Replace Your Ride

Tackling transportation poverty and accelerating emissions reduction

Presentation to Senate Transportation Committee
Linda McGinnis, Economist and Co-Chair RYR Steering Committee
April 1, 2021

Replace Your Ride Actions to date

Jan-Oct 2020	**Research - Transportation Equity/Emissions**: Core team of researchers & experts reviewed successful policies in other states
Oct 2020	**Policy Pitch - EAN 2020 Summit** (like 'Shark Tank, only nicer) Theme: Transportation & Thermal Equity RYR selected among top 4
Nov 2020	**Established Steering Committee and Advisory Group** Meets bi-weekly, and includes transportation experts from private sector, administration, research and non-profit
Nov-Jan 2021	**Developed detailed proposal**: modeled off of successful CA programs, and tailored to VT needs (in consultation with Administration)
Jan-Mar 2021	**Legislative/Administration Support:** RYR included in both House T-Bill and Administration Budget ($1.5m)
April 2021	**Presentation to Senate**

Steering Committee

- Co-Chairs: Linda McGinnis, **EAN** & Peggy O'Neill-Vivanco, **VT Clean Cities/UVM Transportation Research Center**
- Dave Roberts, **VEIC/Drive Electric Vermont**
- Marilyn Miller, **Vt Auto Dealers Association**
- Nancy Seidman, **Regulatory Assistance Project**
- Dana Rowangould, **UVM Transportation Research Center**

Public Partners

- **Agency of Transportation**: Michele Boomhower, Dan Dutcher
- **Agency of Natural Resources**: Heidi Hales
- **State Legislators**: House and Senate Transportation Committees
- **Senator Leahy's office**: Tom Berry
- **Senator Sanders' office:** Haley Pero, Katie Thomas

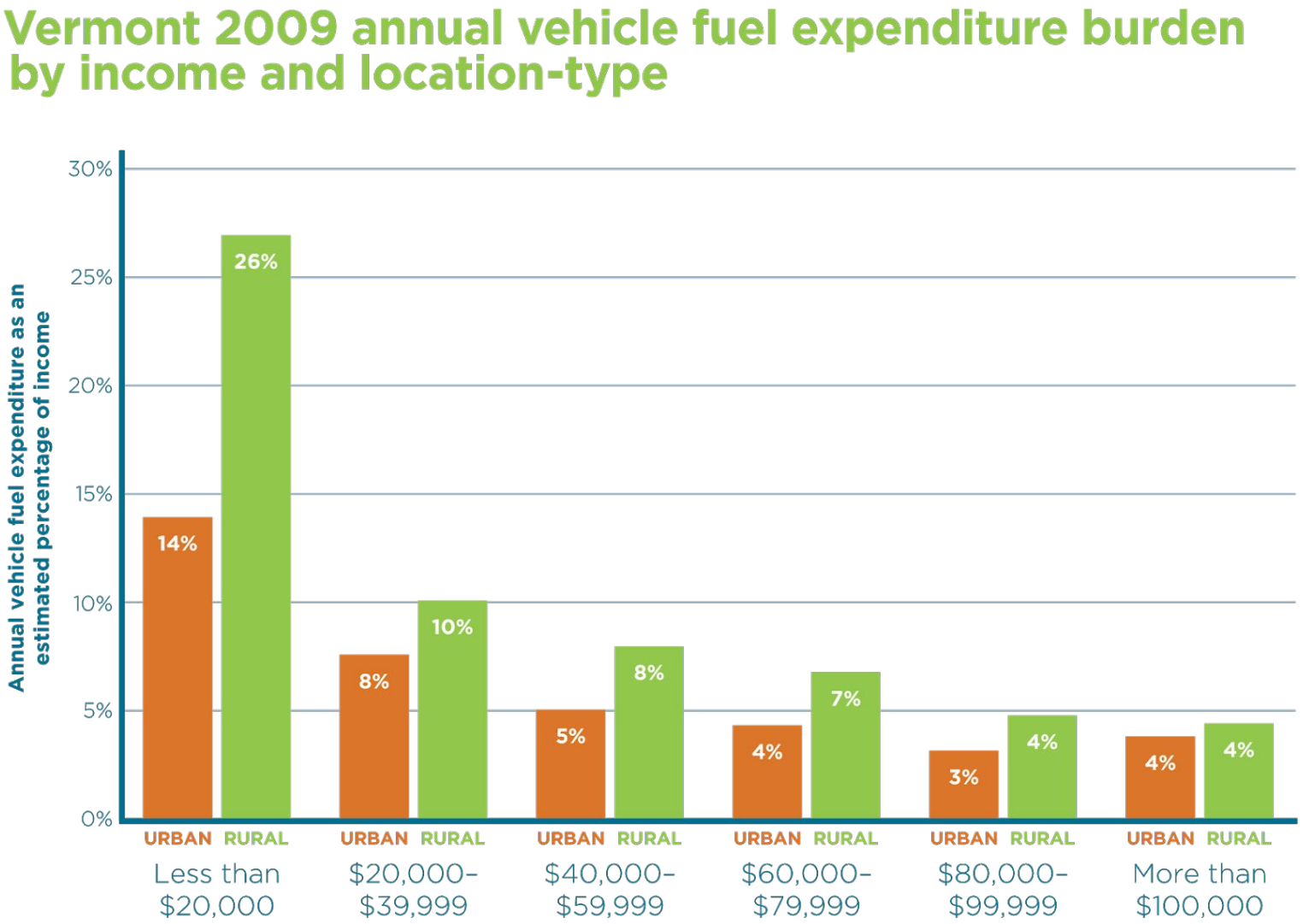
Advisory Group

- **Capstone Community Development**: Sue Minter, Paul Zabriskie
- **VEIC/Efficiency Vermont**: Carole Weston, Kelly Lucci, Hillary Andrews, Jennifer Wallace-Brodeur
- **Utilities:** GMP, BED, VPPSA, VEC, Stowe, WEC
- **Vt Public Transit Authority**: Elaine Haytko
- **CATMA:** Sandy Thibault
- **LocalMotion**: Karen Yacos & Sandy Bender
- **Old Spokes Home:** Laura Jacoby,
- **VBSR**: Jordan Giaconia
- **Sierra Club**: Robb Kidd
- **VNRC & Transportation 4 VT:** Johanna Miller, Kate McCarthy
- **CarShareVT:** Annie Bourdon
- **TNC:** Lauren Oates
- **Cody Chevrolet:** Bob Cody
- **Used Car Dealership:** Jane Lowery
- **Community Action Programs and OEOs:** Steve Gellar, President and all Directors
- **Vital Communities**: Bethany Fleishman
- **Energy Action Network**: Jared Duval, Cara Robechek, Mei Butler
- **Center for Sustainable Energy - CA Clean Transportation:** Jonathan Changus, Karen Glitman

