

***1007 STUCK IN NEUTRAL: WHY POLICIES FAVORING ZERO-EMISSION VEHICLES MAY NOT TAKE US FORWARD**

INTRODUCTION

General Motors introduced the first consumer electric car at the 1990 Greater Los Angeles Auto Show.¹ That same year, California introduced an ambitious plan to have zero-emission vehicles reach 2% of total California car sales by 1998 -- the Zero Emission Vehicle (ZEV) Program.² While the plan did not reach its original goal, the state has seen a slight increase in the number of zero-emission vehicles, due in part to the regulatory scheme that began with the 1990 plan.³ Currently, about 5% of all car sales in the California market are characterized as “plug-in vehicles.”⁴ In 2012, Governor Edmund G. Brown Jr. issued an executive order to help expand the commercialization of zero-emission vehicles, by growing the zero-emission vehicle infrastructure and increasing the number of zero-emission vehicles in California’s fleet.⁵ California is the leader in renewable energy, so it is no surprise that the state was the first to draft policies that encourage the use of zeroemission vehicles.⁶

Several other states and the federal government have followed California’s lead, enacting policies that bolster the market share of zero-emission vehicles. In this comment, I will examine several of the initiatives that attempt to increase the share *1008 of zero-emission vehicles in the market and then assess what needs to be done to ensure this transition is done sustainably.

I. THE IRS PLUG-IN ELECTRIC VEHICLE CREDIT

As part of the Energy Improvement and Extension Act of 2008, Congress approved a tax credit on plug-in electric vehicles.⁷ The credit:

[I]s equal to \$2,500 plus, for a vehicle which draws propulsion energy from a battery with at least 5 kilowatt hours of capacity, \$417, plus an additional \$417 for each kilowatt hour of battery capacity in excess of 5 kilowatt hours. The total amount of the credit allowed for a vehicle is limited to \$7,500.⁸

The credit aims to reduce the United States’ dependence on petroleum “by promoting expanded use of advanced, more fuel-efficient vehicle technologies.”⁹ The tax benefit applies to a certain class of vehicles, and ends once 200,000 units of each qualified car are sold.¹⁰ Once the limit is reached for a vehicle, the credit will phase out over a year.¹¹ General Motors is the car manufacturer currently closest to hitting this threshold, having sold roughly 40,000 Chevrolet Volts in the United States.¹²

Congress enacted the tax credit to incentivize the purchase of lower-emissions vehicles. The success of the tax credit has been smaller than expected due to the higher cost of plug-in vehicles and the delay in receiving the value of the credit.¹³ To increase the market share of zero-emission vehicles -- to compete with traditional vehicles -- more has to be done. Specifically, the tax credit is the extent of the federal government's approach to this issue, while the states are enacting more robust policy prescriptions.

***1009 II. STATE ZERO-EMISSION VEHICLE PROGRAMS**

On October 24, 2013, eight Democratic governors signed the Memorandum of Understanding on State Zero-Emission Vehicle Programs ("MOU").¹⁴ The MOU sets an ambitious goal of having at least 3.3 million zero-emission vehicles on the road in the eight Signatory States by 2025.¹⁵ Similarly, industry data predicts there will be at least 200,000 zero-emission vehicles on the road by 2015.¹⁶ Thus, the MOU has set an ambitious goal for the Signatory States to achieve. The eight Signatory States will create a task force to prepare a plan of action to accomplish the goals established in the MOU.¹⁷

The program's goals include: (a) facilitating the successful commercialization of zero-emission vehicles, (b) adding zero-emission vehicles to the fleet of state vehicles, (c) creating incentives to promote consumer acquisition of zero-emission vehicles, (d) adopting shared standards for all of the states, (e) cooperating with relevant parties in the private sector, (f) informing the public of the benefits of zeroemission vehicles, and (g) pursuing further research on the commercialization of hydrogen fuel cell vehicles.¹⁸ Governors agreed to these objectives in an effort to reduce transportation-related air pollution.¹⁹ Increasing consumer demand for zeroemission vehicles will lead to fewer traditional gas-powered vehicles and, thus, less pollutants will be emitted from automobiles.²⁰ While electric cars are "cleaner" than traditional vehicles, the overall environmental impact needs to be assessed before we can assert that switching to electric cars will result in a net reduction in carbon emissions.

