

Testimony to the Senate Committee on Transportation

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I. Testimony Outline

1. The transportation nexus to Vermont's climate and energy strategies:
 - a. Comprehensive Energy Plan.
 - b. Vermont Climate Action Commission.

2. The EV charging network in Vermont.
 - a. State goals for highway corridor fast charging.
 - b. VW EVSE Grant Program.

For each subject area, I will provide an overview and then leave time for questions and discussion before moving to the next topic. I am also open to taking questions as I go, as the Committee's prefers.

II. Acronyms

ACCD	Agency of Commerce and Community Development
ANR	Agency of Natural Resources
BGS	Department of Buildings and General Services
CEP	Comprehensive Energy Plan (2016)
DCFC	Direct current fast charger
DEV	Drive Electric Vermont
DOH	Department of Health
EV	Plug-in electric vehicle, including pure battery electric vehicles and plug-in hybrid electric vehicles, but excluding conventional hybrid vehicles

EVSE	Electric Vehicle Supply Equipment (meaning electric vehicle charging equipment)
L2	Level 2 charger
PSD	Public Service Department
PUC	Public Utility Commission
VW	Volkswagen

III. The transportation nexus to Vermont's climate and energy strategies: the Vermont Comprehensive Energy Plan and the recommendations of the Vermont Climate Action Commission

A. Comprehensive Energy Plan

As required by Vermont law, PSD updated the State's comprehensive energy plan in 2016. Updates are required every six years, so the next update is due by 2022. The CEP advances multiple policies to move the State toward renewable energy and establishes a target of 90 percent renewable energy over all sectors by 2050 (90 x 50), along with interim milestones and sector-specific goals.

As the CEP points out, the transportation sector is the State's largest source of greenhouse gas emissions, responsible for almost half the State's total. The transportation sector also emits more greenhouse gases than any other on a national level. While Vermont and many other jurisdictions are seeing cleaner sources of electrical power—as hydroelectric, solar, wind, and natural gas replace coal-fired power plants—motor vehicle emissions of greenhouse gases have been increasing with population and economic growth. As of 2015, greenhouse gas emissions in Vermont were 16% above 1990 levels and 10% above 2013 levels.

The CEP establishes a goal 10% renewable transportation by 2025 and at least 80% by 2050. To get there, the CEP recommends four main strategies:

- 1) Smart growth, also known as smart land use planning, to advance the State's overall planning goal of compact centers surrounded by rural countryside;

- 2) transportation demand management, which means moving people away from single-occupancy vehicles through alternatives like bike/ped, public transit, carpooling, and telework;
- 3) using renewable biofuels to power heavy-duty vehicles; and
- 4) increasing the efficiency of light-duty vehicles while rapidly moving toward an electrified passenger-vehicle fleet.

Using biofuels to power heavy-duty vehicles is not making much progress in Vermont, and the rapid advances in EV technology call into question whether biofuels represent a needed interim technology or whether policy initiatives should focus on moving the heavy-duty fleet directly to battery-electric or hydrogen-fuel-cell technology. Certain biofuels, like ethanol, do not reduce greenhouse gases and have harmful environmental side effects, like water pollution.

Smart Growth is a complicated subject. Suffice it to say that about three-quarters of the development in Vermont does not go through Act 250, and a patchwork of local planning, zoning, and enforcement does not always capture the rest. The extensive discussions around Act 250 that can be expected in the Legislature this year and probably next year may address some of Vermont's land-use challenges.

VTrans has been working on transportation demand management for decades. VTrans increasingly incorporates complete streets (bike/ped) into its projects, and VTrans puts significant resources into passenger and freight rail and public transit. In addition, VTrans runs the Go Vermont commuter program and funds a robust network of state and municipal park and ride facilities. These efforts remain important and worthwhile but will not translate into rapid progress toward meeting Vermont's targets for renewable transportation.

The electrification of passenger vehicles can potentially move the State's toward sustainable transportation faster than any other strategy.

The CEP's goal of 10% renewable transportation by 2025 translates into about 50,000 EVs (10% of the passenger fleet) on the road by that date. As of right now, Vermont has only about 2,600 EVs on the road today, and EVs in Vermont are just 3.5% of new passenger vehicle registrations. Vermont is not yet on track to meet its transportation-electrification targets. VTrans, through a contract with the University of Vermont Transportation Research Center, biennially issues a Transportation Energy Profile, which provides grater details about the progress Vermont is making toward the transportation climate and energy goals of the CEP.