Tackling Transportation Poverty

Poorest VTers spend up to 27% income on gas/diesel

Getting to essential jobs, school, services can make or break a monthly budget



Gas/diesel prices are higher, more volatile than electricity

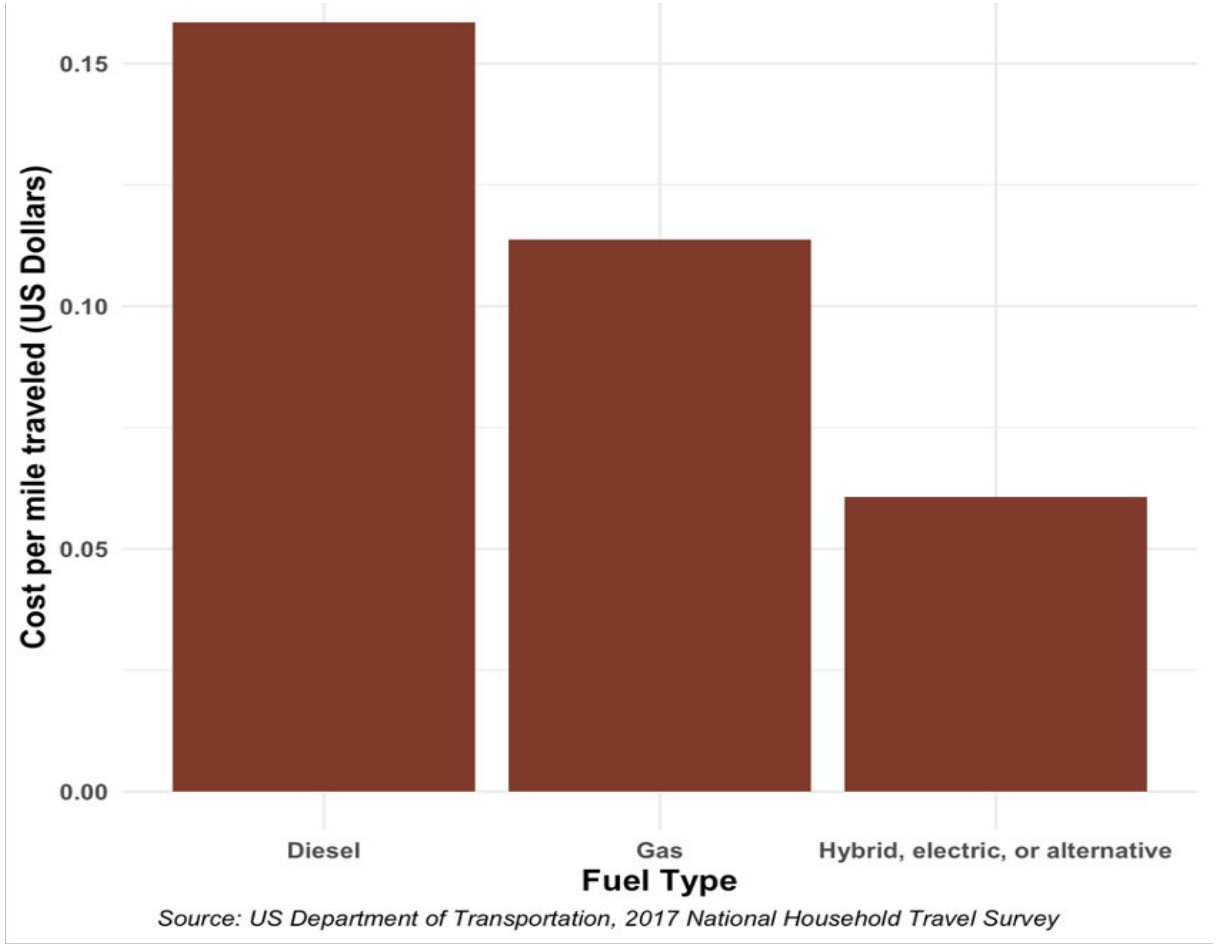
Putting poor households at greater risk.

Filling up an EV ‘tank’ is much less expensive, and prices more predictable than filling up a gas tank

1. Fuel prices (gasoline and diesel) from the Vermont Agency of Transportation (VTrans) and Drive Electric Vermont. **2.** Electric charging costs (gallon equivalent) calculated by Drive Electric VT, based on EIA data on average Vermont residential electric rates and the average efficiency of light-duty electric and gasoline vehicles.

