

BUYER'S GUIDE TO

DRIVING ELECTRIC

IN VERMONT'S UPPER VALLEY

ELECTRIC VEHICLES ARE FUN, FAST, AND AFFORDABLE!

CUT COSTS ON BUYING OR LEASING AN EV BY UP TO
\$14,000 THROUGH STATE AND FEDERAL INCENTIVES



PUBLISHED JUNE, 2022



Ben DeFlorio

UPPER VALLEY TOWNS ARE COMMITTED TO ADDRESSING CLIMATE CHANGE

In the Upper Valley and across Vermont, climate change is manifesting in a variety of ways. From warmer winters to hotter summers, the changing climate is impacting how we live and enjoy our lives here in New England. To combat climate change, towns across Vermont are developing ways to become more resilient, adaptive and cooperative, all while helping residents save money and live a greener, cleaner life. The Upper Valley is committed to working towards carbon reduction goals to lower regional greenhouse gas emissions. From Climate Action Plans to declarations of Climate Emergencies, towns like Norwich and Hartford are working hard to transition residents over to cleaner energy sources and a more resilient energy future. Electric vehicles are a key component of that future.

HARTFORD: The Town of Hartford and Town of Hartford School District commit to reducing town-wide GHG emissions by 45% below 2010 levels by 2025 and achieving net-zero GHG emissions by 2030. Town Municipal Operations will be net-zero by 2027. (2019/2021)

NORWICH: At the 2019 Town Meeting, Norwich Residents directed “all Town Officials to take immediate and sustained efforts to gradually and continually reduce the Town’s direct use of fossil fuels, beginning at a rate of no less than 5% per year starting in the 2019-20 fiscal year and continuing until they are eliminated entirely.”

ABOUT US

Jenny Carter is an attorney and assistant professor at Vermont Law and Graduate School and its Institute for Energy and the Environment. Jenny has been working on promoting clean transportation since successfully leading the legislative effort to make Massachusetts the first state to adopt California's stringent auto emissions standards in 1990.

Molly Smith is the chair of the Hartford Energy Commission. She also serves on the Hartford Climate Advisory Steering Team. Molly is the program coordinator for the Institute for Energy and the Environment at Vermont Law and Graduate School, where she co-leads the Clean Transportation research project.



JENNY CARTER

Staff Attorney and Associate Professor, Vermont Law and Graduate School, Institute for Energy and the Environment



MOLLY SMITH

Program Coordinator, Vermont Law and Graduate School, Institute for Energy and the Environment, and Chair, Hartford Energy Commission

Special thanks to Vermont Law School Energy Clinic students Ciara Hopkins JD/MERL'22 and Ian Lund MERL'21 who contributed their invaluable research skills and creativity to this project.

Prepared by the Institute for Energy and the Environment at Vermont Law School and the Hartford Energy Commission



Made possible by The Vermont Community Foundation



THE Vermont Community Foundation

TABLE OF CONTENTS

INTRODUCTION	1
GLOSSARY AND ACRONYMS	2
EV SHOPPING CHECKLIST	3
INCENTIVES AT A GLANCE	4
ELECTRIC VEHICLES 101	5
MONEY MATTERS	11
LIFE AS AN EV OWNER	16
IMPORTANT RESOURCES	20



Published by the Institute for Energy and the Environment at Vermont Law and Graduate School, © 2022.

The information in this guide was current at the time of publication. For updated info please visit the various links found throughout this guide.

Printed on 100% recycled paper.

For an online version of this guide, please visit vermontlaw.edu/evguide.



Electric vehicles are an integral part of achieving the Upper Valley and Vermont's climate and greenhouse gas reduction goals. We created this easy guide to help community members learn about EVs, and how they can become part of your sustainable lifestyle.

Electric Vehicles are Racing Ahead! Why?

Not long ago, EVs were thought of as small, slow, expensive and couldn't be driven very far. Not anymore! Now, EVs come in all sizes and are so peppy and FUN to drive they are even used by race car drivers! They are cheaper to fuel and maintain, and when purchased using federal and Vermont state purchase incentives, may cost no more to buy than a comparable gas fueled vehicle. Newer models can often go 300 miles on a single charge and as a bonus for Vermont winter driving, the weight of the battery provides increased traction. Best of all, they are much better for the planet than their gasoline fueled cousins.

As of 2022, there are more than 40 different models of EVs for sale or lease in Vermont, ensuring a model for every need. From sedans, SUVs with AWD for driving in Vermont's back roads, and pick-up trucks for farmers and contractors, there is something for everyone. Vermont's most popular vehicle, the Ford F-150, now comes in an electric version, the Lightning, with a base sticker price coming in at under \$40,000 (before applying incentives).

The range of all electric vehicles (AEVs) has also increased dramatically. Now you can drive to Boston or NYC on a single charge! Most models are EPA rated to go 200-300 miles per charge, with the top rated 2022 Lucid Air achieving a rating of 520 miles! If you need to go further, you can fill up at a public charging station using a phone app showing you where the closest one is located. With the

recently passed Federal Infrastructure Bill, more public charging stations are on the way. Or, if you don't have access to home charging or don't want to worry about public charging, there are wide variety of plug-in hybrid electric vehicles for sale that have a supplemental gas tank.

As mileage range and model options have increased, sale prices have gone down, thanks to improved technology and incentives. **With a number of state, federal and Green Mountain Power utility incentives available, the price of a new EV can be reduced by up to \$14,000, and a used EV by as much as \$6,500. Add to that, an estimated \$6,000 - \$10,000 of savings in life-time maintenance costs compared to a traditional gas-powered car and the savings begin to really add up!**

Transportation is the single largest contributor of greenhouse gas emissions in Vermont and a large source of pollution related problems. We encourage walking, biking, ride-sharing and public transportation when possible, but the Upper Valley's largely rural population make personal cars a necessity for many residents. Switching to electric vehicles as quickly as possible is a key component of combating climate change while simultaneously saving Upper Valley residents money.

