

This document has been prepared as part of the implementation project of Legal Pathways to Deep Decarbonization (Michael B. Gerrard and John C. Dernbach, eds. Environmental Law Institute [2019]) (LPDD). For background information on the project, see <https://lpdd.org>

Memorandum To Accompany State Income Tax Credit Legislation For Purchasing Used AFVs

There is a strong consensus in the scientific community that profound changes are occurring in the world’s climate; that these changes are due in large measure to human activities; and that the consequences of unchecked climate change pose grave risks to the environment, human health and socioeconomic stability. *See, e.g., “Climate Science Special Report, Fourth National Climate Assessment,” (the “National Climate Assessment”)* which was released by the federal government on November 17, 2017 (“Earth’s climate is now changing faster than at any time in the history of modern civilization, primarily as a result of human activities.”)¹ The symptoms of climate change are now readily apparent: average global temperatures are increasing inexorably, sea levels are rising measurably, glaciers are retreating, arctic sea ice is disappearing, ocean waters are warming, permafrost is thawing, record droughts are occurring, wildfires are becoming more intense and storms are becoming more severe.”²

The U.S. is not immune to such impacts. Recent years have seen record wildfires break out in the west, unprecedented flooding in the mid-west and devastating storms along our coasts. Over the longer term, reports published by NASA, Columbia University, and Cornell scientists in 2015³ and 2016⁴ predict that “megadroughts” (i.e., droughts of the depression-era “dust bowl” magnitude, but lasting for decades) “could become commonplace” in the southwest and U.S. plain states “if climate change goes unabated.” *Id.* at 6. It is predictions such as these that have led the 2019 report of the World Economic Forum to identify the “failure of climate change mitigation and adaptation” to be one of the *top risks* facing society – ahead of weapons of mass destruction, cyber-attacks, terrorism, and the increasing scarcity of potable water.⁵

The December 12, 2015 Paris Agreement aims to avoid the worst impacts of climate change by holding the increase in average global temperatures to “well below 2°C above pre-industrial levels” with efforts “to limit the temperature increase to 1.5°C above pre-industrial

¹ U.S Global Change Research Program, *Fourth National Climate Assessment*, p.34.
<https://www.globalchange.gov/browse/reports/climate-science-special-report-fourth-national-climate-assessment-nca4-volume-i>

² *Id.* at 37.

³ Benjamin I. Cook, Toby Ault, & Jason Smerdon, “*Unprecedented 21st Century Drought Risk in the American Southwest and Central Plains States*,” *SCIENCE ADVANCES* (Feb. 12, 2015),
<http://advances.sciencemag.org/content/1/1/e1400082>.

⁴ Toby Ault, Justin S. Mankin, Benjamin I. Cook & Jason E. Smerdon, “*Relative Impacts of Mitigation, Temperature, and Precipitation on 21st-Century Megadrought Risk in the American Southwest*,” *SCIENCE ADVANCES* (Oct. 5, 2016), <http://advances.sciencemag.org/content/2/10/e1600873>.

⁵ *The Global Risks Report 2019*, Part I, WORLD ECON. FORUM, <https://www.weforum.org/reports/the-global-risks-report-2019>

levels.”⁶ Achieving these goals will be a daunting task, requiring that greenhouse gas emissions from industrial countries like the U.S. be reduced by about 80 percent by 2050. Reductions of this magnitude will take a colossal effort by virtually all levels of government in the U.S. and all sectors of the economy.

A book published by the Environmental Law Institute, entitled *Legal Pathways to Deep Decarbonization in the United States* (Michael Gerrard & John Dernbach, Eds., ELI 2019) (“LPDD”)⁷, has identified more than 1000 legal strategies that can be taken to achieve dramatic greenhouse gas emission reductions in the United States. Many of those pathways are focused on shifting transportation fuel sources in the U.S. away from fossil fuels, at a level that would result in the deployment of approximately 300 million alternative fuel vehicles (“AFVs”) – particularly electric vehicles (“EVs”), plug-in hybrid electric vehicles (“PHEVs”) and hydrogen fuel cell vehicles (HFCVs”). “The goal is to shift 80%-95% of the miles driven from gasoline to lower carbon energy sources like electricity and hydrogen.”⁸

The importance of achieving this goal is readily apparent: in the United States the transportation sector accounts for 28% of the total energy consumed, 72% of petroleum usage and about a third of GHG emissions.⁹ Cars and trucks use about half the total energy consumed by the transportation sector, which also includes trains, subways, planes, ships and other water craft.

One pathway towards reducing greenhouse gases from the transportation sector is for state governments to provide income tax credits to consumers who purchase used AFVs.¹⁰ The model state income tax credit legislation that accompanies this memorandum is designed to incentivize the purchase of used AFVs. While beginning to fade, an initial barrier to the proliferation of new AFVs is the cost. The cost of new AFVs is impacted both by the new supply chain products required and the lithium ion batteries (the dominant battery for EVs), which comprise approximately one-third of the cost of EVs.¹¹ Most consumers look to the immediate cost of vehicles and do not generally account for the long term benefits associated with AFVs, which in some cases can make the AFV comparable in price to its internal combustion counterpart.¹²

⁶ *Id.* The NASA Study indicates that the risks of a megadrought occurring in the Western U.S. drop sharply – to a range from 30-60 percent in a 2°C warming scenario. *See, e.g.*, <https://www.ecowatch.com/megadroughts-2031955357.html>.

⁷ Michael Gerrard and John Dernbach, *Legal Pathways to Deep Decarbonization in the United States* (“LPDD”)(Environmental Law Institute, 2019).

