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March 21, 2014

To: Connecticut Department of Energy and Environmental Protection (“DEEP”)

From: William E. Dornbos, ENE Connecticut Director

RE: ENE’s Written Comments on DEEP’s Draft Clean Fuels and Clean Vehicles Action Plan (the “Action Plan” or “ZEV Action Plan”)

Rockport, ME
Boston, MA
Providence, RI
Hartford, CT
Ottawa, ON
Canada

ENE (Environment Northeast) is a non-profit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economies. ENE is at the forefront of efforts to combat global warming with solutions that promote clean energy, clean air and healthy forests.

ENE thanks DEEP for the opportunity to submit written comments on the draft ZEV Action Plan.¹ DEEP should be commended for developing this plan and seeking stakeholder input.

I. The Central Role of Electric Vehicles in a Low-Carbon and Sustainable Future

ENE strongly supports implementing policies in Connecticut and the New England region that seek to accelerate the widespread adoption of electric vehicles by consumers.² Electric vehicles will be essential to making our transportation sector sustainable – both economically and environmentally.

Consumers stand to benefit significantly from electric vehicles. Operating costs are approximately 64% lower: about 5 cents/mile for an electric vehicle in the Northeast compared to 14 cents/mile for a conventional medium sedan, for instance.³ This advantage translates into real monetary savings for consumers.

Electric vehicles can also help improve Connecticut’s economic competitiveness. Our overreliance on imported fossil fuels for transportation needs imposes a significant economic burden. In 2011, drivers in Connecticut spent over \$6.3 billion on gasoline and diesel fuel, of which approximately \$4.7 billion (75 percent) left the state as payments to petroleum producers and refiners in other regions and countries.⁴

Electric vehicles are also key to reducing carbon pollution. The transportation sector is the second largest source of U.S. greenhouse gas emissions, responsible for 28% nationally, and

¹ ENE’s comments pertain to the version of the draft ZEV action plan presented by DEEP at the SIPRAC meeting in Hartford on March 13, 2014.

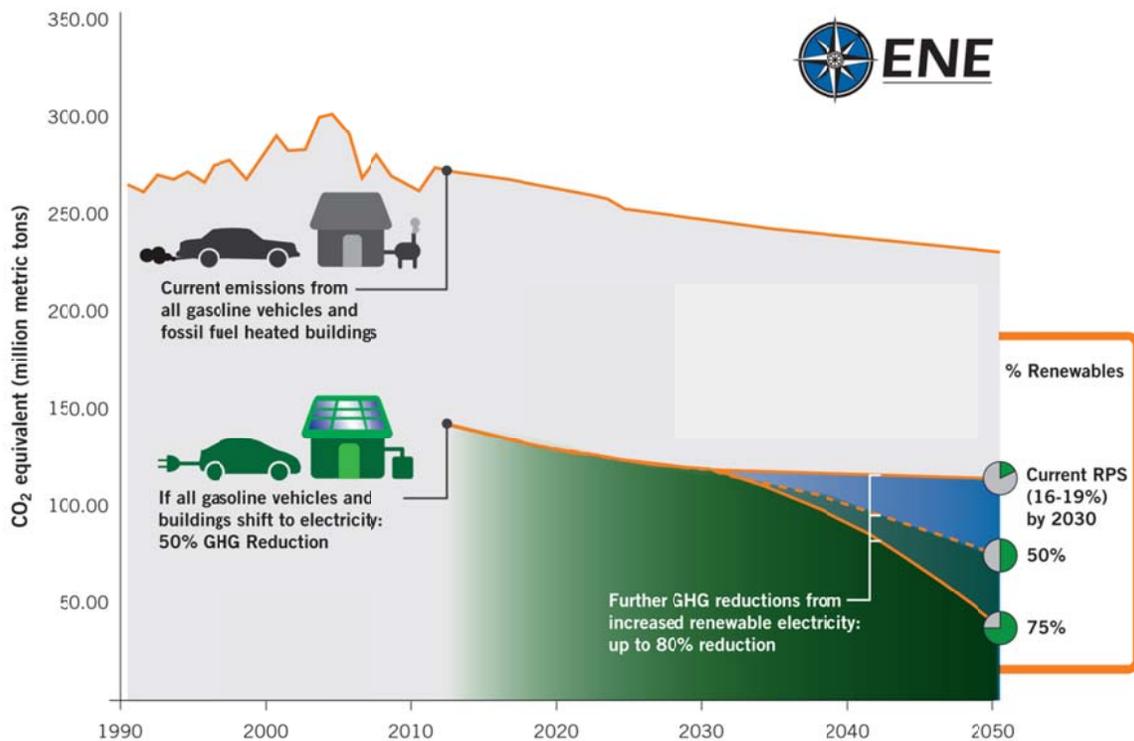
² ENE will refer to “zero emission vehicles” (or “ZEVs”) and “electric vehicles” interchangeably for the purposes of this comment.