When the time comes for you to purchase or lease your next vehicle, we want you to know how to find the right electric vehicle that will fit YOUR needs and how to get it at a price you can afford.

**Note: This guide covers only battery electric vehicles, as hydrogen fuel cell vehicles are not available in Vermont.*



HOW TO TALK LIKE A PRO



*Because this is a relatively new industry, not everyone has settled on consistent terminology. That is why you might hear an **EV** called a **PEV** or an **AEV** called a **BEV**!

AEV/BEV

All Electric Vehicle or Battery Electric Vehicle* - A vehicle with a plug-in charger powered solely by electric energy stored in a battery.

CO₂e

Carbon Dioxide Equivalent - This includes CO₂ and other greenhouse gases such as methane, nitrous oxide, and ozone.

EV/PEV

Electric Vehicle or Plug-In Electric Vehicle* - As used in this guide, the term electric vehicle applies only to plug-in electric vehicles; AEVs and PHEVs. HFCVs are not included in this guide.

HFCV

Hydrogen Fuel Cell Vehicles are similar to electric vehicles (EVs) in that they use an electric motor instead of an internal combustion engine to power the wheels. However, while EVs run on batteries that must be plugged in to recharge, HFCVs generate their electricity onboard. They are not commercially available in Vermont.

GHG

Greenhouse Gases: Primary gases including carbon dioxide, methane, nitrous oxide and ozone.

HV/HEV

Hybrid Vehicle or Hybrid Electric Vehicle* - A vehicle that does not have a plug-in charger and relies primarily on its gasoline engine, but has an electric assist motor. It is sometimes referred to as a conventional or traditional hybrid.

ICE

Internal Combustion Vehicle - a conventional gasoline (or other fuel) powered vehicle.

kWh

A measure of electricity defined as a unit of energy, measured as 1 kilowatt (1,000 watts) of power expended for one hour. kWh/100m represents how many kWh it takes an EV to travel 100 miles.

LEVEL 1 CHARGER

An EV charger that uses 110-120 volt current. Most EVs come with a Level 1 charging adaptor, allowing them to be plugged into most home outlets. They are the slowest of chargers, but the convenience of charging at home may outweigh that aspect.

LEVEL 2 CHARGER

An EV charger that uses 240 volt power. It is the fastest home charger but requires some installation and potential wiring upgrades. Also found at public charging stations.

LEVEL 3 CHARGER / DC FAST CHARGING

An EV charger that converts high voltage AC power to DC power for direct storage in EV batteries. It offers the fastest charging but can only be found at Fast Charging public stations and may require purchase of a separate connector or adaptor.

MPGe/MILES PER GALLON EQUIVALENT

MPGe represents the number of miles the vehicle can go using a quantity of fuel with the same energy content as a gallon of gasoline.

PHEV

Plug In Hybrid Vehicle - A vehicle with a plug-in charger powered by electric energy stored in a battery with a supplemental gasoline engine.

EV SHOPPING CHECKLIST

It's EZ to find an EV that meets all your needs!

Use this info to help guide your research and determine what type of vehicle will fit your needs. Check off each question after you have considered it so you can feel confident that you have found the perfect vehicle!

1

WILL YOU BUY NEW, USED, OR LEASE? *(see pages 11 - 15)*

- Consider the pros and cons of buying versus leasing. What's the best fit for you?
- Have you compared incentives for buying new, versus used, or leasing?

2

WHAT IS YOUR BUDGET?

INCENTIVES CAN SAVE YOU UP TO \$14K *(see pages 12 and 13)*

- Have you researched all current federal, state and utility incentives and considered your eligibility?
- If you don't have tax liability to take advantage of the federal new car credit, have you considered a lease or state used vehicle incentives?
- There may be additional dealer incentives, so make sure to ask!

3

SHOULD YOU GO WITH AN AEV OR A PHEV?

MILEAGE AND CHARGING CONSIDERATIONS *(see page 10)*

- Do you have access to a charger at home? At work?
HELPFUL HINT: If you do not have access to a charger at home or work, a PHEV may be a great option for you!
- How many miles a day do you typically drive?
- How often do you take long trips?
- For a Level 2 charger at home, will you need to upgrade your electrical system?

4

WHAT OTHER FEATURES DO YOU NEED?

- Do you need 4WD, AWD or FWD?
- Do you need space for kids and the dog?
- Will you be towing or hauling anything in your EV?



INCENTIVES AT A GLANCE



Save up to
\$14,000!
See page
13 for more
details.

Incentives current as of June 1, 2022. For details and the most current incentives visit driveelectricvermont.com/incentives.

1

NEW EVs - FEDERAL TAX CREDIT *(see page 12)*

- Up to \$7,500 for new vehicle purchase - must have federal tax liability to use
Excludes Tesla and GM vehicles. May soon exclude Toyota.

2

NEW EVs - VERMONT STATE INCENTIVES *(see page 12)*

- Up to \$4,000 for purchases of AEVs.
Excludes AEVs with a base MSRP over \$45,000.
- Up to \$3,000 for purchases of PHEVs.
Excludes AEVs with a base MSRP over \$40,000.
- Available while funds last; must income qualify



3

NEW EVs - GREEN MOUNTAIN POWER INCENTIVES *(see page 13)*

- \$1,500 rebate for new AEVs
- \$1,000 rebate for new PHEVs
- \$1,000 additional rebate for low-moderate income qualified
- FREE Level 2 home charger (240 volt) = \$600+ value *(customer responsible for installation fees)*

4

USED EVs - VERMONT MILEAGESMART INCENTIVES *(see page 13)*

- Incentives for used AEVs, PHEVs, and some HVs
- Worth 25% of the vehicle cost up to \$5,000. Sale price can't be above the National Auto Dealers Association (NADA) clean retail value
- Eligibility based on household income and other factors
- Contact Mileagesmart; they'll help you find a used EV!