EVs less expensive to drive each month each mile

Average Cost/Mile Travelled by Fuel Type



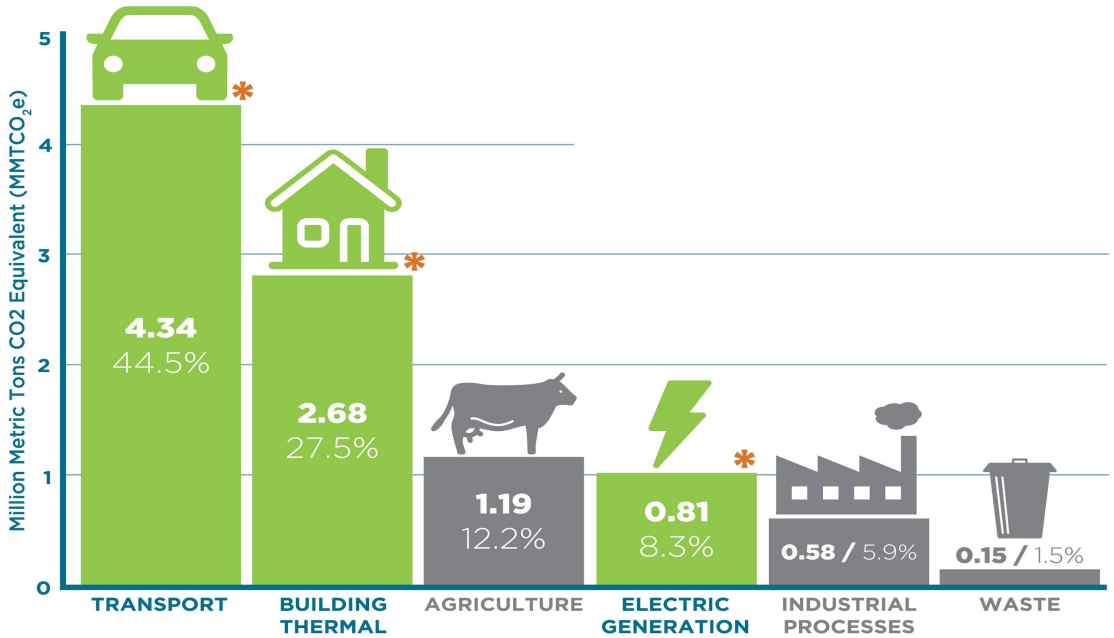
A 2020 study by the Union of Concerned Scientists found that **rural drivers stand to save the most from EVs, and that the average rural Vermont driver stands to save about $1,900/year from driving an EV**.

Accelerating Transportation Emissions Reduction

45% of Vermont total emissions (and GROWING)

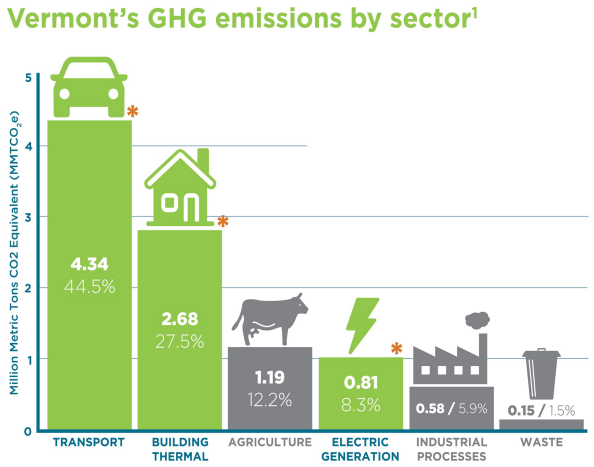
On-road gas = 74% of total transportation emissions

Vermont's GHG emissions by sector[1]



>1/3 of VT cars are older than 2010

The older the car, the higher the pollution

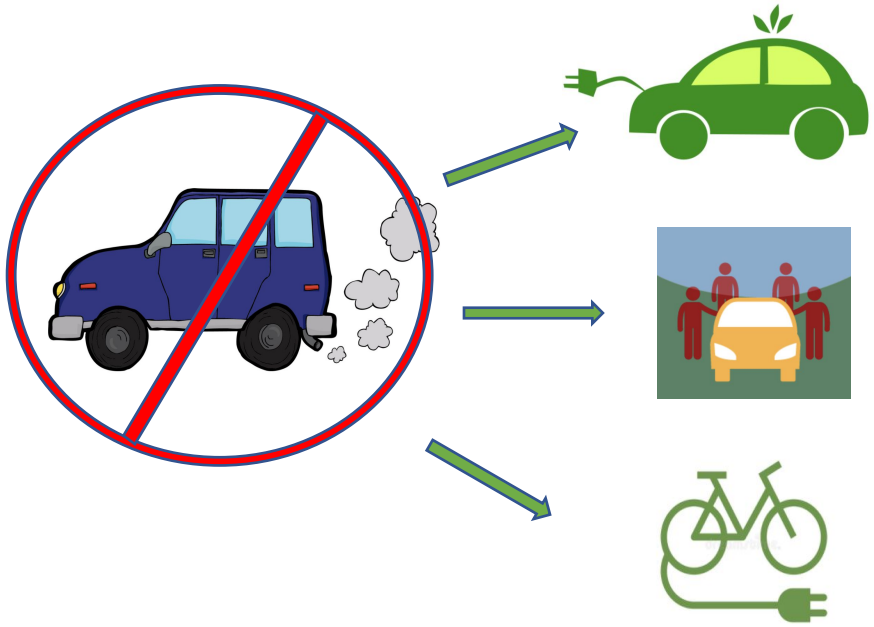


How can we address both challenges?

Replace Your Ride

Up to $3000 incentive for lower-income Vermonters to:

- ➔ **Scrap** older high-maintenance high-polluting vehicle (10 yrs +)
- ➔ **Replace** with new/used clean transportation or shared-mobility options
- ➔ **Stack** on top of existing incentives (e.g., MileageSmart and State Incentive)



