Driving Electric

The Basics

SEPTEMBER 19, 2023

Drive Electric Vermont

Poll Question

What is your experience with plug-in electric vehicles?

1. No experience
2. Been for a ride or drive in one
3. Own one

About Drive Electric Vermont

- Drive Electric Vermont is a public-private partnership established in 2012 by VEIC and the State of Vermont

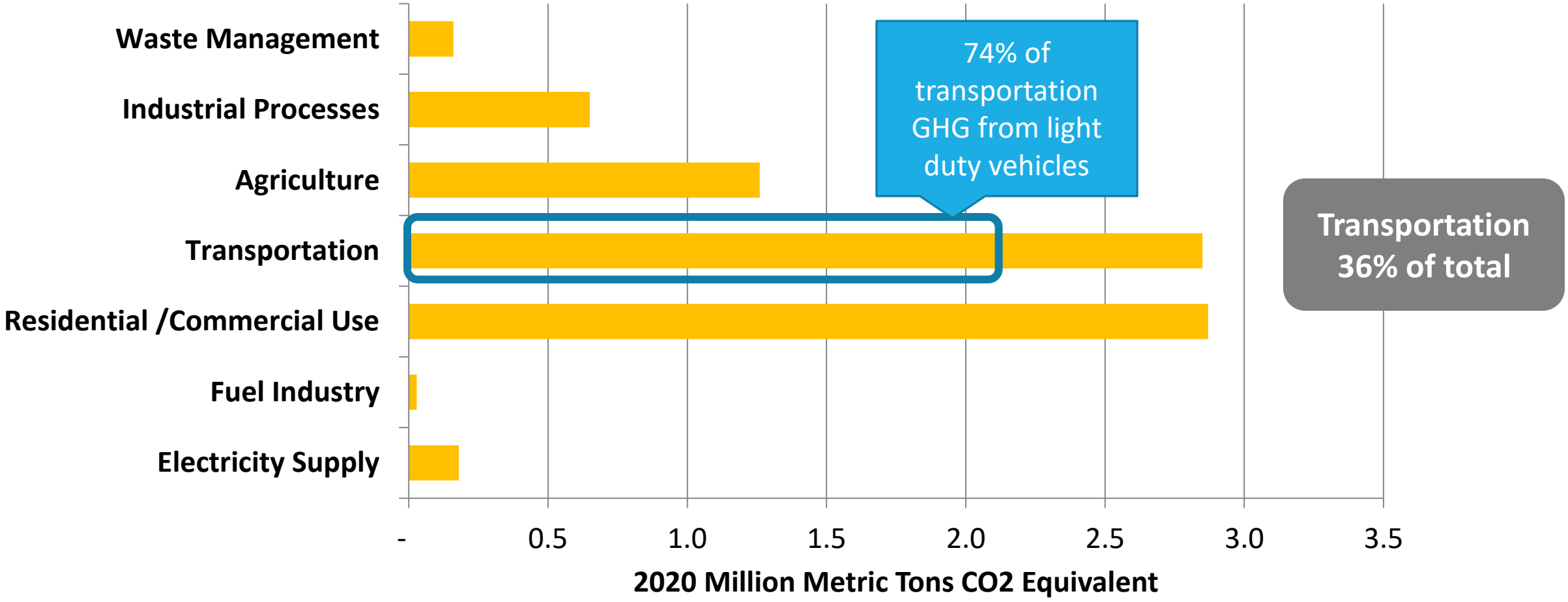
- Working to advance transportation electrification through:
  - Stakeholder coordination
  - Policy engagement
  - Consumer education & outreach
  - Infrastructure development

https://www.driveelectricvt.com/

Why Go Electric?