³ ENE analysis, *EnergyVision: A Pathway to a Modern, Sustainable, Low Carbon Economic and Environmental Future*, p. 8 (available online: <http://www.env-ne.org/resources/detail/energyvision>) (2014).

⁴ ENE analysis, Sources: Energy Information Administration, American Petroleum Institute. Tax data is from 2012 and retailers’ margin is based on 2010 data.

nearly 40% in Connecticut – more than electricity consumption and building energy use.⁵ For Connecticut to meet its carbon pollution reduction targets under the Global Warming Solutions Act, the state will need to support cleaner transportation options than the status quo. With the current electricity mix, the per-mile GHG emissions from an electric vehicle are 60% lower than the emissions of a comparable medium sedan.⁶

In its recent EnergyVision report, ENE assessed the potential for full electrification of the transportation and buildings sectors to reduce carbon pollution. The following chart shows the results: if all gasoline powered vehicles and buildings using fossil fuels shifted to electricity technologies today, carbon pollution would fall by nearly 50%.⁷



What this analysis underscores is that electric vehicles – an already commercially available and cost-effective transportation technology – can help dramatically decarbonize our energy system right now, without adding new renewable supply. The key, then, for Connecticut’s policymakers is to find ways to speed their deployment to maximize their substantial climate and economic benefits as soon as possible.

II. Preliminary Policy Feedback on the Draft ZEV Action Plan

For the contours of a policy framework that can drive increased penetration of electric vehicles in Connecticut’s transportation sector, please see the attached policy analysis prepared by ENE for the state’s policymakers.

⁵ ENE analysis, *ClimateVision2020*, <http://www.eneclimatevision.org/appendix-state-profiles/connecticut>.

⁶ *Id.* at 9.

⁷ ENE analysis, *EnergyVision: A Pathway to a Modern, Sustainable, Low Carbon Economic and Environmental Future*, p. 5 (available online: <http://www.env-ne.org/resources/detail/energyvision>) (2014).

ENE's analysis outlines several key areas for policy action to support the overall adoption goals of the ZEV Memorandum of Understanding ("ZEV MOU") signed by Connecticut and seven other states in October of 2013. They are:

- 1) **Set an electric vehicle target for 2025** based on meeting the greenhouse gas emissions goals in Connecticut's Global Warming Solutions Act. This binding target should also align with, and satisfy, Connecticut's share of the new ZEV MOU target. That overall MOU target is 3.3 million zero emission vehicles by 2025. Based on statements made at the ZEV plan listening session at DEEP headquarters attended by ENE on March 13, 2014, Connecticut currently has about 1,400 low-emission and/or electric vehicles registered here. Connecticut should undertake a policy scenario analysis to determine how best to accelerate EV adoption to satisfy its climate change and ZEV MOU obligations in the required timeframes.
- 2) **Create consumer incentives for the purchase of electric vehicles** by exempting qualified electric vehicles from the state sales tax, or providing an equivalent rebate, until 10% of the electric vehicle target is reached, as well as exempting charging systems and relevant replacement parts for electric vehicles and charging systems.⁸ Importantly, consumers can also be incentivized through rate design reforms – specifically, through the use of time-varying rates, either for the whole house or applicable to electric vehicle charging only. Time-varying rates allow consumers to charge their electric vehicles more cheaply at night (and at home), which results in lower fueling costs. Connecticut should explore implementing time-varying rates for both public *and* private charging of electric vehicles for all electric retail classes.
- 3) **Establish a regulatory framework to support electric vehicle adoption**, including through rate design, grid planning reforms, clarification of charging infrastructure, ownership and utility cost recovery, consumer education, and other necessary reforms. For example, based on our preliminary review of Connecticut statute, it would appear that charging stations are not covered by the state's public utility laws. State officials could issue a definitive statement on this point to help provide regulatory certainty to electric vehicle stakeholders. In a similar vein, weights and measures regulations being developed at the national level for charging stations should be adopted by Connecticut when they are finalized to provide standardized information and safeguards for consumers. Finally, other consumer protection measures, notably open access policies, can and should be adopted to provide the best consumer experience possible for electric vehicle owners.
- 4) **Provide regulatory and planning support for the build-out of charging infrastructure** by setting targets for electric vehicle charging stations, developing guidelines for the location and design of public charging stations, streamlining public charging, as well as issuing model ordinances and updating building codes to accommodate charging infrastructure. Connecticut addressed new, single family residential construction through building code reform in last year's Public Act 13-298, but other building sectors need to be addressed as well. California can serve as an EV code model, having recently made sensible recommendations for other sectors.⁹

⁸ In addition to the state incentives noted in the draft ZEV Action Plan presentation, Massachusetts should be added, as it is just now starting a rebate program for electric vehicles.

⁹ For more information on California's building code recommendations for facilitating electric vehicle adoption, see http://www.opr.ca.gov/s_zero-emissionvehicles.php.

5) **Maximize the benefits of electric vehicles by planning now for vehicle-to-grid integration.** In addition to implementing time-varying rates for public and private charging, Connecticut should begin exploring how best to utilize electric vehicles to provide important and valuable grid services, such as peak demand reduction, energy storage, frequency and voltage regulation, demand response and load management, and back-up electrical power. Vehicle-to-grid integration should be included in all state energy planning processes, such as the Comprehensive Energy Strategy, the biannual Integrated Resources Plan, transmission and distribution planning, as well as any utility-level planning. Grid integration efforts will also require proper notification to distribution utilities of electric vehicle registrations.

6) **Demonstrate leadership** by maximizing the procurement of electric vehicles and charging infrastructure at the state and municipal levels.

Thank you again for the opportunity to provide conceptual input on the draft ZEV Action Plan. Please do not hesitate to contact us if you have any questions or would like additional information.

Sincerely,

William E. Dornbos
ENE Connecticut Director

Policy Framework for Speeding Adoption of Electric Vehicles



December 2013

The transportation sector is responsible for a significant share of greenhouse gas (GHG) emissions and energy expenditures in Connecticut. To reduce emissions and transportation fuel costs, Connecticut should accelerate electric vehicle adoption through the following policy steps (detail on page 3):

- 1) **Set an electric vehicle target for 2025** based on meeting the greenhouse gas emissions goals in the Connecticut Global Warming Solutions Act.
- 2) **Create consumer incentives for purchase of electric vehicles** by exempting qualified electric vehicles from the state sales tax, or providing an equivalent rebate, until 10% of the electric vehicle target is reached, as well as exempting charging systems and relevant replacement parts for electric vehicles and charging systems.
- 3) **Establish a regulatory framework to support electric vehicle adoption**, including through rate design, grid planning reforms, clarification of charging infrastructure ownership and utility cost recovery, consumer education, and other necessary reforms.
- 4) **Provide regulatory and planning support for build-out of charging infrastructure** by setting targets for electric vehicle charging stations, developing guidelines for the location and design of public charging stations, streamlining public charging, as well as issuing model ordinances and updating building codes to accommodate charging infrastructure.
- 5) **Demonstrate leadership** by procuring electric vehicles and charging infrastructure at the state and municipal level.