III. WHAT IS THE ENVIRONMENTAL IMPACT OF THE ELECTRIC CAR?

***1010** Examining the environmental impact of the electric car (widely considered to be the most fuel-efficient zero-emission vehicle) will shed light on whether the MOU will be able to meet its goals. In assessing the environmental impact of an electric car, our inquiry cannot end at the fact that the car is simply a zero-emission vehicle. The actual impact of the electric car is substantially dependent on the source of the electricity that powers it -- especially if the car is dependent on the power grid.²¹ If the electricity is derived from fossil fuels, the car is only competitive with traditional gas-powered cars when the electricity is generated on-board the vehicle.²² Additionally, damages from the emissions associated with manufacturing the vehicle must be considered in assessing the vehicle's environmental impact.²³

Considering the average electric car, if you take into account the entire lifecycle for a power grid-dependent electric car, then the overall emissions may be even *higher* than those of a traditional car.²⁴ For the electric car to be as fuel efficient as a conventional vehicle, two things would need to change: (1) the cars need to derive less electricity from fossil fuels and (2) the manufacturing process needs to become more efficient.²⁵

Currently, about 68% of the electricity generated in the United States originates from fossil fuels (coal, natural gas, and petroleum), with the remainder coming from renewable sources²⁶ To reduce this percentage, an increase in the use of renewable resources is required. In California, for example, the state aims to hit 33% of its energy production from renewable resources (renewable resources currently account for 20%).²⁷ It is projected that it will take about 13-23% more energy in 2035 to produce a plug-in hybrid vehicle than a gasoline vehicle.²⁸ The tradeoff in tailpipe emissions for smokestack emissions make switching to electric vehicles not as obvious a choice as common wisdom suggests.

***1011 IV. THE FUTURE OF ZEV POLICIES**

The governmental bodies that have enacted policies encouraging a greater market-share of zero-emission vehicles have done so as an attempt to reduce carbon emissions.²⁹ As we learn more about the environmental impact of zero-emission vehicles, a new approach must be taken in order to achieve this goal. Policies that solely encourage more electric cars on the road are putting the cart before the horse. In order to more effectively enact sustainability measures, governmental bodies need to introduce policies that both favor the use of zero-emission vehicles and increase the overall share of renewable energy

sources that the power grid utilizes. The baseline goal should be to increase renewable energy sufficiently to offset the additional demand for power that is coupled with the switch to zero-emission vehicles. Without this offset, we are merely shifting our dependence on nonrenewable resources from gasoline-powered vehicles to the infrastructure that powers our cities.

The current regulatory regime does not sufficiently address the concerns that are inherent in an expanded use of the power grid. California and the other states' ZEV policies address the first prong of successfully switching to zero-emission vehicles. The policies emphasize more zero-emission vehicles on the road and establishing an infrastructure that is better equipped to handle these new vehicles. The issue of generating renewable energy from this increased use of the power grid goes unaddressed. It is essential that the federal government, California, and the other states enact policies that address this concern.

The two-step policy solution for shifting to zero-emission vehicles will usher in an era of sustainable transportation. Until that point, we should look at the available technology and decide if the current use of electric vehicles simply maintains the status quo or is a down payment on a cleaner future. Policy-makers should take an expansive view to determine whether the shift to zero-emission vehicles begins today or once a larger share of our energy is derived from renewable sources.

There are many alternative solutions that address the goal of reducing vehicle emissions in the United States. While electric cars can one day help us achieve this goal, a meaningful step forward requires both manufacturing the vehicles more efficiently and connecting to a power grid that is more dependent on renewable sources. ZEV policies coupled with this shift in ZEV efficiency are our best bet at streamlining this process and making a meaningful difference in the level of pollutants that our vehicles are emitting.

