

elimination of federal tax credits likely to kill U.S. EV market

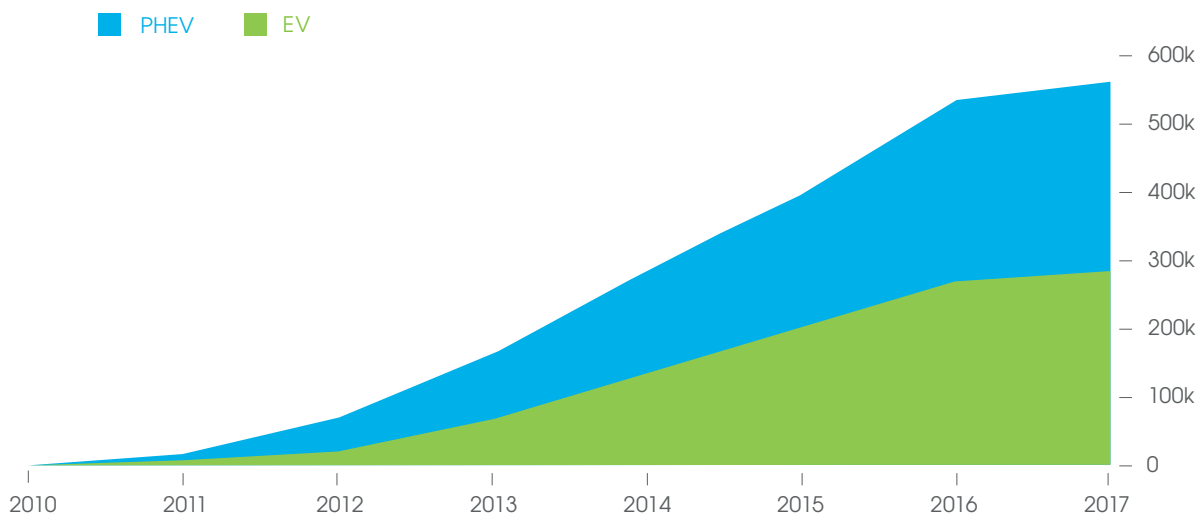
With an end of credits imminent, the EV market will have to reinvent itself

Market status

Back in 2011, President Obama famously predicted that there would be 1 million electric vehicles on U.S. roads by 2015. It seemed like a stretch at the time — even with ideal market conditions — so no one was surprised when his goal fell drastically short. Two years beyond his projected timeline, the U.S. is only a little over halfway to that target.

Currently, EV/PHEV sales are growing, but they only make up 1 percent of all new-car sales. The upside for this market is new product. The Chevrolet Bolt, with an increased range, launched in December and the Tesla Model 3, priced for a wider range of incomes, is expected later this year. This second wave of EVs is expected to surpass compliance vehicle status and reach a larger audience.

Cumulative EV/PHEV sales in U.S.



Source: Edmunds

Federal tax credit issue

Since 2010, buyers of qualified plug-in electric-drive vehicles have been eligible for a federal tax credit of up to \$7,500. These credits are available for the first 200,000 customers of each auto company producing eligible vehicles. To date, Tesla has sold nearly 100,000 vehicles, which would put the company near the halfway point of its 200,000 federal tax credit allotment assuming its customers received the credit. Nissan, which is expected to debut a second-generation Leaf next year, is about halfway through its credit allotment. General Motors, which has the Bolt and Volt among others, is expected to run out of credits at some point in late 2018 or 2019.

Federal tax credits for EVs are a part of broader set of EPA policies, which require congressional approval to adjust. So the Trump administration may not eliminate them prematurely but is unlikely to extend these credits. Without these credits, this market is likely to crash. While President Trump did not address federal EV tax credits specifically in his 2018 budget blueprint released last month, he proposed the elimination of funding for the Department of Energy's Advanced Technology Vehicles Manufacturing (ATVM) loan program, which would have assisted future EV production.