Background

The current transportation system is unsustainable. The transportation sector is the second largest source of U.S. GHG emissions, responsible for 28% nationally, and nearly 40% in Northeast and mid-Atlantic states. In Connecticut, this sector is responsible for 40% of emissions, more than electricity consumption and building energy use.¹ To meet the ambitious GHG emissions reduction targets in the Global Warming Solutions Act (10% below 1990 levels by 2020 and 80% below 2001 levels by 2050), Connecticut needs to support cleaner transportation options than the status quo.

Additionally, the current transportation system is almost entirely dependent on gasoline and diesel, resulting in a transfer of wealth from New England to other regions and countries. In 2011, drivers in Connecticut spent over \$6.3 billion on gasoline and diesel, of which approximately \$4.7 billion (75 percent) left the state as payments to petroleum producers and refiners in other regions and countries.² At recent electricity and gasoline prices, the fuel costs of a battery-electric vehicle like the Nissan Leaf are approximately 65 percent lower than the fuel costs of a conventional medium sedan.³

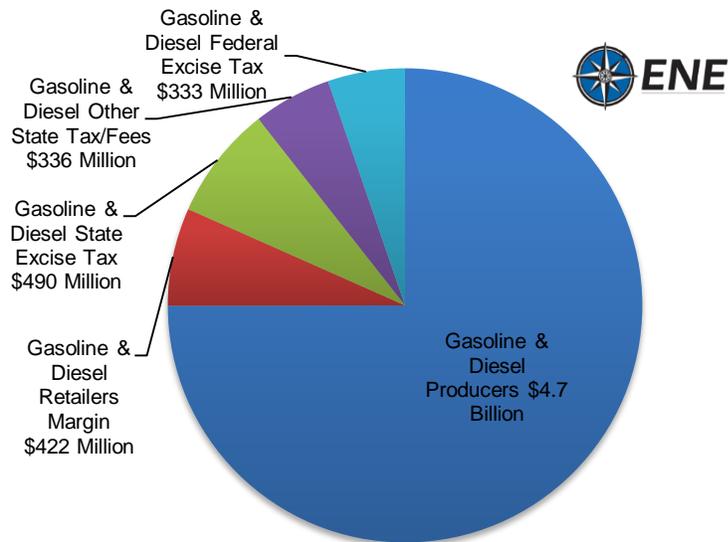
¹ <http://www.eneclimatevision.org/appendix-state-profiles/connecticut>

² ENE analysis. Sources: Energy Information Administration, American Petroleum Institute. Tax data is from 2012 and retailers' margin is based on 2010 data.

³ ENE analysis assumes gasoline price of \$3.63 per gallon of gasoline and \$0.15 per kWh of electricity. The conventional vehicle fuel efficiency (miles per gallon) and electric efficiency (kWh/100 miles) from U.S. DOE. Fuel efficiency of the "medium sedan" category is the average of MY 2012 Chevrolet Impala, Ford Fusion, Honda Accord, Nissan Altima, and Toyota Camry. Available from: <http://www.fueleconomy.gov/>.

Shifting a greater portion of driving to electric vehicles will reduce our total expenditure on transportation fuels and slow the flow of wealth out of the state.