- Save money
- Reduce emissions
- Great performance
- Quiet
- Convenient charging at home

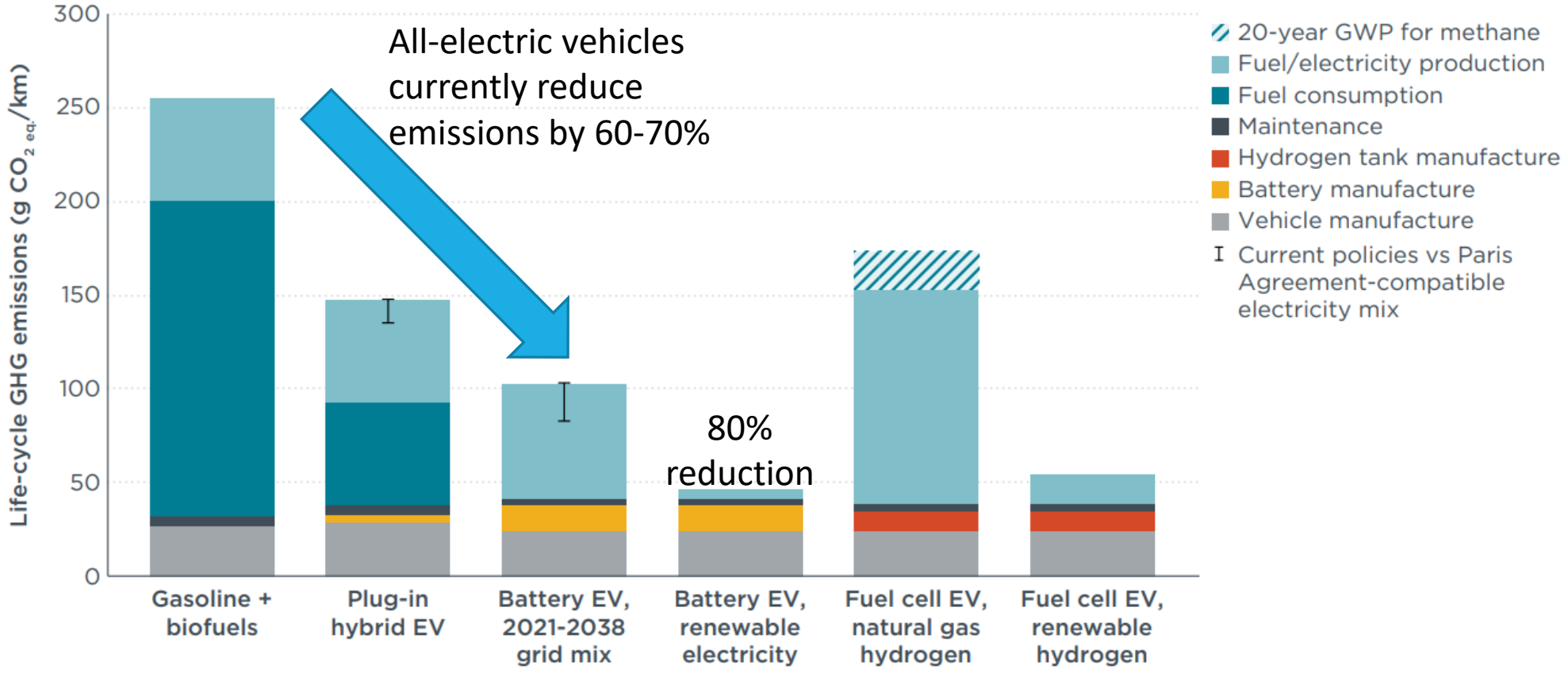
Vermont Greenhouse Gas Emissions



EV Emission Reductions

Reducing vehicle travel is the most efficient way to address transportation emissions