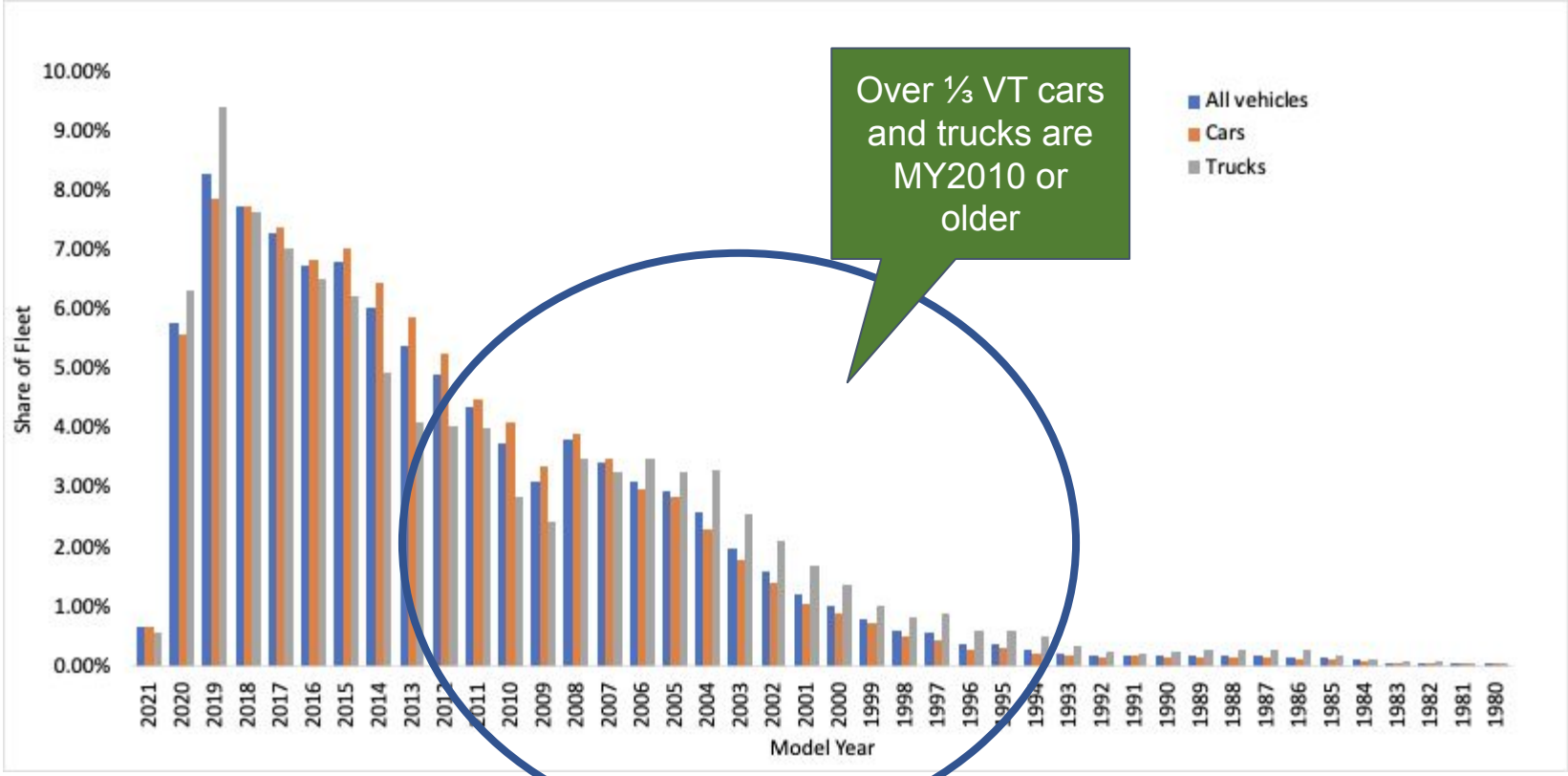
Removing older vehicle accelerates GHG emissions impact

What?

Replace Gas/Diesel powered cars 10 years or older

(higher maintenance/higher GHG emissions)

Registered Vehicles in Vermont (as of Dec 2020)



Source: DMV data, Dec 2020

Note that the car/truck classification is based on the DMV/NHTSA vehicle typology. Trucks include everything from pickups and cargo vans to tractor trucks for freight. The car category includes everything that is not considered a truck. This includes larger SUV/multipurpose passenger vehicles like the Chevrolet Tahoe, GMC Yukon, and the Toyota RAV4.

The older the car, the higher the maintenance costs and GHG emissions

Who?

Targeted Population = Lower-Income Vermonters

Number of Vermont Tax Filers by AGI Categories (2019)

Filing Status/AGI	< $25,000	$25,000 -$49,999	$50,000 -$74,999	$75,000 -$99,999	$100,000 -$124,999	≥125,000
Single	77,622	55,100	23,500	7,847	3,143	4,590
Head of Household	6,254	11,338	4,719	1,691	682	841
Widower/ Surviving Spouse*	xxx	xxx	xxx	xxx	xxx	xxx
Married Filing Jointly	13,088	15,286	19,297	21,195	16,979	32,754
Married Filing Separately	1,564	2,593	1,422	506	209	313

*Information not available

Eligible Vermonters - Lowest Income categories (Total: 249,813 or 57%)

Note: If a person qualifies under the MileageSmart program, they automatically qualify for RYR

How?

Ability to Choose

EV or PHEV

SHARED MOBILITY

Bicycles, E-Bikes, E-motorcycles

Keep it Simple

Build on what works

- Same eligibility requirements
- Same application forms
- Same administration

Used EVs

New EVs

mileagesmart

State Incentives

+ $3000

Stacked incentives put real $$ in the pockets of low-income Vermonters

New EV purchase

- Replace Your Ride ($3,000)
- Utility Incentives (vary $500 - $2,500)
- State Incentives (up to $4,000)
- Federal Incentives (up to $7,500)

TOTAL Incentives: up to $17,000

Used EV purchase

- Replace Your Ride ($3,000)
- Utility Incentives (vary $0 - $1,750)
- MileageSmart (25% of vehicle cost up to $5,000)

TOTAL Incentives: up to $10,000

Ongoing savings on fuel and maintenance expenses

New EV Price with Incentives

Most Popular 2020

Nissan Leaf
Chevy Bolt

New Car Comparison

	Nissan LEAF		Nissan Sentra
	Standard Incentive	<$50,000 AGI	
Starting Price	$31,600	$31,600	$19,310
OEM Incentive	- $6,000	- $6,000	-
State Incentive	- $2,500	-$4,000	
Utility Incentive (varies)	- $1,500	-$2,500	-
Current Price After Incentives	$21,600	$19,100	-
Replace Your Ride	-	-$3000	-
Price After RYR	$21,600	$16,100	$19,310
Federal Tax Incentives*	up to -$7,500	up to -$7,500	-
Lowest Possible Price w/ Federal Tax Incentives*	$11,100	$8,600	$19,310

*Federal Incentives are currently tax-based, and do not carry over into more than one tax year. The incentive can be passed through into lease agreements, allowing purchasers without the taxable income to benefit from the lower lease price.

