

1. Pitch Submitted By (Your Name or Organization):

Vermont Energy Investment Corporation

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4. Pitch Title: Charge Ahead Vermont

5. Pitch Summary:

Plug-in electric vehicles (EVs) are a critical strategy to meeting Vermont’s climate and energy goals - they use a fraction of the energy required by gasoline vehicles and when powered from Vermont’s grid can cut greenhouse gas emissions by over 50% today, with even greater reductions possible as renewable energy use grows. EVs can reduce household transportation costs, particularly for rural residents who must travel long distances for jobs and services. If strategically deployed, EVs can also help utilities manage peak demand and better integrate renewable energy sources, saving money for all ratepayers. In order to realize these benefits, public programs and policy can help overcome the primary barriers to EV adoption - upfront cost of the vehicle, public awareness of EVs and availability of EV models, and availability of public charging – while ensuring equity and affordability for all Vermonters. We propose:

- State incentives for EV purchases targeted to low and middle income Vermonters and those in areas with high transportation costs; Support for expanding EV charging infrastructure;
- Expanded EV outreach and education activities, including partnerships with auto dealers; and
- Utility policy that encourages EV adoption and incentivizes charging behavior that benefits the grid.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- | | |
|---|---|
| <input checked="" type="checkbox"/> Energy Efficiency | <input type="checkbox"/> Thermal Heating &/or Cooling |
| <input checked="" type="checkbox"/> Electricity | <input type="checkbox"/> All (Total Energy) |
| <input checked="" type="checkbox"/> Transportation | <input type="checkbox"/> None: Non-energy related carbon reduction proposal |

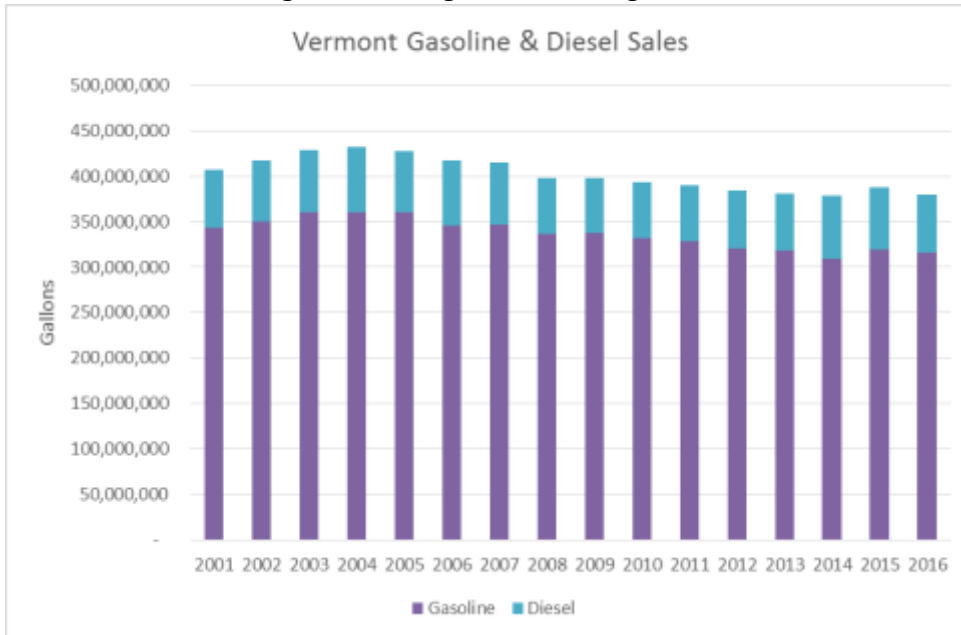
7. Which criteria category(ies) does it address? (Check all that apply):

- | | |
|---|---|
| <input checked="" type="checkbox"/> Economic Activity | <input checked="" type="checkbox"/> Vulnerable Vermonters |
| <input checked="" type="checkbox"/> Affordability | <input type="checkbox"/> Other |

8. Scale of impact on Vermont’s energy and climate goals: If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

- Transportation is the largest contributor to Vermont’s climate emissions, responsible for about 45% of the total and is also the largest end use sector for energy consumption. Gasoline and diesel sales in the state have decreased slightly over the past 15 years,

primarily due to more efficient vehicle technologies, but these incremental gains are not on track to meet our greenhouse gas reduction goals.