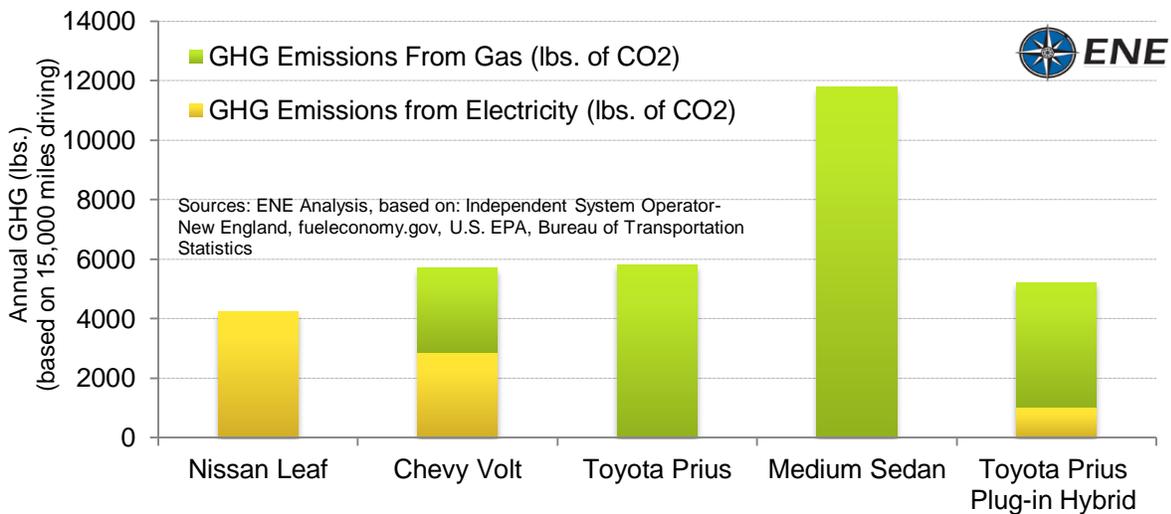
Chart 1: Connecticut Gasoline and Diesel Fuel Expenditure, 2011



Sources: EIA, American Petroleum Institute

Shifting our transportation needs to electricity and increasing renewable generation capacity are critical to driving down greenhouse gas emissions from the transportation sector. As the carbon intensity of the regional energy mix decreases, the environmental and climate benefits of electric vehicles increases. Already in New England, electric vehicles can reduce transportation emissions by over 60 percent when compared to a traditional internal combustion engine.⁴

Chart 2: Greenhouse Gas Emissions from Electric and Conventional Vehicles in ISO-NE



⁴ ENE analysis based on 2010 ISO-NE marginal emissions rate, gasoline emissions factor and fuel (gas and electricity) efficiency from U.S. EPA. Calculations also assume a 55% utility factor for the Chevy Volt.

A Policy Framework for Speeding the Adoption of Electric Vehicles in Connecticut

The suite of policies and actions outlined below can begin the process of bringing additional vehicle choice to consumers and speeding the transition off of petroleum-based fuels.

- 1) **Establish 2025 Target for Electric Vehicles Based on Global Warming Solutions Act** – Electric vehicles provide significant reductions in greenhouse gas emissions compared to existing vehicles on the road. Replacing only ten percent of the 1.7 million conventional automobiles in Connecticut with electric vehicles could reduce greenhouse gas emissions by over half a million tons with the current electricity mix.⁵ As we continue to clean our electric sector over the coming decades, the greenhouse gas benefits of electric vehicles will increase and can represent a substantial percentage of the proportional reductions from the transportation sector.
- 2) **Provide Consumer Incentives to Accelerate EV Adoption** – Electric vehicles purchased in or after 2010 may be eligible for a federal income tax credit of up to \$7,500.⁶ Connecticut should capitalize on this incentive to further reduce costs and encourage electric vehicle adoption. Additional incentives to consider implementing:
 - a. Exempt qualified electric vehicles from the state sales tax, up to \$2,500, or provide an equivalent up-front rebate, until 10% of the electric vehicle target is reached.⁷
 - b. Exempt charging equipment and relevant electric vehicle parts from the state sales tax.
- 3) **Remove Regulatory Barriers and Modernize the Electric Grid** – Public utilities commissions are well suited to consider the structural reforms necessary to ensure that electric vehicles are integrated into the electric system in a manner that enhances system reliability, minimizes costs, and protects consumers. In November 2012, the National Association of Regulatory Utility Commissioners (NARUC) recognized the unique role that public utility commissions can play in developing EV markets when it passed a resolution urging state regulators to “remove barriers to alternative fuel vehicle deployment, and ensure consistent, fuel-neutral policies to help realize the full economic, environmental, and societal benefits of [EVs].”⁸ ENE recommends states adopt legislation that directs public utilities commissions to consider the following issues and recommendations:
 - a. Establish and publicize mechanisms to incentivize EV owners to charge vehicles during off-peak periods. These mechanisms may include, but not be limited to, time-varying electricity rates.
 - b. Adopt rules and regulations that encourage utilities to support the integration of electric vehicles into the electric grid to increase asset utilization, load management, and energy storage.
 - c. Integrate electric vehicles into short and long term distribution-level system planning and load forecasting. Provide for reporting of EV charging station location and capacity and direct the department of motor vehicles to share EV registrations with the electric distribution utilities.