5

USED EVs - GREEN MOUNTAIN POWER INCENTIVES *(see page 14)*

- \$750 rebate for used electric vehicles, both AEV and PHEV
- \$1,000 additional rebate for low-moderate income qualified
- FREE Level 2 home charger (240 volt) = \$600+ value *(customer responsible for installation fees)*

6

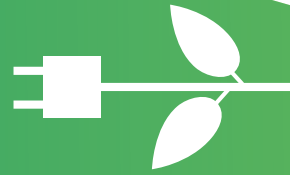
USED AND NEW EVs - REPLACE YOUR RIDE *(see page 13)*

- Program coming summer 2022
- Get up to \$3,000 for retiring a high polluting vehicle and replacing with a new or used EV



ELECTRIC VEHICLES FOR

What Makes a Vehicle Electric?



CONVENTIONAL GAS

ICE - INTERNAL COMBUSTION ENGINE VEHICLE

ICEs have one engine, typically powered by gasoline or diesel fuel. ICE vehicles contain a small battery that is only used as a source of electricity to start the engine and power the vehicle's accessories. Due to their dependence on fossil fuels, ICE vehicles are huge sources of greenhouse gas emissions and particulate pollution through their exhaust systems.

ENERGY



EMISSIONS



ICE FACTS

- ICEs typically run on non-renewable, polluting fossil fuels
- Mileage range of ICE vehicles average 25 mpg
- A typical vehicle releases close to 10,141 pounds (4.6 metric tons) of CO₂e into the atmosphere every year
- The average American household spends between \$1,650 and \$4,900 on fuel every year
- ICEs are, at best, 40% efficient which results in 60% or more of your \$\$\$ and gasoline wasted as pollution

CONVENTIONAL HYBRID

HV - HYBRID VEHICLE

HVs have a regular gas or diesel powered engine and an electric motor. The battery does not need an external electricity source to charge. While the electric motor is too small to run the car fully, HVs are still cleaner than ICEs, producing fewer GHG emissions, especially when idling or in traffic. Range of miles on HVs meets/exceeds that of conventional ICEs.

ENERGY



EMISSIONS



HV FACTS

- HVs have both a gasoline powered engine and an electric battery which is charged through a regenerative braking process
- The average miles per gallon of an HV is 55 mpg
- Hybrid vehicles produce an average of 55% fewer emissions than ICE vehicles
- A typical hybrid vehicle emits 6,258 pounds of CO₂e per year; nearly half that of an ICE
- The average hybrid owner spends an average of \$1600 on fuel every year



SOURCE OF FACTS:

carvana.com
afdc.energy.gov
insideevs.com/news

PLUG-IN HYBRID

PHEV - PLUG-IN HYBRID ELECTRIC VEHICLE

Like conventional hybrids, PHEVs have both a gas tank and a battery. However, unlike a conventional hybrid, their battery is larger and is charged via an external port which can be plugged in to any 110 -120 volt outlet like those in your home! They can also be plugged into Level 2 or DC Fast Charging stations. Given both fuel sources, PHEVs have ranges upwards of 600 miles!

ALL-ELECTRIC

AEV - ALL ELECTRIC VEHICLE, OR BEV - BATTERY ELECTRIC VEHICLE

AEVs run entirely off of a rechargeable battery and have no fuel tank. Once an AEV is on the road, it produces zero greenhouse gas emissions, making it one of the most sustainable ways to get around and lower your carbon footprint.

ENERGY



EMISSIONS



ENERGY



EMISSIONS



PHEV FACTS

- PHEVs run on stored electricity combined with a conventional internal combustion engine
- PHEVs have smaller rechargeable batteries than AEVs but can travel 20-40 miles on electricity alone
- Combined range of EV battery plus gas can reach up to 600+ miles
- Batteries can be recharged both at home or at public charging stations
- PHEVs produce less emissions than hybrid cars or traditional ICEs
- PHEVs are a good option for drivers who have short commutes or may not have regular access to charging

AEV/BEV FACTS









- AEVs run only on electricity stored in a battery; no back up gas-powered engine
- 150 to 250 mile range is common, with some over 300 miles
- Batteries can be recharged both at home or at public charging stations
- AEVs produce no emissions due to no internal combustion engines
- AEVs have zero tailpipe emissions, but a vehicle's overall emissions will depend on the power source for its battery's electricity. GMP's power is 97% hydro and nuclear.

DIVERSITY OF ELECTRIC VEHICLES



AEV

PHEV

	SEDAN	SUV	TRUCK
	<p>CHEVY BOLT</p> <ul style="list-style-type: none"> • FWD • Battery size: 66 kWh • Total range: Up to 247 miles 	<p>HYUNDAI KONA ELECTRIC</p> <ul style="list-style-type: none"> • FWD • Battery size: 64 kWh • Total range: Up to 258 miles 	<p>FORD F-150 LIGHTNING</p> <ul style="list-style-type: none"> • FWD • Battery size: 125 kWh • Total range: Up to 230 miles 
	<p>TESLA MODEL 3 LONG RANGE</p> <ul style="list-style-type: none"> • AWD • Battery size: 75 kWh • Total range: Up to 353 miles 	<p>VOLVO XC40 RECHARGE TWIN PURE</p> <ul style="list-style-type: none"> • AWD • Battery size: 82 kWh • Total range: Up to 223 miles 	<p>RIVIAN R1T</p> <ul style="list-style-type: none"> • AWD • Battery size: 135 kWh • Total range: Up to 300 miles 
	<p>SUBARU CROSSTREK HYBRID</p> <ul style="list-style-type: none"> • AWD • Battery size: 8.8 kWh • Total Range: Up to 480 miles • All electric range: Up to 17 miles 	<p>TOYOTA RAV4 PRIME</p> <ul style="list-style-type: none"> • AWD • Battery size: 18.1 kWh • Total Range: Up to 600 miles • All electric range: Up to 42 miles 	<p>MORE MODELS OF AEVs AND PHEVs ARE ROLLING OFF THE ASSEMBLY LINE EVERY YEAR!</p>

Images of vehicles are from the various car company websites.

