clf

conservation law foundation

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Submitted via Email: DEEP.EnergyBureau@ct.gov

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Department of Energy and Environmental Protection
Ten Franklin Square
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Re: Opportunity for Written Comments on Connecticut DEEP's 2017 Draft Comprehensive Energy Strategy

Dear Ms. Morrell,

Conservation Law Foundation ("CLF") appreciates the opportunity to provide comments to the Connecticut Department of Energy and Environmental Protection ("DEEP") on the draft *2017 Comprehensive Energy Strategy* ("Draft CES"), pursuant to the Notice dated July 26, 2017.

INTRODUCTION

CLF is New England's leading environmental advocacy organization. We are a nonprofit, member-supported organization with offices throughout New England. Since 1966, CLF has worked to protect New England's people, natural resources, and communities. CLF promotes clean, renewable, and efficient energy production and use throughout New England and has substantial experience and deep expertise in this field. CLF advocates have provided testimony on Connecticut's renewable energy bills, commented on Connecticut regulatory proceedings regarding renewable energy procurements, and participated in siting and permitting processes for energy generation facilities in Connecticut.

CLF and its members have a deep and abiding interest in mitigating the adverse impacts of climate change. Reducing Connecticut's climate-warming greenhouse gas ("GHG") emissions is the greatest challenge facing Connecticut's energy system now and in the coming decades. First

and foremost, the *2017 Comprehensive Energy Strategy* must be a comprehensive climate change mitigation strategy.

Any review of the Draft CES must begin with—and be informed in every respect by—Connecticut's Global Warming Solutions Act, or "GWSA."[1] The GWSA, originally passed by the General Assembly in 2008 and amended since, mandates that Connecticut "shall" cut its GHG pollution at least 10% below the 1990 level by 2020 and at least 80% below the 2001 level by 2050.[2] The GWSA also required state regulators to establish a baseline GHG emissions inventory and to analyze emissions-reduction strategies that would set Connecticut on a path to achieving its statutory requirements.[3]

To help Connecticut achieve the GWSA's emission-reduction goals (as well as other state energy-policy goals), in 2011, Connecticut passed Public Act 11-80, which not only overhauled the way Connecticut approaches energy policy but also required the newly formed DEEP to create a comprehensive energy plan by July 2012.[4] In creating this plan, DEEP had to consider energy efficiency and renewable-energy generation, and it further had to include an assessment of ratepayer benefits "including, but not limited to, carbon dioxide emissions reductions."[5]

DEEP released its initial plan, called a *Comprehensive Energy Strategy* or "CES," in 2013. The 2013 CES aimed to reduce both energy costs and Connecticut's development on fossil fuels. Unfortunately, however, the plan's recommendation for a dramatic expansion of natural gas infrastructure cut squarely against that aim—and hampered Connecticut's ability to meet the GWSA requirements. Though the 2013 CES described natural gas as a "bridge fuel" to a fossil-fuel-free future, in fact, investment in new natural gas infrastructure only extends the use of fossil fuels when they should instead be phased out, and forces the public to bear unnecessary costs.

Additional energy-focused legislation followed, but largely continued the theme of one step forward toward clean energy and two steps backward toward fossil fuels. For instance, in 2013, "An Act Concerning Implementation of Connecticut's Comprehensive Energy Strategy and Various Revisions to the Energy Statutes" increased the state's funding and programs for energy efficiency and promoted microgrids and electric vehicles ("EVs"); but the same act also

[1] Conn. Pub. Act No. 08-98, codified at Conn. Gen. Stat. §§ 22a-200 *et seq.*
[2] Conn. Gen. Stat. § 22a-200a.
[3] *Id.* § 22a-200b.
[4] Conn. Pub. Act No. 11-80 (2011).
[5] *Id.* § 51.

encouraged conversion of non-gas customers to gas supply and the further build out of gas infrastructure.[6] Connecticut advanced its clean energy goals in passing a 2013 law allowing for the large-scale regional procurement of renewable energy.[7] But in 2015, the General Assembly adopted another statute that authorized DEEP to solicit natural gas proposals to enhance winter electric reliability.[8]

Overall, unfortunately, Connecticut's emission-reduction goals and the General Assembly's willingness to try new approaches to energy policy have not borne fruit: in fact, statewide GHG emissions have been on the rise in recent years. DEEP acknowledged this in its 2013 Connecticut Greenhouse Gas Emissions Inventory, which stated that "[b]etween 2012 and 2013, there was a slight uptick in economy-wide emissions for both the consumption- and generation-based accounting methodologies."[9] A more recent report using data from the U.S. Environmental Protection Agency's State Inventory Tool—the same tool that Connecticut uses for its GHG accounting and reporting[10]—found that between 2012 and 2014, Connecticut's statewide GHG emissions increased by 4.4%.[11] Alarmingly, the report found that Connecticut's 2014 emissions exceeded the state's target for emissions in 2020 by the equivalent of approximately 1.5 million tons of carbon dioxide equivalent ("CO2e").[12] Finally, the report found that statewide GHG emissions through 2015 appeared to be increasing even beyond the noncompliant 2014 levels.[13]

Connecticut needs to do more. As the below comments discuss in more detail, the Draft CES contains some positive elements; but overall, it is not enough to bring Connecticut into compliance with the GWSA's emission-reduction requirements, let alone the more aggressive

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[6] Conn. Pub. Act No. 13-298 (2013).
[7] Conn. Pub. Act No. 13-303 (2013).
[8] Conn. Pub. Act No. 15-107 (2015).
[9] *Available at* http://www.ct.gov/deep/lib/deep/climatechange/2012_ghg_inventory_2015/ct_2013_ghg_inventory.pdf.
[10] *See* CT DEEP, *Taking Action on Climate Change: 2014 Progress Report* at 6, note 5 (Jun. 2, 2014), *available at* http://www.ct.gov/deep/lib/deep/climatechange/2011progressreport-2014-10-27/taking_action_on_climate_change_-_2014__progress_report_-_final.pdf.
[11] Acadia Center, *New Analysis Shows Connecticut's Greenhouse Gas Emissions Have Increased Since 2012; No Longer on Track to Meet State's 2020 Target* (May 23, 2016), *available at* http://acadiacenter.org/new-analysis-shows-connecticuts-greenhouse-gas-emissions-have-increased-since-2012-no-longer-on-track-to-meet-states-2020-target/; *see also* Acadia Center, *Updated Greenhouse Gas Emissions Inventory for Connecticut* (June 13, 2016), *available at* http://acadiacenter.org/wp-content/uploads/2016/06/CT-GHG-Emissions-Inventory-Report-2.pdf.
[12] *Id.*
[13] *Id.*

emissions reductions that science tells us we need in order to avoid the worst effects of climate change.[14]

SUMMARY OF RECOMMENDATIONS

Overall, the lack of long-term vision in the Draft CES is disappointing. Though the Draft CES contains some positive elements, it fails to serve as a roadmap to Connecticut's clean energy future. Meeting the GWSA emission-reduction requirements necessitates visionary action and leadership. We urge DEEP to seize this opportunity to present an actionable pathway forward for the state that has decarbonization at its core.

In addition to incorporating the comments below, DEEP should recommend that the General Assembly revise the GWSA to ensure that Connecticut's emission-reduction targets are mandatory and binding. Given Connecticut's troubling emissions trajectory, it appears that only legally binding targets—together with binding interim targets in 2030 and 2040, and aggressive implementing regulations—will be enough to get Connecticut on track to achieve the clean energy future we need.

Electric Power Sector

It is imperative that the electric power sector rapidly decarbonize in order to accommodate electrification in the buildings, transportation, and industrial sectors without increasing emissions. Significant development of both small-scale, behind-the-meter and utility-scale, grid-facing renewable generating resources will be necessary to accomplish this decarbonization. The Final CES should set ambitious renewable-energy procurement goals that fully recognize the value of both behind-the-meter and grid-facing renewables.

In order to accomplish rapid decarbonization, Connecticut needs—and the Final CES should recommend—a more ambitious expansion of the RPS than 30% by 2030. Connecticut should rapidly phase out RECs for landfill gas, a carbon-intensive fuel that is inconsistent with the state's waste and energy goals, and should limit biomass RECs. And Connecticut needs a full suite of programs to promote rapid behind-the-meter and grid-facing renewable energy projects; this suite should not include limits on behind-the-meter procurements and should include a mix of programs including an aggressive RPS, net metering, a renewable energy tariff

[14] *See*, *e.g.*, Holz, Christian, Sivan Kartha, and Tom Athanasiou, "Fairly sharing 1.5: national fair shares of a 1.5° C-compliant global mitigation effort," International Environmental Agreements: Politics, Law and Economics: 1-18 (Aug. 2017) (applying principles of climate science and equity to determine the United States must achieve zero net carbon emissions by 2021 in order to keep overall average temperature change below a 1.5-degree rise).

program, and shared programs such as virtual net metering. At the same time, Connecticut must set sensible siting rules for renewable-energy facilities to avoid converting the state's rapidly declining farmland while still ensuring that the state can meet its ambitious goals.

Improving the resiliency of the electric power system in Connecticut is an essential undertaking, but DEEP should refocus away from outdated, fossil fuel-dependent conceptions of reliability and take advantage of grid modernization lessons learned in other jurisdictions. The concept of natural gas as a "bridge" fuel is outdated, and DEEP does not need to devote further time or effort to helping pipeline-affiliated utilities secure ratepayer subsidization, whether at a state or regional level. In addressing climate adaptation resiliency measures to protect critical grid infrastructure from adverse weather events, Connecticut should plan for river as well as coastal flooding. And while DEEP has identified a number of timely grid modernization-related topics for PURA to address, in place of a noncommittal exploratory docket, DEEP should recommend specific dockets on non-transmission alternatives, dynamic pricing, storage, and EDC ownership of key resources.

Building Sector

Buildings have an important role to play in reducing Connecticut's emissions as they are the site of considerable energy consumption through appliance energy use, heating and air conditioning, and more, as well as a growing source of energy generation, storage, and transportation fueling. The Final CES should account for these diverse roles and harness buildings as a vehicle for decarbonization.

First and foremost, it will be impossible to meet Connecticut's ambitious GWSA goals while continuing to rely, let alone expand, on the use of natural gas for building heating. Increased reliance on natural gas for building heating will only continue to stymie Connecticut's efforts to reduce emissions; the final CES should not encourage oil or propane to natural gas conversions for heating. Connecticut should not invest in new natural gas infrastructure, and should if anything shift focus to reducing methane leaks in existing gas infrastructure, starting with the biggest, most environmentally damaging leaks.

Achieving Connecticut's GWSA goals also requires continued and increased commitment to all cost-effective energy efficiency, which should be calculated in reference to Connecticut's GWSA commitments in addition to other energy and environmental goals and societal objectives.

Additionally, the state must take steps to prepare the building sector for its growing role in facilitating beneficial electrification. The most important of these steps is an "electric vehicle-ready" building code that ensures all new commercial and residential buildings are wired to

support electric vehicle charging infrastructure, which is more cost-effective than retrofitting existing buildings.

Transportation Sector

Strategies to reduce transportation-sector emissions are essential to achieving Connecticut's GWSA targets and other clean-energy goals. Transportation is the single largest source of GHG emissions in Connecticut, and growing.[15] The rise in GHG emissions in Connecticut in 2015 was largely due to increased transportation-sector emissions.[16] As the Draft CES rightly recognizes, the transportation sector is also a significant source of conventional air pollutants such as ozone, particulate matter, and smog precursors that harm human health and the environment.[17]

It is imperative that Connecticut begin to bend its transportation emissions curve. While the Draft CES acknowledges the importance of promoting vehicle electrification[18] and sets forth some general long-term goals for the transportation sector that are useful, such as the development of an EV Roadmap and support of smart growth and transit-oriented development strategies, the Draft CES falls short of what is needed to ensure achievement of the GWSA targets, federal air quality standards, and Connecticut's commitment under the multi-state ZEV MOU to have 150,000 EVs on its roadways by 2025.[19]

As detailed further below, DEEP should specify aggressive, targeted policies to address all aspects of the "three-legged stool" of transportation-sector emissions: 1) policies and programs to facilitate a massive shift from petroleum-fueled vehicles to EVs; 2) greater support of alternative transportation modes—particularly, public transit—to reduce vehicle miles traveled ("VMT"); and 3) investments to improve transportation system efficiency. Additionally, as gas-tax revenues continue to decline, Connecticut must identify alternative sources of revenue for transportation investments that are harmonious with efforts to reduce emissions from the sector, such as a regional cap-and-invest program that puts a price on carbon in transportation

[15] Draft CES at 161, fig.T1; Connecticut Department of Energy and Environmental Protection, 2013 Connecticut Greenhouse Gas Emissions
Inventory, 2016,
http://www.ct.gov/deep/lib/deep/climatechange/2012_ghg_inventory_2015/ct_2013_ghg_inventory.pdf.