PLUS annual operations & maintenance savings of $500 to $1,500

Used EV Price with Incentives

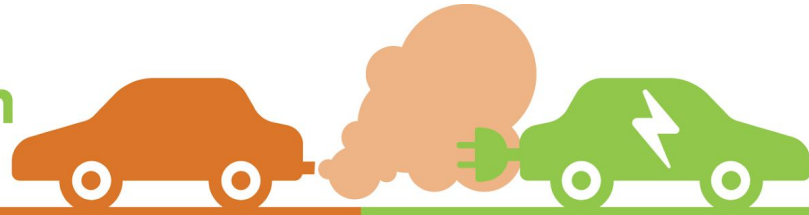
Used Car Comparison

	Nissan LEAF (2017) 107 range	Chevy Bolt (2017) 238 range	Nissan Sentra (2017)
Starting Price	$11,000	$17,000	$15,000
Mileage Smart	- $2,750	-$4,250	-
Utility Incentive (varies)	- $1,500	-$1,500	-
Current Price After Incentives	$6,750	$11,250	-
Replace Your Ride	-$3,000	-$3,000	-
Price After RYR	$3,750	$8,250	$15,000

PLUS annual operations & maintenance savings of $500 to $1,500

Low O&M Saves $10,000 over life of vehicle

Gas vs. EV cost comparison over 150,000 miles[1]



	GAS VEHICLE	ELECTRIC VEHICLE
Fuel	$17,585	$9,164
Oil Changes & Filter Replacement	$900	None
Tire Changes	$600	$600
Engine Air Filter Replacements	$207	None
Cabin Air Filter Replacements	$273	$273
Spark Plug Replacements	$439	None
Coolant Flush and Replacement	$110	$110
Total	$20,114	$10,147

1. American Automobile Association. 2018. Your Driving Costs.

National Seachange in 2021

➔ Manufacturers/Dealers on board

- **Manufacturing ramping up - Currently 40 models from 20 manufacturers**
- **GM, Volvo, and others phasing out Gas vehicles by 2035, (GM 30 new models by 2025)**
- **Prices dropping (now from as low as $21K Cooper SE, M3 Tesla at $35K)**
- **AWD and SUVs now available, Trucks on market 2021 (4 models)**
- **Battery Prices dropped 90% over past decade**

➔ Federal Administration Shift

- **Focus on vehicle electrification, expanding charging and public transit**
- **Restore Full EV tax credit**
- **500,000 *new* charging stations by 2030**
- **New stricter fuel economy standards**
- **Possible new Federal Replace Your Ride (listen to NPR Story)**

➔ State Level

- **Massive investment in charging stations (VT is highest per capita!)**
- **Widespread EV/PHEV incentives**
- **CA all new passenger vehicle sales must be zero emissions by 2035**

"Climate Change is real, and we want to be part of the solution by putting everyone in an electric vehicle."

- Mary Barra, GM Chair and CEO (Jan 2021)

Proposed Vermont RYR Step-by-Step Guide

Step 1: Eligibility

- Check if you meet income and vehicle eligibility requirements

Step 2: Apply

- Complete online application with supporting documents

Step 3: Review

- Case manager reviews application
- If eligible, case manager sends pre-approval

Step 4: Select

- Applicant selects replacement vehicle
- Dealer submits sales contract for voucher approval/payment

Step 5: Scrap

- Dealer contacts scrapper for pickup

*Modeled off of CA Replace Your Ride Program, adapted to Vermont

Impact: Democratize the Benefits of Clean Transportation

Affordability	Reduce both vehicle purchase costs and monthly transportation costs for low-income Vermonters
Access	Increase mobility and access to services
Predictability	Eliminate volatility of gas prices for vulnerable
Economy	Keep more $ local with renewable electric power for vehicles. New opportunities for Auto Dealers, shared mobility services, bike dealers
Health	Improve air quality for vulnerable
Emissions	Accelerate emissions reductions by both removing older vehicles permanently and replacing with low/no emissions vehicles

Takeaways Why RYR?

1. **Makes switching to clean transportation much more affordable for low-income Vermonters**
2. Reduces monthly fuel and operations costs
3. **Stackable** on existing State and MileageSmart incentives
4. Targets lower-income only
5. **Options:** Gives Low income Vermonters a choice among cleanest transportation options
6. **Administratively seamless:** RYR could use either income eligibility method (AGI or weatherization), depending on implementing program
7. Accelerates transportation GHG reduction by **scrapping** older high-polluting, high-maintenance vehicles

T-Bill

Two Minor modifications from House T-Bill Language

- Sec. 16 (p. 3, ln. 19 to p. 6, ln. 10): Proposed policy change to allow one incentive under the Replace Your Ride Program per individual and not per individual or married couple.

- Sec. 16 (p. 6, lns. 18 and 19): Proposed policy change to have an eligible swap under the Replace Your Ride Program also cover the purchasing of necessary safety equipment to go along with a new or used bicycle, including a bicycle that is fully electric, or a motorcycle that is fully electric.

Thank You!

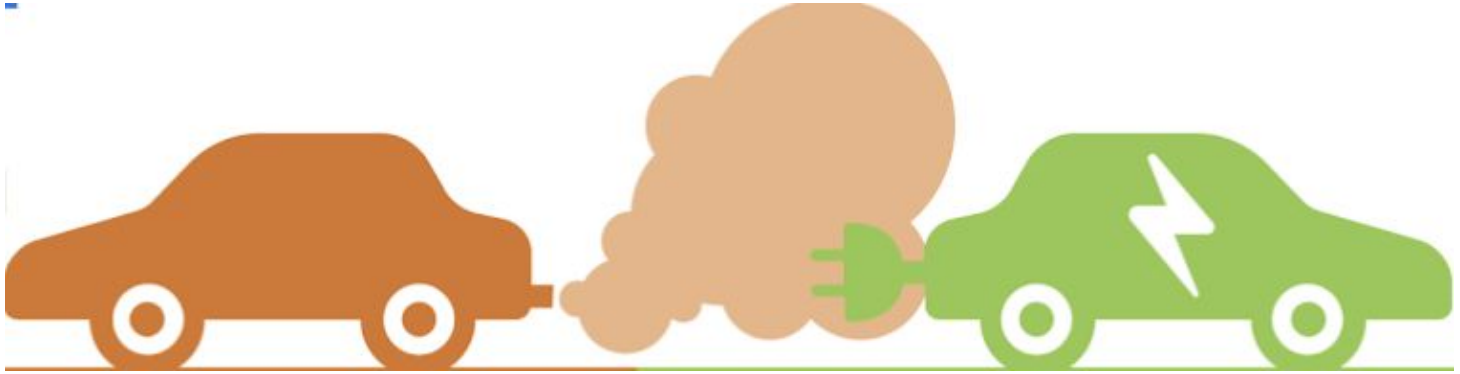
Linda McGinnis (lindamcginnis0@gmail.com)

