

---

# Road Usage Charges for Electric Vehicles

---

SENATE TRANSPORTATION COMMITTEE, APRIL 7, 2023

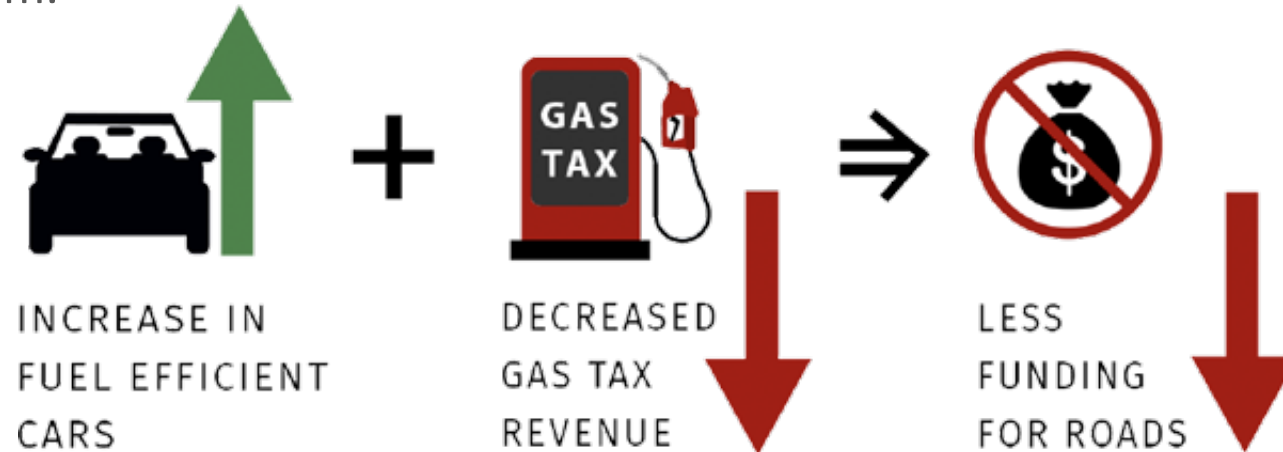
WANDA MINOLI, COMMISSIONER, DEPARTMENT OF MOTOR VEHICLES, AOT

MICHELE BOOMHOWER, DIRECTOR, POLICY, PLANNING, AND INTERMODAL DEVELOPMENT, AOT

PATRICK Ó. MURPHY, SUSTAINABILITY + INNOVATIONS PROJECT MANAGER, AOT

# What is a road usage charge?

A **road usage charge** is a fee on vehicle use of the public road system.



## Examples:

Chicago Congestion

- A mileage-based user fee (MBUF)
- An annual flat fee
- A per kilowatt hour fee

**Basis of MBUF:** A roadway consumption tax, with distance, stated in miles, as the measure of consumption.

An **annual flat fee** is collected at vehicle registration.

# Road Usage Charge Study

---

Road Usage Charge Advisory Committee and subcommittees convened stakeholders several times in Fall 2021 to consider impacts of a variety of policy scenarios and alignment with shared goals:

- Vermont needs to develop long-term, sustainable revenue to maintain our transportation system
- Future funding must be fair where all drivers contribute to transportation system according to use
- Any funding policy must be aligned with Vermont's Climate Action Plan



# Road Usage Charge Study – Guiding Principles

---

## **Do No Harm**

- Revenue neutrality
- Sustained EV uptake

## **Equitable & Fair**

- User pay system
- Users have choices
- Privacy and security data protected
- Equitable cost distribution (rural/urban, income)

## **Feasible & Efficient**

- Ease of administration/minimal government burden
- Enforceable
- Simplicity of compliance and ease of use
- Accurate and system performance

## **Transparent and Accountable**

- Open system
- Accountable oversight

## **Adaptive for the future**

- Integration with other state policies
- Interoperability with other state systems
- Flexible, secure, and scalable

# Mileage-based User Fee in Vermont

---

Road Usage Charge Study Advisory Committee recommended in its final report a mileage-based user fee for plug-in electric vehicles:

- Best opportunity to align sustainable transportation revenue and climate goals
- Cost-effectively utilizes existing inspection process with odometer reading
- Flexible payment options/frequencies
- Fairness: drivers only pay for what they use
- Avoids privacy concerns of reporting devices
- Federal money can be leveraged to assist with implementation
- System can evolve over time



# Road Usage Charge Study – Stakeholder Outreach

## Vermont Natural Resources Council, Conservation Law Foundation, and Sierra Club of Vermont

The project team invited the three environmentally focused organizations (the Vermont Natural Resources Council, Conservation Law Foundation, and Sierra Club of Vermont) to a virtual online stakeholder meeting on September 10, 2021, to discuss the RUC concepts. The organizations reviewed the materials that were presented at the advisory committee meeting and gave an overview of the proposals being considered.

Generally, the three entities expressed universal support for the idea that EV adoption should be supported and expressed concern that an additional tax or fee would be a deterrent for some. They recommended that the State consider looking wider than simply “plugging a hole”—that an opportunity may exist to improve the current transportation funding system. More specific topics of the discussion included the following:

- Two attendees noted studies referencing a state goal to achieve an EV 15% market share of vehicles before any changes to fees or costs are imposed on EV drivers. An attendee from Vermont Electric Cooperative referred to a study from Bakersfield that mentioned that EV purchasers would be less interested in an EV if there is a cost per mile that reduces the current cost savings of owning an EV compared to an ICEV. It was posited by the group that if EV initial purchase prices decrease, the concern with the per-mile fee may diminish.
- One attendee advocated for a MBUF adopted across the board for all vehicles as a substitute for the motor fuel tax. The project team mentioned that other states such as Utah and Oregon, among others, do have intentions to implement MBUF across all vehicle types; however, implementation is a lengthy process and the approach being considered by AOT could be a more manageable step because of the focus on a smaller number of vehicles.