[16] Acadia Center, Updated Greenhouse Gas Emissions Inventory for Connecticut: Recent Increases and Underlying Factors (June 13, 2016), http://acadiacenter.org/wp-content/uploads/2016/06/CT-GHG-Emissions-Inventory-Report-2.pdf.

[17] *See* Draft CES at 168-69.

[18] *See* Draft CES at 160.

[19] *See* State Zero-Emission Vehicle Programs Memorandum of Understanding (Oct. 24, 2013), *available at* http://www.zevstates.us/about-us/.

fuels. While reducing transportation-sector emissions, Connecticut should also ensure that solutions grow mobility options, increase transportation reliability, and promote equitable access for all. Additionally, Connecticut must take proactive action to ensure that new mobility modes and technologies benefit the system and supplement public transit, while avoiding potential pitfalls such as increased VMT.

This is no small challenge; but there are concrete steps DEEP can take now to set the state on the path toward a cleaner and more equitable transportation future, as discussed further below. The final CES should include more specific guidance about those measures and pathways to their swift implementation.

DETAILED COMMENTS

ELECTRIC POWER SECTOR

Goal 1: Align existing programs supporting renewable and zero carbon resources with renewable portfolio standards and global warming solutions act goals.

E.1.1 Expand the RPS to achieve 30 percent Class I renewables by 2030.

CLF disagrees with DEEP's conclusion that amending the RPS to achieve 30% renewable generation by 2030 will be adequate for Connecticut's needs. DEEP cites the availability of non-RPS Class I resources as reason to curtail the growth of the RPS at this level, but different size and types of clean energy resources must be aggressively pursued in tandem if Connecticut is going to meet its legal obligations under the GWSA. Large scale resource procurements are helpful for moving Connecticut's generation fleet off of fossil fuels, but smaller scale and more local renewable generation sources provide valuable balancing and resiliency benefits for Connecticut's electric power system and are dependent on the RPS for financing. Further, each increment of renewable energy generation reduces Connecticut's dependence on fossil fuels, especially natural gas. Recent analysis conducted by Synapse Energy Economics and Sustainable Energy Advantage found significant economic benefits to Connecticut from annually increasing the RPS by 2.5% after 2020, adding 1400 MW of renewable energy to the New England power system, creating 7,100 new jobs, and reducing reliance on imported natural gas by 43%.[20] The

[20] *See* Knight, P., et al., *Increasing the Connecticut Renewable Portfolio Standard: Creating Economic and Environmental Benefits for Connecticut*, http://www.synapse-energy.com/sites/default/files/Increasing-the-Connecticut-Renewable-Portfolio-Standard-17-070_0.pdf.

study also found that DEEP's current proposal fails to result in even a straight line path to 2050 emissions reductions, which should be the bare minimum acceptable policy action.[21]

E.1.2 Phase down biomass and landfill gas RECs in Connecticut's Class I of the RPS.

As the Draft CES notes, the fact that current RPS incentives for biomass and landfill gas are being granted to mature resources is not an economically optimal use of the RPS. However, the current incentives for these resources are also not environmentally sound and should be reduced further than DEEP is proposing. A phase-down to 50% is not enough; CLF urges DEEP to eliminate landfill gas from RPS eligibility and to strictly curtail the eligibility of biomass to the most efficient generation facilities and the most sustainably-sourced feedstock, using the Massachusetts RPS standards for biomass as a floor.

Specifically, allowing RECs for landfill gas creates perverse incentives and undermines Connecticut's waste-management and energy policy goals. As to waste management, Connecticut has made serious efforts to divert organic material from its waste stream and to support a buildout of anaerobic digestion and composting operations. But organic material is also what generates methane—the primary fuel component of landfill gas—when it breaks down under landfill conditions. Allowing RECs for landfill gas creates an incentive to keep organic material in the waste stream, where it will generate remunerative landfill gas. At the same time, as to energy, Connecticut recognizes that it must move away from greenhouse gas-generating power sources. But the methane generated in landfills is a potent greenhouse gas, and when burned it generates carbon dioxide, another greenhouse gas. Landfill operators cannot and do not capture all the methane their landfills generate, and what methane is captured is burned, producing carbon dioxide. On top of that, the management alternative to capturing landfill gas and using it to generate power involves capturing landfill gas and burning it in flares. The first option is remunerative without incentives; the second option is an unmitigated negative on landfill operators' balance sheets. Altogether, incentives for landfill gas-to-energy facilities are bad policy and should be eliminated.

Incentivizing the use of biomass through clean energy programs can have significant negative impacts on forests and carbon emissions unless adequate and strict standards are enforced.

Burning forest biomass to create electricity has smokestack GHG emissions that are equivalent to or higher than combustion of fossil fuels like coal and oil.[22] It is only possible for woody

[21] *Id.* at 2-3.

[22] *See* Walker, T., et al., Manomet Center for Conservation Sciences, Biomass Sustainability and Carbon Policy Study, 95 (2010) ("per unit of useable energy biomass typically releases more CO_2 than natural gas, oil or coal."),

biomass combustion to reduce GHG emissions relative to fossil fuels if the lifecycle of the fuel is handled properly, to enable netting of the smokestack emissions against avoided emissions from forest decomposition and the carbon sink value of forests. In order to preserve trees and forests and incentivize only the least harmful woody biomass harvesting, DEEP should limit biomass fuel eligibility to residues, forest salvage (e.g., trees removed due to pest infestations) and energy crops that do not displace agricultural crops, and set a clear limit of 15% of all forest products removed.[23]

Further, the best way to mitigate immediate smokestack GHG emissions from burning biomass is to require an efficiency standard that incentivizes the use of combined heat and power technology rather than electric power generation alone.[24] The technology needed to achieve a sixty percent efficiency standard from biomass combustion has been commercially available for over a decade.[25] DEEP should require at least sixty percent efficiency from biomass generators to be eligible for RPS incentives.[26]

In order to protect public health and incentivize only scientifically-supported renewable technologies, DEEP should rapidly phase landfill gas out of the RPS and revise the standards for biomass eligibility to ensure that only the most carefully harvested biomass is combusted in the most efficient manner.

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available at https://www.manomet.org/sites/default/files/publications_and_tools/Manomet_Biomass_Report_Full_June2010.pdf; Smith, P., et al., Climate Change 2014: Mitigation of Climate Change, IPCC Working Group III Contribution to the IPCC Fifth Assessment Report, 11.13.4 at 877, ("The combustion of biomass generates gross GHG emissions roughly equivalent to the combustion of fossil fuels."), *available at* https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter11.pdf.

[23] 225 C.M.R. 14.02 (Defining eligible biomass woody fuel as forest derived residues, forest derived thinnings, forest salvage, and non-forest derived residues); 225 C.M.R. 14.05(8) (Requiring generation units to comply with annual removal limits associated with the specific source forest area, and to demonstrate sustainable forest management for the area).

[24] *See* Manomet Study, supra note 22, at 7 ("Replacement of fossil fuels in thermal or combined heat and power (CHP) applications typically has lower initial carbon debts than is the case for utility-scale biomass electric plants because the thermal and CHP technologies achieve greater relative efficiency in converting biomass to useable energy."); 225 C.M.R. 14.05(8)(c)(2) (Including "useful thermal energy" in the calculation of a generation unit's overall efficiency).

[25] *See* Manomet Study, supra note 22, at 22; "Biomass Combined Heat and Power: Catalog of Technologies," U.S. Environmental Protection Agency Combined Heat and Power Partnership, at 1 (September 2007) (discussing common combined heat and power biomass technology that achieves sixty to eighty percent efficiency), *available at* https://www.epa.gov/sites/production/files/2015-07/documents/biomass_combined_heat_and_power_catalog_of_technologies_v.1.1.pdf.

[26] 225 C.M.R. 14.05(8)(c)(3)(a) (Rewarding generation units who achieve 60% or higher overall efficiency in a quarter one RPS Class I Renewable Energy Attribute for each MWh of RPS Class I Renewable Energy Generation).

E.1.3 Achieve a sustainable balance between behind the meter programs and grid-scale procurements supporting Class I Renewables to expand clean energy at the least cost for ratepayers.

While achieving a sustainable balance between behind-the-meter programs and grid-scale procurements sounds reasonable in theory, the 0.25%/0.75% split proposed by DEEP would not accomplish that goal but rather would depress current trends in development of behind-the-meter projects, bringing an end to what is currently a success story in Connecticut energy policy. DEEP should abandon the idea for a 0.25%/0.75% split between behind-the-meter renewables and grid-scale renewables and eliminate goal E.1.3 from the CES.

It appears that DEEP's proposal to suppress behind-the-meter renewable generation while promoting grid-scale projects is based on a significant undercounting of the benefits of behind-the-meter renewables. Figure E8 of the Draft CES is illustrative. That figure suggests that behind-the-meter solar generation has a total cost to ratepayers of 23.2 cents per kilowatt-hour, brings ratepayer benefits of 15.1 cents per kilowatt-hour, and therefore has a net cost to ratepayers of 9.1 cents per kilowatt hour. But DEEP's methodology for determining ratepayer benefits is incomplete and incorrect.

In a 2015 report, Acadia Center analyzed the ratepayer benefits of behind-the-meter solar in Connecticut.[27] That analysis includes important factors not considered by DEEP, such as avoided NOx and SOx compliance costs, as well as the important fact that behind-the-meter renewable generation has a price-suppressing effect by reducing peak demand. Reducing peak demand allows ISO-NE to procure less capacity (saving money) and to avoid calling on the most expensive "peaking" plants at times of peak demand, as these plants drive up costs tremendously in the realtime energy market. Fewer transmission upgrades are necessary when peak demand is reduced, avoiding significant fixed bill cost increases for customers. The price-suppressing effect of behind-the-meter renewables is known as a "demand reduction induced price effect" or "DRIPE," and it can be very significant—Acadia Center has it at about 2.5 cents per kilowatt-hour. Factor in these additional effects of behind-the-meter solar generation and ratepayer benefits rise from DEEP's suggested 15-cent-per-kilowatt-hour range to the 20- to 26-cent-per-kilowatt-hour range. Benefits at this level fully or near-fully offset the costs of behind-the-meter solar, which, again, are around 23 cents per kilowatt-hour.

[27] Acadia Center, *Value of Distributed Generation: Solar PV in Connecticut* (March 2015), *report and methodology available at* http://acadiacenter.org/document/value-of-distributed-generation-solar-pv-in-connecticut/.

Finally, neither DEEP's nor Acadia Center's analysis accounts for the social cost of carbon or the benefits of avoided carbon emissions (although a non-Connecticut-focused Acadia Center publication does include the avoided carbon costs from distributed solar generation, determining that these avoided costs produce an additional 3-cent-per-kilowatt-hour benefit[28]). Adding the social cost of carbon into the mix plainly tips the cost-benefit scale in favor of behind-the-meter renewables. Simply put, this is not the time to be suppressing any form of renewable energy, let alone one that benefits both project owners and ratepayers.

E.1.4 Increase transparency and certainty in the cost structure for net energy billing by creating renewable energy tariffs.

CLF agrees with DEEP's recommendation that Connecticut create a renewable energy tariff system. In addition to bringing about predictability, as the Draft CES points out, well-designed tariffs are effective tools for encouraging distributed renewable energy development while also creating a system of incentives and disincentives tied to more specific policy goals. The Draft CES is exactly right when it says on page 72: "Bonus payments (often called 'adders' in this context) could be established if desired to meet other policy objectives, such as encouraging renewable development on brownfields, supporting waste management goals, deferring distribution system upgrades, or addressing peak loads."

In establishing a tariff system, Connecticut should look to Rhode Island's Renewable Energy Growth ("REG") program. The Rhode Island REG program is established by statute and is funded by a surcharge on ratepayers' electric bills. The revenue derived from that surcharge is administered by a "Distributed Generation Board" that works with the electric-distribution company to establish a tariff including different rates for different types of projects.[29] The program has been successful: a May 12, 2017 analysis by the Brattle Group found that the REG program is on track to bring 160 MW of renewable energy online by 2019, adding 88 jobs per year, and avoiding over $50 million by 2040 in costs that would otherwise be attributable to the carbon emissions avoided by displacing fossil-fuel generation with renewables.[30]

That said, DEEP should not eliminate and should reconsider its intention to modify its traditional net metering program, which can serve as a simpler alternative to a renewable-energy tariff for small projects whose energy is used on site. Rhode Island's example shows that

[28] Acadia Center, *Next Generation Solar Framework* (November 2015), *available at* http://acadiacenter.org/wp-content/uploads/2015/11/Acadia-Center-Regional-Policy-Framework-for-Distributed-Solar-PV.pdf.
[29] *See* R.I. Gen. Laws § 39-26.6-5.
[30] Mark Berkman and Jurgen Weiss (Brattle Group), *Renewable Energy Growth Program Analysis* at 1 (May 12, 2015), *available at* http://www.energy.ri.gov/documents/News/Brattle%20Group%20-%20RI%20Renewable%20Energy%20Growth%20Program%20Report%20-%20May%202017.pdf.

net metering and renewable energy tariffs can live peacefully side-by-side, with property owners and developers able to make the choice which program to enter into. Eliminating a program that might be the best fit for some property owners would again effectively suppress rapid renewable-energy development in Connecticut, setting the state back in its efforts to attain its emission-reduction goals.