Additional Slides

Vermont All-Electric Vehicle / Plug-in Hybrid EV Incentives Comparison

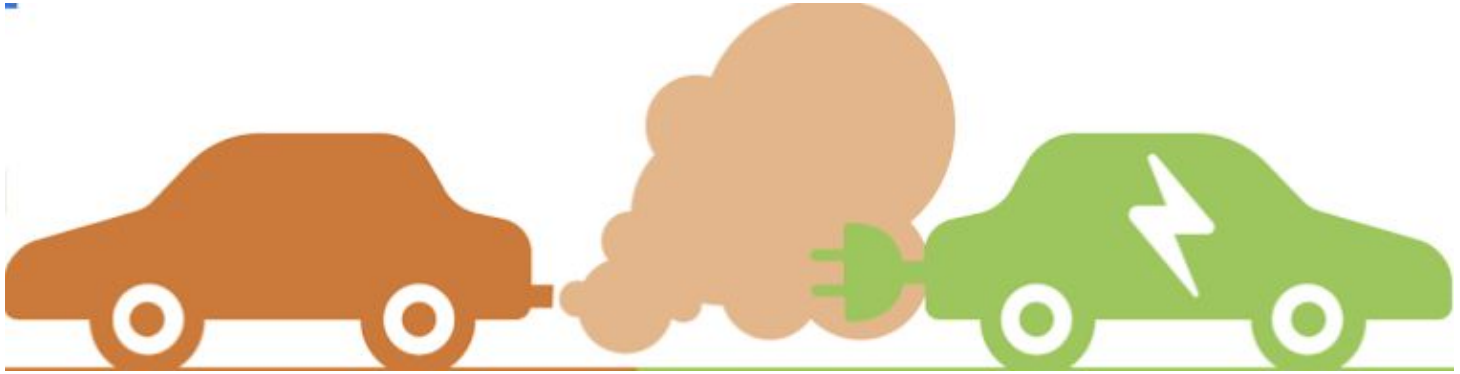
	Beneficiary	Incentive Amount	Targeting	Eligible Actions	Tax Based or Cash	GHG Impact
Proposed Replace Your Ride	Low-Income	$3,000 for PHEV/AEV Stacked on other incentives with scrappage of higher polluting vehicle	<$50,000 AGI (for single) <$75,000 AGI for Married filing jointly	New or Used AEV/PHEV -or- Other clean transportation option	Cash Voucher	**Highest** (EV/Clean option plus permanent removal of high GHG vehicle)
State Incentives	Low-Income Moderate Income	$3,000 for PHEV $4,000 for EV $1,500 for PHEV $2,500 for EV	Low income: <$50,000 AGI ***proposed add:*** <$75,000 AGI for Married filing jointly	New ONLY AEV/PHEV Base price under $40,000	Cash Voucher/ Rebate	**High** (New EV)
MileageSmart	Low-Income	25% of purchase price up to $5,000	Weatherization eligible households	Used Only AEV/PHEV -or- High MPG	Cash Voucher	**Medium** (Used higher MPG vehicle, PHEV or AEV)

Comparing Tailpipe Emissions EV Vs. Older Cars



Estimated U.S. Average Vehicle Emissions Rates per Vehicle by Vehicle Type using Gasoline and Diesel (Grams per mile)					
	2005	2010	2015	2018	Electric
Gasoline - Light duty					
Total HC	1.020	0.786	0.499	0.350	0.0
Exhaust CO	9.759	7.121	4.898	3.941	0.0
Exhaust NOx	1.079	0.901	0.518	0.289	0.0
Exhaust PM2.5	0.023	0.017	0.011	0.008	0.0
Brakewear PM2.5	0.003	0.003	0.003	0.003	0.003
Tirewear PM 2.5	0.001	0.001	0.001	0.001	0.001
Diesel - Light duty					
Total HC	1.915	0.939	0.232	0.183	0.0
Exhaust CO	28.016	13.604	3.205	2.663	0.0
Exhaust NOx	1.691	1.008	0.248	0.153	0.0
Exhaust PM2.5	0.052	0.023	0.005	0.004	0.0
Brakewear PM2.5	0.003	0.003	0.003	0.003	0.003
Tirewear PM 2.5	0.001	0.001	0.001	0.001	0.001

Comparing Life-Cycle Emissions EV Vs. Gas



Cradle to grave (incl manufacturing), EVs are cleaner

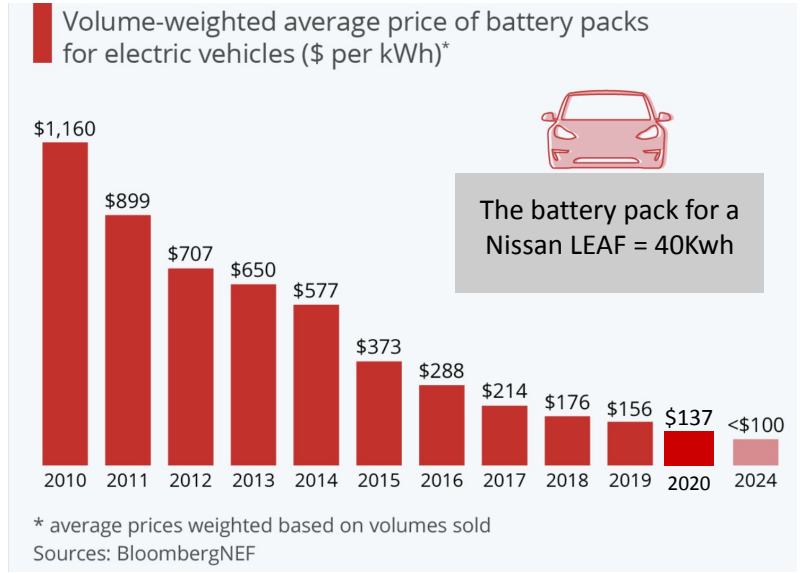
- EVs produce <50% the GHG emissions on average of comparable gas-powered vehicles ***in a full life-cycle analysis***
- Excess manufacturing emissions (appx 15%) are offset within 6 to 16 months of average driving*
- Increasingly, manufacturers are moving to recycle batteries

*Based on modeling of the two most popular BEVs available today and the regions where they are currently being sold