Footnotes

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¹ Burge Hulett, *L.A. Auto Show Focuses on Glitter, Practicality*, L.A. Times, Jan. 6, 1990, http://articles.latimes.com/1990-01-06/news/vw-579_1_1-a-auto-show.

² Air Resources Board, *Zero-Emission Vehicle Legal and Regulatory Activities and Background*, <http://www.arb.ca.gov/msprog/zevprog/zevregs/zevregs.htm> (last reviewed Jun. 10, 2013).

³ Louise W. Bedsworth & Margaret R. Taylor, *Learning from California's Zero-Emission Vehicle Program*, 3 Cal. Econ. Pol. 4, 1-20 (2007).

⁴ Green Car Congress, *Pike Research Forecasts US Plug-in Vehicles Penetration Rates to be Highest in Smaller States*, <http://www.greencarcongress.com/2011/09/pike-20110924.html> (last reviewed Sept. 24, 2011).

⁵ Edmund G. Brown Jr., *Executive Order B-16-2012*, Mar. 23, 2012, <http://www.gov.ca.gov/news.php?id=17472>.

⁶ Pete Danko, *Shocker! California Tops US Renewables List*, Earth Techling, Feb. 29, 2012, <http://earthtechling.com/2012/02/shocker-california-tops-u-s-renewables-list/>.

⁷ Transportation and Domestic Fuel Security Provisions, Pub. L. No. 110-343, 122 Stat. 3832 (2008).

⁸ 26 U.S.C. § 30D (2008).

- 9 154 Con. Rec. S9238-023 (daily ed. Sept. 23, 2008) (statement of Sen. Carl Levin).
- 10 33A Am. Jur. 2d Federal Taxation ¶ 15412 (2013).
- 11 *Id.*
- 12 John Voelcker, *When Do Electric-Car Tax Credits Expire?*, Green Car Reports, http://www.greencarreports.com/news/1085549_when-do-electric-car-tax-credits-expire.
- 13 Associated Press, *8 States Join Forces to Promote Clean Cars*, Los Angeles Times, <http://www.latimes.com/business/la-fi-zero-emission-ledge-20131024,0,4110469.story#axzz2jqKg098t>.
- 14 Memorandum of Understanding on State Zero-Emission Vehicle Programs (Oct. 24, 2013) (the eight states included in the memorandum are California, Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island, and Vermont), <http://www.oregon.gov/deq/docs/MOUzev.pdf> [hereafter “Memorandum”].
- 15 *Id.* at 2.
- 16 Jason Dearen, *8 States Join Forces to Promote Clean Cars*, S.F. Chronicle, <http://www.sfgate.com/business/energy/article/8-states-join-forces-to-promote-clean-cars-4922601.php>.
- 17 *Id.*
- 18 *Id.* at 2-3.
- 19 Memorandum, *supra* note 12 at 1.
- 20 Kirk Kardashian, *Why Electric Vehicles Have Stalled*, The New Yorker, <http://www.newyorker.com/online/blogs/currency/2013/10/why-electric-vehicles-have-stalled.html>.
- 21 Mikhail Granovski et al., *Economic and Environmental Comparison of Conventional, Hybrid, Electric and Hydrogen Fuel Cell Vehicles*, 159 J. of Power Sources 1186 (2006).
- 22 *Id.*
- 23 Jared L. Cohon et al., National Academy of Sciences, *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use* 197-203 (2010).
- 24 *Id.* at 202-203.
- 25 *Id.* at 202-203.
- 26 U.S. Energy Information Administration, *Frequently Asked Questions: What is U.S. Electricity Generation by Energy Source?*,

[http:// www.eia.gov/tools/faqs/faq.cfm?id=427&t=3](http://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3) (last visited Oct. 27, 2013).

²⁷ CA RPS First Quarter 2013.

²⁸ Cohon, *supra* note 21, at 203.

²⁹ Alternative Fuels Data Center, Benefits and Considerations of Electricity as a Vehicle Fuel, http://www.afdc.energy.gov/fuels/electricity_benefits.html (last visited Mar. 2, 2014).