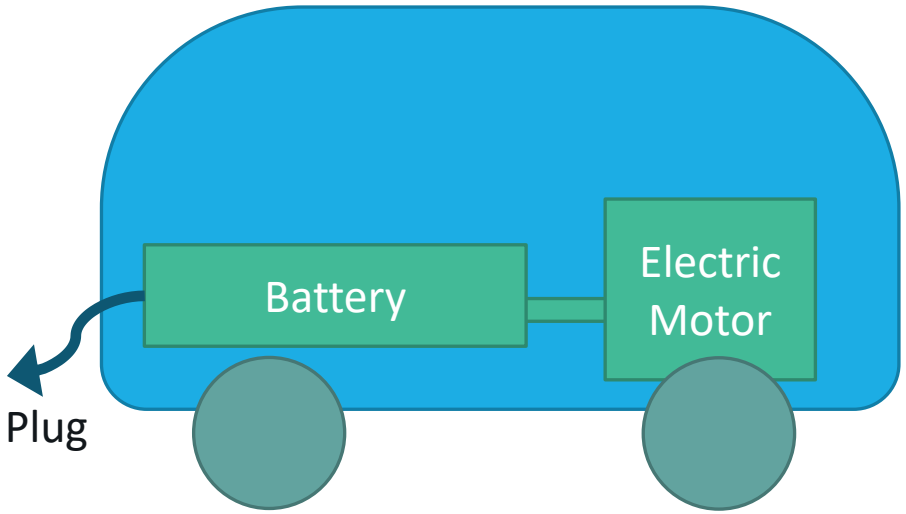
2021 **Life-cycle GHG emissions** of passenger cars registered in the United States



https://theicct.org/publication/a-global-comparison-of-the-life-cycle-greenhouse-gas-emissions-of-combustion-engine-and-electric-passenger-cars/
https://www.efficiencyvermont.com/blog/our-insights/are-evs-better-for-the-environment-than-gas-powered-vehicles