AEV EXAMPLE: NISSAN LEAF

- Range: 151 miles
 - AWD
 - Battery: 40 kWh
 - Base MSRP: \$27,400
 - Federal, VT state, and utility incentive eligible
 - Standard monthly lease: \$199*
 - Lease down payment: \$1,149*
- *may not be available at all Nissan retailers



image: nissan.com



images left to right: cardivision.com, edmunds.com, cars.usnews.com



PHEV EXAMPLE: TOYOTA RAV4 PRIME

- Total range: 600 miles (electric only range: 42 miles)
 - AWD
 - Battery: 18.1 kWh
 - Base MSRP: \$38,250
 - Federal*, VT state, and utility incentive eligible
 - Standard monthly lease: \$412**
 - Lease down payment: \$3,062**
- * federal incentive may phase out for Toyota soon
**may not be available at all Toyota retailers



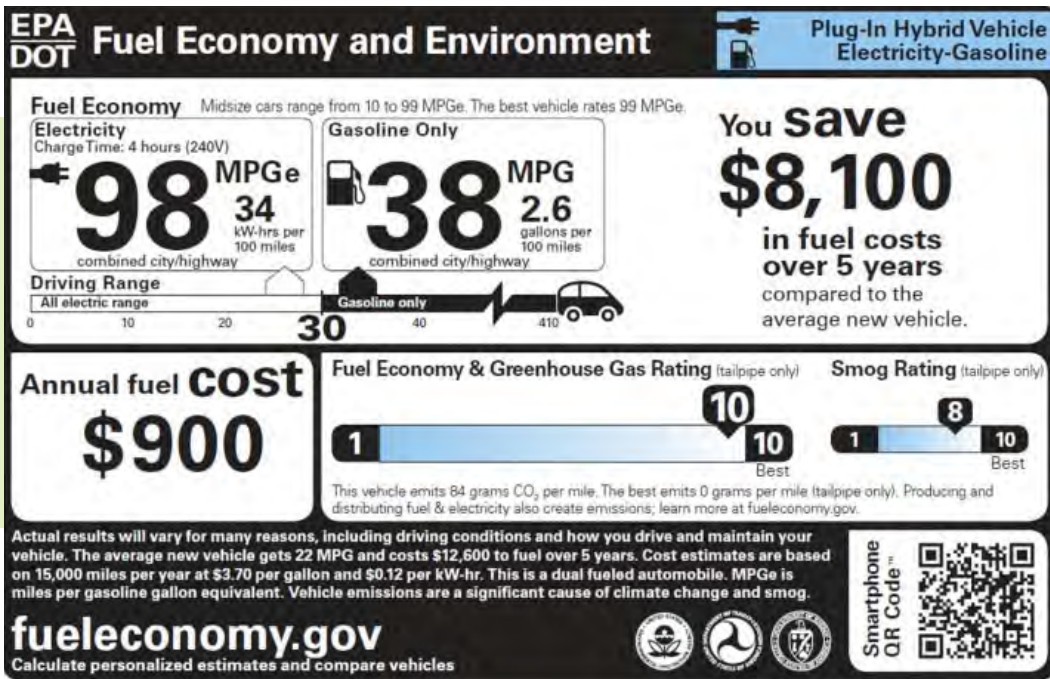
image from toyota.com



images left to right: toyota.com, autoguide.com, toyota.com



****Examples from time of publication. Actual costs may vary.



Visit fueleconomy.gov to compare vehicles and get a detailed explanation of EPA's labels.

BATTERIES, MILEAGE RANGE, AND CHARGING BASICS

Batteries put the “Electric” in Electric Vehicle. While conventional ICE vehicles have only gas tanks, AEV’s have only batteries, and PHEVs have both. EVs store electrical energy in lithium-ion batteries, similar to the kind you would find in your cell phone or computer. They are charged using a cable and nozzle inserted into a port in the side of the vehicle. New EVs, except Teslas, come with a 120 volt, or Level 1, charging cable.

BATTERY CAPACITY

How far an EV can travel on a charge is, in part, a function of its lithium-ion battery’s capacity, which is measured in kilowatt-hours (kWh). Battery capacity is analogous to the size of a gas vehicle’s gas tank, in that it represents how much fuel—or energy—the vehicle can hold. EV models vary in battery capacity. For example, a Chevy Bolt has a 65 kWh battery while the Ford Mustang Mach-E has a nearly 100 kWh battery.

MILEAGE RANGE

Like the size of an ICE vehicle’s gas tank, an EV’s battery capacity is only one part of the equation in determining how far a vehicle can travel on a single tank or charge. The mileage range of a

vehicle is also dependent on the vehicle’s weight, aerodynamics, and overall efficiency. That is why, when shopping for an EV, start by reviewing EPA’s estimated figures. EPA will give you an idea of both how efficiently the vehicle uses its’ electricity, which it expresses as MPGe, and how far you can expect it to go on a charge.

Be aware that a variety of other factors will also affect your actual driving range. On average, it is estimated that EVs lose approximately 2% of their range per year and frequent DC fast charging can further compromise range. Extreme cold, like that in Vermont’s winters may reduce your range 20%-50%, but the impact is temporary.

BATTERY LIFE AND WARRANTY

Every EV sold in the U.S. comes with at least an eight year/100,000 mile battery warranty but batteries can last up to 20 years. Replacing a battery can be expensive, but when an EV battery isn’t performing properly they can often be serviced and individual cells inside the battery can be replaced. You can extend the life of your battery by minimizing the frequency of full discharge.