The motor vehicle market is undergoing a dramatic shift toward electrification. And while it is safe to say that transportation electrification is coming fast, it is also safe to say that this transformation is not coming fast enough to meet the science-based transportation climate and energy targets that Vermont and many other jurisdictions have established. Public policy is needed to move the market until market forces can take over. Meeting Vermont's transportation-electrification targets will help make Vermont attractive to employers, workers, and tourists and will help grow Vermont's economy by keeping transportation energy expenditures in-state. And even though Vermont is falling short of its EV goals, Vermont is near the head of the class on a per capita basis compared to other U.S. states. It is also likely that in the coming years, EVs will continue to capture market share at an increasing rate.

B. Vermont Climate Action Commission

The Vermont Climate Action Commission recognized that transportation is the leading energy driver in the State and made numerous recommendations for reducing greenhouse gas emissions from the transportation sector. These recommendations fall into two main categories: One is continued work on transportation demand management. The other is accelerating the pace of vehicle electrification.

Regarding vehicle electrification, the Report made twelve specific recommendations:

- Rec. 8: Provide a state-funded EV purchase incentive that applies to new and used EVs, with incentives targeting rural and low to moderate income Vermonters.
- Rec. 9: Strengthen the used EV market.
- Rec. 10: Work with auto dealers to collect and publicize deals on EVs, and use the Drive Electric Vermont (DEV) website to generate sales leads for EV dealers.
- Rec. 11: Implement the recommendations of VTrans' fast-charging corridor study to provide DCFC within 30 miles of all Vermonters.
- Rec. 12: Develop and execute a strategy for deployment of VW settlement funds for EV charging.

- Rec. 13: Conduct the research and analysis needed to support the PUC investigation of issues relating to the charging of EVs under Act 158 of 2018.
- Rec. 14: Leverage and enhance DEV to maximize the impact of education and outreach campaigns and stakeholder engagement to build awareness and encourage purchase consideration for EVs.
- Rec. 15: Implement ride-and-drive events to give Vermonters a chance to test drive or experience EVs in person.
- Rec. 16: Work collaboratively with auto dealers on developing and deploying strategies to effectively engage customers who are interested in purchasing an EV and to make the sale.
- Rec. 17: Make EVs available through traditional car rental, car share, taxi, or ride-hailing service to provide drivers ready access to an EV at low cost and with no ownership or lease commitment.
- Rec. 18: Use VW settlement funds to jumpstart a transition from diesel to electric transit and school buses.
- Rec. 19: Investigate and utilize grant funding and finance strategies to help overcome the high upfront costs of electric transit buses.

VTrans and other agencies are already at work on several of these strategies:

For example, the basic structure of a purchase and lease incentive program for new and used EVs is included in the current draft of this year's Transportation Bill. VTrans, ANR, and PSD have worked collaboratively on the basic program elements. VTrans and possibly the other agencies will provide this committee with additional details about the incentive program later in the legislative session.

The current draft of the Transportation Bill also includes authorization for state agencies to charge their employees or members of the public a fee for the use of EVSE that the agencies install to power their own electric fleets. This is also an interagency collaborative effort that includes VTrans, ANR, PSD, and BGS. VTrans and possibly other agencies will provide this Committee with a full briefing on this subject later in the legislative session.

A grant program for charging infrastructure (VW EVSE Grant Program) is in place and underway, and I will talk to you more about that in a few minutes. Also, ANR is leading an interagency team to administer the rest of Vermont's share of the national VW settlement funds and is starting that effort with a pilot project for electric transit and school buses. ANR is committed to using all the national VW settlement funds on vehicle electrification and none on replacing or converting older diesel vehicles with newer diesel technology.

The PUC has launched a workshop on promoting the ownership and use of electric vehicles in Vermont. An interagency team, including VTrans, has been working with the PUC and other stakeholders. As required by last year's Transportation Bill, the PUC is tackling several issues with the aim of improving the regulatory environment around EVs and EV charging. Among other subjects, the PUC is looking into rate design (including the challenge of restructuring demand charges for EV fast-charging stations), jurisdiction over non-utility EVSE owners and operators (including the ability to charge for charging by the kWh), and highway user fees for EVs.

VTrans is using other sources of federal funding to bring two full-size electric transit buses and two cutaway shuttle buses to Vermont. The full-size buses are expected to begin service late next summer, and the cutaways are scheduled to arrive the following summer.

In its preliminary report, the Climate Action Commission recommended a market-based cap and invest system for the transportation sector. Governor Scott has committed Vermont to work with other jurisdictions in the Northeast and Mid-Atlantic regions of the U.S. through the Transportation and Climate Initiative to develop a cap and invest program for the transportation sector by the end of this year. At that time, the States will decide whether to adopt the program.