> *E.1.5 Evaluate the conditions around utilizing a diverse zero-carbon generation mix to meet our greenhouse gas emissions reduction goals.*

While CLF agrees that it is sensible to "investigate scenarios for nuclear retirement and retention, and evaluate the rate impact and environmental impacts for Connecticut under those scenarios," CLF does take issue with some of the underlying assumptions presented by DEEP under goal E.1.5.[31]

First, the prospects that Millstone might retire in the near future are questionable at best. The evidence right now suggests that Millstone is the most profitable nuclear power plant in the nation, with a net profit of $14.80 per megawatt-hour, and Millstone has offered nothing concrete to counter that evidence.[32] And additional market changes are being contemplated that could generate market revenues for Millstone and other zero-emission resources, to compensate them for their carbon-free attributes: pending proposals to incent zero-emission energy generation include a proposal by CLF, NextEra Energy, and Brookfield Renewable called Carbon-Linked Incentive for Policy Resources ("CLIPR") that would incorporate additional market opportunities for zero-emission resources (nuclear included) into existing ISO-NE markets.[33]

Second, the concept that Millstone's retirement would "likely result in the replacement of its 2,000 MW with natural gas fired generators," presented by DEEP on page 75 of the Draft CES, is likewise questionable. The regional grid is awash in surplus capacity, and price signals in the most recent capacity auctions have been at or near the auction floors. Additionally, ISO-NE set a target of 34,075 MW capacity in its most recent Forward Capacity Auction, FCA-11, but

[31] It appears that a bill recently passed by the Connecticut Senate would authorize DEEP to enter into a 3-10 year competitive contract for nuclear energy generation if "necessary"; for the reasons that follow in this comment letter, CLF respectfully submits that such a contract will not be necessary.

[32] Geoffrey Haratyk, MIT Center for Energy and Environmental Policy Research, *Early Nuclear Retirements in Deregulated U.S. Markets: Causes, Implications and Policy Options* at Figure 2 (March 2017).

[33] For basic information about CLIPR, see the New England Power Pool's Integrating Markets and Public Policy webpage, http://www.nepool.com/IMAPP.php.

actually procured 35,835 MW in the auction—a surplus of 1,760 MW.[34] That surplus is expected to increase by an additional 395 MW in the next capacity auction (FCA-12, in February 2018) as a result of a recent change by ISO-NE to its internal method for forecasting the output of distributed, behind-the-meter solar generation.[35] And on top of that, ISO-NE's 2017 Capacity, Energy, Loads, and Transmission ("CELT") report projects that aggressive deployment of behind-the-meter renewables and energy efficiency projects will result in peak load reductions on the order of hundreds of megawatts.[36] For example, the 2017 CELT projects a net peak load of 26,298 MW in summer 2020, while the 2016 CELT had forecast a net peak load of 26,789 MW, a difference of 491 MW. Looking at the region's surplus capacity and its declining projected peak loads, it is questionable whether Millstone's 2,000 MW would be missed, let alone replaced with natural gas generation at a 1:1 ratio.

As a concrete illustration of this surplus capacity and lack of need to bring new gas generation online, it should be noted that the proposed Killingly Energy Center failed to clear in the ISO-NE Forward Capacity Market, and, because it did not obtain a Capacity Supply Obligation, was rejected by the Connecticut Siting Council as unneeded.

In the end, DEEP is right to investigate the likelihood and effects of a Millstone retirement, but it should not rush to provide additional revenues to a profitable plant.

E.1.6 Pursue goals of the shared clean energy facility program through multiple avenues based on lessons learned from the pilot program.

CLF agrees that Connecticut should pursue the goals of the Shared Clean Energy Facility ("SCEF") program, allowing people who cannot site solar on their own property—including low- and moderate-income ratepayers—to participate in distributed generation projects and enjoy rate reductions. The success of a tariff-based program benefiting low- and moderate-income ratepayers while ensuring that projects are sited on brownfields is a win for Connecticut and is worth expanding. Some of DEEP's recommendations for program expansion, however, raise concerns. Implementing a hard requirement that SCEF subscribers pay to subscribe may dampen participation among low- and moderate-income ratepayers. And lumping SCEF projects in with other behind-the-meter renewable energy projects subject to an effective cap of 0.25% of new RECs would depress expansion of both types of projects. DEEP should not place these

[34] ISO-NE, *Forward Capacity Auction #11 Results Summary*, *available at* https://www.iso-ne.com/static-assets/documents/2017/03/ccp_2020_21_fca_11_cso_flow_diagram.pdf.
[35] Maria Scibelli, ISO-NE, *Proposed Installed Capacity Requirement (ICR) Values for the 2021-22 Forward Capacity Auction (FCA # 12)* at 10 (Sept. 19, 2017), *available at* https://www.iso-ne.com/static-assets/documents/2017/09/a7_icr_and_tie_benefits_for_fca12.zip.
[36] https://www.iso-ne.com/static-assets/documents/2017/05/2017_celt_report.xls.

kinds of limits on SCEF projects (or other behind-the-meter renewable projects, for that matter) but should ensure that renewables can be built out aggressively in order to meet Connecticut's greenhouse gas reduction targets.

E.1.7 Strengthen voluntary renewable product verification in the competitive electric supplier market.

As discussed above, strengthening Connecticut's RPS program is an essential step toward meeting the state's GWSA requirements. Voluntary "renewable" offerings from competitive electricity suppliers that consist of renewable generation from other jurisdictions with weaker standards undermines that goal, and CLF supports action by DEEP to prevent competitive suppliers from marketing RECs from distant states with lower standards. However, it is not clear to CLF that a market for voluntary REC offerings would provide better customer value than a revamped CCEO program with consistent standards for competitive supplier programs. Further, DEEP should narrow the geographic scope of acceptable out-of-state RECs to adjoining states within ISO-NE to ensure that Connecticut customers are supporting the development of local renewable resources with stringent qualification criteria.

E.1.8 Convene a working group to implement best practices to optimize siting of renewable facilities on appropriate sites in Connecticut.

Convening a working group to implement best practices for renewable-energy siting in Connecticut is a reasonable first step toward tackling a problem that is currently posing difficulties regionwide.

As DEEP recognizes, the sites that are easiest to convert to renewable-energy uses are often undeveloped plots of farm, forest, or open space land. But, like much of the northeast, Connecticut has been rapidly losing these lands to development. Land is expensive in Connecticut, which means that it can be difficult for small and beginning farmers to access farmland—and difficult for landowners to resist the pressure to sell their land for development.

Thoughtful siting practices can allow landowners to convert a portion of their land to renewable-energy generation, producing revenue that helps them to avoid full-scale land conversion. But thoughtful siting practices also should ensure that any such partial conversion is reversible, restricting topsoil-stripping and gravel dumping, and ensuring that there exists a financial mechanism for restoring the property to its pre-development state at the end of the renewable-energy project's useful life. Thoughtful siting practices should also ensure that entire

farm, forest, or open space parcels are not lost to renewable-energy development, but that farming and other low-intensity land uses are balanced with energy generation.

Achieving this balance with broad stakeholder buy-in is best accomplished through a process such as the working group suggested by the Draft CES.

Goal 2: Continue to support regional and state reliability and resiliency efforts.

E.2.1 Support ISO-NE in addressing regional winter natural gas generation reliability issues.

CLF strongly contests the premise that any public financing is necessary to provide a particular type of fuel to a certain segment of New England's merchant generation fleet. ISO-NE has already taken successful steps to adequately incentivize merchant generators to acquire sufficient fuel to serve system needs during the winter with its interim Winter Reliability Program, and will soon implement a long-term solution with the Pay for Performance standard. Analysis commissioned by CLF demonstrates more than adequate supply of natural gas through existing pipelines and liquefied natural gas imports.[37] The fallacy of a natural gas "crisis" in New England has been debunked many times over, most recently in a study from Synapse Energy Economics that shows a declining need for natural gas in New England over the next fifteen years.[38] No further subsidization of natural gas generation is necessary, and would in any event be explicitly at odds with Connecticut's legal commitment to dramatically reduce its GHG emissions by 2050. Again, Connecticut is already approximately 1.5 million tons of CO2e emissions above its 2020 emissions-reduction goal, and that figure is rising, not falling. Adding new CO2e emissions from new fossil fuel power plants to Connecticut's emissions portfolio now would effectively reduce to zero Connecticut's chances of complying with the GWSA's mandatory emissions-reduction targets of 10% by 2020 and 80% by 2050. We cannot afford to lock Connecticut into new gas generation at a time when not only GHG emission reduction targets but also the best available science require the entire region, and Connecticut specifically, to move away from gas generation.

E.2.2 Continue to deploy community microgrids to support statewide resiliency goals in strategic locations and support the Energy Assurance Plan.

[37] Greg Lander, *Solving New England's Gas Deliverability Problem Using LNG Storage and Market Incentives* 16-17 (2015), *available at* http://www.clf.org/wp-content/uploads/2016/03/Solving-New-Englands-Gas-Deliverability-Problem.pdf.

[38] Synapse Energy Economics, Inc., *New England's Shrinking Need for Natural Gas* 17 (February 7, 2017), *available at* http://www.synapse-energy.com/sites/default/files/New-Englands-Shrinking-Need-for-Natural-Gas-16-109.pdf.

CLF supports DEEP's continued facilitation of municipal microgrid development.

E.2.3 Ensure coastal resiliency of substations and other critical grid infrastructure to support DEEP's flood management goals.

DEEP's coastal resiliency analysis must be broadened to a comprehensive analysis of climate adaptation needs for Connecticut's energy grid. Instead of the full range of weather events that are likely to threaten statewide energy infrastructure in the future, the Draft CES focuses solely on the impacts of ocean flooding on coastal communities. Risks to energy infrastructure across Connecticut associated with all dangerous weather conditions, including temperature variation, heat, and wind, should be taken into account when considering necessary upgrade. Moreover, the Draft CES seems to ignore the vulnerabilities of inland communities to flooding. Consulting only the current FEMA flood maps is inadequate to plan for flooding. As Hurricane Harvey, as well as Hurricane Irene and Tropical Storm Lee, have demonstrated, inland riverine flooding from extreme precipitation events is just as critical a threat to inland communities as storm surge and coastal flooding is to coastal communities. Considering this along with the long life span of energy infrastructure, projection data on sea level rise and extreme precipitation should also be consulted when assessing potential impacts.

Considering the above concerns, any procedures developed for eligible cost recovery associated with infrastructure upgrades should include a mandatory climate vulnerability assessment of all energy infrastructure to all climate impacts. DEEP should consider the way Con Edison has revised its risk assessment model in the wake of Hurricane Sandy and a subsequent administrative order. The order required Con Edison to conduct a comprehensive assessment of its short and long term vulnerability to climate change, including risks other than flooding, such as rising heat.[39] The order also calls on all of New York's utility companies to familiarize themselves with scientists' projections for local climate change impacts on each service territory, and to integrate the projections into their system planning and construction forecasts and budgets.[40]

In developing its vulnerability assessment, Con Edison has placed utmost importance on utilizing a variety of outside experts and climate models in order to develop a mitigation plan

[39] Case 13-E-0030 *et al.*, *Consolidated Edison Company of New York, Inc.* – Order Approving Electric, Gas, and Steam Rat Plans in Accord with Joint Proposal, 63-64 (issued and effective February 21, 2014), *available at* http://columbiaclimatelaw.com/files/2016/12/Final-Order-2014-02-21.pdf.
[40] *Id.* at 71-72.

that is comprehensive and prudent.[41] This is consistent with the recommendations that the Sabin Center for Climate Change Law sent to New York's Public Service Commission on the issue.[42] This document includes examples of how several jurisdictions have incorporated climate change into their utility planning, and could help guide DEEP's further analysis.

E.2.4 Continue to identify and explore grid modernization initiatives.