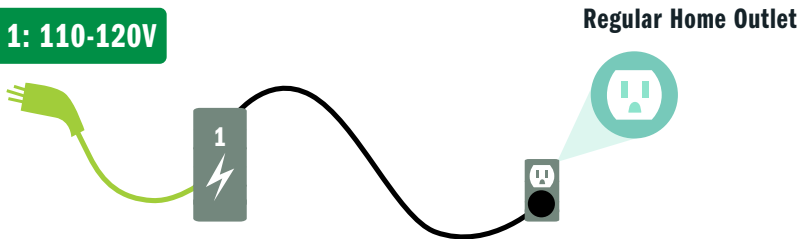
CHARGING YOUR VEHICLE



Just like a conventional vehicle needs to be filled with gas, AEVs and PHEVs need to be plugged in so their batteries can charge. There are three, main types of chargers; Level 1, Level 2 and Level 3 (DC Fast Charging)

TYPE OF CHARGER	POWER	TIME NEEDED TO CHARGE 40 MILES	LOCATION
Level 1	110V-120V	8-10 hours	Mostly for home and workplace charging; can be plugged into a regular home outlet
Level 2	240V	1-2 hours	Home, workplace, and public charging
Level 3 (DC Fast Charging)	480V	15 minutes	Mostly for public charging

LEVEL 1: 110-120V



LEVEL 2: 240V

May require service upgrade



LEVEL 3: 480V

DC Fast Charging



AT TODAY'S ELECTRIC PRICES, CHARGING AN EV COSTS THE EQUIVALENT OF \$1.50 PER GALLON!

COST TO CHARGE

AT HOME

- Depends on the cost of electricity
- If you drive 540 miles a month, and get an average of 3-4 kWh per mile, you'll use 180 kWh/month. At 17 cents per kWh, it will cost you about \$30.60 per month to charge your EV

OUT AND ABOUT

- Level 1, 2 and 3 (DC Fast Charging) stations are publicly available
- Some are pay as you go. For example, EVgo's "Pay As You Go" costs 35¢ in VT
- Others are subscription based. EVgo's "Plus" subscribers pay \$6.99/mo. plus 28¢/minute in VT



REMEMBER!

GMP OFFERS AN INCENTIVE FOR A FREE LEVEL 2 CHARGER FOR HOMES AND DISCOUNTED ELECTRIC RATE PLANS



MONEY MATTERS\$

Financial Incentives and Low Maintenance Make EVs Affordable

The verdict is in – EVs are a smart financial investment. Electricity is a cheaper source of fuel than gasoline and EVs are cheaper to maintain than their gas guzzling counterparts. According to Drive Electric Vermont, the cost of fueling an EV is roughly the equivalent of \$1.50/gallon using today's state wide average electricity prices. Compare that to the \$4-5/gallon seen at the pump recently and an average \$4,600 in lifetime maintenance cost savings, and it is easy to see why EVs are starting to go mainstream.

But before you can achieve the savings, the first hurdle a prospective car buyer must face is how to pay the up-front cost of the purchase price. Fortunately, not only have EV prices declined as technology has improved, but incentive and rebate opportunities have reduced prices further. Adding to the available federal incentives for new vehicles, **Vermont is a leader in the nation in providing state incentives for new and used vehicles targeted to those who need them the most, low and moderate income residents.** Using these incentives can often make a vehicle's final purchase price equal to a comparable gas vehicle and in some cases even lower!

To simplify the process of navigating all the incentives and trying to figure out which might apply to you and your chosen vehicle, we have broken them down into three sections.

- The first section will address federal and state incentives that are available for **new vehicles, including new vehicle leases.**
- The second section will address what incentives are available for **used** vehicles, and includes details of Vermont's **MileageSmart** program. It also covers the **Replace Your Ride** program for **new and used vehicles.**
- The third and final section covers **Green Mountain Power's** incentives for purchasing **new and used** EVs plus their **FREE** Level 2 Charger program

A 2020 Consumer Reports study showed a typical EV owner can expect to save between \$800-\$1,000 per year on fueling costs over an equivalent ICE vehicle. In addition, EV owners can save up to \$4,600 on maintenance costs, given EVs do not require oil changes or new spark plugs and overall have fewer moving parts.

While all incentive information was accurate and correct at the time of publication, opportunities are constantly changing. Please visit driveelectricvt.org to check for the latest updated information on incentives.

NEW CAR STATE AND FEDERAL INCENTIVES



There are two primary ways to access incentives for new car purchases or leases that can add up to big savings: federal tax credits and state tax incentives. It is possible to get both PLUS additional savings from Green Mountain Power (see page 14 if you are a GMP customer!)

VERMONT STATE INCENTIVES

Incentive applied either to purchase price at dealership or as a cash refund from your utility.

• ELIGIBILITY AND AMOUNT BASED ON HOUSEHOLD INCOME

- **ONLY FOR AEVs WITH BASE MSRP ≤ \$45,000**
- **ONLY FOR PHEVs WITH BASE MSRP ≤ \$40,000**

- Up to \$4,000 for purchases or leases of AEVs
- Up to \$3,000 for purchases or leases of PHEVs
- There are two options for claiming your incentive:

Option 1: Apply through a participating dealer like **White River Toyota** or **Key Chevrolet**

- Full incentive applied to down payment

Option 2: Get a direct refund

- Check with Drive Electric VT to see if you need to submit a Consumer Pre-Approval Form first
- Submit refund forms directly to your utility

For the most current Vermont state incentives and forms visit driveelectricvt.com

FEDERAL TAX CREDITS

Tax credit is claimed when your income taxes are filed.

- Up to \$7,500 for new vehicle purchase
- Leasing companies can pass on savings for leased vehicles
- Size of credit based on battery size
- AEVs are eligible for full \$7,500; PHEVs vary
- All Tesla and General Motors models (including the Chevy Bolt) are no longer eligible for the federal tax incentive. Toyota's may end soon.