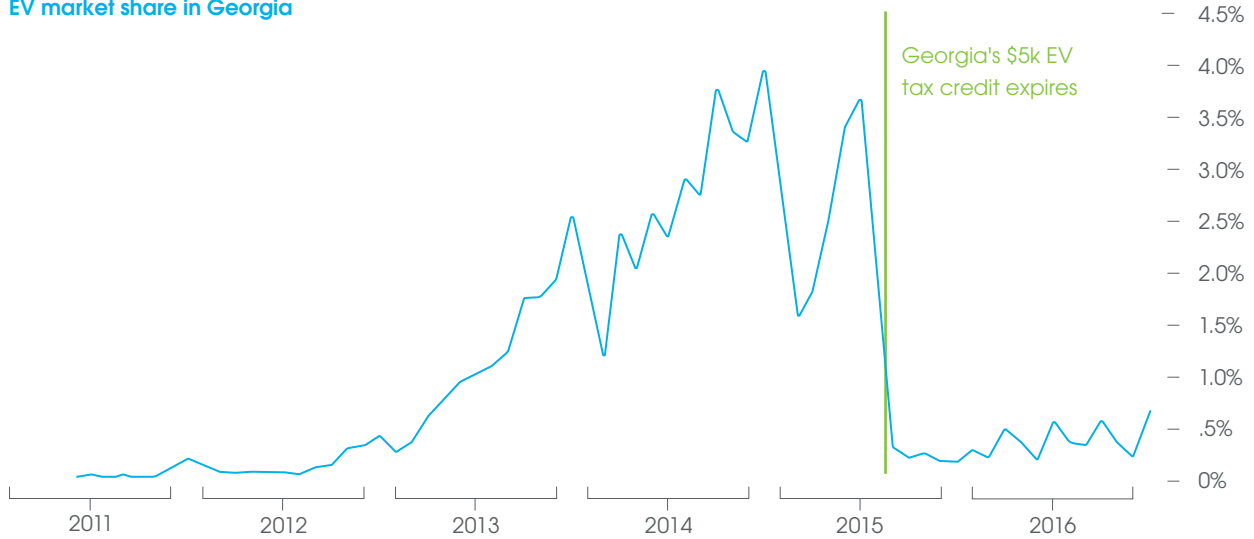
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Georgia case study

What happens when subsidies go away

The state of Georgia witnessed tremendous success with EV sales and boasted the second-highest EV sales rate in the U.S. behind California. In 2014, the state accounted for 17 percent of all EVs sold in the U.S. Driving these remarkable numbers was not just shoppers' dedication to the environment but the state's offer of a \$5,000 tax credit for zero-emission vehicles, in addition to the \$7,500 U.S. federal tax credit. These generous incentives could be applied to new vehicles purchased or leased, putting a big dent in the overall cost.