Grid modernization is both essential to meet the current and future needs of Connecticut's electric customers, and difficult to implement effectively and equitably without a strong regulatory hand to prevent utilities from protecting their existing business model at the cost of progress. In Massachusetts, for example, a 2012 docket with a stakeholder engagement process gave rise to substantive orders in 2014 that required electric utilities to prepare detailed plans, which were initially filed in 2015, updated in 2016, and adjudicated in 2016 and 2017, with final orders still outstanding.~~[43]~~ Unfortunately, even with extensive time spent on the process, the utility plans under consideration fall far short of implementing comprehensive grid modernization or reforming utility business practices, as originally envisioned by the D.P.U.[44] DEEP should contrast this experience especially with the ongoing grid modernization proceeding in Rhode Island, which is better integrating the utility's role with stakeholder input and innovative thinking about the future of electric service in Rhode Island.[45]

Connecticut has significant work to do to achieve minimum levels of grid modernization necessary to meet the energy challenges of the next ten years, let alone what's needed to get the state to GWSA compliance in 2050. Effective grid modernization, which makes the electric system more resilient to the effects of climate change while also reducing emissions and reducing distribution system costs, requires a fundamental reconsideration of the central planning role of the utility.[46] While each state must implement a system that works for that state, enough progress has been made in other jurisdictions from which DEEP can draw

[41] Consolidated Edison Company of New York, Inc., *Storm Hardening and Resiliency Collaborative Phase Three Report*, 121 (September 1, 2015), *available at* http://columbiaclimatelaw.com/program-areas/energy-law/electric-utilities/new-york-state-electric-utility-resilience/.
[42] The Center for Climate Change Law et al., *Petition on Natural Hazard Planning* (December 12, 2012), *available at* http://columbiaclimatelaw.com/files/2016/12/Sabin-Center_Petition-2012-12-10.pdf.
[43] *See generally* Massachusetts D.P.U. Dockets 12-76 and 15-120, 15-121, and 15-122/23.
[44] *See, e.g.*, D.P.U. 15-122, Direct Testimony of Tim Woolf and Ariel Horowitz, PhD, Exhibit CLF-TWAH-1 at 15-21 (Mar. 10, 2017), available at http://170.63.40.34/DPU/FileRoomAPI/api/Attachments/Get/?path=15-122%2fExhibit_CLFTWAH1.pdf; D.P.U. 15-122, Direct Testimony of Caroline Golin, Exhibit CLF-CG-1 at 7-10 (Mar. 10, 2017), available at http://170.63.40.34/DPU/FileRoomAPI/api/Attachments/Get/?path=15-122%2fExhibit_CLFCG1.pdf.
[45] *See* RI PUC, Docket No. 4600.
[46] *See* Direct Testimony of Tim Woolf and Ariel Horowitz, note 44, supra, at 6-15.

conclusions that beginning from a general exploratory docket in Connecticut would not be in the interests of the customers who stand to benefit from near-term deployment of the grid modernization strategies named by DEEP in the Draft CES. CLF urges DEEP to reconsider its recommendation of a generic grid modernization proceeding to PURA, and instead recommend specific dockets implementing the initiatives identified by DEEP in the Draft CES at 82:

Non-Transmission Alternatives

Non-Transmission Alternatives are a powerful tool to increase resilience and reliability while avoiding higher transmission charges for electric customers. In 2017, Connecticut has the benefit of other states' hindsight on the subject of Non-Transmission Alternatives, and an exploratory docket that merely considers making utilities perform an alternatives analysis is grossly inadequate. In Massachusetts, electric utilities are required to analyze alternatives to transmission upgrades, but no significant NTA projects have ever gone forward. The only major NTA project proposed in MA, to avoid upgrades to National Grid's Nantucket subsea cable, was withdrawn by the utility and has not been refiled.[47] To advance their regulatory initiative, Reforming the Energy Vision, New York's public service commission ordered the state's large utilities to develop and submit demonstration projects that included NTA projects.[48] In its order, the Commission incentivized utilities to develop feasible proposals through performance-based ratemaking reforms. While the combination of the order with the ratemaking reforms yielded several demonstration projects involving NTAs, there is no guarantee that the utilities will continue to utilize NTAs in the future. A regular process that independently evaluates the possible need for NTAs is crucial for the development of a market in which NTA resources can thrive.

Maine is currently in the process of designating an independent NTA coordinator, who will use their expertise and knowledge of DERs and associated technologies to identify and develop NTAs. Maine's Public Utilities Commission initiated the proceeding to determine the scope of the role, as well as the the best selection process. After extensive feedback on the matter, Maine's PUC determined that the coordinator should be a non-utility, independent entity, which will prevent conflicts of interest that would arise with a utility coordinator. The NTA Coordinator, for example, would be running the RFP for NTA resources and selecting winning bids, and a utility coordinator would be put in a position where it may select its own resources, as well as consider the impact of other bids on its own business. Creating incentives for a utility coordinator to be unbiased through ratemaking reforms were suggested as a method to

[47] *See* Docket No. 16-06, *available at* http://web1.env.state.ma.us/DPU/FileRoom/dockets/bynumber.

[48] Case 14-M-0101, State of New York Public Service Commission - *Order Adopting Regulatory Policy Framework and Implementation Plan* (February 16, 2015), *available at* http://www3.dps.ny.gov/W/PSCWeb.nsf/All/C12C0A18F55877E785257E6F005D533E?OpenDocument.

mitigate these likely problems, but the commission determined that such reforms would add a level of complexity that would impede the NTA Coordinator selection process.[49]

It is abundantly clear that electric utilities will not voluntarily forego the revenues of a transmission upgrade or expansion on a regular basis, whether or not they produce alternatives analyses. DEEP should recommend a PURA docket to appoint an independent Non-Transmission Alternatives Coordinator, as well as consider performance-based ratemaking reforms like those in New York to incentivize utilities to invest in NTAs on their own.

Dynamic and Time-of-Use Pricing

CLF supports DEEP's call for PURA to investigate dynamic pricing and time-varying rates for both Eversource and United Illuminating to maximize the benefits and distributed resources and efficiently manage load.[50] More specifically, however, DEEP should recommend a requirement that both Eversource and United Illuminating develop opt-out time-varying rate programs by a date certain and implement such programs in reasonable fashion.

As other states with grid modernization initiatives have recognized, time-varying rates are critical to realizing the benefits of a modernized grid.[51] In an opt-out time-varying rate program, all customers would be subject to time-varying rates except for those customers who notify their electric company that they want to be exempted. When coupled with modern grid technologies, time-varying rates empower customers to be more engaged in their energy usage and foster new markets for modern grid services. In response to price signals indicating higher or lower energy prices at a given time, time-varying rates enable customers to better manage their electricity bills and optimize their consumption patterns by shifting demand to off-peak periods. Moderating supply and demand in accordance with system needs can reduce costs for all customers. Time-varying rates will also help Connecticut utilities better integrate distributed energy resources, including renewable generation, efficiently and cost-effectively, thereby

[49] State of Maine Public Utilities Commission, *Investigation into the Designation of NonTransmission Alternative Coordinator* (October 20, 2016), *available at* https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2016-00049.

[50] Draft CES at 82.

[51] *See, e.g.*, Order Adopting Policy Framework for Time Varying Rates, Mass. Dept. Pub. Util. 14-04-C at 1 (Nov 5, 2014) (affirming that grid modernization "includes the use of time varying electric rates that will provide an incentive for customers to reduce peak energy use in response to price signals and reduce their own electricity bills and the costs of the entire electricity system"); Order Adopting a Ratemaking and Utility Revenue Model Policy Framework, N.Y. Pub. Serv. Comm'n Case 14-M-0101 (May 19, 2016).

enhancing system resilience. Furthermore, as discussed further below, time-varying rates are essential to manage demand as EV charging load increases.

Storage

The implementation of energy storage systems in Connecticut is crucial if the state is to achieve its goals of delivering cheaper, cleaner, and more reliable electricity while reducing emissions. Despite the Draft CES's stated understanding of the significant role that energy storage plays in achieving these goals, the Draft CES goes no further than expressing a general intention to stay abreast of federal and other state initiatives regarding energy storage, a recommendation that PURA investigate energy storage systems, and an encouragement to Connecticut's electric distribution companies ("EDCs") to revise failed proposals or submit new storage project proposals pursuant to an Act that has largely expired.[52] These measures are inadequate. DEEP must take concrete measures to realize the benefits of energy storage systems, including by facilitating the establishment of mandatory storage procurement targets for Connecticut's EDCs and a *requirement* that the EDCs to submit new and improved energy storage proposals.

The benefits that energy storage resources can provide are well-documented in the influential *State of Charge* report by the Massachusetts Department of Energy Resources,[53] which the Draft CES references. As with NTAs, Connecticut is able to benefit from looking to the several states that have developed expertise on this subject as models. Successful implementation of energy storage in California, for example, has helped to mitigate reliability and emission concerns associated with the closing of a nuclear plant in 2014 and the Aliso Canyon methane leak disaster.[54] In Texas, energy storage has proven to be a useful technique to balance the intermittent output of the state's expansive wind power generation.[55] And in New York, the utility ConEdison plans on using energy storage to add capacity and flexibility to its load portfolio in order to better manage times of peak demand.[56]

Mandatory storage procurement targets would place Connecticut in a better position to meet its 2050 GWSA emissions reduction mandate, as well as help modernize the state's grid infrastructure through more flexible load management and enhanced integration of distributed and renewable energy resources. Requiring EDCs to procure energy storage capacity has proven to be a successful method for stimulating the storage market and realizing the benefits of

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[52] Conn. Gen. Stat. § 16-244w (2015) (requiring DEEP to review proposed projects by January, 1, 2017).
[53] *See generally* Mass. Dept. of Energy Resources, *State of Charge* (2016), *available at* http://www.mass.gov/eea/docs/doer/state-of-charge-report.pdf.
[54] *Id.* at 16; Ivan Penn, *Edison and Tesla Unveil Giant Energy Storage,* L.A. Times (Jan. 30, 2017), *available at* http://www.latimes.com/business/la-fi-tesla-energy-storage-20170131-story.html.
[55] Mass. Dept. of Energy Resources, *supra*, at 17.
[56] *Id.*

storage. California, for example, has an energy storage procurement program that aims to implement well over 1,000 MW of energy storage by 2020.[57] In the absence of an organized market for such devices and systems, mandatory procurements provide a crucial impetus for companies to invest in storage devices. Indeed, mandatory procurement targets are a proven method of jump-starting new technologies and the markets necessary to support them in the long run.

In addition, the Draft CES should call for legislation requiring new energy storage project proposals that incorporate feedback from the unsuccessful 2016 proposals. The state saw the benefit of re-issuing a refined RFP with the Shared Clean Energy Facility Pilot Program, and could realize the same success with a reissued energy storage RFP.

In developing a procurement program or new RFP, Connecticut should require energy storage device implementation throughout the entirety of the electric power distribution system. Because storage can provide valuable services in different locations on the grid, utilization of storage on the transmission system, distribution system, and behind the meter would maximize the cost-effectiveness and benefits of storage. Notably, behind-the-meter storage has the potential to provide the greatest range of system benefits; the closer to the consumer storage is sited, the more such benefits are likely to accrue to the grid and to Connecticut businesses and families.[58] As such, the Draft CES should specifically support procurement of behind-the-meter storage.

Finally, in development of the state's energy storage capacity, the Draft CES should recommend standards to guard against the potential for utility ownership of storage to limit or impair the ability of third-party providers to market and deploy storage systems, as well as the ability of consumers to own storage themselves. California and New York both have accompanied their energy storage strategies with policies that prevent utility ownership of storage from stifling competition.[59] Connecticut should follow suit in order to ensure balance in the market for energy storage.

EDC Ownership

[57] *Id.* at 16.

[58] *See generally* Rocky Mountain Inst., *The Economics of Battery Storage* (2015).

[59] *See* Cal. Pub. Util. Code § 2838.2(c)(1) (limiting utility ownership of storage to a percentage of total assets); NY Pub. Util. Comm'n, *Order Adopting Regulatory Policy Framework and Implementation Plan 66–70* (Feb. 26, 2015), a*vailable at* http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b0B599D87-445B-4197-9815-24C27623A6A0%7d (establishing that "utility ownership of DER will be the exception rather than the rule" and allowing it mainly in order to correct actual or, initially, predicted market failures).

PURA should undertake an exploratory docket to consider the extent to which utilities should be allowed to own grid-enhancing system elements. The docket's directive should also encompass ways in which utilities can be incentivized to work better with third party service providers in lieu of EDC ownership.

BUILDING SECTOR

Goal 1: Prioritize energy savings as both a financial and energy resource.

B.1.1 Procure energy efficiency as a resource.