⁵ Based upon reductions per vehicle shown in Chart 2.

⁶ The Internal Revenue Service maintains an index of qualified electric drive motor vehicles eligible for the federal tax credit. Available from: <http://www.irs.gov/Businesses/Qualified-Vehicles-Acquired-after-12-31-2009>.

⁷ At the current Connecticut vehicle sales tax rate of 6.35%, the 2013 Nissan Leaf S (MSRP \$28,800) would receive a tax exemption of \$1,829.

⁸ Available at:

<http://www.naruc.org/Resolutions/Resolution%20on%20Expanding%20the%20Alternative%20Fuel%20Vehicle%20Market.pdf>

- d. Clarify that 1) non-utilities are allowed to own and operate EV charging stations, and 2) all owners of EV charging stations will be able to purchase electricity on fair terms.⁹
 - e. Require electric utilities to provide consumer education on electric vehicle charging rates and costs of residential charging infrastructure installation.
- 4) Facilitate Home and Public EV Charging** – A significant build-out of electric charging infrastructure is needed to support widespread electric vehicle adoption. Connecticut can facilitate deployment by providing guidance and standards for infrastructure site selection and integration of charging infrastructure into the built environment:
- a. Establish targets for public and private electric charging infrastructure to accommodate the adoption target for electric vehicles.
 - b. Develop statewide guidelines for public electric vehicle charging stations that inform technical design and optimal site selection to serve diverse consumer groups.
 - c. Make charging costs easily visible in a format easily understandable to consumers.
 - d. Require state and local building code officials to implement standards related to electric vehicle charging and provide expedited review and inspection of home charging infrastructure.
 - e. Recommend standardized signage for use by cities and towns to identify EV parking and charging locations.
- 5) Lead by Example** – Connecticut can accelerate transportation electrification and prime the market for vehicles and infrastructure by committing to electric vehicle usage and providing guidance to municipalities:
- a. Add a state fleet purchasing requirement for electric vehicles and increase the percentage over time.¹⁰
 - b. Develop model RFPs or procurement standards for vehicle and charging equipment by state agencies and municipalities.¹¹

For Further Information:

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⁹ Retail rate structures should be designed to avoid discriminating against electric vehicle charging stations. Charging station owners should be able to act as a supplier of generation services but must be subject to the same requirements, such as renewable portfolio standards, as other entities providing electric energy from the wholesale markets.

¹⁰ Currently, Connecticut requires all vehicles purchased or leased by the state to be “alternative-fueled, hybrid electric or plug-in electric.” C.G.S. § 4a-67d(b). Under the relevant federal definitions, alternative fueled vehicles include dual-fueled or “flex-fuel” vehicles that can operate on both gasoline and ethanol.

¹¹ Rhode Island recently added the all-electric Ford Focus, Nissan Leaf, and Honda Fit to its list of eligible alternative fuel vehicles. Plug-in gas-electric models include the Chevrolet Volt, Ford C-Max, Toyota Prius Hatchback, and Ford Fusion. For additional information, see: <https://www.purchasing.ri.gov/RIVIP/StateAgencyBids/7458316.pdf>.



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ENE is a nonprofit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economic development. ENE is at the forefront of state and regional efforts to combat global warming with solutions that promote clean energy, clean air and healthy forests.