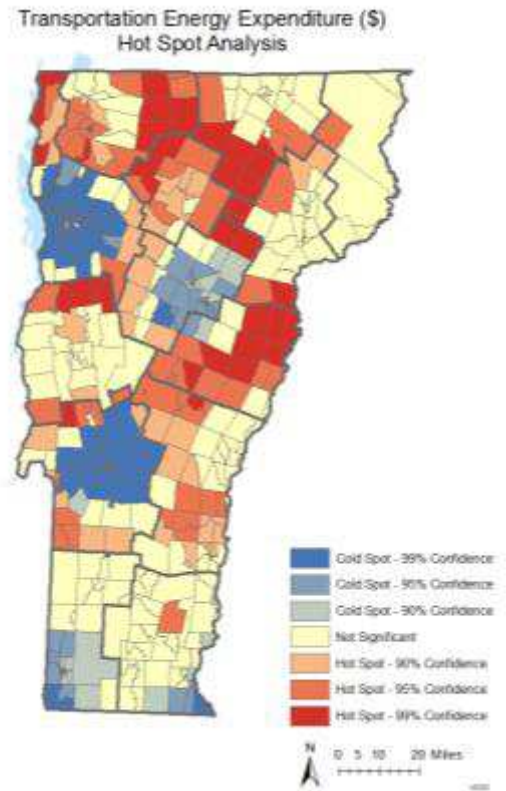
- Meeting the 2025 Comprehensive Energy Plan goal of 10% renewably powered transportation would require about 45,000 EVs – a major increase from the current total of about 2,000.
- EVs are incredibly efficient compared to gasoline powered vehicles. They are able to convert about 70% of the energy supplied from the grid to power the wheels. Typical gasoline vehicles are only about 20% efficient from the tank to the wheels.
- From a climate perspective, an EV powered by the average New England grid mix is currently the equivalent of a 107 mile per gallon vehicle and as more renewable energy enters the mix in Vermont this will accelerate.
- EVs were the only “high impact” transportation pathway identified in the 2013 EAN study as gaining more than 10% toward the overall 90% renewable by 2050 goal.

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

- Vermonters collectively spent over \$1 billion on transportation energy in 2015. Driving on electricity could cut this cost by 65%, to about \$350 million, with more of the electricity dollars staying local to Vermont.
- Auto ownership is high in Vermont. While it’s essential to invest in public transportation and other options to reduce single occupancy driving, we also need to recognize that these options are challenging to deploy in rural areas. The majority of Vermonters will continue to use personal vehicles to meet their mobility and access needs for the foreseeable future. As a result, low income Vermonters often have disproportionate transportation burdens due to costs of owning and fueling vehicles in our rural

landscape. The map to the right shows red hotspot areas where transportation energy burdens are highest – in some cases over 10% of household income¹.

- New EVs currently cost more up front than comparable gasoline vehicles, but provide lifecycle savings by cutting energy and maintenance costs in half or more. Over the next 10 years the price difference is expected to shrink as EV technology achieves greater economies of scale. More used EVs are coming onto the market and provide even greater opportunities for affordable, low carbon transportation.
- The American Lung Association estimates Vermont experienced \$347 in health and climate related costs in 2015 due to fossil fueled transportation. Shifting to EVs could reduce this by more than 90%.
 - EVs also reduce other harmful and toxic tailpipe emissions, leading directly to added health and environmental benefits beyond GHGs.
- The cost of the incentive program will depend on the value of the incentive and level of adoption.