## 2.1 Survey Administration

Respondents were recruited into the survey using email invitations distributed to current Vermont BEV and PHEV owners. The contact list was developed by VTrans through their partnership with Drive Electric Vermont and served as the primary sampling frame for the survey. RSG also leveraged its relationships with local stakeholders, including regional planning commissions, community organizations, environmental organizations, auto dealers, and other interested organizations to help drive participation.

The survey remained open from Wednesday, September 8, 2021, until Tuesday, October 26, 2021. A total of 385 responses were received during the administration period. Table 1 presents the number survey completions from each key stakeholder.

TABLE 1: COMPLETES BY STAKEHOLDER GROUPS

| Stakeholder Group             | Complete Surveys |
|-------------------------------|------------------|
| Drive Electric Vermont        | 169              |
| Capstone Community Action     | 81               |
| Regional Planning Commissions | 54               |
| Facebook                      | 29               |
| Environmental Organizations   | 21               |
| Auto Dealers                  | 4                |
| Other                         | 27               |
| <b>Total</b>                  | <b>385</b>       |

Figure 1 shows survey completions by ZIP Code. Participants were recruited from regions across the entire state, but were more heavily concentrated in Chittenden and Washington Counties.

# Key Questions & Some Answers

---

- **What are we trying to solve?**

Revenue losses due to electrification  
(Nearly \$1 million in 2023 and growing)
- **Why now?**

A new revenue collection system takes time and resources to develop. Federal funds available to help.
- **What is the impact of not doing something?**

Less funding for not only roads and bridges, but public transit, bike/pedestrian and EV charging infrastructure, PEV incentives
- **Wait for 15% and diffusion of innovations theory?**

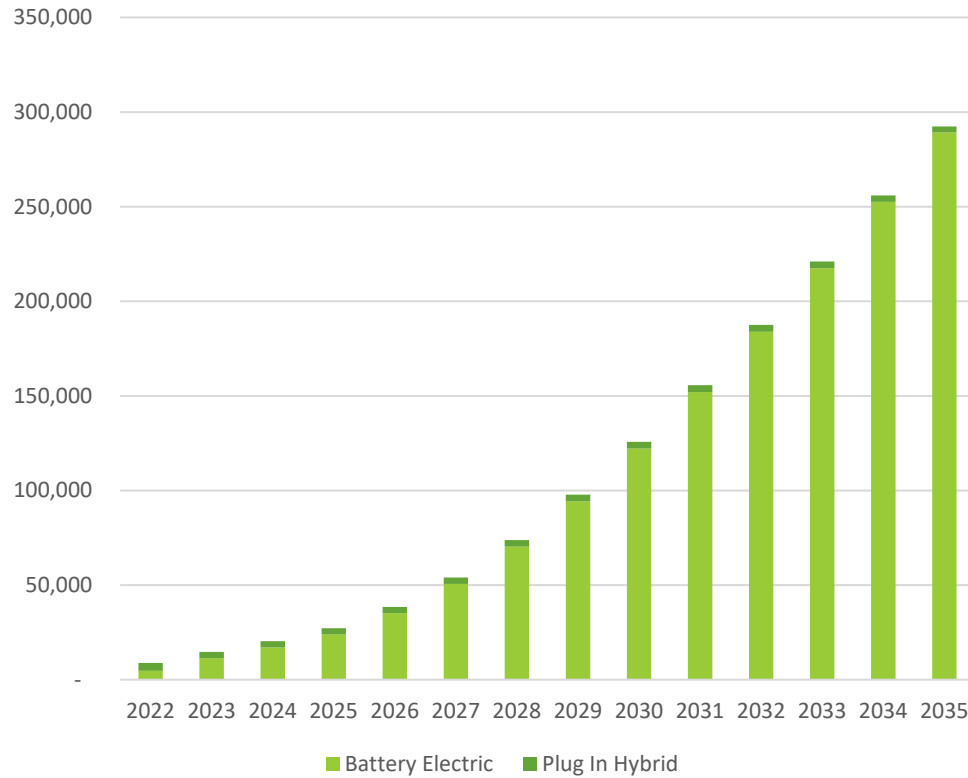
Ounce of action is worth a ton of theory
- **Barrier to EV adoption?**

Mileage-based user fee is a fee on miles, not the EV itself, discouraging VMT not vehicles
- **What's fair? For whom?**

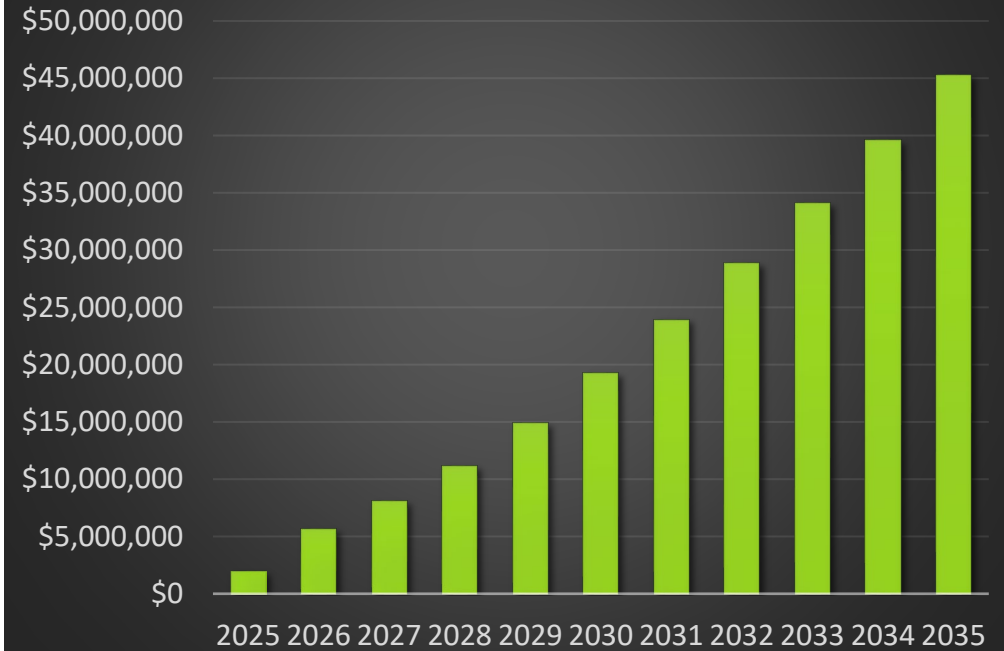
For current EV drivers?