- Your tax credit cannot exceed the amount you owe in federal taxes in the tax year you purchase your vehicle, and cannot be carried over into the next tax year

As of publication, federal legislation is pending to change this inequitable tax requirement. For details and the most current federal tax credits visit fuelconomy.gov/feg/taxevb.shtml

VERMONT TAX FILING STATUS	ADJUSTED GROSS INCOME LIMITS	VERMONT STATE INCENTIVES	
		Plug-in Hybrid Electric Vehicle (PHEV)	All-Electric Vehicle (AEV)
Individual filing as single or head of household	\$50,000 or less	\$3,000	\$4,000
	\$50,001 up to \$100,000	\$1,500	\$2,500
Individual filing as qualifying widower	\$75,000 or less	\$3,000	\$4,000
	\$75,001 up to \$125,000	\$1,500	\$2,500
Married filing jointly	\$75,000 or less	\$3,000	\$4,000
	\$75,001 up to \$125,000	\$1,500	\$2,500
Married filing separately	\$50,000 or less	\$3,000	\$4,000
	\$50,001 up to \$100,000	\$1,500	\$2,500

SAVINGS\$ FOR USED EVS



MileageSmart is Vermont's used car incentive program. Used EVs are in such high demand they can be a challenge to find. Luckily, MileageSmart has friendly staff that will help you find the used EV right for you. A list of available used cars can be found on their website: mileagesmartvt.org

MILEAGESMART INCENTIVES

- Apply ahead of time to Mileagesmart **BEFORE** you buy
- Incentives for used high efficiency vehicles
- Eligible vehicles must have an efficiency rating of 40 miles per gallon or higher. May apply to traditional hybrids
- Worth 25% of the vehicle cost up to \$5,000. Sale price can't be above NADA clean retail value
- Eligibility based on household income. Must be Vermont resident, over 18 and employed, over 60, or on disability
- Must buy from a DMV registered Vermont used or new car dealer
- Finance with a Vermont based institution

MAXIMUM INCOME BY HOUSEHOLD SIZE

HOUSEHOLD SIZE	ANNUAL INCOME	MONTHLY INCOME
1	\$47,110	\$3,926
2	\$53,840	\$4,487
3	\$60,570	\$5,048
4	\$67,300	\$5,608
5	\$72,684	\$6,057
6	\$78,068	\$6,506
7	\$83,452	\$6,954
8	\$88,836	\$7,403

Table source: Mileagesmart.com



UP TO \$3000 TO REPLACE YOUR RIDE

The Vermont Legislature approved a new incentive program called “**Replace Your Ride**” that should be up and running this summer (2022). The purpose is to encourage owners of older, higher polluting vehicles to switch to cleaner transportation options.

Eligible applicants will need to either meet the lower-income thresholds of Vermont’s new EV incentive program (see chart on p.12) or meet the criteria for the MileageSmart program. It is anticipated that up to \$3,000 in incentives will be available to participants who retire a high-polluting vehicle towards purchase of a new either a new or used EV; a bike, electric bike, or fully electric motorcycle; and/or shared mobility services which reduce the need for vehicle ownership. Incentives through this program may be applied in combination with other incentive programs. More details will be available from the Vermont Department of Transportation when the program becomes operational.





SAVINGS\$ FOR NEW AND USED EVS

GMP ELECTRIC VEHICLE INCENTIVES



REBATES

- \$1,500 rebate for **new AEVs***
- \$1,000 rebate for **new PHEVs***
- \$750 rebate for **used AEVs or PHEVs***
- 1,000 EXTRA rebate for **new and used AEVs or PHEVs for low-moderate income qualified***

*One person households making \$52,080 or less, and two+ person households making \$69,122 or less

ADDITIONAL INCENTIVES

- **FREE Level 2 home charger for all EV owners** in GMP service territory who enroll in GMP's Home Charging Program. A \$700 value, but customer is responsible for installation costs, which may require an upgraded electrical outlet.
- **Discounted off-peak EV charging rates:** Sign up for rates as low as \$0.13433/kWh, which is on average like paying \$1.00 per gallon.

To learn more about utility incentives please visit [greenmountainpower.com](https://www.greenmountainpower.com)

BUYING — VS. — LEASING

Not eligible for the federal tax incentive? A dealer MAY take the tax incentive on your behalf and be able to pass the savings on to you in the form of lower monthly payments! Be sure to ask the dealer about these options.

BENEFITS OF BUYING

- **NO MILEAGE LIMITATIONS:** Leased vehicles have annual mileage limits, often with steep charges for going over the allotment
- **OWNERSHIP:** Once the car has been paid off, it is 100% yours to drive, customize and use how you'd like
- **RESALE OPPORTUNITY:** Used EVs are in high demand
- **TAX INCENTIVES:** Available for both new and used EVs

BENEFITS OF LEASING

- **DRIVE THE LATEST:** With lease periods of 12-36 months, you can always have the latest technology
- **DEPRECIATION:** A lease will allow you to avoid depreciation
- **DEALS:** Federal income tax credits can be rolled into lease agreements



LIFE AS AN EV OWNER

Charging, Maintenance, Dealers, and Resources



Molly Smith

Now you've chosen your vehicle, applied for your incentives and rebates, and signed on the dotted line, it's time to enjoy your new life as an EV owner! The following section will discuss issues like charging, both at home and in public, maintenance, and where to buy or lease your next EV.



I LOVE my Chevy Bolt! There are many apps you can use to learn where to charge your car if you are going on a longish trip. Just check it out ahead and plan where to stop with a back-up in case. Green Mountain Power provides a free home charger but you have to have it installed. Most times all you need is the home charger to keep your car charged. In the summer my range is over 300 miles. In the coldest part of winter it is around 200 miles. Electric cars teach you to keep your speed down. You get a larger range if you don't speed. **TRY ONE. THEY NEED LITTLE ATTENTION BEYOND PLUG IN AND GO.**

~ Laura Simon, Wilder, VT



I LOVE this car. Still odd that I have no engine, but rather a "frunk"- a front trunk! **I HAVE NOT PURCHASED GAS IN THREE YEARS** and the only maintenance has been adding windshield wash, air in the tires and yearly inspection. It is easy to drive around the Upper Valley—there are so many charging stations. I have taken a few long trips to Pa., N.J., N.Y.C., and there are plenty of charging stations along the way. My car can get about 300 miles on a full charge. Charging when "empty" is about 45 minutes at a super charging station (and much less if you are just 'topping off' the charge).