DEEP's introductory discussion to Chapter Two accurately describes the benefits of energy efficiency, and the pressing challenges of achieving deep conservation from the residential and commercial and industrial sectors as well as facilitating meaningful energy efficiency services for low income energy customers. However, despite Connecticut's decoupling progress, the electric and gas utility business model remains tethered to load growth. Unless incentives and penalties for utility performance are designed to counter the traditional incentive model, Connecticut will not be able to access all cost effective energy efficiency resources. DEEP should consider how to strengthen independent oversight of the utilities' three year planning cycles to help spur innovation in this area and to ensure that utility performance incentives do not become a one-way ratchet without disincentives for poor performance.

CLF strongly supports DEEP's procurement of energy efficiency resources through its recent request for proposals, and urges DEEP to issue additional and larger requests for proposals for energy efficiency resources.

B.1.2 Enhance competitiveness of Connecticut's businesses with customized energy efficiency investments.

CLF supports DEEP's efforts to encourage customized energy efficiency strategies for commercial and industrial customers, in order to reach beyond light bulb replacement and achieve deeper savings. DEEP should provide more specificity and metrics for these efforts.

B.1.3 Reduce the energy affordability gap in low-income households.

It is essential that DEEP continue to synthesize low-income energy assistance programs as much as possible. CLF supports DEEP's proposal to bring Connecticut in line with most other states by

allocating a portion of LIHEAP funds toward energy efficiency. DEEP should also ensure that energy efficiency program materials are culturally appropriate and translated into each of the main languages spoken in Connecticut's low-income communities, and focus particular attention on overcoming the barriers to program access for renters (DEEP accurately identified renters as a particularly difficult segment to serve in the 2013 CES).

In addition to the lowest-income customers, there is a large segment of energy consumers who do not qualify for low-income services but still struggle to manage their electric and heating bills, and do not have the ability to take on the upfront costs of deep efficiency retrofits. DEEP should focus some of its energy efficiency efforts on helping these moderate-income customers to access the benefits of Connecticut's energy efficiency programs.

B.1.4 Improve financial programs to increase access to clean and efficient energy improvements.

CLF supports DEEP's efforts to further develop innovative financing mechanisms to help residential customers especially to unlock the value of deep energy efficient retrofits. In advocating for an R-PACE bill, DEEP should ensure that oil to gas conversions are not qualified energy investments, and that water conservation and electric vehicle charging stations are qualified energy investments.

In order to better reach efficient appliances upstream, DEEP should urge the General Assembly to adopt backstop federal efficiency standards into state law.[60]

B.1.5 Maximize consumer demand for energy efficiency by increasing awareness and understanding of its value.

CLF agrees with DEEP that energy efficiency program marketing budgets can be wasted money if customers do not understand the value proposition of the programs. DEEP should continue to develop the data gathering and tracking measures proposed to provide as much detailed energy audit information as possible to homebuyers at the point of sale. Specific marketing to realtors will likely be needed.

B.1.6 Evaluate current cost-effectiveness testing methods for accurate reflection of all resource costs and benefits.

[60] *See* Vt. Stat. Ann. tit. 9, § 2795 (Lexis Advance through the 2017 Session).

Connecticut must meet its GWSA GHG emission reduction requirements for 2050, and the cost-effectiveness screening for its EE programs needs to incorporate that and other legal mandates. Utility perspective and financial needs should be accounted for through properly-structured performance incentives and penalties, rather than centered in the cost-effectiveness analysis. CLF supports DEEP's proposal to assess the Resource Value Test proposed in the 2017 National Standard Practice Manual, but also urges DEEP to consider a full Societal Cost Test. Although the Resource Value Test framework allows for consideration of several impact categories, the Societal Cost Test would give Connecticut a clearer picture of the larger societal impacts of its EE programs, particularly environmental and health impacts. While the Resource Value Test seeks to answer the threshold cost-effectiveness question for particular energy efficiency resources, it may not provide answers to questions such as how those resources should be acquired, who should pay for them, and how to structure the programs.[61] The Societal Impact Test, on the other hand, includes the broadest range of energy efficiency costs and benefits experienced by all members of society, and provides the best measure of public policy benefits that have been prioritized by legislators and regulators.[62] The test can serve as a valuable supplement to the Resource Value Test to ensure that all necessary categories of impacts and benefits are included in the primary test. To the extent that DEEP chooses to recommend a Resource Value Test, it should thoroughly justify the elements of a Societal Cost Test that it does not include as relevant applicable policy goals.

B.1.7 Ensure equitable efficiency investment for delivered heating fuel customers through equitable conservation charges.

CLF strongly supports DEEP's proposal to implement an oil heat efficiency program, a proposal that was also outlined in the 2013 CES. In addition to bringing propane and oil heating customers equitably into the Energy Efficiency Fund, this would provide DEEP with an additional opportunity to work toward residential conversions from oil and propane heating to air or ground source heat pump technology, in order to efficiently achieve GHG reductions from the thermal sector without expanding the natural gas distribution system. DEEP should synthesize this with the workforce training efforts to help oil and propane companies diversify into renewable heating technology proposed in Goal B.2.9.

Goal 2: Improve the performance and productivity of buildings and industrial processes.

[61] National Efficiency Screening Project, *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, 43 (2017), *available at* https://nationalefficiencyscreening.org/national-standard-practice-manual/.

[62] Synapse Energy Economics, Inc., *Energy Efficiency Cost-Effectiveness Screening*, 4 (2012), *available at* http://www.synapse-energy.com/sites/default/files/SynapseReport.2012-11.RAP_.EE-Cost-Effectiveness-Screening.12-014.pdf.

B.2.1 Ensure application of and compliance with current building energy codes and product efficiency standards.

The built environment has an important role to play in achieving Connecticut's climate and clean energy goals. The Draft CES recognizes that "Connecticut must continue adopting and maintaining current and stringent building codes and product efficiency standards," as well as supporting federal standards.[63] CLF supports this recommendation, but calls upon DEEP to go even further in modernizing state standards for buildings and products.

As the Draft CES acknowledges, modernized building codes and state-of-the-art product efficiency standards are essential to keeping Connecticut's economy competitive as well as ensuring that Connecticut's building sector does its part to facilitate critical emissions reductions. For over 25 years, federal minimum appliance efficiency standards have been a cost-effective mechanism to reduce emissions for more than 50 products while saving consumers money.[64] But the future of federal standards is uncertain under and presidential administration and Congress that are hostile to environmental regulations and seek to weaken energy efficiency programs. To ensure that Connecticut does not lose the great benefits associated with these standards, the final CES should recommend adoption of a state policy to protect federal appliance efficiency standards from any federal rollback. Such a policy would implement the federal appliance efficiency standards in Connecticut as a matter of state law if those federal standards are repealed or voided. California and Vermont have laws that would protect federal appliance efficiency standards and could serve as a useful model for Connecticut.[65]

CLF also urges DEEP in particular to recommend new building code requirements that will help prepare the building sector to support strategic electrification in line with the state's GHG emissions-reduction goals. Specifically, the state building code should include a requirement that all new residential and commercial buildings in Connecticut are "EV ready" with sufficient circuitry and panel capacity to accommodate the future installation of Level-2 electric vehicle ("EV") charging equipment. In the coming decades, residential and commercial buildings will play a significant, growing role in fueling Connecticut's transportation sector. Notably, state programs designed to accelerate EV ownership, such as the Connecticut Hydrogen and Electric

[63] Draft CES at 120.

[64] *See* U.S. Dept. of Energy, *Saving Energy and Money with Appliance and Equipment Standards in the United States* (2017), *available at* https://energy.gov/sites/prod/files/2017/01/f34/Appliance%20and%20Equipment%20Standards%20Fact%20Sheet-011917_0.pdf.

[65] *See* Vermont H.411, *An act relating to miscellaneous energy issues* (2017); Cal. Code Regs. tit. 20, § 1605.

Automobile Purchase Rebate ("CHEAPR") Program, have contributed to soaring rates of EV ownership in the state. An EV-ready building code will serve the needs of future residents and businesses, attracts economic growth, and helps ensure the long-term prosperity of Connecticut.

Updating the state building code to accommodate EV charging is key to achieving the Draft CES's transportation electrification recommendations. It is also a priority action under the eight-state Zero-Emission Vehicle Memorandum of Understanding ("ZEV MOU"), to which Connecticut is a signatory.[66] Moreover, an EV-ready building code just makes sense. Designing and constructing a new building to accommodate EV-charging equipment is significantly less expensive than retrofitting an existing building. The average EV-charging system installation cost for new commercial construction is estimated at $1,000, representing only a small portion of the overall construction cost of a new building. In comparison, retrofitting an existing building to accommodate EV charging can be prohibitively expensive. A recent California Air Resources Board report finds that EV-ready building codes save $3,750 to $6,975 per parking space as compared to the costs of later retrofits.[67] The added costs of retrofits may include, for example, the cost of upgrading electrical systems to provide sufficient capacity, and trenching and boring to lay electrical supply conduit[68]—work that can be wholly avoided when EV charging needs are considered during design and construction.

Importantly, buildings constructed in the coming years will exist for decades, and perhaps even centuries, during which time our transportation sector will undergo a significant shift toward EVs. Even if the building owner or operator does not want to install charging infrastructure right away, preparing for EV charging during design and construction allows owners and operators to select the least-cost arrangement, thus saving costs in the long run.

B.2.2 Strategically sequence deployment of cleaner thermal fuel choices to transition buildings from fossil fuels.

CLF continues to support DEEP's focus on strengthening Connecticut's energy efficiency programs, both with regard to air sealing as well as deeper retrofits. It is encouraging that saving building heat is the first step in a thermal fuel strategy for buildings. DEEP should also

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[66] *See* State Zero-Emission Vehicle Programs Memorandum of Understanding (Oct. 24, 2013), *available at* http://www.zevstates.us/about-us/.

[67] Cal. Air Resources Board, Electric Vehicle Charging Infrastructure 3 (2015), *available at* http://www.documents.dgs.ca.gov/bsc/2015TriCycle/CAC/GREEN/Exhibit-B-CARB-Cost-Analysis-and-Technical-Report.pdf.

[68] *See* U.S. Dept. of Energy, Costs Associated with Non-Residential Electric Vehicle Supply Equipment 13 (2015), *available at* http://www.afdc.energy.gov/uploads/publication/evse_cost_report_2015.pdf.

proceed with efforts to ensure that only the most efficient HVAC equipment is being installed in new and renovated buildings.

CLF strongly opposes any DEEP efforts to encourage oil or propane to natural gas conversions for heating. The concept of natural gas as a "bridge" fuel from coal and oil to renewable technologies was somewhat useful in New England's merchant electric generation sector in the 1990s and 2000s. However, as discussed above, we are now well past the point of needing new gas generation to play that role. In the buildings sector, where there are hundreds of thousands of individual units requiring a conversion from fuel oil to a cleaner source of heat, it makes no sense on a systemic level to encourage cleaner heating sources via a step down to a fossil fuel that is only 25% less carbon-intensive by DEEP's own calculations and which requires further major changes to a truly sustainable and renewable source of heat within ten or fifteen years. The fact that a gas conversion may be easier under certain circumstances than conversion to heat pumps for individual customers makes it all the more important for DEEP to focus its energies on encouraging and incentivizing the latter. The detailed analysis and recommendations for optimizing incentives for renewable thermal technologies at 128–133 is undercut by the continued endorsement of natural gas conversions in the preceding pages.

The limited progress of the gas utilities under the misguided 2013 gas conversion plan, as well as the reduced fuel cost advantage for gas over oil, provides Connecticut with an opening to change course from its focus on gas. DEEP must seize this opportunity to urge the General Assembly to revoke the directive for the Natural Gas Expansion Plan and to remove PURA's authority to approve recovery of costs incurred under a natural gas infrastructure expansion plan.[69]

Further, it is disappointing that the Draft CES discusses the gas utilities' Joint Natural Gas Infrastructure Expansion Plan and gas distribution main expansion in general without any mention of the energy and greenhouse gas emissions savings that can be achieved by fixing natural gas distribution system leaks and replacing leak-prone infrastructure. The enabling statute for the CES and the expansion plans requires steps to reduce leaks.[70] The Joint Natural Gas Infrastructure Expansion Plan itself has vague mentions of main replacement programs.[71] However, the CES is an opportunity for aggressive leadership from DEEP on attacking gas leaks.

[69] Conn. Gen. Stat. §§ 16-19oo; 16-19ww.

[70] *See* Public Act 13-298, *An Act Concerning Implementation of Connecticut's Comprehensive Energy Strategy and Various Revisions to the Energy Statutes*, § 51(a) ("Such plan shall include, but not be limited to, the following components: . . . 7) a plan to harmonize natural gas infrastructure expansion with steps to reduce methane leakage from existing gas infrastructure".)