EV market share in Georgia

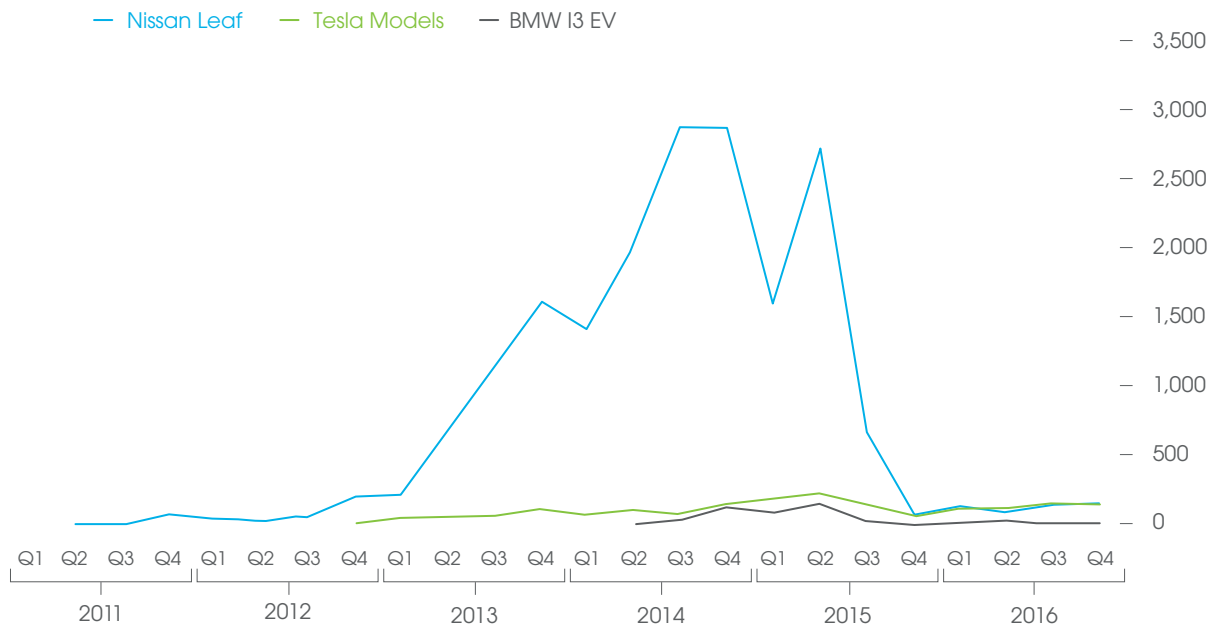


Source: IHS Markit

The crash

Once the state credit was eliminated in July 2015, sales of EVs came tumbling down in Georgia, from 17 percent of all U.S. EV sales to 2 percent. This crash was not uniform among all EVs. Sales of the Tesla Model S declined post credit elimination but bounced back to normal levels within a few months. Nissan Leaf sales, however, never rebounded after the credit elimination and are now at parity with sales of the Tesla Model S.

Georgia EV sales

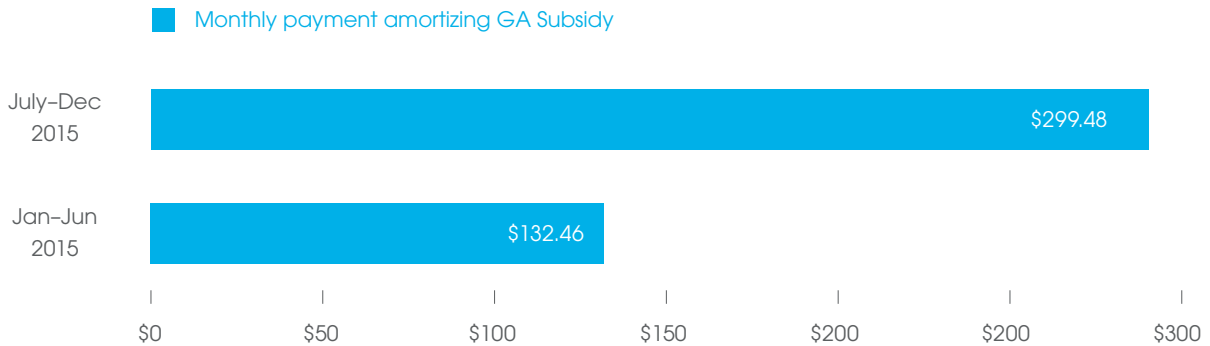


Source: IHS Markit

The deal

The crash in sales should not have been too much of a surprise considering the massive payment spike for lessees who accounted for 80 percent of all EVs sold in the state. The average monthly lease payment for a Nissan Leaf increased by 119 percent following elimination of the state credit.

Leaf lease monthly payment in 2015



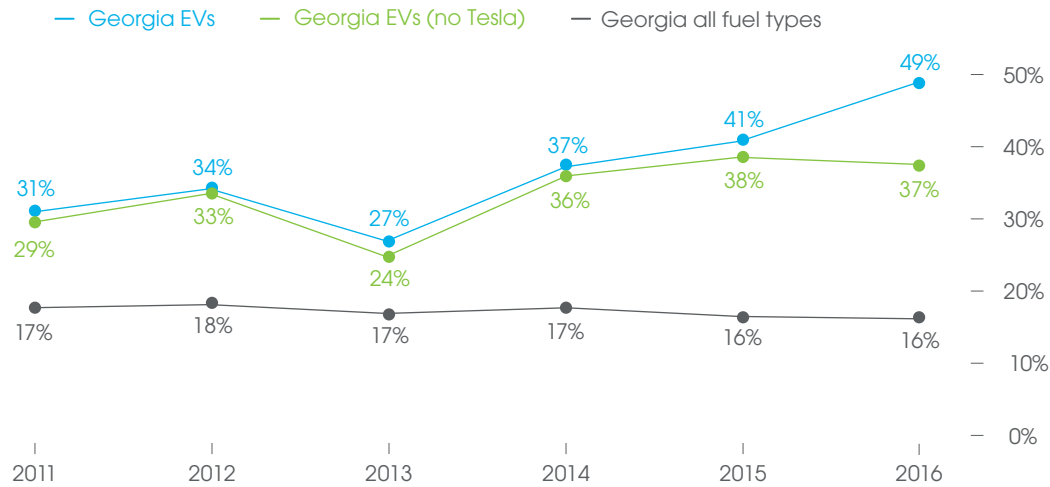
Source: Edmunds transaction data
Based on 3yr/36k/\$0 down leases

There is also something to be said about being on the wrong side of the deal. At \$290.48, a Nissan Leaf payment is still less than the average lease vehicle payment (due to the \$7,500 federal subsidy), but there is a negative psychological effect when consumers know they missed out on a much more generous deal.

