

Vermont Energy & Climate Summit Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):** Transportation for Vermonters Coalition; Rebecca Ryan (American Lung Association – VT) – Coalition Member
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4. **Pitch Title:** (one line): Big Buses, Big Opportunity: Electric Buses, Healthier Kids, Lower Costs
5. **Pitch Summary:** Vermont has the opportunity to improve our children’s health and our communities’ bottom lines while reinforcing our commitment to transportation choices, affordability, and clean energy. The large buses that travel our streets – both the colorful transit buses and the timeless yellow school buses – show how our rural state has worked to provide transit and other transportation choices that help people get where they need to go. At the same time, the inefficient, diesel buses that make up most fleets come with real issues: they emit diesel exhaust that is dangerous for children, drivers, and passersby, especially those with chronic disease; are subject to fluctuations in fuel prices, and are inefficient - the average diesel transit bus gets just 4.5 miles per gallon. Fortunately, electric transit and school buses – including buses that have been designed and tested in our cold climate – are now available. We propose two options to catalyze the shift from diesel to electric in our state’s buses. ***The first*** is to use VW settlement funds, pollution pricing revenue, state bonding capacity, and/or leveraged federal funds to help school districts across the state integrate one or more electric buses (and charging infrastructure), into their fleets. ***The second*** is to use these revenue sources to make a focused effort to replace *the majority* of buses in a transit fleet that has access to 100% or near 100% renewable energy. Implementing one or both of these will show how electric buses can work in Vermont, and lay the groundwork for the long-term shift to electric buses in our state.
6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal
7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other
8. **Scale of impact on Vermont’s energy and climate goals:**
 - Currently, 47% of Vermont’s greenhouse gas emissions come from transportation, and gasoline and diesel represent more than 35% of all of the energy consumed in Vermont (CEP,

p. 135). Switching from low mileage, high emitting buses to electric vehicles will help us meet our goals by reducing greenhouse gasses and overall energy consumed.

- Achieving this goal assumes that electric buses are powered with renewable energy. Currently, approximately 55% of Vermont's electricity is considered renewable, with utilities required to increase the percent of renewable electricity in their portfolio annually until 75% is achieved. In some jurisdictions, the percentage is higher: for example, both the Burlington Electric Department and Washington Electric Co-op have portfolios that are 100% renewable, while GMP's portfolio has forecasted 60% renewable energy by the end of next year.
- School buses have predictable routes and times as well as predictable downtimes, providing ample opportunities for charging. In grid constrained areas, having school buses use power from the grid will help ease these constraints.

9. Benefits/costs of this proposal for Vermont and Vermonters:

- *Financial benefits and costs* – As of 2016, about 5% of the VTrans budget went toward transit. We commend the Agency's efforts to use its funds flexibly to support transit across the state, and urge decision makers to maintain and increase this baseline funding even as they work to supplement it to invest in new technologies. If the state can commit to funding the up-front cost differential for electric transit and school buses (which we estimate currently being between approximately \$200K to \$350K per bus, depending on the technology and the region), the charging infrastructure, and a maintenance training program, Vermont stands to gain long-term financial benefits. For example, the long-term financial benefits of fuel savings from electric school buses will accrue to school districts – a welcome savings for taxpayers already struggling with school budgets.
- *Economic benefits* – Since Vermont doesn't produce any petroleum products, money spent on petroleum based fuels leaves the state. According to the 2016 Comprehensive Energy Plan, in 2013 "over \$1 billion left the state to buy fuel" (p. 9). By providing Vermonters with more renewably powered electric vehicle and bus options, we can help keep far more of the dollars we currently send out of state for transportation energy - approximately 8 out of 10 dollars - in state, circulating in our economy. In addition, establishing a fleet of electric buses helps start to build maintenance expertise within Vermont's automotive sector, helping fleet operators and mechanics get a head start on gaining the skills that will ultimately be needed as not only electric buses, but also other electric vehicles, make up more of the state's registered vehicles. This positions Vermont's workers for future opportunities.
- *Social and health benefits* – Communities who have electric buses, whether for transit or school buses, will help reduce the very real impacts of diesel on people's health. According to the Clean Air Task Force's study,¹ the cost of health impacts in Vermont from fine diesel particles was \$29 million dollars in 2005.
- *Environmental benefits* – Savings vary by bus models, but to give an example, switching one diesel transit bus to an electric bus can lead to annual savings of over 50 tons of greenhouse gasses, 445 metric tons of CO₂, and nearly 300 lbs of CO, 628 lbs of NO_x. Multiplied over the estimated 12 year lifespan of a bus, and multiple buses across a fleet, Vermont stands to gain real environmental benefits and make progress toward its goals.

¹ http://www.catf.us/methane/black_carbon/diesel/dieselhealth/state.php?site=0&s=50

10. Decision-makers necessary for this proposal to be adopted or move forward

To ensure success, utilities, transit agencies, VTrans, and school districts must be involved in crafting how Vermont acquires, funds, and charges electric buses. Planning for this transition together will ensure that the specific solutions work at a variety of scales in Vermont. In addition, under Act 56 electrical utilities have a “Tier III” requirement to offset the use of fossil fuels in their service areas. Electric buses offer utilities the opportunity to meet these statutory obligations and provide benefits to the grid, such as load deferment. In addition, we look to the Legislature for leadership in committing to increasing amounts of funding over time to aid in this shift.

11. Strategy and key considerations

Overall strategy: We propose to electrify a transit fleet, school buses throughout the state, or both. We recommend selecting only one in order to make a transformative energy impact in that sector. For school busses, to maximize the benefits to people and the grid: 1) Geographic diversity should be achieved to provide the savings and learning opportunities throughout the state and 2) Communities where bus charging may help relieve grid constraint issues should be prioritized. For transit buses, the availability of renewable energy for charging and the immediacy of replacement needs should be prioritized. Implementation should be monitored through performance metrics (charging costs, miles traveled per charge, etc.) and qualitative review (rider and driver satisfaction, maintenance considerations, etc.) to help improve the deployment of electric buses.

Gaps:

- To maintain momentum, it will be necessary to identify significant additional sources of funding for subsequent phases. This will ensure that investments in charging infrastructure and driver and mechanic training are maximized. Subsequent funding could include gradual reallocation of VTrans dollars (with careful consideration of tradeoffs relative to state goals) and federal funding such as the LONO (Low or No Emission vehicle funding) program.
- Another gap is the lack of a regulatory framework for electric vehicle charging that reflects state goals. Policies could include time of use charging, incentives for charging at times that help stabilize the grid, and using revenue from EV charging to support further deployment.

Barriers:

- Uncertainty about technology, impact on service, and the bottom line.
- Up front cost of technology.
- Lack of awareness.

Opportunities:

- Educate kids about renewable energy and bus technology.
- Peer to peer learning between transit agencies, municipalities, and school bus operators.
- Capitalize on the experience and success of the Clean Energy Development Fund (CEDF) as potential catalyst for electrification of this sector.

12. Timeline

VTrans will help transit providers put a limited number of electric buses on the road in the next year. Additional investment will help build a critical mass of electric buses, with the immediate benefits of taking old diesel buses off the road. Transit and school bus electrification *will* be game changing; by making these initial investments, Vermont will build the infrastructure, knowledge, and confidence we need to clean up our buses.