# Climate Action Modeling and Road Usage Charge Projections

### Projected EV Adoption in CAP Modeling

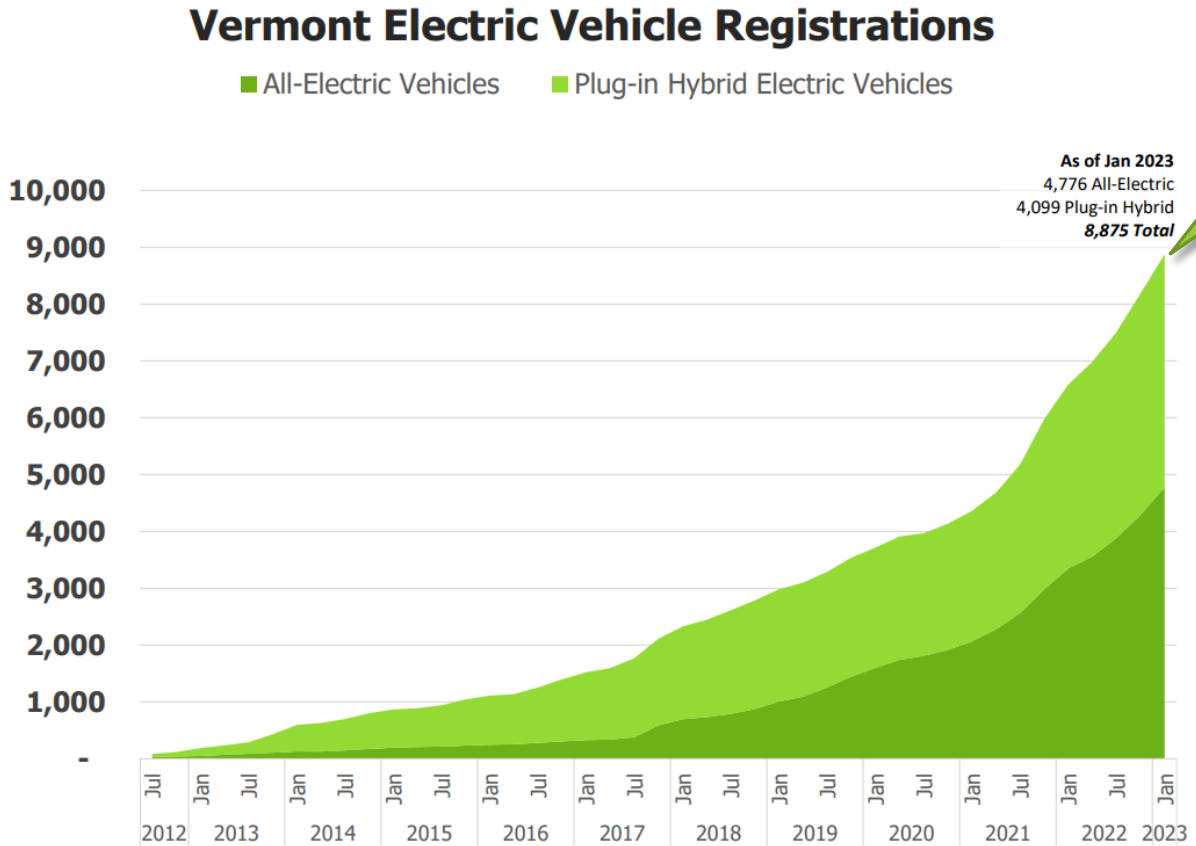


### Potential Revenue from