 50% of credit	Eligible for 50% of credit	Eligible for 25% of credit	Eligible for 25% of credit

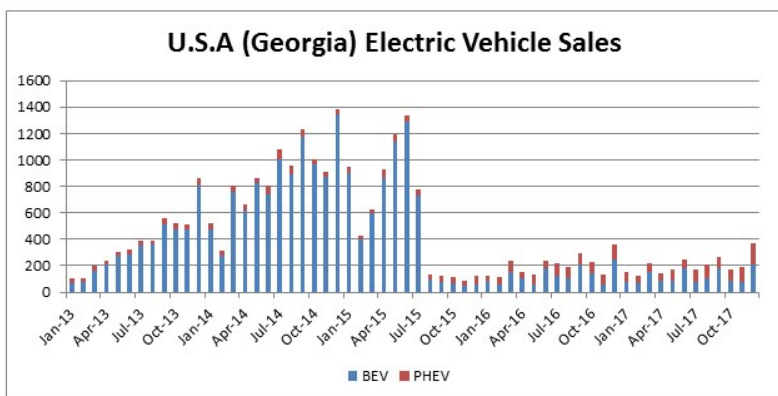
The logic of the 200,000 unit limitation for the tax credit is that by then, the OEM should have gained scale and moved along the cost curve to a lower point, making their vehicles market competitive without governmental encouragement. The US government has used this carrot in various industries, from telecommunications to pharmaceuticals to aerospace.

Three OEMs in the American market are moving toward 200,000 units sold in the near future. General Motors (powered by sales of the Bolt and Volt), Nissan (driven by the next generation Leaf), and Tesla (slowly delivering Model 3s) are likely to hit the sunset threshold toward the end of 2018 or in 2019. All three OEMs have been active and prodigious in the EV space for longer than their competition in the US, so other manufacturers are not expected to hit the threshold for several more years.

What happens to sales after the tax credit goes away?

The US state of Georgia may help to uncover some of the economics that surround how the market will react after the tax credit fades away, by providing a natural experiment in tax credit incentives. Georgia had an aggressive state-level tax credit, similar to the US federal tax credit discussed above, offering up to \$5,000 incentive to purchase an EV. The combination of federal and state incentives was effective; at its peak, 4% of Georgia’s vehicle fleet was EVs.

In June 2015, Georgia’s state legislature allowed the tax incentive to expire. New registrations of electrified vehicles in the state fell over 80%, from 1,340 in June 2015 to 134 in August 2015 and have not rebounded. The top line sales figure clearly plummeted, but that is not the whole story. Sales of Tesla models in the state remained virtually unchanged. The decline in consumption was in the more “utilitarian” EVs, like the Nissan Leaf and similar models.



Source: Auto Alliance

In analyzing the outcomes, Stratas Advisors believes the difference in market reaction reveals that there may actually be two separate markets within the EV space – a luxury market and a relative economy market. This juxtaposition could cause disruption to EV demand at current prices which in turn would dampen the overall adoption rate of electric vehicles in the

United States. In Georgia, the luxury market proved to have a highly inelastic demand for EVs. This could be motivated by several different market dynamics. A consumer in the market for Tesla Model S, starting at \$68,000, is likely electing to purchase a Tesla after comparing to similar luxury models. That consumer is looking for a vehicle to accent his lifestyle and to make an environmental or vehicle performance statement. The marginal impact on a tax incentive of \$5,000 is likely to have a smaller impact on the purchase decision for the luxury consumer.

The comparison shopping, economy EV consumer is likely more susceptible to fluctuations in incentives and price. This consumer may be environmentally motivated but may be persuaded to stick with an ICE vehicle if the sticker price and incentive for an EV are not the economic decision. Fuel saving technology in ICE vehicles at a lower price point may be more attractive to this consumer, so her preferences will shift if the comparable EV is more expensive. Her demand for an EV is more elastic than the luxury consumer; the economy EV market must fend with increasingly efficient ICE competition.

In the elastic demand dynamic of the economy EV market, price will be a defining factor in a purchase decision. A manufacturer that has sold over 200,000 units and is not eligible for US federal tax credits will need to sell its EVs at a price competitive with other manufacturers that are still eligible. The net price, factoring in the tax credit, will be the market clearing price point in a crowded, and growing, market. Leveraging economies of scale and building on their EV success will prove pivotal in driving down costs to compete in the market with incentivized competition after hitting the 200,000 threshold for manufacturers.

As the EV market matures, manufacturers will need to navigate uncharted waters, taking what they have learned as they have scaled production to compete in a marketplace with asymmetric incentivization to drive down prices to be competitive.