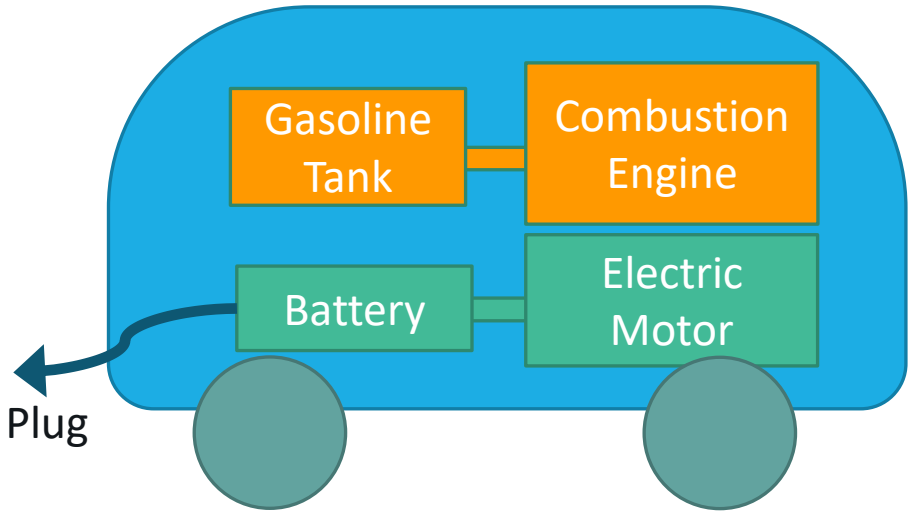
Types of Plug-in Vehicles

All-Electric



70 – 400+ Mile Range on Battery

Plug-in Hybrid



15 – 80 Mile Range on Battery

+

300 or More Miles on Gasoline

Popular EV Models

All-Electric Vehicles

Chevrolet Bolt
260 Miles
120 MPGe
$27k+

Tesla Model 3
250-322 Miles
113-132 MPGe
$40k+

Nissan LEAF
150-225 Miles
104-111 MPGe
$28-36k+

Plug-in Hybrid Vehicles

Toyota Prius Prime
39/550 Miles
114 MPGe
$32k+

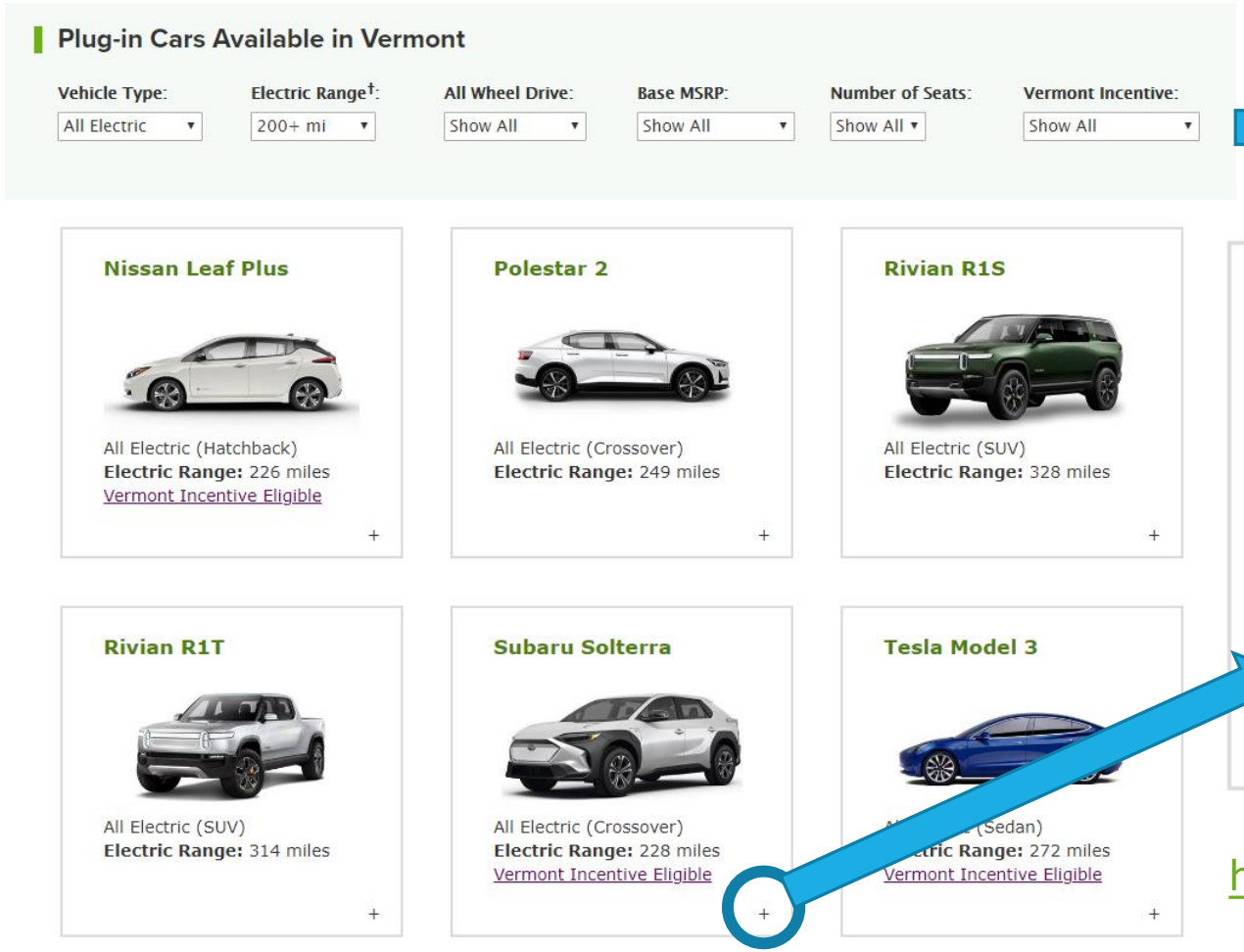
Hyundai Tucson PHEV
33/420 Miles
80 MPGe
$38k+