The buyers

The EV buyers in Georgia, however, weren't people who necessarily needed a cheap lease payment. Although they certainly appreciated the technology, they were financially motivated by these cheap lease deals. When comparing their income to that of the average new-car buyer in the state of Georgia, they clustered more in the higher income brackets.

Percent of EV buyers with income over \$150k



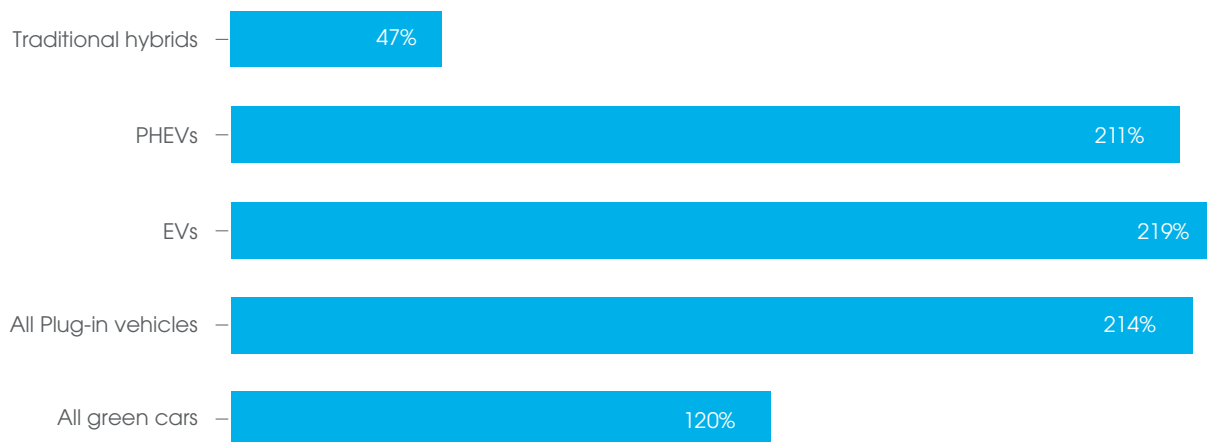
Source: IHS Markit

Higher-income deal seekers

While most EV owners have been painted as tree-hugging environmentalists, that is only in part true. Georgia data shows that discounting provided a higher motivation than the desire to drive green. And traffic on Edmunds on a national level shows that shoppers of green technology are much more likely to view manufacturer incentives and rebates pages than those shopping internal combustion engine vehicles. In fact, if we were to roll up all vehicles with a green variant (EV/PHEV/hybrid), incentive and rebates pages for green cars experienced 120 percent more traffic than their non-green counterparts.

Incentives & rebate traffic on Edmunds

Green cars vs. internal combustion counterparts

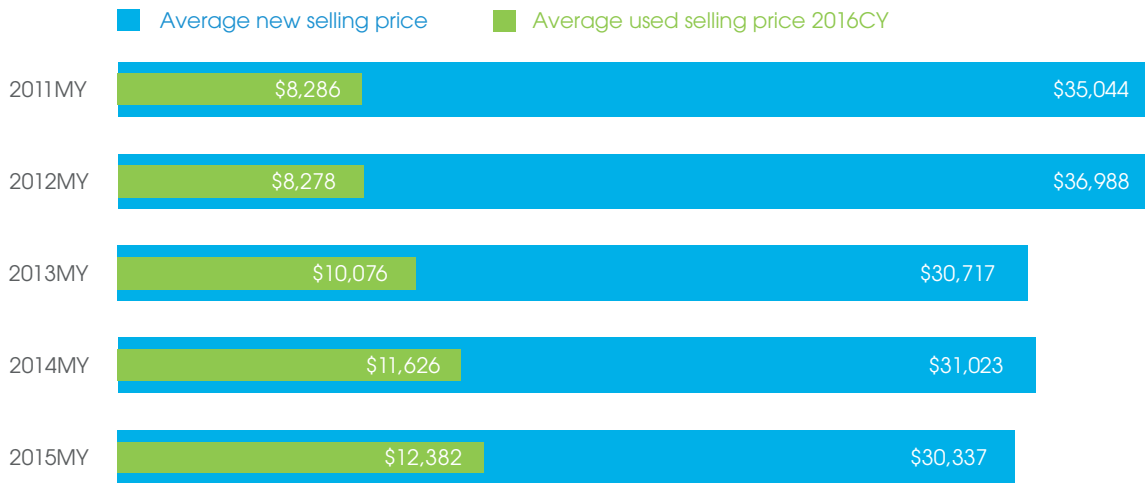


Source: Edmunds site data — Jan–Feb 2017

Federal tax credit creates an atypical used market

EV values are depressed on the used-car market since they fall victim to a steep depreciation curve due to rapidly advancing technology. The federal tax credit (along with credits offered by many states) create low purchase prices — particularly for leasing — which further decreases demand on the used-car side. Used vehicles do not present an attractive cost-saving alternative to new vehicles when leased.