⁸ LPDD, Ch. 14, at 353; *see also*, Chris Gearhart, *Implications of Sustainability for United States Light-Duty Transportation Sector*, 3 MRS Energy & Sustainability 1, 7, note 6 (2016)

⁹ U.S. Energy Information Agency: Annual Energy Review: 2011 (2012), available at: <http://www.eia.gov/totalenergy/data/annual/>; *see also*, <http://www.eia.gov/todayinenergy/detail.php?id=29612>.

¹⁰ LPDD, Ch. 14, at 375 (providing that a way to “accelerate development of this secondary market [is] by allowing a subsidy for purchasing used AFVs”).

¹¹ Andreas Poullikkas, *Sustainable Options for Electric Vehicle Technologies*, 41 Renewable & Sustainable Energy Revs. 1272, 1282 (2015).

¹² Eric Loveday, *Electric Cars to Cost Same as, or Less than ICE Within a Decade*, Inside EVs, <http://insideevs.com/electric-cars-to-cost-same-as-or-less-than-ice-within-a-decade/> (last visited Sept. 24, 2019); Jens Hagman et. al., *Total Cost of Ownership and Its Potential Implications for Battery Electric Vehicle Diffusion*, 18 RES. Transp. Bus. & Mgmt. 11 (2016).

Additionally, some studies suggest that AFVs depreciate faster than internal combustion vehicles, making the higher or equivalent purchase price less acceptable to consumers.¹³ Two main reasons AFVs depreciate faster than internal combustion vehicles are (i) the rapid pace that technology is advancing for AFVs and the potential for obsolescence and (ii) the lack of tax incentives for used AFVs.¹⁴ As iSeeCars CEO Phong Ly stated, “Categorically, electric vehicles depreciate more than the average vehicle because resale values take into account the \$7,500 federal tax credit and other state and local credits that were applied to these vehicles when they were bought new.”¹⁵ This built in depreciation for AFVs explains in large measure the 18.4% higher average depreciation rate for electric vehicles compared to internal combustion vehicles.¹⁶ As a result, certain consumers may be deterred from purchasing an AFV as compared to an internal combustion vehicle.

The proposed legislation is intended to incentivize consumers to purchase both new and used AFVs because it will (i) help maintain the resale value of AFVs and (ii) make used AFVs more affordable.¹⁷

The model legislation has been drafted to provide policy makers with several options as to the types of used vehicles that would qualify for the tax credit, so the legislature can decide -- based upon market or political considerations -- which types of vehicles should qualify for a credit. Under one of the options, the proposed legislation would allow used hybrid electric vehicles (“HEVs”) (in addition to the AFVs listed above) to be eligible for the credits, provided that the vehicles meet a minimum EPA mpg rating for combined city and highway driving, which would be determined on a year-to-year basis by the State’s environmental or transportation commissioner (as determined by the legislature), and would be keyed to the third highest performing HEV on the market during the year in which such vehicle was manufactured. Initially, the HEV EPA rating qualification would be set at 50 mpg combined city/hwy. This initial threshold is deemed appropriate for two primary reasons. First, as of the 2018 model year, several small HEVs meet the 50 mpg target, so this threshold offers used car-buyers a multiplicity of options, at different

¹³ Bernd Propfe et al., *Cost Analysis of Plug-In Hybrid Electric Vehicles Including Maintenance & Repair Costs and Resale Values, Presentation at EVS26 International Battery, Hybrid, and Fuel Cell Electric Vehicle Symposium* (May 6-9, 2012), at 4, http://elib.dir.de/756971/1/EVS26_propfe_final.pdf; *see also* Fred Lambert, *Tesla Holds Its Value 2 Times Better Than Average Gasoline Car, Study Says* (June 17, 2019), <https://electrek.co/2019/06/17/tesla-holds-value-better-than-average-car-study/>.

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ These benefits may seem mutually exclusive because any incentive available to a used car purchaser will be built into the resale value. From an economics standpoint, however, an increase in resale value can lead to an increase in demand for new AFVs. If there is an increase in the sale of new AFVs, there will be an increase in the supply of used AFVs. With more used AFVs available for purchase, resellers will decrease the price to increase demand. The support for this point is only bolstered if the incentives for new AFVs go away entirely.

prices. Second, no current model achieves an EPA rating of 60 mpg combined city/hwy, and only two achieve a rating of 55 mpg or more.

Additionally, the proposed legislation provides that to qualify for the tax incentive, the used AFV must be a model year that is no less than two and no more than six years earlier than the date of the sale. This is intended to incentivize new purchasers of AFVs to retain the vehicle for a longer period of time than they may otherwise have intended and also tends to lower the underlying resale value. This will improve the affordability of qualifying sales. The proposed legislation also limits the tax incentive to lower income households. This decreases the barriers to entry into the AFV market for more households and limits the possibility that sellers of used AFVs will increase the prices of used AFVs to account for the tax incentive.

As drafted, the tax credit would remain in effect through December 31, 2030. However, following December 31, 2024 and December 31, 2026, respectively, the amount of the tax credit would decrease by Seven Hundred Fifty Dollars (\$750) from its then current amount. This reduction balances the aim of stabilizing the resale value of used AFVs, on the one hand, and the goal of incentivizing consumers to take more immediate action to purchase used AFVs. The effectiveness of the incentive should diminish by December 31, 2030, for, among other reasons, the cost of used AFVs will likely continue to decrease as supply increases.

Lastly, the proposed legislation requires that the used AFV be purchased from a qualifying seller – a registered car dealership or business that is primarily involved in the sale of used vehicles. This limits the possibility for affiliated transactions, fraud and price manipulation that may otherwise occur in transactions between individual buyers and sellers.