VTrans and other agencies provide funding to Drive Electric Vermont to perform a variety of functions for the State, including consumer and dealer education and outreach relating to EVs.

To sum up this part of my testimony, vehicle electrification is a key strategy for meeting the State's climate and energy goals for transportation. The State is not on target to meet these goals. However, Vermont is actively working on a breadth of initiatives for accelerating vehicle electrification.

C. Questions/Discussion about the transportation nexus to the Vermont's climate and energy strategies

IV. An EV charging network in Vermont

A. State goals for highway corridor fast charging

In 2017, VTrans consultants completed a report on Electric Vehicle DC Fast Charging on Vermont Highway Corridors. The report identified seven sites that, if equipped with fast charging, would put a publicly available fast charger within 30 miles of nearly every address in Vermont and form the backbone of a statewide highway corridor fast-charging network. Each of the report's proposed sites is near an interstate exchange and was screened for proximate 3-phase power, site amenities, 24-7 access, and willing site hosts. A multiagency team, with ANR in the lead, identified a handful of additional general locations along major Vermont highways for DCFC development. (See attached map of Preliminary EVSE Priority Locations for Review.)

VTrans' state strategic plan for 2018-2023 includes a goal for electric vehicle infrastructure among only five major goals in the plan. The vehicle-electrification goal specifically aims to ensure that every Vermont household is within 30 miles of an EV fast charging station. A fast charging network is an essential part of alleviating consumer anxiety about entering the EV market.

B. VW EVSE Grant Program

VW settlement funds can be used to help develop a highway corridor fast charging network in Vermont. Vermont's share under Appendix D of the national VW settlement is \$18.7M. Under the terms of the settlement, Vermont is entitled to dedicate up to 15% of that amount, or \$2.8M, to passenger vehicle charging equipment. The remaining amount, as noted, will go to replacing heavier duty vehicles, including transit and school buses, with electric technology, along with the associated charging infrastructure to go with those vehicles.

ANR has delegated responsibility for administering the VW passenger vehicle charging infrastructure grant program to ACCD, with the support of an interagency team that includes VTrans, ANR, BGS, and DOH.

ACCD has just awarded funds in the first grant round. Funding for the first round was capped at \$400,000, and applicants requested over \$1.6M. Funding went to nine different towns and organizations across the State. The funding supported one DCFC, and the rest went to L2. Although the grant materials included a link to

VTrans' highway corridor fast charging report, no applications were received for any of these sites. After administrative costs, \$2M of funding is left for additional passenger vehicle EVSE grants.

The agencies are considering a carve-out for DCFC in future grant rounds. However, it may be beneficial to wait for the PUC to address rate design, including demand charges, before taking this step. Possibly \$1.2M to \$1.5M may be needed to build out a basic fast charging network in the State. Because of low traffic volumes, fast chargers may not be profitable for some time, even without demand charges. VTrans has set aside an additional \$300,000 for EV charging, probably for park and rides. These state funds may be available to help build out a fast charging network through public-private partnerships.

Under Appendix C of the nationwide VW settlement, VW's subsidiary, Electrify America, must invest about \$2B on L2 and DCFC and education and outreach. None of that money has to be invested in Vermont, and so far, Electrify America has invested elsewhere due to Vermont's relatively low traffic volumes. Electrify America, which is aiming to profit from its investments over the long run, may invest in Vermont in future investment cycles. However, even when Electrify America concludes its ten-year investment program, it will have met less than 10% of the nation's charging needs.

The U.S. Department of Energy's Alternative Fuels Data Center EVI- Pro lite projection tool estimates how much EV charging is needed at state and city levels based on projected consumer demand. For 50,000 EVs, which is Vermont's 2025 goal, EVI-Pro Lite projects that 190 DCFC stations will be necessary. Vermont currently has fewer than 30, and these are not strategically distributed.

C. Questions/Discussion about the EV charging network in Vermont.

V. Conclusions

This year's Transportation Bill may include important provisions to help accelerate vehicle electrification in Vermont. These provisions could include an EV purchase and lease incentive, authorization for the State to charge the public or its employees for the use of its EVSE, and possibly additional provisions addressing the jurisdiction of the PUC over charging stations, rate design and demand charges, and highway user fees for EVs. These are all important initiatives that will help move the state toward its climate and energy goals for the transportation sector and merit the Committee's careful consideration. Thank you for your attention.