Toyota RAV4 Prime
42/600 Miles
94 MPGe
$43k+

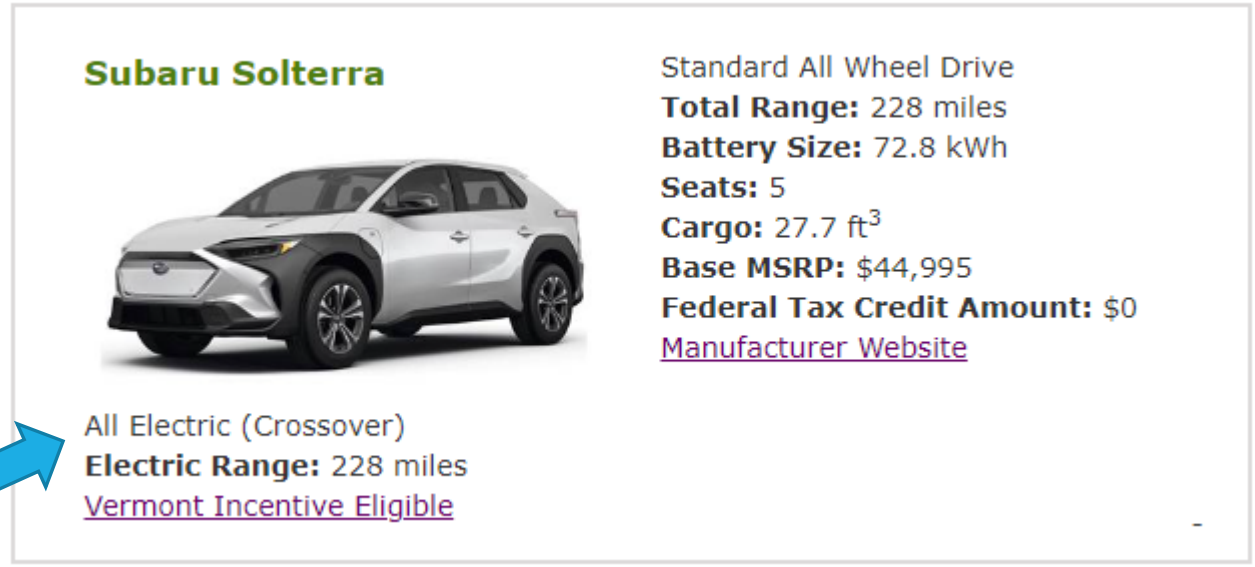
Other Popular Models

VW ID.4
245-280 miles, $39k

Website EV Model Explorer