[71] See, e.g., *Connecticut's Gas Local Distribution Companies Joint Natural Gas Infrastructure Expansion Plan* (2013) at 50, 66, 74.

Leaks from natural gas infrastructure threaten the environment, public health, and public safety. Gas leaks contribute to smog and respiratory illness. Methane, the main component of natural gas, has far more potent climate-warming effects than carbon dioxide. Alarmingly, gas leaks can also cause explosions that destroy buildings and roads, and cause injuries or even death. And environmental impacts aside, leaky gas infrastructure hurts the pocketbooks of electric ratepayers, who ultimately bear the cost of lost gas.[72]

Studies suggest that Connecticut's aging natural gas infrastructure likely leaks at a higher rate than the national average. Recent methane-mapping studies conducted by EDF, for instance, show that gas distribution systems comprised of high levels of older, leak-prone materials leak more frequently, with the number of leaks per mile of pipe correlating to the percentage of leak-prone mains.[73] A recent survey commissioned by the Sierra Club of Connecticut found that gas pipelines in Hartford leak approximately 313 metric tons of gas per year, which translates into millions of dollars of costs to the state each year.[74]

Connecticut's gas companies know how to repair and replace leaking and leak-prone pipes, but lack sufficient incentives to address the most environmentally damaging leaks. Studies show that a small number of outsized "super-emitter" leaks disproportionately account for the majority of lost gas.[75] Decisions about how to target and prioritize natural gas infrastructure improvements should be based on consideration of not only immediate public safety risk but also climate and other environmental impact. High-volume natural gas leaks cause substantial environmental harm even if they do not pose a direct safety risk. Eliminating emissions from these "super-emitters" would save ratepayers money, protect property and public health, and substantially aid Connecticut in meeting its near-term emission-reduction goals.

DEEP and PURA should work collaboratively, with input from stakeholders, to establish criteria to determine whether a leak has significant environmental impact, and to prioritize repair of these leaks. Such criteria should include, *inter alia*, super-emitters, defined as the top portion of

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[72] *See* Kathryn McKain et al., *Methane Emissions from Natural Gas Infrastructure and Use in the Urban Region of Boston, Massachusetts*, 112 Proc. Nat'l Acad. Sci. 1941 (2015) (finding that ratepayers pay approximately 90 million dollars per year for lost and unaccounted for gas in the Boston, Massachusetts region alone).
[73] *See* EDF, *Natural Gas: Local Leaks Impact Global Climate* (2017), https://www.edf.org/climate/methanemaps.
[74] Nathan Phillips et al., *Hartford, CT Mobile Methan Leak Survey* (2016), *available at* https://sierraclub.org/connecticut/blog/2017/03/connecticut-gas-pipelines-leaky-and-ratepayers-bear-cost.
[75] *See, e.g.*, Margaret F. Hendrick et al., *Fugitive methane emissions from leak-prone natural gas distribution infrastructure in urban environments*, 213 Envtl. Pollution 1 (2013); Adam R. Brandt et al., *Methane Leaks from Natural Gas Systems Follow Extreme Distributions*, 50(22) Envtl. Sci. & Tech. 12512 (2016).

leaks by the volume of gas leaked over time. Estimation of the relative volumetric rate of leaks should be based on the best available science, methodology, and data.

Additionally, DEEP should update its greenhouse gas inventory calculation methodology according to best-available science to account for the fact that the rate of gas leaks in Connecticut is likely to be significantly higher than national-level estimates. DEEP must commit to establishing an accurate baseline of system emissions and implementing an effective system of leak detection and leak measurement that accounts for the realities of Connecticut's aging, leak-prone infrastructure. To the extent that emissions factors are used to calculate leaks from the distribution system, Connecticut should use empirically derived and regionally-appropriate factors, and incorporate mechanisms to verify emissions with on-the-ground measurements and monitoring.

B.2.3 Continue increasing the rate of home weatherization and assessment, statewide.

CLF support's DEEP's effort to address home weatherization challenges for older and low income housing stock, including health and safety challenges. It is unlikely that low or even moderate income residents, even those with the legal ability to make weatherization decisions regarding their homes, will be able to take advantage of funding options, like loans from a revolving fund, that require up-front cost sharing as opposed to grant aid. On-bill financing that stays with the unit, in addition to using a portion of LIHEAP funds as grant aid, should be pursued.

CLF also supports DEEP's efforts to broaden the public-facing reach of the Home Energy Score.

B.2.4 Address the unique needs of multifamily buildings for implementing cost-effective, clean and efficient upgrades.

The Draft CES accurately describes the universe of differences between single family and multifamily housing for energy efficiency purposes. In addition to programmatic attempts to reach landlords and property managers to get at deeper savings measures, DEEP and the program administrators should continue to push the "shallower" universe of measures like light bulb switching, air sealing, and programmable thermostats to renters themselves (unless each renter in the state has made these changes, it is not "nearly useless" to pursue renters as well as landlords.

B.2.5 Reduce energy waste by using combined heat and power, where it is cost-effective, in commercial and industrial applications.

CLF endorses DEEP's support of combined heat and power. As part of this effort, DEEP should require combustion technology in the RPS to meet boiler efficiency standards commensurate with combined heat and power uses, as detailed in CLF's response to Goal E.1.2 above.

B.2.6 Reduce energy waste at water and wastewater treatment facilities.

CLF supports the measures DEEP outlines to encourage efficient use of energy at water and wastewater treatment facilities. Retrofits undertaken for this purpose should also contribute to these facilities' climate resiliency in the face of increased storm intensity and flooding.

B.2.7 Evaluate applicability of district heating and thermal loops in high density areas.

Where duly permitted and state-of-the-art natural gas generators are operating in high density areas, they should be incentivized to create district heat systems where such a system would be cost effective. This effort should be tightly tied to avoiding expansion of natural gas distribution systems. DEEP should explore, as New York City is, the potential for geothermal heat pump technology in Connecticut's large commercial buildings.[76]

B.2.8 Inventory state buildings and their energy usage patterns to identify greatest energy savings opportunities.

DEEP should continue to help state properties lead by example, and should translate the lessons learned from this effort into strengthening the commercial and industrial energy efficiency programs.

B.2.9 Support diversification of the heating oil delivery industry's products and services.

The declining emissions trend in the heating sector is encouraging and must continue. As we discuss above, converting residential oil users to sustainable and/or renewable thermal technologies like air and ground source heat pumps should be the state's goal, and conversions to natural gas for thermal use should be strongly disfavored. Instead, DEEP should harness the

[76] *See* City of New York, *Geothermal Systems and their Application in New York City* (Feb. 2015), www.nyc.gov/html/planyc/downloads/pdf/publications/2015_Geothermal.pdf.

existing workforce in the fuel oil delivery industry to help drive electrification and efficiency goals. CLF urges DEEP to implement the Energy Workforce Assessment Report as quickly as possible.

Goal 3: Continue prioritizing grid load management to reduce peak demand.

B.3.1 Target peak demand reductions.

CLF agrees that Connecticut absolutely should target peak demand reductions. The Draft CES links peak demand reductions primarily to energy efficiency measures, and CLF agrees that Connecticut should aggressively pursue energy efficiency. However, Connecticut should also bear in mind the significant peak demand reduction potential of distributed renewable-energy generation. As is discussed in more detail above, a suite of programs to promote behind-the-meter renewable generation—including RECs, tariffs, and net metering—will necessarily lead to peak demand reductions and corresponding savings through avoided capacity and energy costs.[77]

B.3.2 Increase and standardize two-way advanced meter communication.

CLF agrees that Advanced Metering Infrastructure, including smart meters, is necessary to unlock the potential of demand response, especially on a residential level. However, smart meters can be underused, providing insufficient value to ratepayers, unless regulators design rates and programs that allow third party service providers to help unlock the potential of the technology.[78] DEEP is correct in noting that new metering technology can support dynamic rate structures, but it should ensure that entities with expertise in cutting edge smart meter strategies are able to compete to utilize the data and provide the easiest possible options for ratepayers.

B.3.3 Optimize economic signals and incentives for demand response to recognize shifts in demand from expanding electrification of heating and transportation.

CLF agrees with the Draft CES that demand response—including active demand response—can have grid-level benefits and generate ratepayer savings. In particular, CLF agrees with DEEP's conclusion on page 155 that:

[77] *See* Direct Testimony of Tim Woolf and Ariel Horowitz, note 44, supra, at 13.
[78] *See* Direct Testimony of Tim Woolf and Ariel Horowitz, note 44, supra, at 10-11.

> By consuming energy from onsite generation, these facilities effectively reduce demand on the electric grid. Increasing renewable generation sources for onsite generation, such as solar, wind, anaerobic digestion, and cleaner generation sources such as fuel cells can enable participation in active demand response programs without turning to diesel generators for standby generation for non-critical and critical infrastructure buildings.

CLF therefore returns to its earlier comments: it is important that DEEP not scale back or eliminate incentives for distributed renewable-energy generation. RECs, renewable-energy tariffs, and net metering all stand to incent behind-the-meter renewable energy projects that reduce demand on the electric grid.

CLF further supports DEEP's call for mandatory time-varying rates and demand response rates to encourage electric load shifting or curtailment. As detailed above, CLF urges DEEP to call for a requirement that Connecticut's electric companies develop and implement opt-out time-varying rate programs. In line with the transportation electrification goals set forth in the Draft CES, the CES should specifically call for the state's EDCs to develop time-varying tariffs that are appropriate for at-home charging of EVs and EV charging stations. Time-varying rates promote charging behavior that facilitates the integration of EVs into the power grid and encourages EV charging at times when charging will provide the greatest grid benefits, helping to reduce overall system costs and costs to ratepayers. Additionally, the PURA should require the EDCs to develop a demand response program that includes EV charging.

The establishment of time-varying rates and demand response programs in advance of significant EV charging load is critical to ensure that "as Connecticut seeks to electrify its transportation systems, electric vehicle fleets . . . can serve as storage devices" as contemplated in the Draft CES.[79] In addition, as discussed in further detail above, building code updates are necessary to ensure that buildings are equipped to serve as a locus for transportation fueling and energy generation and storage.

TRANSPORTATION SECTOR

Goal 1: Put the State on a strategic pathway to decarbonize the transportation sector.

> *T.1.1 Develop an Electric Vehicle Roadmap to accelerate the adoption of low and zero-emissions vehicles and strengthen alternative fueling infrastructure.*

[79] Draft CES at 158.

There is simply no way to achieve Connecticut's ambitious climate change goals without a sea-change in how vehicles are fueled. As reported in the Draft CES, meeting the 2050 GWSA goal requires nearly all of the light-duty vehicles in Connecticut to be EVs.[80] EVs also benefit Connecticut's local economy, save drivers money, reduce dependence on imported oil, enhance air quality and public health, and provide services that are valuable to the state's grid infrastructure.[81] Increasing EV penetration in Connecticut requires policies and programs to make EVs affordable, appealing, and accessible for everyone.

Echoing comments that CLF submitted to DEEP separately through the Connecticut Electric Vehicle Coalition,[82] CLF supports DEEP's commitment to initiate development of an "EV Roadmap" that will investigate and recommend Connecticut-specific policies, programs, and strategies to promote EVs. However, DEEP's EV Roadmap proposal lacks sufficient urgency and specificity. The EV Roadmap proposed by DEEP is mainly focused on efforts to "evaluate" and "review" approaches to EV deployment,[83] when Connecticut should also be implementing more initiatives now to promote EVs. Moreover, the EV Roadmap development process would not begin until 2018, with no definite conclusion or implementation date. Delaying the identification and implementation of specific strategies threatens Connecticut's ability to meet the GWSA emissions-reduction requirements and the ZEV MOU goals. To provide the most benefit, any EV Roadmap process should be accelerated and should identify strategies that Connecticut can implement right away in 2018, building off of successful initiatives already identified as integral to EV promotion and models in other ZEV MOU state leaders.[84]

In addition to the elements that DEEP has already identified for inclusion in the EV Roadmap, CLF urges DEEP to incorporate the following.

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[80] Draft CES at 191 (citing Connecticut Department of Energy and Environmental Protection, "Governor's Council on Climate Change (GC3)
Meeting Minutes - March 7, 2017 Meeting,"
http://www.ct.gov/deep/lib/deep/climatechange/gc3/3_7_17_gc3_meeting/gc3_meeting_3_7_2017.pdf.)

[81] *See generally* M.J. Bradley & Assoc., *Electric Vehicle Cost-Benefit Analysis: Connecticut* (2016), *available at* http://mjbradley.com/sites/default/files/CT_PEV_CB_Analysis_FINAL.pdf; Am. Lung Assoc., *Clean Air Future: Health and Climate Benefits of Zero Emission Vehicles* (2016), *available at* http://www.lung.org/local-content/california/documents/2016zeroemissions.pdf.