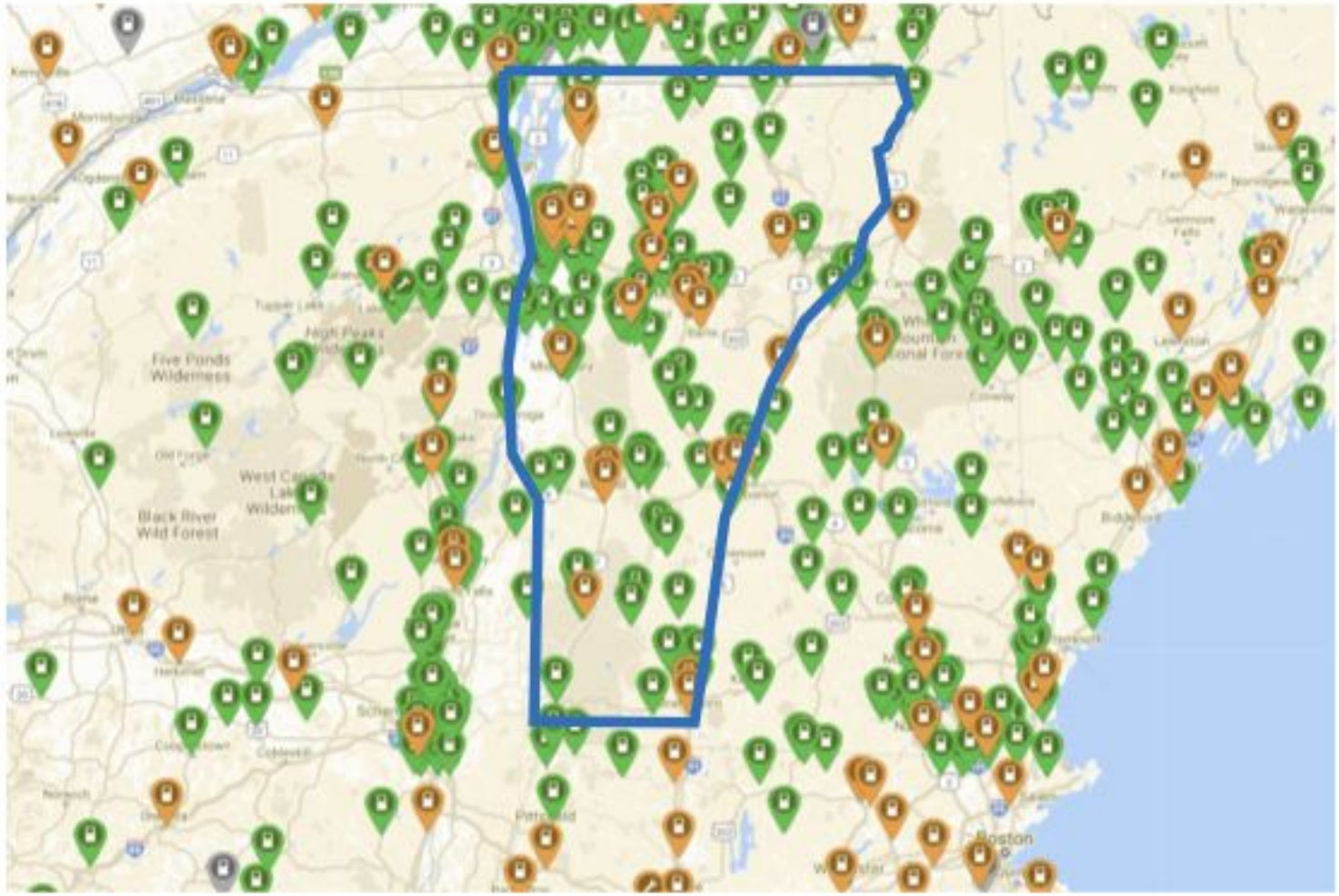
Source: Union of Concerned Scientists (2015), *Cleaner Cars from Cradle to Grave: How Electric Cars Beat Gasoline Powered Cars on Lifetime Global Warming Emissions*

What about batteries?

- **EV Battery Warranty = 8 yrs/100,000 miles**
  - Most used EVs are <3 yrs old, so batteries would still be under warranty
  - EVs sold in U.S.: 2011-2018 = 750,000; 2018-2020 = 980,000
- **EV Battery Lifespan = 200,000 miles**
  - Consumer Report estimates. Equivalent to 17 years of use if driven 12,000 miles/year
- **Cold Climates = Longer Battery Life**
  - Cars that are located in hotter climates will typically experience a faster battery degradation.
- **EVs have far fewer moving parts needing replacement than Gas/Diesel cars**
  - Gas/diesel cars have over 24 components that do not exist on an EV
  - Replacing a transmission can cost between $4,000 and $8,000 (same as battery)
- **EV Battery Price Drop 90% over the past decade**
  - From $1,160 in 2010 to $137/kwh in 2020
  - A Nissan LEAF has a 40 kWh battery



Public EV Charging Availability



PlugShare.com

- 290 public charging locations in Vermont
- 29 with DC fast charging available (orange points)
- Vermont has the highest per capita charging availability in the USA

https://www.energy.gov/eere/vehicles/articles/fotw-1169-january-18-2021-vermont-had-highest-number-public-electric-vehicle

Anticipated EV Charging Investments

State of Vermont

- $2 million contract with Blink / UGo finalized
  - 11 additional locations (green points on map)
  - Two fast chargers and level 2 at each location
- State preparing RFP for another $750,000 for additional fast charging
- Potential $1 million for multifamily EV charging pilot in current T-Bill

Utility incentive programs available

Federal

- Existing tax credit for EV charging
- Potential infrastructure bill support for 500,000 additional chargers