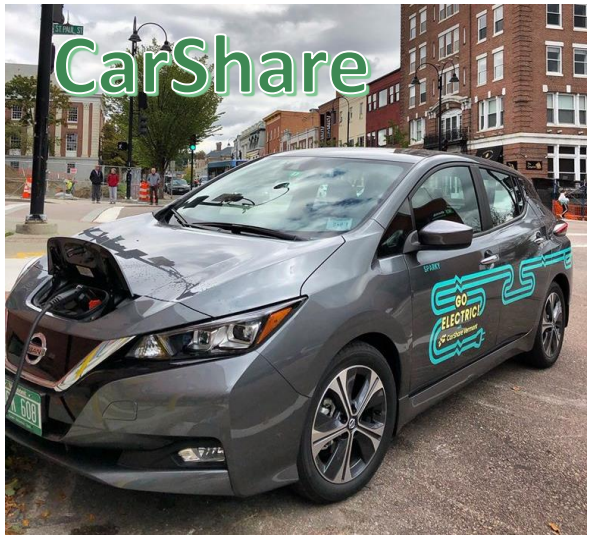


Filters for vehicle characteristics



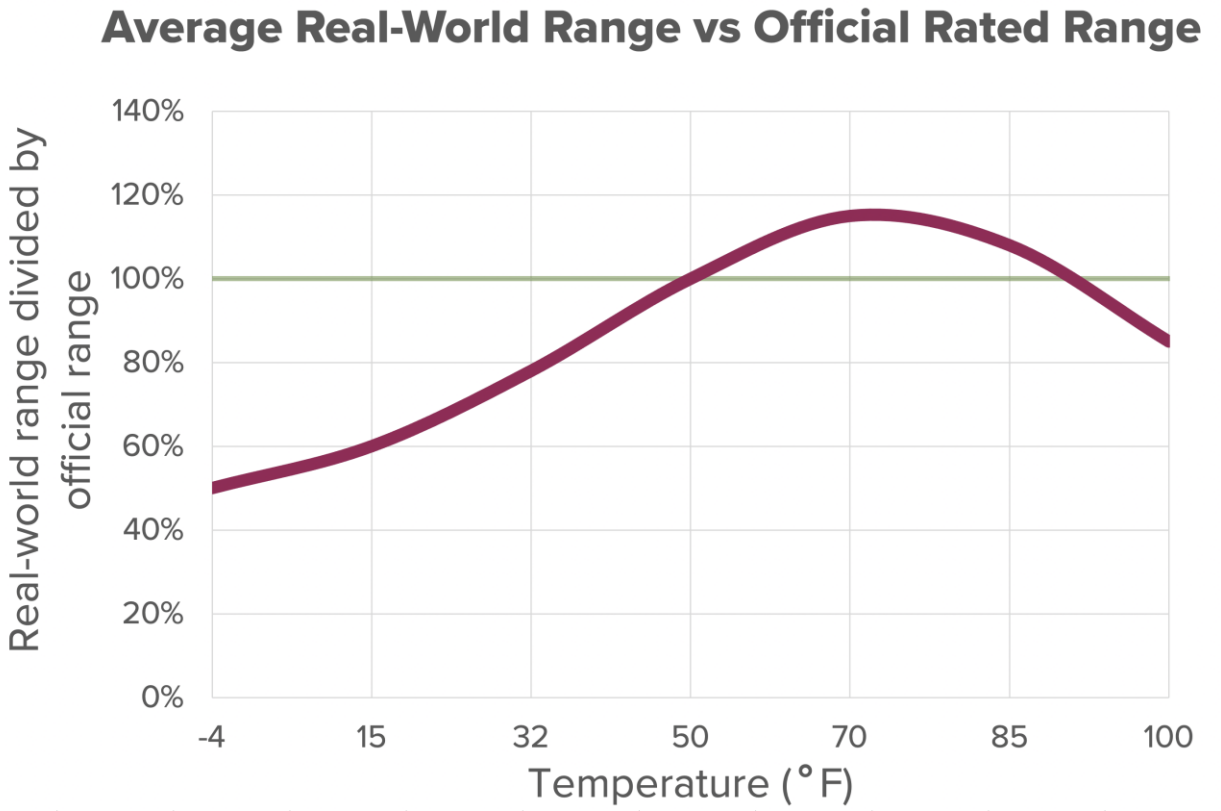
https://www.driveelectricvt.com/find-your-ev/compare-models