~ Dan Fraser, Hartford Selectboard, Co-owner, Dan and Whit's General Store, Happy Tesla Owner

FINDING A CHARGING STATION



There are several phone apps out there to help you find a charging station. Here are a few of them:

PlugShare

App Cost: Free

Platform: iOS, Android

What's Special: With over 230,000 chargers listed on their app, PlugShare uses crowdsourcing to help keep users up to date on charger status and lines.

plugshare.com



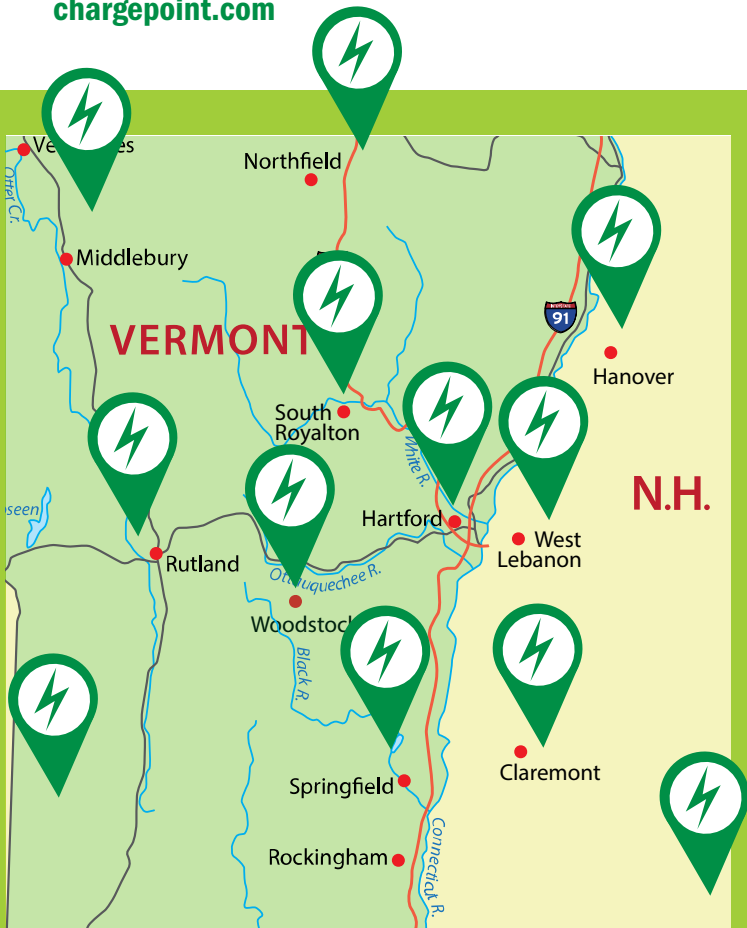
ChargePoint

App Cost: Free

Platform: iOS, Android

What's special: Shows ChargePoint branded charging stations as well as other networks. Includes information on busy times, waitlists and port availability.

chargepoint.com



ChargeHub

App Cost: Free

Platform: iOS, Android

What's special: A feature lets you communicate with fellow charger users in the area, and includes a map of other networks. chargehub.com



EVgo

App Cost: Free

Platform: iOS, Android

What's special: Different plans have different costs. In VT for the EVgo Plus plan, there is a monthly subscription of \$6.99 evgo.com



EV hotels

App Cost: \$2.99

Platform: iOS, Android

What's special: Maps out hotels which have chargers on site, as well as ones which are within a short walking distance of a charger.

evhotels.org



PUBLIC CHARGING STATIONS IN OUR REGION:

300+ locations in Vermont, and 180+ locations in New Hampshire; with more on the way!



Rob Bossi

Molly Smith (left) and Jenny Carter (right) in front of two of Vermont Law School's thirteen charging stations.



EVs require far less maintenance than conventional vehicles.

CONSUMER REPORTS FOUND THAT EV MAINTENANCE AND REPAIR COSTS ARE ABOUT HALF THAT OF ICE VEHICLES. IN FACT, THE AVERAGE EV OWNER SAVES UP TO \$4,600 ON MAINTENANCE COSTS OVER THEIR VEHICLE'S LIFETIME.

- AEVs have fewer moving parts than gas vehicles
 - No oil changes, no spark plugs
 - Fixed gears instead of transmissions (reduces maintenance)
- Plug-in hybrids also require less maintenance
 - While PHEVs have internal combustion engines, they are not used as the primary source of propulsion
- Brakes last longer due to regenerative braking process

WHEN MAINTENANCE IS REQUIRED, YOU MAY NEED TO GO TO A CERTIFIED DEALER.

- Most dealers who sell EVs are also certified to service them. Be sure to ask your sales associate!
- Some simple maintenance, such as tire mount and balance, may be done at your local mechanic
- Currently, any Tesla vehicle that requires maintenance will typically need to utilize Tesla's mobile service or be taken to a service center in Mass. or N.Y. In the not too distant future Tesla may open a dealership and maintenance facility in Vermont

PLACES TO BUY A USED OR NEW EV



List may not be comprehensive, as not all dealerships keep EVs in stock, so be sure to check their inventory online and ask!

Turnover of used EVs is generally very fast. Connect with Mileagesmart and a used car dealer and let them know what you're looking for so they can let you know when one comes on the lot!

Upper Valley new EV dealers participating in Vermont's Incentive Program

- KEY Chevrolet
- White River Subaru
- White River Toyota

*VT Incentive Participants can directly apply the new car incentive to your downpayment.