MBUF + Flat Fee

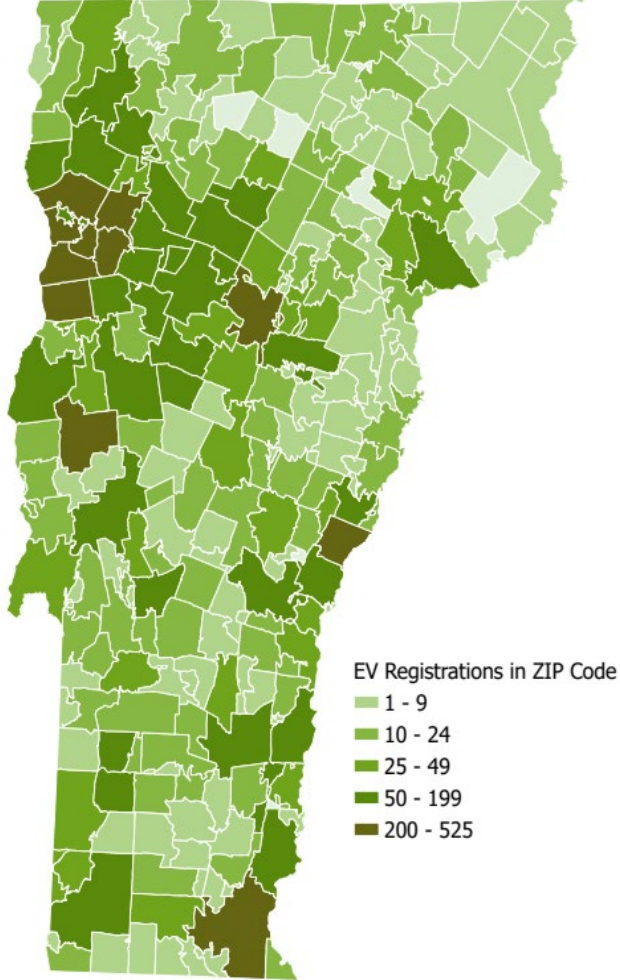




# EV Adoption in Vermont

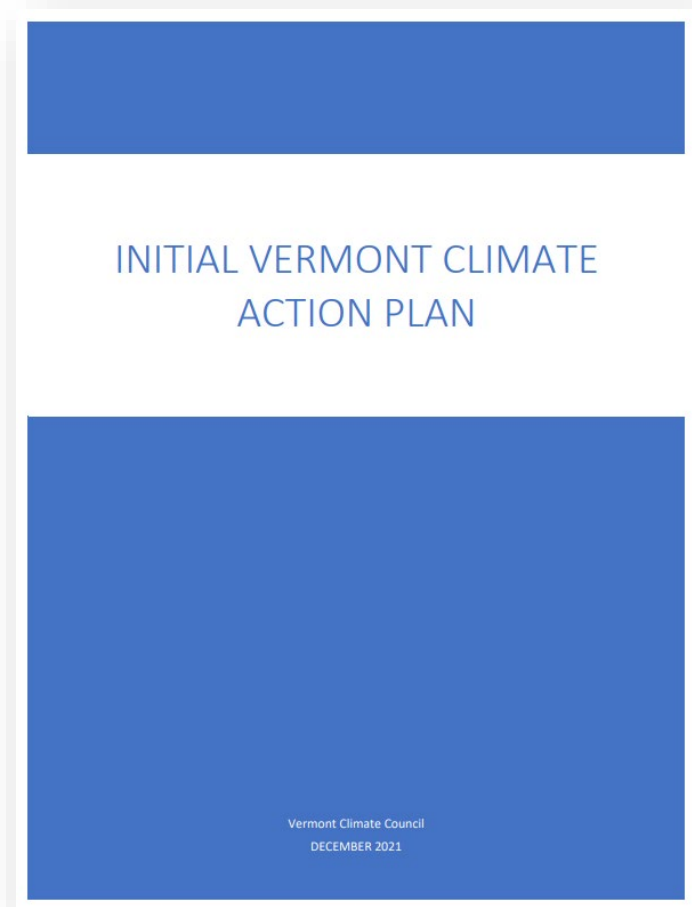
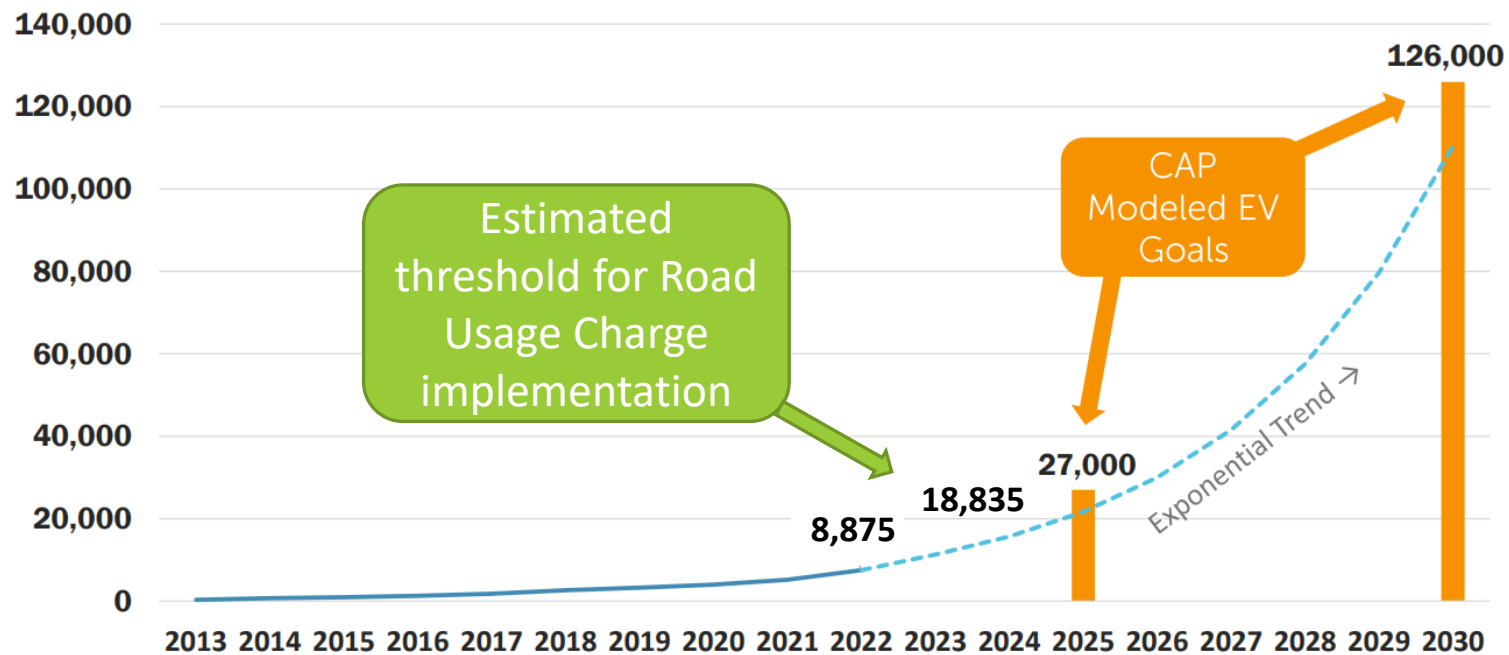