[82] *See* Comments of Connecticut Electric Vehicle Coal. (Sept. 19, 2017).

[83] *See* Draft CES at 193-94.

[84] *See generally* Conservation Law Foundation, Sierra Club, & Acadia Center, *Charging Up: The Role of States, Utilities, and the Auto Industry in Dramatically Accelerating Electric Vehicle Adoption in Northeast and Mid-Atlantic States* (2015), *available at* https://www.clf.org/wp-content/uploads/2015/10/ChargingUp_DIGITAL_ElectricVehicleReport_Oct2015.pdf; *Multi-State ZEV Action Plan* (2014), *available at* https://tinyurl.com/ya7jl3x3.

- *Solidify funding for incentive programs.* CLF commends DEEP's recognition of the need to identify sustainable long-term funding for the CHEAPR incentive program. In this early phase of EV market development, EV incentives remain critically important to EV sales.[85] Stable funding for CHEAPR is key to program stability, sending a clear market signal to automakers, dealers, drivers, charging companies, and other third-party service providers. One potential source of funding for CHEAPR is the Section 177 States' settlement with Volkswagen, which provides more than $14.8 million in funds that may be used "for any environmentally beneficial purpose."[86] Another potential funding source is a regional cap-and-invest policy for transportation fuels, discussed further below.

- *Expand incentive programs.* Connecticut should not only solidify funding for a permanent CHEAPR program but also expand the program's scope. For instance, Connecticut should have an incentive program targeted specifically to low-income consumers that is designed to overcome the particular barriers those consumers face to adopting EVs. Massachusetts and California have low-income community programs that might serve as a useful model for Connecticut.[87] As a primary barrier to EV adoption in low-income communities is upfront cost, the rebate program should include larger rebates and incorporate used EVs. Materials promoting the program should be language-specific and culturally appropriate, and distributed through trusted channels in low-income communities. Connecticut should also revive and expand other lapsed incentive programs that offered financial support for the installation of charging infrastructure and EV fleet acquisition, including the Public Fleet EV and PUblic Workplace EV Charging Station Incentive Program and the Electric Vehicle Charger Incentive Program, which have not accepted new applications since 2016.[88]

- *Adopt EV-Ready building codes.* As noted in CLF's comments on the Building Sector chapter of the Draft CES, DEEP should support EV-ready building code requirements for

[85] *See, e.g.*, Shanjun Li et al., *The Market for Electric Vehicles: Indirect Network Effects and Policy Design*, 4(1) J. Assoc. Envtl. & Resource Economists 89 (2016).
[86] *See* Section 177 States Settlement, *In re: Volkswagen "Clean Diesel" Marketing, Sales Practices, and Products Liability Litigation*, MDL No. 2672 CRB (JSC), ¶ 8(B) (Mar. 30, 2017) (Doc. No. 3107), *available at* http://www.mass.gov/ago/docs/environmental/ecf-filed-remand-stipulation-with-executed-settlement-agreement.pdf.
[87] *See, e.g.*, Cal. Air Resources Bd., *Making the Cleanest Cars Affordable* (2015), *available at* https://www.arb.ca.gov/newsrel/efmp_plus_up.pdf; Cal. Clean Vehicle Rebate Project, *Income Eligibility* (2017), https://cleanvehiclerebate.org/eng/income-eligibility (describing how California consumers with household incomes less than or equal to 300 percent of the federal poverty level are eligible for an increased rebate amount).
[88] *See* DEEP, *Charger Incentives*, http://www.ct.gov/deep/cwp/view.asp?a=2684&q=561884&deepNav_GID=2183.

all new construction. Building code requirements are necessary to reduce the overall costs of installing EV charging infrastructure and to prepare the building sector for its growing role as a site for vehicle fueling.

- *Detail spending priorities for VW mitigation trust funds, with a focus on transit electrification and EV charging infrastructure development.* DEEP has proposed that the EV Roadmap will "identify strategic opportunities to invest the allowable fifteen percent of the VW Appendix D funds in electric vehicle infrastructure."[89] Expanding charging infrastructure is critical to increasing the appeal and adoption of EVs.[90] As such, CLF commends DEEP for its concerted work to develop and solicit public comment on an early draft mitigation plan. Echoing the Connecticut EV Coalition's comments on that draft spending plan, CLF urges Connecticut to use VW settlement funds to invest in future-oriented transit electrification instead of perpetuating dirty fossil-fuel use.[91] The CES should call for the full 15% of allowable VW mitigation trust funds on the acquisition, installation, operation and maintenance of new light-duty EV supply equipment and infrastructure. The remaining funds should be allocated to purchasing new electric buses and/or repowering old buses to run on electricity, and subsidizing the supporting charging infrastructure. In particular, we urge deployment of electric buses in Connecticut's underserved Environmental Justice that most rely on public transportation and are most affected by harmful air pollution. Investing the VW funds in transit electrification would reduce air pollution and GHG emissions, improve public health, and address inequities in the distribution of environmental benefits in Connecticut. Connecticut should consider investment models and strategies that would maximize the impact of the funds by supporting planned or ongoing investments, such as: establishing a revolving, no-interest loan program for local governments; establishing a continuing grant program for EV fleets,[92] or enhancing the state's purchase power through coordination with other government entities on purchases or bidding processes.[93]

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[89] Draft CES at 194.

[90] *See* Li et al., *supra*; Nat'l Research Council, *Overcoming Barriers to Deployment of Plug-In Electric Vehicles* (2015), *available at* http://www.nap.edu/catalog/21725/overcoming-barriers-to-deployment-of-plug-in-electric-vehicles.

[91] For additional details, *see* Ltr. to Bureau of Air Mgmt., DEEP, from Connecticut EV Coal., *Comments on the Draft Proposed State of Connecticut Mitigation Plan under the Volkswagen 2.0L Partial Consent Decree, Appendix D* (Mar. 6, 2017).

[92] *See, e.g.*, California HVIP, https://tinyurl.com/y7enj3wt.

[93] *See, e.g.*, Joe Ryan, *Cities Shop for $10 Billion of Electric Cars to Defy Trump*, Bloomberg Tech. (Mar. 15, 2017), https://tinyurl.com/hu2ec4x; Electric Vehicle Request for Information (EV RFI), L.A. Bus. Assist. Virtual Network, https://tinyurl.com/ybfqerp9.

- *Call for PURA to open a proceeding to explore utilities' role in EV promotion and load management.* Connecticut's EDCs have a role to play in achieving Connecticut's climate and ZEV goals.[94] Accordingly, the CES should call upon PURA to open a docket focused on the appropriate role of utilities in EV promotion.[95] Such a proceeding would support development of Connecticut's EV and EV charging market in a manner that promotes competition and innovation and empowers customers. Specifically, DEEP should call for requirement that the state's EDCs develop and implement time-varying rate structures specific to EV charging and, given Connecticut's ambitious transportation electrification goals, develop other programs and policies necessary to manage EV charging load for public and ratepayer benefit. For instance, EV charging rates should not incorporate demand charges which are counterproductive to achieving Connecticut's ZEV goals. DEEP should also support the submission of well-structured proposals by utilities to invest ratepayers dollars in EV initiatives that are designed to promote EVs in all communities, lower electric system costs, and reduce GHGS.[96] Any utility proposal should be conditioned on programs and policies to properly integrate EV charging into the grid and to appropriately influence charging behavior, thus ensuring net public and ratepayer benefits in the long term.[97] Utility proposals related to EVs should be coordinated with Connecticut's broader grid modernization initiatives.

- *Commit to procurement of electric buses*. DEEP should commit to 100% zero-emission bus procurement by 2030, with appropriate interim milestones for bus purchases. Connecticut's transportation system is the state's largest source of GHG emissions. Switching from dirty fossil-fuel-powered buses to electric buses is a key pathway to both lowering Connecticut's transportation GHGs and expanding access to clean transportation, while also increasing the visibility of EVs. The lifecycle maintenance, fuel and operational cost savings associated with electric buses offset the upfront costs, making electric buses a cost-effective investment for Connecticut. Additionally, electric

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[94] *See generally* NRDC, *Driving Out Pollution: How Utilities Can Accelerate the Market for Electric Vehicles* (2016), *available at* https://www.nrdc.org/sites/default/files/driving-out-pollution-report.pdf; Citizens Utility Bd., *The ABCs of EVs* (2017), *available at* https://citizensutilityboard.org/wp-content/uploads/2017/04/2017_The-ABCs-of-EVs-Report.pdf.

[95] *See, e.g.*, Department in its Order on Department Jurisdiction over Electric Vehicles, The Role of Distribution Companies in Electric Vehicle Charging and Other Matters, Mass. D.P.U. 13-182-A (Aug. 4, 2014), *available at* http://170.63.40.34/DPU/FileRoomAPI/api/Attachments/Get/?path=13-182%2fORDER_13182A.pdf.

[96] *See, e.g.*, Decision 16-01-023, Cal. Public Util. Comm'n (Jan. 14, 2016); Decision 16-01-045, Cal. Public Util. Comm'n (Jan. 28, 2016); Decision 16-12-065, Cal. Public Util. Comm'n (Dec. 15, 2016).

[97] *See* M.J. Bradley and Associates, *Electricity Pricing Strategies to Reduce Grid Impacts from Plug-in Electric Vehicle Charging in New York State*, NYSERDA Report 15-17 (2015), *available at* https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Transportation/EV-Pricing.pdf.

buses offer significant savings in the form of environmental, climate, and public health benefits, as well as benefits to local economies and electric ratepayers.[98] California is currently developing a policy to phase in zero-emission bus purchase requirements, which may serve as a model for CT.[99] Notably, numerous transit agencies across the country have already committed to significantly increasing the number of electric buses in their fleets, including Seattle, Southeastern Pennsylvania Transportation Authority , Miami-Dade County, Antelope Valley Transit Agency, Rhode Island Public Transit Authority, Worcester Regional Transit Authority, and the Pioneer Valley Transit Authority. Incentive funding for electric bus purchases is available through various public programs and can be combined with VW settlement funds for maximum impact.

- *Establish an EV-sharing pilot program in low-income or environmental justice communities.* An EV-sharing program is a good way to expand access to emission-free transportation without requiring drivers to invest in the purchase or lease of an EV. An EV-sharing program may be a particularly promising mechanism to ensure environmental justice communities, which suffer the worst air quality and greatest impacts of vehicle pollution, have access to and experience the benefits of EVs. The cities of Los Angeles and Sacramento are piloting such programs, which may offer useful models for Connecticut.[100]

- *Set goals for target EV charging infrastructure deployment by market segment.* To be most useful as a long-term guide for the development of Connecticut's EV market, the EV Roadmap should set goals for target EV charging infrastructure deployment by market segment—for example, highway corridors, workplaces with parking, workplaces without parking, municipal or town centers, state buildings, multi-unit dwellings, residences without dedicated parking, etc.

T.1.2 Advocate for the implementation of federal vehicle fuel economy standards and maintaining LEV, ZEV, and GHG programs.

CLF appreciates the leadership role that Connecticut has played and continues to play in supporting aggressive federal clean cars standards and robust programs for Section 177 states.

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[98] *See* Kate Cohen et al., *From Deceit to Transformation: How Connecticut Can Leverage Volkswagen Settlement Funds to Accelerate Progress to a Clean Transportation System* (2017), *available at* http://www.connpirgedfund.org/sites/pirg/files/reports/ConnPIRG%20Final%20Paper.pdf.

[99] *See* Cal. Air Resources Bd., *Fleet Rule for Transit Agencies* (2017), https://www.arb.ca.gov/msprog/bus/bus.htm.

[100] *See* Patrick Lee, *LA is bringing 100 electric carsharing vehicles to its poorest neighborhoods*, Curbed Los Angeles (Dec. 21, 2016), https://la.curbed.com/2016/12/21/14046080/electric-carsharing-los-angeles-bluecalifornia; Our Community CarShare Sacramento (2016), http://ourcarshare.org/.

DEEP played a particularly influential role in advocating for the expiration of the ZEV program "travel provision" on schedule. CLF applauds DEEP's strong commitment set forth in the Draft CES to continue to advocate for strong federal standards as well as its call for Connecticut to support legal challenges to defend Connecticut's public health, environment, and economy, including defense of the federal waiver that allows California, Connecticut, and the other Section 177 states to maintain aggressive clean cars and GHG standards.

