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 MODEL LAW FOR STATE INCOME TAX CREDITS FOR PLACING IN SERVICE ELECTRIC VEHICLE CHARGING STATIONS

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 2015[3] and 2016[4] 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. plains states "if climate change goes unabated."[5] 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.[6]

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1 U.S Global Change Research Program, *Fourth National Climate Assessment* at 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 *Id.* at 6.

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

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 levels."[7] 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")[8], 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."[9]

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.[10] 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.

The lack of adequate charging infrastructure stands as a major impediment to the widespread adoption of electric vehicles. According to experts "[c]onsumer reluctance towards EVs . . . arises from the limited range of the battery pack. The nearest charging station may be prohibitively far, or its wait time far too long. With no charging nearby. . . EV drivers could become stranded."[11] The proliferation of electric vehicle charging stations -- in residential, commercial, governmental and industrial locations – is essential to addressing such "range anxiety" issues and promoting the expanded consumer acceptance of electric vehicles. One pathway towards achieving this goal is for state legislatures to enact legislation providing a tax credit to offset a portion of the cost of installing electric vehicle charging infrastructure.

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[7] *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.

[8] Michael Gerrard and John Dernbach, *Legal Pathways to Deep Decarbonization in the United States* ("LPDD") (Environmental Law Institute, 2019).

[9] 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, n. 6 (2016)

[10] 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.

[11] Clint Cohen, *Blowing Smoke: Why the Current Government Incentive Regime Makes EVs and PHEVs A Distant Prospect-and How to Fix It* (2013) 38 Colum. J. Envtl. L. 375, 384.

Currently, the federal government provides a credit against federal income tax for 30% of the cost of an electric charging station for residential and commercial applications. However, that credit is scheduled to expire on December 31, 2021. Whether or not the federal tax credit program is renewed, States have a critical role to play in sparking the robust development of electric vehicle charging infrastructure nationwide.[12] The model law would establish a credit against state income tax and further incentivize the development of EV charging infrastructure in the state.

The model law provides for different levels of tax credits, as follows: (i) up to a 20% credit for the cost of the purchase and installation of new electric vehicle charging equipment that is at least a "Level 2" charger,[13] without restriction on use or location; (ii) up to a 30% credit for the cost of the purchase and installation of new electric vehicle charging equipment charging equipment that is at least a "Level 2" charger and is made available to the public; and (iii) up to a 35% credit for the cost of the purchase and installation of new electric vehicle charging equipment that is at least a "Level 2" charger, and is made available to the public and located along a critical travel corridor designated by the tax administrator in consultation with the state's transportation commissioner. (The credit amounts set forth in the model law are suggestions only, and would be at the discretion of state legislatures.)

The model law directs the state tax authority to promulgate implementing regulations, and in doing so to consider measures (including the scaling of tax benefits within the limits set forth in the statute) to encourage the installation of equipment that: (i) is capable of providing DC fast charging along critical travel corridors; (ii) has features making it convenient for use by the general public;[14] (iii) is co-optimized with other electric vehicle charging networks; and (iv) is capable of tracking time of use or otherwise designed to benefit the electrical grid. The regulations must also include provisions for the recapture of credits allowed for publicly available charging stations and

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[12] LPDD at 367; *see also* Vicki Arroyo *et al.*, *New Strategies for Reducing Transportation Emissions and Preparing for Climate Impacts* (2017) 44 Fordham Urb. L.J. 919, 938–939 (explaining that government incentives for building charging stations "can help develop the scale of infrastructure needed to make a wholesale shift in the type of vehicles people purchase.").

[13] There are three levels of electric vehicle charging, each provided by "Level 1", "Level 2" and "Level 3" chargers respectively. The technical definition for each of these levels is fairly complicated. Suffice it to day that "Level 1" charging is serviced by a standard wall outlet providing AC 120 volts/20 amps of power, and can fully recharge a car battery in 8-12 hours; Level 2 chargers connect to outlets providing AC 208/240 volts/40 amps service (about the same required for a dryer plug) and can recharge a car battery in 4-8 hours, and "Level 3" chargers – commonly called "DC Fast Chargers" -- provide DC service that can recharge a car battery to 80% capacity in less than an hour. See SAE J 1772; see also https://www.boston.gov/sites/default/files/file/2020/06/How%20To%20Install%20an%20EVSE%20.pdf.

[14] The model statute would direct the tax authority to consider, among other things, how to encourage the installation of charging equipment that "conforms to governmental or industry-developed billing, roaming or other interoperability standards." The development of such "interoperability" standards is well underway, and adherence to those evolving standards is essential to the creation of an infrastructure network that is effective in "maximizing driver access … simplifying payment and billing … and promoting effective vehicle-to-grid communications for smart charging and demand response programs." See Report of the "Multi-State ZEV Task Force and Northeast Corridor Steering Committee": Electric Vehicle Interoperability Recommendations for State Policy Makers, NESCAUM, May 2020, available at https://www.nescaum.org/documents/ev-charging-interoperability-reccomendations_5-1-20.pdf/

stations located along critical corridors in the event that those chargers are removed from service within one year after initial installation. The credit program under the model law terminates on December 31, 2030.