Examples of dealers in Vermont's Upper Valley selling used EVs

- Upper Valley Auto Mart
- Miller Auto Group
- McGee Family Used Cars

**Only cars from a registered Vermont dealership can qualify for MileageSmart incentives.

Examples of online resources for used EVs (typically do not qualify for MileageSmart incentives)

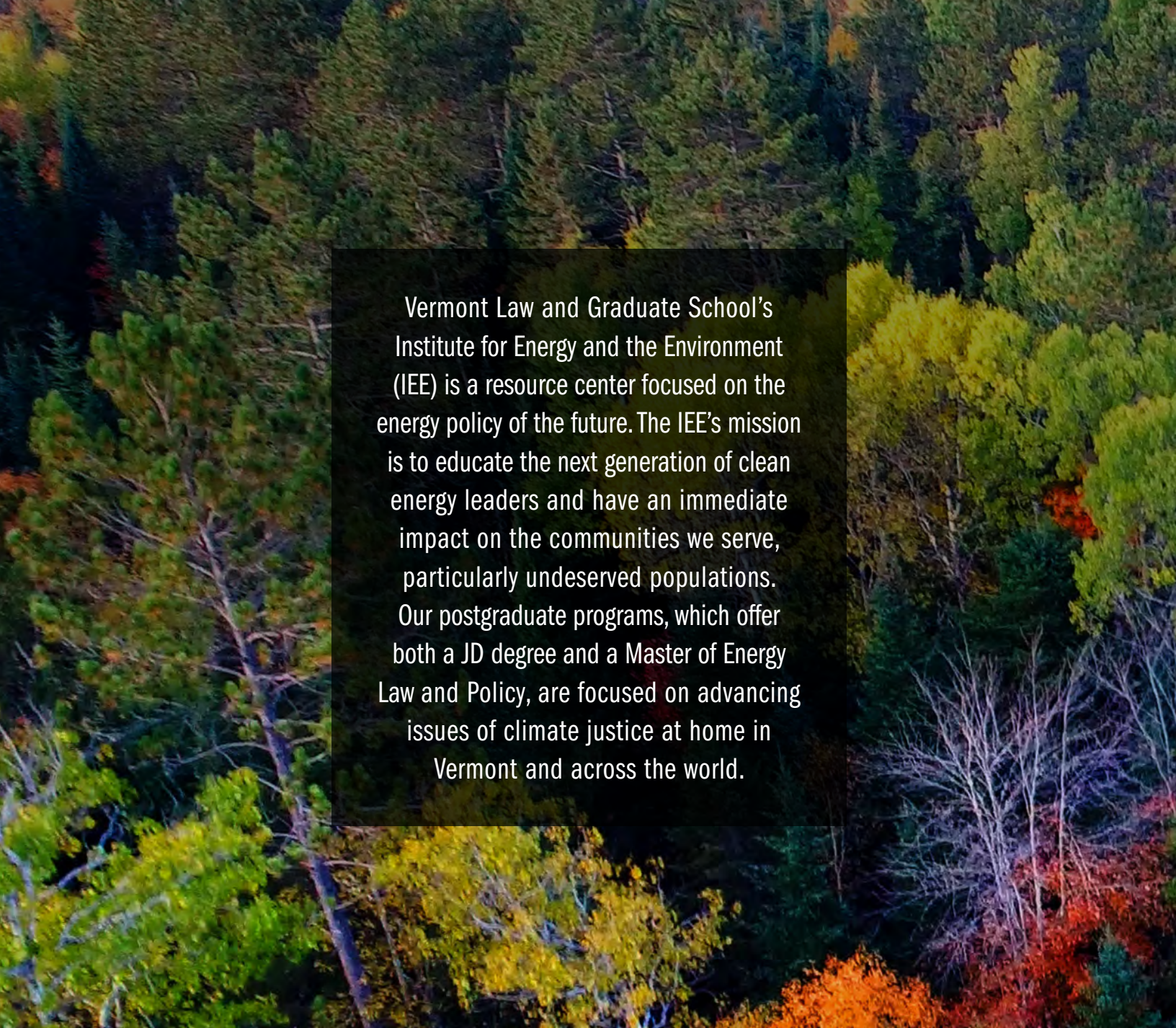
- Vroom.com
- Carmax.com
- Edmunds.com
- Carvana.com

IMPORTANT RESOURCES

Ready to Answer Your EV Questions

This guide is intended to get you started on your EV journey. The following resources will provide more in-depth information and provide updates regarding incentives and changes in the marketplace.

ORGANIZATION	CONTACT	EXPERTISE	WEBSITE
Drive Electric Vermont	Dave Roberts info@driveelectricvt.com	Best overall EV resource website	driveelectricvt.com
Green Mountain Power	Energy Services Team energyserviceteam@greenmountainpower.com 888-835-4672	Incentives and rebates	greenmountainpower.com/rebates-programs/electric-vehicles/ev-rebate
Hartford Energy Commission	Molly Smith msmith@vermontlaw.edu	Hartford transportation, EV basics	hartford-vt.org/229/Energy-Commission
Mileage Smart	support@milesagesmartvt.org	Best used car assistance and incentives	milesagesmartvt.org
Vital Communities	Anna Guenther anna@vitalcommunities.org	Upper Valley public transportation and carpooling options	vitalcommunities.org/transportation
Vermont Law School	Jenny Carter jcarter@vermontlaw.edu	Incentives, energy policy, and law, free community EV consultation	vermontlaw.edu/academics/centers-and-programs/Institute-for-Energy-and-the-Environment
Environmental Protection Agency	See fueleconomy.gov FAQ for contact	Fuel economy estimates and comparisons, current federal tax incentives	fueleconomy.gov



Vermont Law and Graduate School's Institute for Energy and the Environment (IEE) is a resource center focused on the energy policy of the future. The IEE's mission is to educate the next generation of clean energy leaders and have an immediate impact on the communities we serve, particularly underserved populations. Our postgraduate programs, which offer both a JD degree and a Master of Energy Law and Policy, are focused on advancing issues of climate justice at home in Vermont and across the world.

Thank You to the Green New Fund at Vermont Community Foundation for supporting our Vermont Electrify Campaign in Hartford.

Thanks also to the following for their behind-the-scenes support:

- Capstone Community Action's Mileage Smart Program
- Drive Electric Vermont
- MileageSmart
- The Hartford Energy Commission
- Vital Communities



VERMONT
LAW & GRADUATE SCHOOL

Institute for Energy and the Environment
Vermont Law and Graduate School
164 Chelsea Street | PO Box 96
South Royalton, VT 05068
vermontlaw.edu