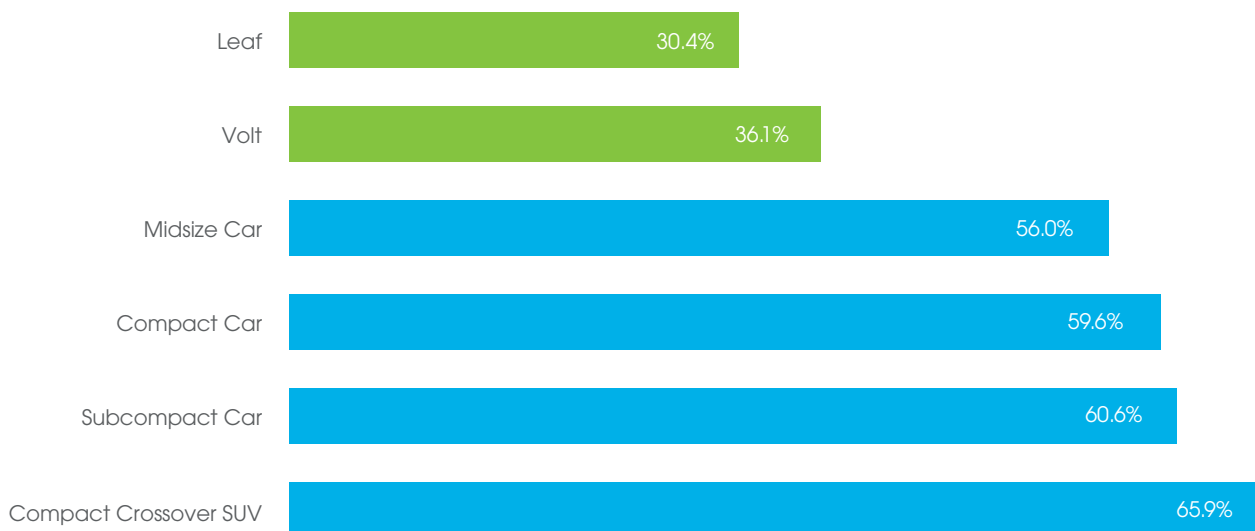
Nissan Leaf residual value in 2016



Source: Edmunds

When comparing EV/PHEV residuals to segment averages, which include all types of engines, there is a notable difference. After three years of ownership, a Nissan Leaf held 30.4 percent of its original value while the compact car segment held 59.6 percent on average.

Residual Value of 2013MY Vehicles in 2016



Source: Edmunds

The low used values are a problem for automakers because if the federal subsidy is lifted, lease payments will go up significantly due to low residual values. Without advantageous pricing, the market would be further limited.

What does this mean for the future of EVs?

There seems to be two distinct markets for EVs: the high end and the mainstream. As we saw in Georgia, the high-end market is able to weather price manipulations more so than the mainstream market due to their buyers' higher incomes and desire for a status vehicle. The luxury segment has historically been proving grounds for pioneering technology in the automotive industry. New technology is introduced at peak pricing, but the premium gets marginalized by the luxury markets' higher price points and heavy contenting. As price efficiencies improve, the technology trickles down to mainstream vehicles in a vetted and more affordable iteration.

The plug-in segment took an alternative path. Largely championed by first-to-market mainstream offerings the Volt and the Leaf, the two vehicles have struggled to expand beyond a small market niche, and sales are largely dependent on both government and automaker subsidies. The mainstream vehicles are expected to improve, and growing global markets — particularly in Europe and China — will allow automakers to achieve economies of scale, but there is a Catch-22. For EVs to achieve mainstream sales levels, better infrastructure is needed nationwide, along with the development of longer-range batteries. However, it's hard for investments to be made without seeing consumer acceptance. So for the time being, government support for this technology is proving to be very important for the early stages on the market. Without government support, the onus will be on automakers to keep sales afloat — most likely with their own incentive programs and at a detriment to their bottom lines.