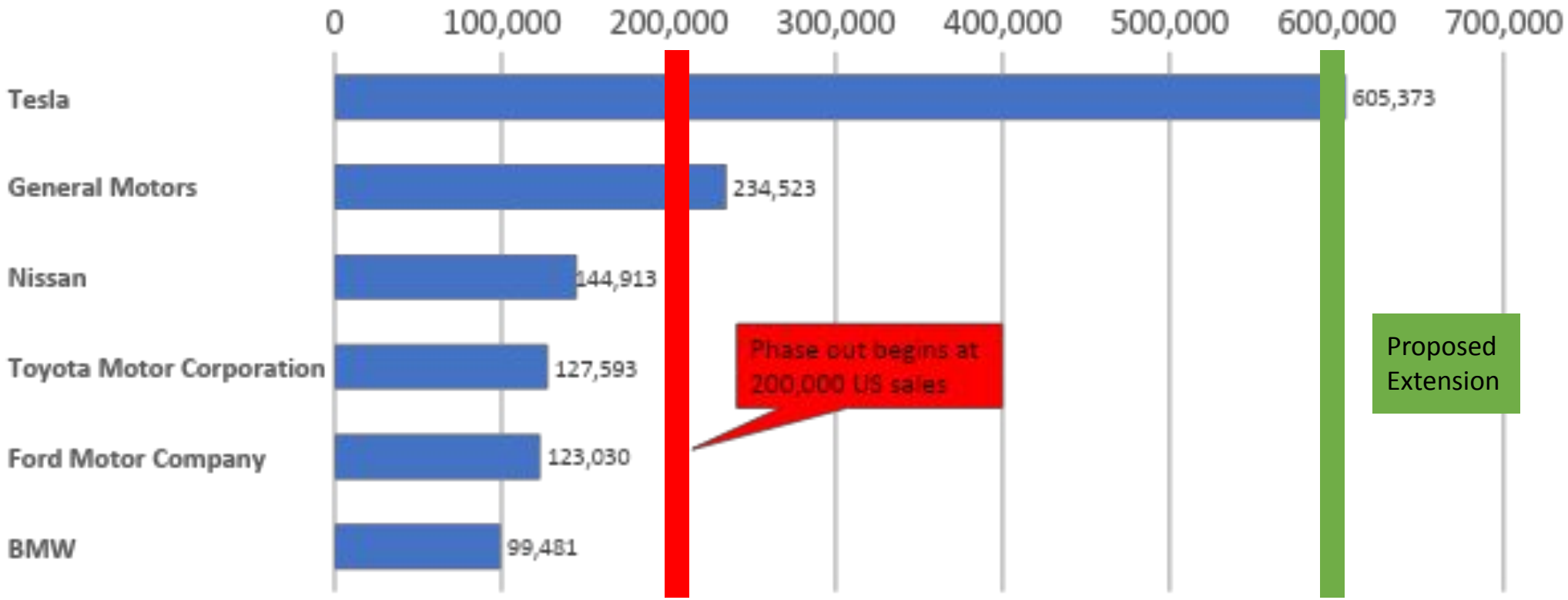
https://accd.vermont.gov/community-development/funding-incentives/electric-vehicle-supply-equipment-evse-grant-program
https://www.driveelectricvt.com/for-businesses

New EV Purchase Incentives - Federal

Federal Tax Credit

- Available for *new* EV purchases starting in 2010
- Up to $7,500, based on battery size
- Begins to sunset when manufacturer reaches 200,000 EV sales
  - No longer available for Tesla and General Motors EVs (they hit limit in 2019)
  - Biden Administration proposing to extend it to 600,000
- Claim on income taxes (unless leasing)
  - If leasing, then the tax credit is claimed by the leasing company as they technically own the vehicle. The leasing entity will usually pass through the value of the tax credit as a lease incentive.
- Tax credit also available for charging equipment installation

US EV Sales by Automaker – Through June 2020



https://evadoption.com/ev-sales/federal-ev-tax-credit-phase-out-tracker-by-automaker/

Proposed Federal GREEN Act EV Tax Credit

Growing Renewable Energy and Efficiency Now (GREEN) Act

- EV tax credit for new EVs extended to 600,000 per automaker
  - Not retroactive for Tesla or GM purchases made prior to enactment
  - Would reduce the amount of the tax credit by $500 for automakers going over 200,000 US sales
- Adds a used EV tax credit
  - Half the value of the new EV credit (up to $3,750)
  - Only available for lower income filers (up to $45k AGI single; $75k AGI joint)

https://www.congress.gov/bill/117th-congress/house-bill/848/

Help Vermont Meet Transportation Climate Goals

VT State Incentives

(2020)

Nearly Half of Participants are Low-Income

Model	Low Income		Moderate		TOTAL	
	Count	Funds	Count	Funds	Count	Funds
Chevrolet Bolt	25	$ 109,000	49	$ 122,500	74	$ 231,500
Nissan LEAF	27	$ 126,000	25	$ 62,500	52	$ 188,500
Volkswagen e-Golf	24	$ 118,000	2	$ 5,000	26	$ 123,000
Toyota Prius Prime	23	$ 82,000	26	$ 39,000	49	$ 121,000
Nissan LEAF Plus	16	$ 75,000	16	$ 40,000	32	$ 115,000
Tesla Model 3	15	$ 69,000	6	$ 15,000	21	$ 84,000
Hyundai Kona EV	5	$ 24,000	14	$ 35,000	19	$ 59,000
Hyundai Ioniq PHEV	13	$ 49,000	6	$ 9,000	19	$ 58,000
Ford Fusion Energi	8	$ 30,000	8	$ 12,000	16	$ 42,000
Subaru Crosstrek Hybrid	7	$ 26,000	5	$ 7,500	12	$ 33,500
Toyota RAV4 Prime	2	$ 6,000	11	$ 16,500	13	$ 22,500
Hyundai Ioniq EV	4	$ 16,000	1	$ 2,500	5	$ 18,500
Kia Niro Electric	2	$ 8,000	4	$ 10,000	6	$ 18,000
Mitsubishi Outlander PHEV	3	$ 9,000	4	$ 6,000	7	$ 15,000
Kia Niro PHEV	1	$ 3,000	2	$ 3,000	3	$ 6,000
Hyundai Sonata PHEV	1	$ 4,000	1	$ 1,500	2	$ 5,500
Chevrolet Volt	1	$ 4,000	0	$ -	1	$ 4,000
Chrysler Pacifica Hybrid	0	$ -	1	$ 1,500	1	$ 1,500
Pending Preapprovals	*11*	*$ 38,000*	*25*	*$ 54,500*	*36*	*$ 92,500*
Grand Total	**188**	**$ 796,000**	**206**	**$ 443,000**	**394**	**$1,239,000**