**8,875 ZEVs:**  
 4,099 PHEVs  
 4,776 AEVs



# EV Adoption in Vermont

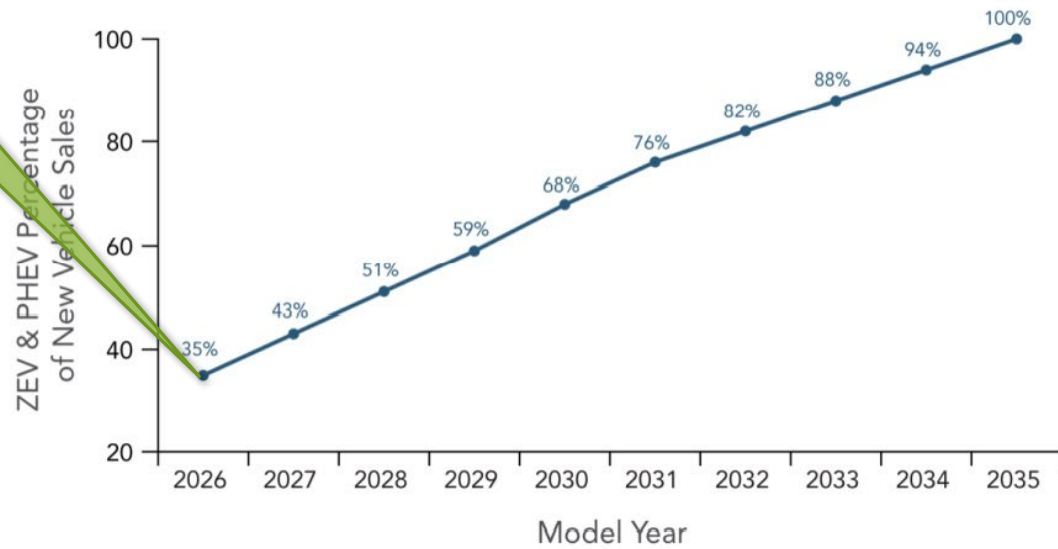
How many vehicles does Vermont need to electrify?



# EV Adoption in Vermont

## Vermont's Low and Zero Vehicle Regulation

The new regulation accelerates requirements that automakers deliver an increasing number of zero-emission light-duty vehicles each year beginning in model year 2026. Sales of new ZEVs and PHEVs will start with 35% that year, build to 68% in 2030, and reach 100% in 2035.



