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CAFE update:

What does the future hold for vehicle electrification?

October 2012

pwc

The Obama Administration recently finalized the 2025 US CAFE (Corporate Average Fuel Economy) fleet standard at 54.5 mpg (miles per gallon), on top of the 35.5 mpg standard already in place for 2016. The administration estimates that the cost to the industry to meet these new regulations will be upwards of $192 billion, resulting in vehicles costing about $2,000 more than they do today[1]. However, the administration also estimates that the potential benefits will be much greater, with consumers expected to save $515 billion in fuel during this same period[2]. With energy security looming large as a national priority for the US, fuel costs on the rise, and political instability in key oil producing markets continuing, the push to develop and deploy alternative propulsion vehicles has perhaps never been greater.

The US National Highway Transportation Safety Administration (NHTSA) and US Environmental Protection Agency (EPA), who are jointly enforcing the new fuel economy and emission reduction regulations, are counting on the industry to introduce a host of fuel-saving technologies and applications in order to meet these increasingly stringent standards, including new Plug-In Hybrid (PHEV) and Pure Electric (PEV) vehicles. But for the industry and consumers, the question remains, how big of a role will these vehicles actually play over the next several years?

Through August 2012, hybrid, PHEV, PEV, and hydrogen fuel cell vehicles (HFCV) accounted for roughly 3.2% of US auto sales[3]. However, when excluding traditional hybrid applications, that number shrinks considerably to 0.3% of the market[4]. While a number of new electric offerings are expected from automakers in the coming years (today, there are ten PHEV, PEV, HFCV models available), continued high price premiums and an underdeveloped grid to support these vehicles will minimize their raw sales impact in the near to mid-term. Consumers are coming to terms with the increasing cost of vehicles due to safety and emission standards along with higher demand for in-vehicle technology, but the current premiums for electric and fuel cell vehicles don't appear to offer enough of a value proposition yet, even when taking into account increasing fuel costs. An argument can be made that these premiums can be additionally offset by lower maintenance costs and total cost of ownership, but at this point only a limited number seem willing to plug into vehicle electrification.

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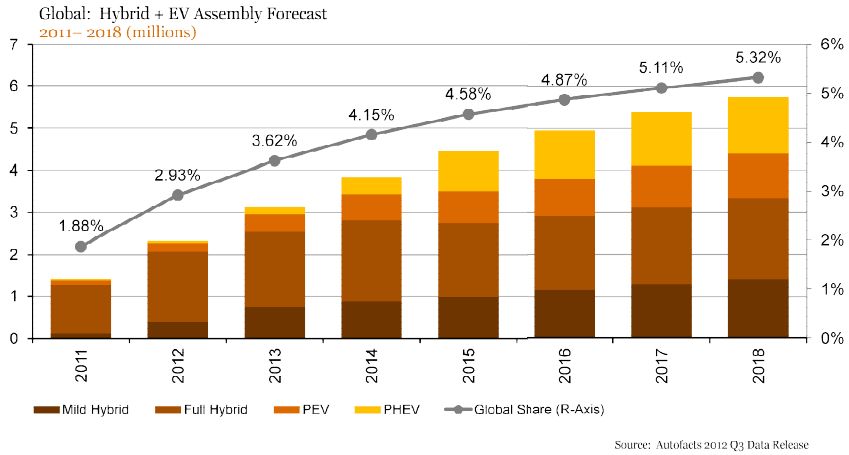
[1] "President Obama Announces Historic 54.5 mpg Fuel Efficiency Standard", White House press release, July 29, 2011, http://www.whitehouse.gov/the-press-office/2011/07/29/president-obama-announces-historic-545-mpg-fuel-efficiency-standard, accessed October 8, 2012.

[2] Ibid.

[3] *Ward's Automotive Reports*, WardsAuto, August 2012.

[4] Ibid.



Preliminary results of PwC's *Charging Forward* electric vehicle survey, due out later this year, suggest that we still have a long way to go before EVs can become a viable mainstream option. Over 86% of those surveyed felt that consumers are either not willing to pay a premium (38.8%), or willing to pay no more than $5,000 (47.4%) after government incentives for a PEV, with similar results for PHEVs. Although battery costs continue to decline, the industry still has much progress to make for EVs to be more affordable. In addition, the readiness of the EV grid remains a primary concern to industry participants. Over 40% of those surveyed felt that having a sufficient number of conveniently located charging and battery swap locations was the most crucial element to developing a sustainable EV infrastructure. According to the Alternative Fuels Data Center, there are currently 4,364 public charging stations in the US, a good start based on the number of EVs on the road, but below the amount needed for mainstream consumption. By comparison, there are approximately 160,000 retail gas stations in the US[5], almost all of which have multiple gas pumps to service vehicles.

A Winding Path Towards Compliance

To meet CAFE standards, each automaker will have a different target to meet, based on the characteristics of their fleet (i.e. car vs. light truck, small vs. full-size applications). Therefore, a number of different strategies will be used to fit each automaker's individual needs and competencies. EVs will undoubtedly be part of the solution, but much of the needed fuel efficiency gains will be achieved by a host of currently available technologies such as engine downsizing via direct injection and turbocharging, advanced transmissions and micro-hybridization. Additional gains will be realized through advances in aerodynamics and increased application of lightweight materials. The rule of thumb for the industry is that there really is no one perfect solution; it's going to take a number of small, incremental gains (including EVs) to cross the finish line.

[5] "2011 MarketFacts Industry Survey", National Petroleum News, October 2011.

Looking Down the Road

PwC's Autofacts group is forecasting global hybrid & EV share to reach 5.3% in 2018, up from roughly 1.9% in 2011. Traditional hybrid applications will still comprise the bulk of alternative propulsion vehicles, with PEVs (1%) and PHEVs (1.3%) providing additional support. From 2018 - 2025, these technologies will continue to gain incremental market share, ramping up at an accelerated rate as the 2025 standard draws closer.

Make no mistake - progress is being made towards mass adoption of electric vehicles, but developing cost-effective offerings with acceptable range while simultaneously overhauling power grids to support millions of vehicles cannot happen overnight. Rather, the emergence of vehicle electrification is best seen as a generational change. Continued investment in research and development to improve EV efficiencies along with ongoing efforts to create clean energy solutions will ultimately determine their level of success. Electric vehicles are here to stay; just don't expect one to be parked in every driveway anytime soon.

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