> *T.1.3 Educate and engage citizens and employers on the benefits of clean and efficient transportation options, including the advantages of transportation demand management measures.*

CLF agrees with the importance of leveraging opportunities to further public awareness about clean transportation options and benefits. In addition to the communication modes and methods outlined in the Draft CES, CLF recommends the following, building on best practices that have emerged in recent years:

- *Lead by example by committing Connecticut to transition the state fleet to 100% ZEVs by 2030*. Nothing sends a message and engages citizens like state leadership. Connecticut should commit to transitioning its own fleet to 100% ZEVs by a date certain, with appropriate interim milestones.

- *Better engage auto dealers in promoting EVs*. Well-trained EV salespeople at auto-dealerships are important messengers about the benefits of EVs. DEEP should coordinate with stakeholders and dealerships to develop materials and other resources that draw from best industry practices to help auto-dealers promote EVs. Such efforts should build upon on Connecticut's successful EV dealer award program, the "CHEAPR Electric Vehicle Champion Award."[101]

- *Leverage electric utilities to engage customers about EVs*. Connecticut's EDCs have trusted relationships with their customers and regular engagement through mailings, bills, websites, events, and other customer engagement channels. Connecticut should leverage these channels to inform customers about EVs, EV charging, and the benefits of electric transportation. It would be particularly beneficial for utilities to combine messaging about EVs with information about programs related to renewable energy, time-varying rates, energy storage, or demand response. In addition, a robust customer education and marketing program regarding the benefits of EVs should be a required condition of any utility program to invest in EV or EV charging infrastructure promotion.

[101] *See* DEEP, *Dealer Awards* (2016), http://www.ct.gov/deep/cwp/view.asp?A=2684&Q=539780.

- *Increase promotion of state incentive programs.* As noted above, a key barrier to EV adoption is the upfront cost of vehicles. Despite the success of Connecticut's CHEAPR program, many Connecticut drivers remain uninformed about available benefits. The final CES should call for promotion of state program materials more widely and frequently, through diverse forums, and in both Spanish and English, to drivers as well as auto-dealers.

- *Target outreach to low-income and environmental justice communities*. The final CES should include recommendations for how Connecticut can better educate and engage traditionally underserved communities on clean transportation. As one avenue, DEEP should work with other federal, state, and local government entities and non-governmental entities that have trusting relationships with these communities to help increase awareness of state programs and incentives, solicit valuable stakeholder input on state programs, and meaningfully engage communities in state decisionmaking.

Goal 2: Facilitate state planning to advance smart-growth, transit-oriented development, and mixed-use planning that leads to energy and emissions reductions.

T.2.1 Implement Let's Go CT! initiatives and its long-term vision to create a best-in-class transportation system.

CLF agrees with DEEP regarding the importance of a long-term vision for Connecticut's transportation system that will reduce GHG emissions, increase mobility options, and benefit all residents. *Let's Go CT!*—Connecticut's thirty-year transportation plan—contains some laudable goals and strategies; however, *Let's Go CT!* does not contemplate a level of investment in public transportation needed to achieve the Draft CES goals in the near-term or the long-term.

For instance, the thirty-year *Let's Go CT!* vision calls for an investment of over $66 billion in Connecticut's highways and bridges while devoting only $2.8 billion to public bus transportation—despite the fact that public bus transportation is less carbon-intensive than single-passenger vehicle travel and serves communities with the least access to clean transportation options.[102] Likewise, *Let's Go CT!* proposes an expansion of bus service by only 25%, which is likely insufficient to meet the needs of Connecticut's urbanized areas over the coming decades.[103]

[102] *See* Conn. Dept. of Transp, *Let's Go CT!* (2015), *available at* http://www.transformct.info/img/documents/CTDOT%2030%20YR%20Corrected_02.17.2015.pdf.
[103] *See Id.* at 32.

Substantial investments in public transit are necessary to achieve Connecticut's ambitious climate goals while also increasing mobility options and enhancing transportation equity. Connecticut's long-term transportation planning must appropriately balance investments in roadway infrastructure with investments in public transportation considering Connecticut's broader emission-reduction goals. The final CES should specifically call for increased state investment in public transportation. As discussed herein, VW settlement funds and a regional cap-and-invest policy for transportation fuels could help Connecticut fund new and expanded clean transportation programs and initiatives.

> *T.2.2 Encourage and support smart-growth, transit-oriented development, mixed-use planning, and development efforts that improve connectivity and accessibility to public transit.*

CLF supports the Draft CES's call for the state to encourage and support smart growth, transit-oriented development ("TOD"), mixed-use planning, adoption of a "complete streets" policy, and other development efforts designed to improve transportation-system connectivity and reduce GHG emissions. The final CES should go further in outlining specific policies and programs and a pathway to their implementation.

Currently, the Draft CES largely references overarching principles and existing plans and fora, such as of the Office of Policy and Management's Conservation and Development Policies ("CD&P") Plan for 2013-2018 and the existing Interagency TOD work group.[104] However the Draft CES largely lacks specifics regarding how Connecticut will implement such plans and achieve its laudable connectivity goals. For instance, the Draft CES calls for the state to "[p]romote," "[e]ncourage," and "[i]mprove" various initiatives and services, but fails to specify the concrete measures that state should take to facilitate this on a timeline that accords with Connecticut's GWSA requirements. Additionally, the Draft CES notes the need to solve the "first and last miles" problem for transit commuters and to enhance the efficiency of public transportation, but the Draft CES does not reference any specific actions the state will take to address these challenges.

The final CES should specifically outline how state policies and programs will facilitate achievement of Goal T.2.2, coupled with reasonable implementation timelines and identification of funding sources and needs and lead implementation entities. The final CES should further outline a clear pathway for developing and implementing beneficial programs beyond 2018.

[104] *See* Draft CES at 199-200.

Goal 3: Develop and support strategic partnerships to improve access to a wider array of transportation options.

T.3.1 Embrace technological advances, shared mobility services, and transportation demand partnerships that improve mobility and access to clean modes of transportation.

Shared Mobility Services

The Draft CES rightly acknowledges the growing interest in new mobility models, such as "shared mobility" services, and their potential benefits.[105] However, the final CES should be clarified to confirm that the state is committing to ensuring that Connecticut's transportation system captures the best possibilities of technological advances while also avoiding the worst potential consequences.

For instance, new mobility options should supplement—not supplant—public transportation. As emphasized above, continued and significant investments in public transportation are necessary to meet Connecticut's climate goals and meet the transportation needs of Connecticut's residents now and into the future. The final CES should clarify this point and, as noted above, call for increased commitment to public transportation.

Additionally, the CES should recognize that some technological advances, such as autonomous vehicles, have the potential to dramatically increase GHGs. Various studies have estimated VMT increases associated with autonomous vehicles between 37 and 90 percent, with dramatic impacts in emissions of GHGs and conventional pollutants, as well as increased traffic congestion and road wear.[106] Estimated increases in VMTs would result from multiple factors, including the greater accessibility of autonomous vehicles, the potential of autonomous vehicles to replace public transportation trips, and likely "zombie" trips without passenger in the vehicle.[107]

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[105] *See* Draft CES at 201.

[106] *See* Daniel J. Fagnant & Kara Kockleman, *Preparing a nation for autonomous vehicles: opportunities, barriers and policy recommendations,* Transportation Research Part A (2015), *available at* https://doi.org/10.1016/j.tra.2015.04.003*; Zia Wadud, et al., Help or hindrance? The travel, energy and carbon impacts of highly automated vehicles,* Transportation Research Part A (2016), *available at* https://doi.org/10.1016/j.tra.2015.12.001; Int'l Transport Forum, *Urban Mobility System Upgrade: How shared self-driving cars could change city traffic* (2015), *available at* https://www.itf-oecd.org/sites/default/files/docs/15cpb_self-drivingcars.pdf.

[107] *See* Long L. Truong, et al., *Estimating the Trip Generation Impacts of Autonomous Vehicles on Car Travel in Victoria, Australia*, Transportation (2017), *available at* https://doi.org/10.1007/s11116-017-9802-2.

Given the potential of autonomous vehicles and other new mobility options to increase GHGs and effect other detrimental impacts on Connecticut's transportation system, the state should not only be seeking to harness these new options but also consider actions to mitigate possible negative impacts. New technologies will not contribute to Connecticut's vision for a better, more efficient, and more equitable transportation system without proper guidance. Connecticut must play a proactive role to maximize the potential benefits of new mobility options. Accordingly, the final CES should call for development and implementation of policies and initiatives related to new mobility options that incentivize socially beneficial behavior (such as ride-sharing, electrification, and connectivity to public transit) and disincentivize negative behavior (such as zombie trips, unnecessary VMTs, and inequities in transportation access across communities).

Group Purchase Models

CLF supports the Draft CES recommendation for the state to pursue a pilot-program in Connecticut to evaluate group-buy EV and EV-solar initiatives. Such programs have been successful in other jurisdictions and have great potential to promote EVs and enhance the accessibility of clean energy technologies in Connecticut. In addition to the Colorado and Utah program models cited in the Draft CES, DEEP should refer to the *Drive Green* bulk-purchase discount program sponsored by the Massachusetts Energy Consumers Alliance as another potential model for Connecticut.[108]

T.3.2 Participate in regional partnerships and initiatives to advance a clean and efficient transportation network throughout the region.

While many of Connecticut's goals in the transportation section of the Draft CES are commendable, they are unattainable without proper funding. As indicated in the Draft CES, Connecticut's transportation system is in need of drastic infrastructure improvements, yet funding support from the U.S. Department of Transportation and revenues from the state gasoline tax have declined sharply in recent years. Partnering with other states in the region to establish a cap-and-invest program for transportation emissions is precisely the sort of alternative funding mechanism that Connecticut needs to address both of these challenges.

CLF urges Connecticut to take a leadership role in development of regional cap-and-invest program for transportation fuels. As noted in the Draft CES, Connecticut is a founding member of the Transportation & Climate Initiative ("TCI"), which seeks to develop regional strategies to

[108] *See, e.g.*, *Drive Green with Mass Energy*, https://www.massenergy.org/drivegreen.

reduce transportation-sector GHGs.[109] The final CES should call for Connecticut to lead the TCI toward establishment of a program modeled after the successful Regional Greenhouse Gas Initiative, which has significantly reduced power-plant GHG emissions[110] and generated at least $2.9 billion in net economic benefits.[111]

Attaching a price to transportation carbon emissions would account for their negative health impacts and climate harms while also helping Connecticut meet its GHG reduction targets and creating jobs. For illustration, with a price set at $10 per ton of carbon dioxide emissions, Connecticut could generate around $167 million in revenue for investments in clean transportation and transportation equity enhancements.[112] A recent analysis by Cambridge Systematics estimated that a regional transportation cap-and-invest policy would add over 91,000 jobs, put about $10 billion in families' pocketbooks, and contribute more than $11 billion to the regional economy in 2030.[113] A regional transportation climate policy could help facilitate all of the goals outlined in the Transportation chapter of the Draft CES and warrants explicit discussion.

CONCLUSION

CLF reiterates its appreciation for the opportunity to comment on the Draft CES. Overall, we urge DEEP to seize the 2017 CES process as an opportunity to set Connecticut on a track to achieve the GWSA targets and drive significant economy-wide emissions reductions. As detailed above, this result will require DEEP to set significantly more ambitious goals than the Draft CES contemplates in the energy, building, and transportation sectors. Additionally, while CLF appreciates the extent of the public process Connecticut has made available for stakeholders in

[109] Draft CES at 204.
[110] Acadia Center, *RGGI on the World Stage* (June 27, 2017), *available at* http://acadiacenter.org/wpcontent/uploads/2017/06/AC_RGGI_on_the_World_Stage_20170626.pdf.
[111] Data compiled by Acadia Center from the following reports: Analysis Group, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States, Review of RGGI's Second Three-Year Compliance Period* (July 14, 2015), *available at* http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_july_2015.pdf; Analysis Group, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States, Review of RGGI's First Three-Year Compliance Period* (Nov. 15, 2011), *available at* http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/economic_impact_rggi_report.pdf.
[112] Georgetown Climate Center, *Reducing Greenhouse Gas Emissions from Transportation: Opportunities in the Northeast and Mid-Atlantic* (Nov. 24, 2015), *available at* http://www.georgetownclimate.org/reports/reducing-greenhouse-gasemissions-from-transportation-opportunities-in-the-northeast-and-mid-atlantic.html.
[113] *Id.*

developing the CES, Connecticut nevertheless could and should take additional steps to make the process more open and transparent.[114]

Thank you for your consideration of these comments. We look forward to working the DEEP to implement our recommendations above and help facilitate achievement of Connecticut's ambitious clean energy and climate goals.

Respectfully submitted,

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[114] In particular, CLF respectfully suggests that Connecticut take a hard look at the PURA website, which is cumbersome to navigate and effectively "buries" important documents behind slow-loading nested menus.