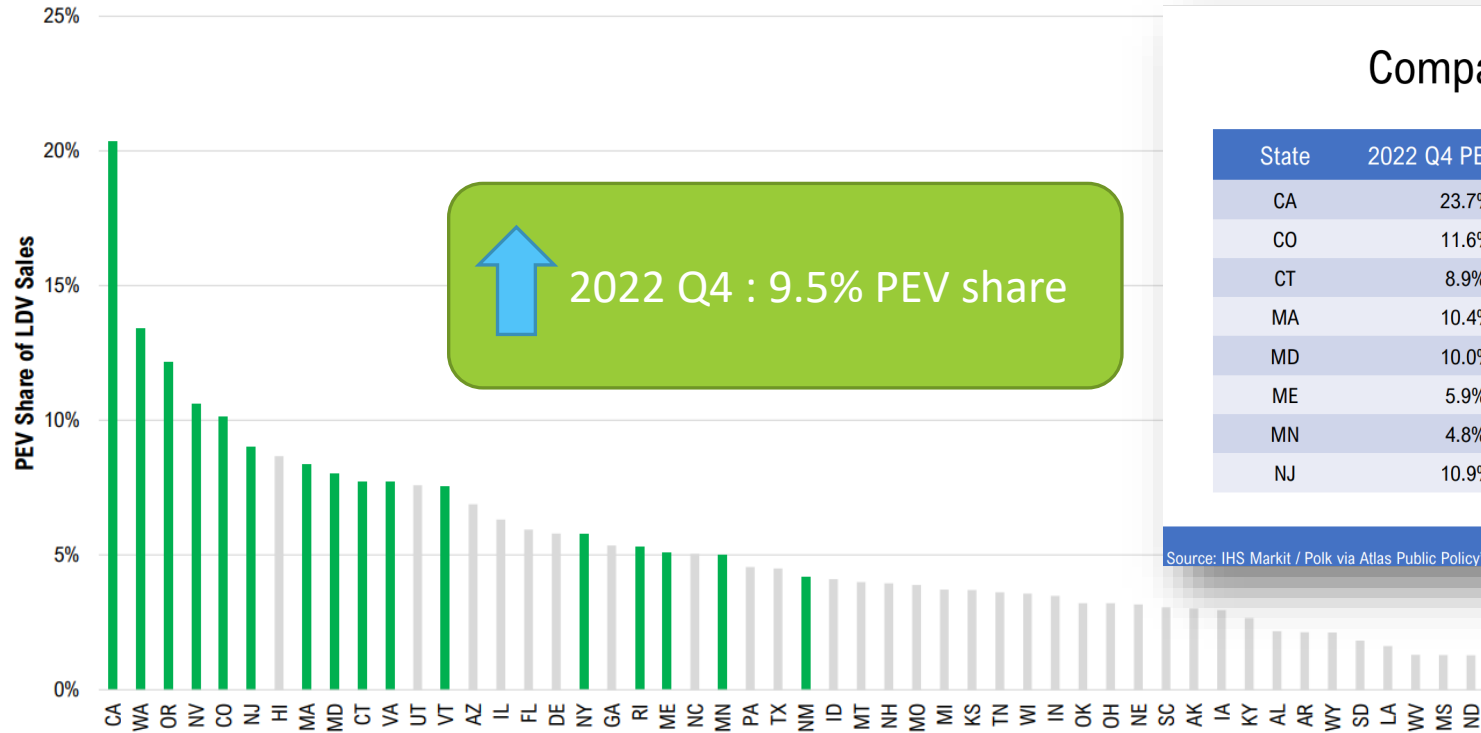
35% of new vehicle sales by 2026

INITIAL VERMONT CLIMATE ACTION PLAN

Vermont Climate Council  
DECEMBER 2021

# EV Adoption in Vermont

**U.S. New Light-Duty PEV Sales in 2022:  
California and the Section 177 ZEV States Outpace Non-ZEV States**



**Comparing 2022 Q3 & Q4 Sales**

| State | 2022 Q4 PEV Share (± Q3) | State | 2022 Q4 PEV Share (± Q3) |
|-------|--------------------------|-------|--------------------------|
| CA    | 23.7% (+3.5%)            | NM    | 4.7% (+0.4%)             |
| CO    | 11.6% (+1.6%)            | NV    | 13.0% (+1.4%)            |
| CT    | 8.9% (+0.9%)             | NY    | 6.6% (+1.0%)             |
| MA    | 10.4% (+2.6%)            | OR    | 15.4% (+2.7%)            |
| MD    | 10.0% (+2.7%)            | RI    | 6.1% (+0.8%)             |
| ME    | 5.9% (+0.7%)             | VT    | 9.5% (+2.0%)             |
| MN    | 4.8% (+1.7%)             |       |                          |
| NJ    | 10.9% (+2.2%)            |       |                          |

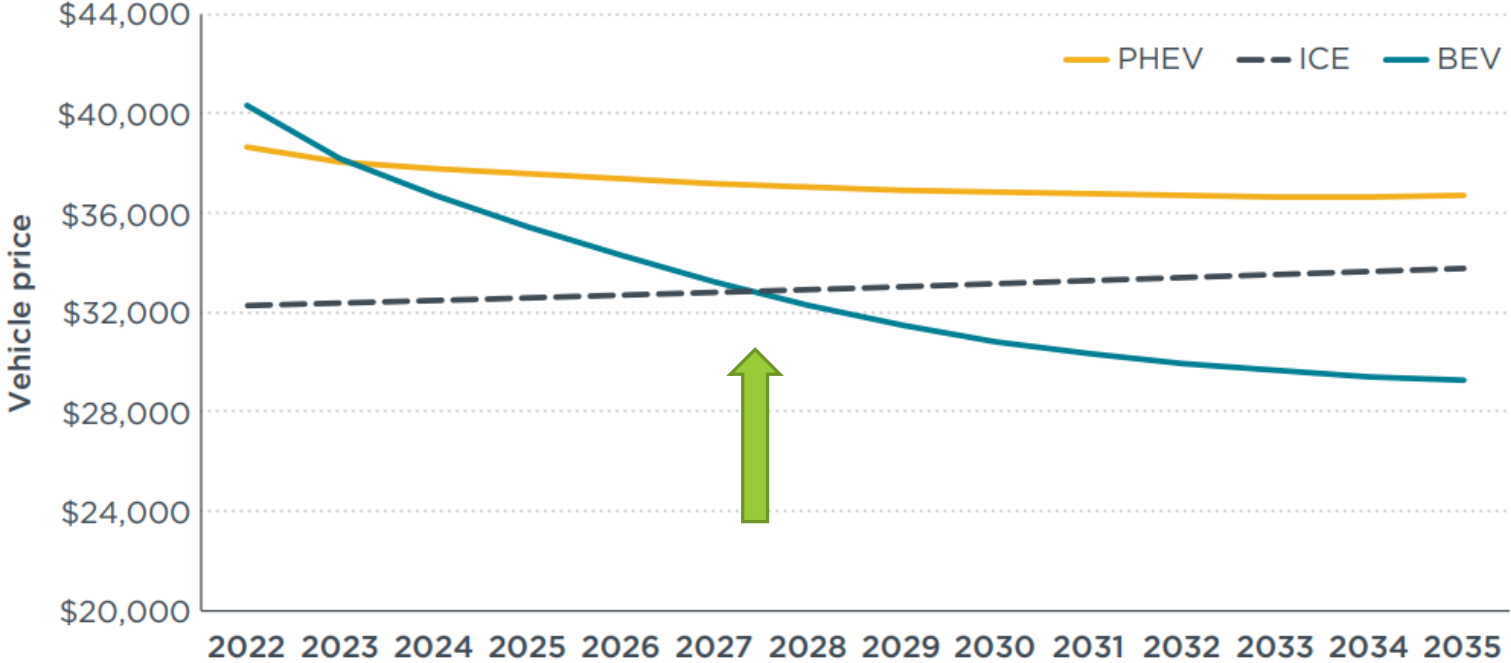
Source: IHS Markit / Polk via Atlas Public Policy's EV Hub



Section 177 ZEV States include: CO, CT, MA, MD, ME, MN, NJ, NM, NV, NY, OR, RI, VA, VT, WA  
Source: IHS Markit / Polk via Atlas Public Policy's EV Hub