10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

- The Governor to champion and direct state agencies to support efforts and identify viable program funding mechanisms;
- Legislature to establish programs and approve funding in consultation with Governor, electric utilities and others;
- Community action agencies and other advocates to inform strategies for low income EV adoption;
- Utilities, regulators and private businesses to support EV charging infrastructure development and policies to realize the greatest benefits to the grid;
- Auto dealers and their sales staff to stock and market EV models and communicate market demand for EV trucks and all-wheel drive models to manufacturers; and
- Drive Electric Vermont to expand EV marketing and outreach in partnership with others.

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

¹ Map excerpted from: Justine Sears, *Mapping Total Energy Burden in Vermont* (Efficiency Vermont: 2016), <https://www.encyvermont.com/news-blog/whitepapers/mapping-total-energy-burden-vermont>

Overall Strategy

- Every recent study on climate and energy in Vermont has identified EVs as an important pathway to meeting long term goals. The market cannot move quickly enough on its own to affect the transformation needed in the transportation sector. The following programs and policies are needed in the immediate term to address the primary barriers to EV adoption.

Barrier 1: Upfront Cost of EVs

Solutions:

- Evidence in Vermont and other states show incentives can drastically increase EV purchase consideration. In designing a Vermont incentive program, it is critical that it be tailored to low income populations and those who are impacted by high transportation costs. Program design could include a cash for clunkers component to encourage Vermonters to turn in older, high-emission vehicles. Incentives for used EVs should also be considered. Funding options for an incentive program that would not impact state general fund or transportation fund revenue include:
 - Electric utility tier 3 options
 - Expansion of RGGI cap and trade program to include transportation fuels
 - Joining Western Climate Initiative
 - Carbon Tax
 - Legal Settlements
 - Feebate programs (higher fees for more polluting vehicles paired with rebates for lower emissions)

Barrier 2: Availability of Public Charging and Maximizing Benefits of EV Charging

Solutions:

- Allocate the maximum allowable amount of VW Settlement dollars for EV charging infrastructure and focus on areas of the state that won't be served well by private sector investments.
- Establish regulatory framework to encourage utility investment in EV charging, reward customers for charging during off peak times or allow utility control of charging equipment to increase use of renewable energy and minimize grid impacts.
- Adopt building codes to require EV charging readiness in new multifamily housing construction and work with multifamily housing providers to install charging in existing buildings. Could also consider "right to charge" requirements for these properties to allow drivers to install charging when feasible and/or utility or shared ownership models for charging in these areas.

Barrier 3: Increase Vermonters Awareness of EVs and Their Benefits

Solutions:

- Continue to support Drive Electric Vermont program to coordinate EV stakeholders and implement education and outreach programs that inform people of their options and the programs that can help them purchase an EV that will work for them.
- Adopt dealer incentive programs that educate and engage dealers to sell EVs.
- Educate policy makers, including legislators, about the benefits of EVs, their role in climate strategy and opportunities for addressing needs of low income Vermonters.

Opportunities

- Work with utility regulators and partners to increase beneficial electrification
 - Off-peak charging / demand response programs
 - Increased grid load factor can lower rates for all
 - Explore opportunities to increase harmony between various utility EV incentive programs and coordinate on broader state offering.
- Work with low income advocates to ensure EV programs are designed to meet needs of Vermonters, potentially to include incentives on used vehicle purchases.
- Continue working with auto dealers to increase their sales teams' knowledge of EVs in Vermont context and support incentives at point of sale.

Summary – A sustained program to increase the pace of EV adoption in Vermont will ensure all Vermonters are able to participate in the clean energy transition. EVs will increase affordability, support our economy and put the state on a path to meeting our climate and energy goals.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

- 2025 goals call for 10% renewably powered transportation, which would require about 45,000 EVs. Currently at about 2,000 and on track to maybe hit half of this goal without greater intervention.
 - Vehicles are a durable good – their average age in Vermont is over 9 years old. Advancing EV sales in the short term will pay compound benefits over the coming years.
- Several EV incentive programs have already been delivered in Vermont. Once funding is identified it would likely be less than a year to launch a program.