# Projected Vehicle Price Parity

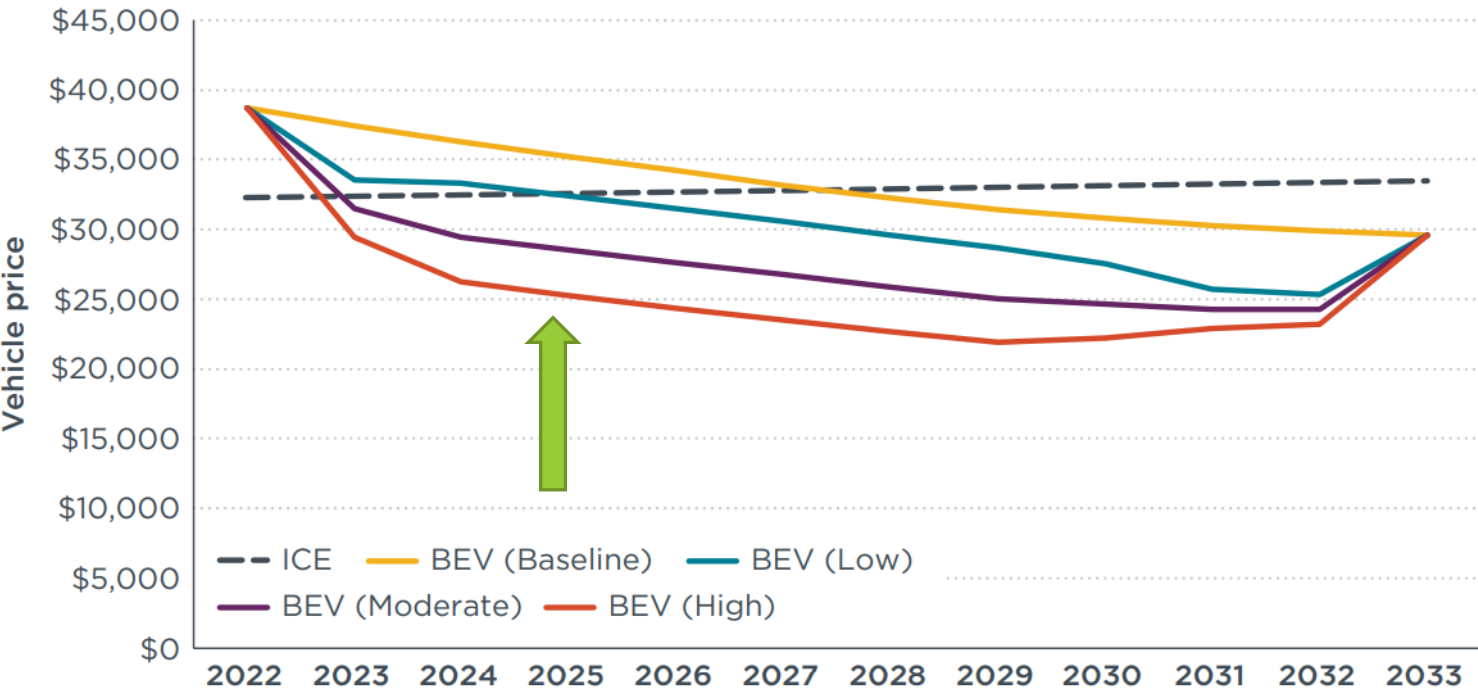


Vehicle Price Parity  
**2027-2028**

Figure 1. Sales-weighted average conventional and electric vehicle prices applied in this analysis

Source: January 2023 [ICCT Report](#)

# Projected Vehicle Price Parity with IRA



Vehicle Price Parity factoring in Inflation Reduction Act tax credits 2023-2025

Figure 4. Sales-weighted average new ICE and BEV prices with IRA incentives and tax credits applied

Source: January 2023 [ICCT Report](#)

# MBUF + Flat fee in Vermont

## Mileage-based User Fee for All-Electric Vehicles (AEVs)

- Create new fee based on annual miles traveled for AEVs as collected at the annual vehicle inspection, with rate to approximate equivalent gas tax (**\$0.013/mile --\$150/yr**)
- Vehicle owners pay on a selected frequency (monthly, annually) to a third-party account manager
- DMV to ensure compliance with MBUF program through existing policies and practices

## Flat Fee for Plug-in Hybrids (PHEVs):

- Use existing “other specialized fuels” language for 1.75 x registration fee for PHEVs
- 1.75 X \$76 annual registration fee (**\$57 additional fee** vs. \$72 estimated in report)

## RUC Study Advisory Committee Survey

| What is your initial reaction to introducing mileage-based user fees for fully electric, plug-in hybrid electric, or other highly fuel-efficient Vermont registered vehicles? | Percent | Count |
|---|---------|-------|
| Very Supportive   | 30%     | 116   |
| Somewhat Supportive   | 30%     | 116   |
| Somewhat Opposed  | 15%     | 58    |
| Very Opposed  | 22%     | 85    |
| No Opinion  | 2%      | 9     |
| Total   | 100%    | 384   |

# MBUF + Flat fee in Vermont

## Mileage-based User Fee for All-Electric Vehicles (AEVs)

- Create new fee based on annual miles traveled for AEVs as collected at the annual vehicle inspection, with rate to approximate equivalent gas tax (**\$0.013/mile --\$150/yr**)
- Vehicle owners pay on a selected frequency (monthly, annually) to a third-party account manager
- DMV to ensure compliance with MBUF program through existing policies and practices

## Flat Fee for Plug-in Hybrids (PHEVs):

- Use existing “other specialized fuels” language for 1.75 x registration fee for PHEVs
- 1.75 X \$76 annual registration fee (**\$57 additional fee** vs. \$72 estimated in report)

## RUC Study Advisory Committee Survey

Table 6. EV Purchase Likelihood with Road Usage Fees

| If mileage-based fees or flat fees are implemented in the state of Vermont for electric vehicles and highly efficient fuel vehicles, how likely are you to purchase an electric vehicle in the next few years? | Percent | Count |
|--|---------|-------|
| More likely  | 6%      | 8     |
| About the same   | 78%     | 109   |
| Less likely  | 16%     | 22    |
| Total  | 100%    | 139   |



# Mileage-based User Fee vs. Cost of Ownership

## Estimated annual savings

The annual cost comparison shown below is based on the above cost and efficiency information combined with estimated annual vehicle use of 12,000 miles per year.

**Gasoline Vehicle: \$1,795 a year**



**Electric Vehicle: \$830 a year**



## EV savings over 5 years

Savings add up! The following cost and savings estimates are based on the information provided above multiplied over 5 years. Think of all the things you could do with potential savings like this!

**Gasoline Vehicle: \$8,975 over 5 years**



**Electric Vehicle: \$4,148 over 5 years**



**\$965**

Switch to electric and save big on fuel. Estimated annual savings.

**\$4,827**

Switch to an EV and your 5 year savings could look like this.

## Estimated Annual MBUF payment

**\$156**

**(\$97)**

federal taxes avoided

Fees designed to achieve parity with *state* gas tax for fossil-fueled vehicles –i.e. no net-costs or savings

**\$780**

**(\$485)**

federal taxes avoided

# Mileage-Based User Fee for Battery-Electric Vehicles

---

The MBUF rate is intended to be revenue-neutral relative to the gas tax, and is calculated as the state gas tax rate divided by the combined average miles per gallon (MPG) per light-duty vehicle in Vermont:

$$\mathbf{\$0.30 \text{ per gallon} / 22.7 \text{ miles per gallon} = \$0.013 \text{ per mile}}$$

This is an approximation and not necessarily the proposed rate.

$$\mathbf{\$0.184 / 22.7 = \$0.008 \text{ per mile avoided in federal taxes}}$$

# Flat Fee for Plug-In Hybrid Electric Vehicles

---

**\$76 registration fee x .75 = \$57 annually**

25% Electric miles: Total road usage charge = \$117 gas tax + \$57 flat fee = **\$174** (\$24 federal tax avoided)

50% Electric miles: Total road usage charge = \$78 gas tax + \$57 flat fee = **\$135** (\$48 federal tax avoided)

75% Electric miles: Total road usage charge = \$39 gas tax + \$57 flat fee = **\$96** (\$72 federal tax avoided)

Based on 12,000 mile average

# Equity Impacts of Road Usage Charges

University of Vermont Transportation Research Center study investigated the geographic and demographic impacts of move to a mileage-based user fee (MBUF):

- Most Vermont households would see minimal difference from gas tax burden to mileage-based user fee
- Rural and lower-income households would be least impacted, while urban and higher-income households would see greater increases
- MBUF would be more progressive than gas tax, and much more so than a high flat fee, supporting the findings of prior studies but with a much more robust data set

[A Data Driven Analysis of Rural Equity and Cost Concerns for Mileage-Based User Fees in Vermont \(uvm.edu\)](https://scholarworks.uvm.edu/trc) (2022)

University of Vermont  
UVM ScholarWorks

University of Vermont Transportation Research Center      Research Centers and Institutes

2022

**A Data Driven Analysis of Rural Equity and Cost Concerns for Mileage-Based User Fees in Vermont**

Clare Nelson  
The University of Vermont, clare.nelson@uvm.edu

Gregory Rowangould  
The University of Vermont, gregory.rowangould@uvm.edu

Follow this and additional works at: <https://scholarworks.uvm.edu/trc>

Part of the [Transportation Commons](#), and the [Transportation Engineering Commons](#)

**Recommended Citation**

Nelson, Clare and Rowangould, Gregory, "A Data Driven Analysis of Rural Equity and Cost Concerns for Mileage-Based User Fees in Vermont" (2022). *University of Vermont Transportation Research Center*. 274. <https://scholarworks.uvm.edu/trc/274>

This Article is brought to you for free and open access by the Research Centers and Institutes at UVM ScholarWorks. It has been accepted for inclusion in University of Vermont Transportation Research Center by an authorized administrator of UVM ScholarWorks. For more information, please contact [schw@uvm.edu](mailto:schw@uvm.edu).

# The Road Ahead

---

The MBUF Assessment is evaluating how Vermont can build a cost-effective system. AOT is considering:

- Implementation and long-term operational/staffing costs
- System design and processes
- Rate-setting, rulemaking elements
- Transition timeline
- Federal grant application to US DOT



# Strategic Innovation for Revenue Collection (SRIC)

---

Authorized by IJA:

To test the design, acceptance, equity, and implementation of user-based alternative revenue mechanisms, including among—

- (i) differing income groups; and
- (ii) rural and urban drivers, as applicable.

FEDERAL SHARE.—The Federal share of the cost of a pilot project carried out under this section may not exceed **80 percent** of the total cost of a project carried out by an eligible entity that has not otherwise received a grant

Current Project Implementation Cost Estimate: \$3.5 million



# Project & Federal Grant Timeline



\*USDOT announcement of Federal SIRC grantees varies from cycle to cycle. January 2024 may be an optimistic date

# Contact

---

**Wanda Minoli**

Commissioner  
Department of Motor Vehicles  
*Vermont Agency of Transportation*

[Wanda.Minoli@vermont.gov](mailto:Wanda.Minoli@vermont.gov)

**Mike Smith**

Deputy Commissioner  
Department of Motor Vehicles  
*Vermont Agency of Transportation*

[Michael.Smith@vermont.gov](mailto:Michael.Smith@vermont.gov)

**Michele Boomhower**

Division Director  
Policy, Planning & Intermodal Development Division  
*Vermont Agency of Transportation*

[Michele.Boomhower@vermont.gov](mailto:Michele.Boomhower@vermont.gov)

**Patrick Ó. Murphy**

Sustainability & Innovations Project Manager  
Policy, Planning & Intermodal Development Division  
*Vermont Agency of Transportation*

[Patrick.Murphy@vermont.gov](mailto:Patrick.Murphy@vermont.gov)