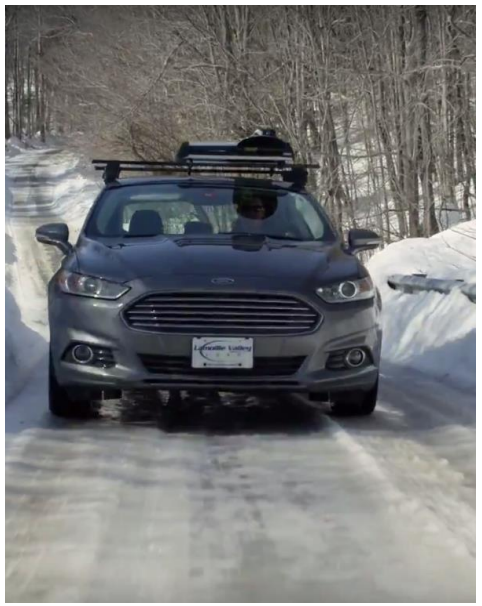
Other Electric Options



EVs in Vermont Conditions

Cold weather reduces electric range 20-50%





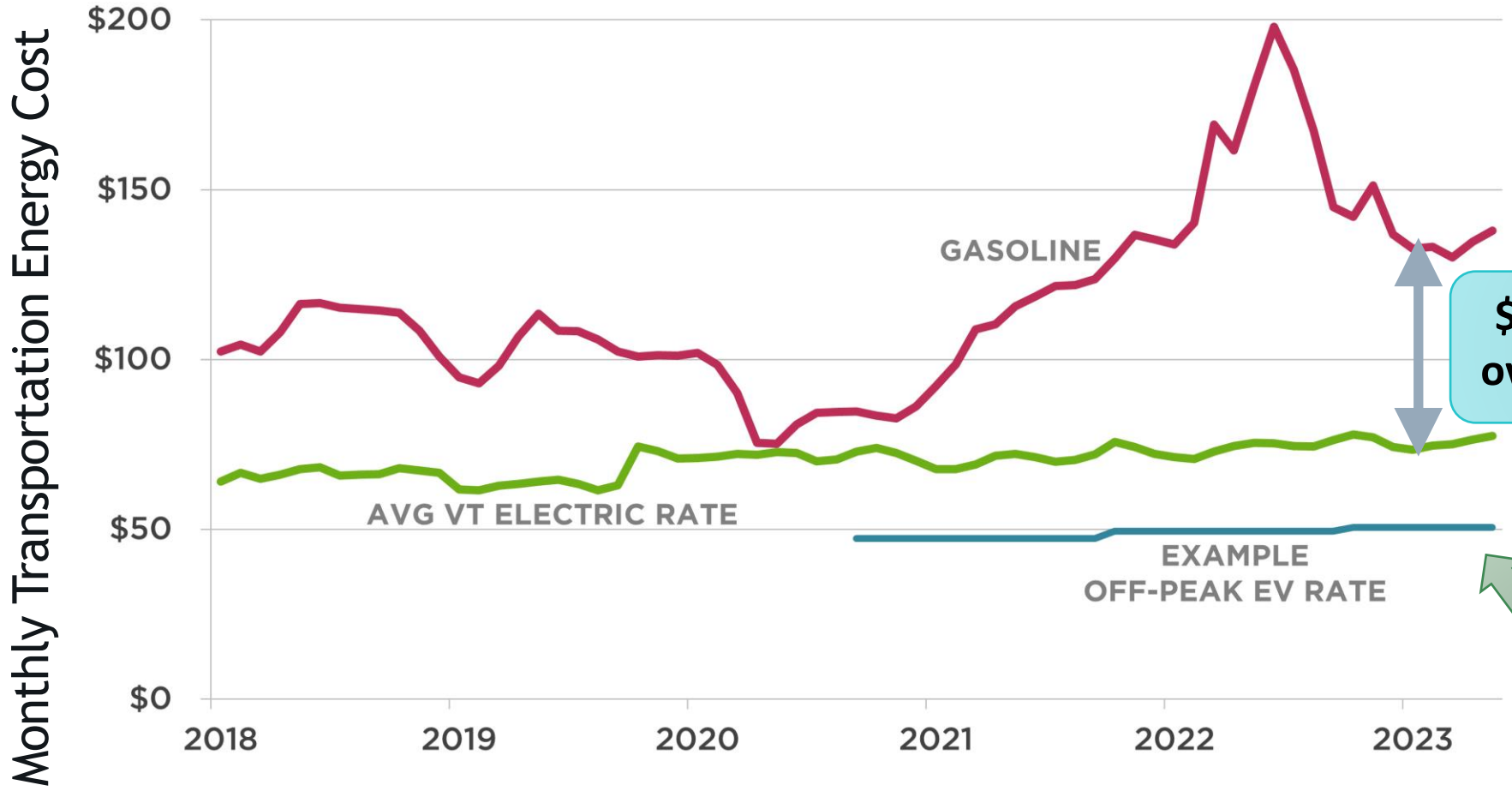
Range Saving Tips

- Cold weather option packages are encouraged (when available)
- Heated seats / steering wheels
- Heat pumps on some EVs
- Preheating
- Drive slower

Other Considerations

- Slower fast charging
- Battery technology advancements

Monthly Energy Cost Comparison



$2,800 Savings over last 5 years

30-50% lower EV charging costs with off-peak rates from some utilities

Sources: US Energy Information Administration VT avg home electric rate and VEIC
Assumptions: 25 mpg gasoline vehicle; 3 mile per kWh EV; 1,000 miles per month

https://www.driveelectricvt.com/about-evs/cost-of-ownership

US EIA / VEIC

Total Cost of Ownership Savings

CR Consumer Reports

EVs Offer Big Savings Over Traditional Gas-Powered Cars

A CR study shows that total ownership cost savings can more than make up for an electric vehicle's typically higher purchase price

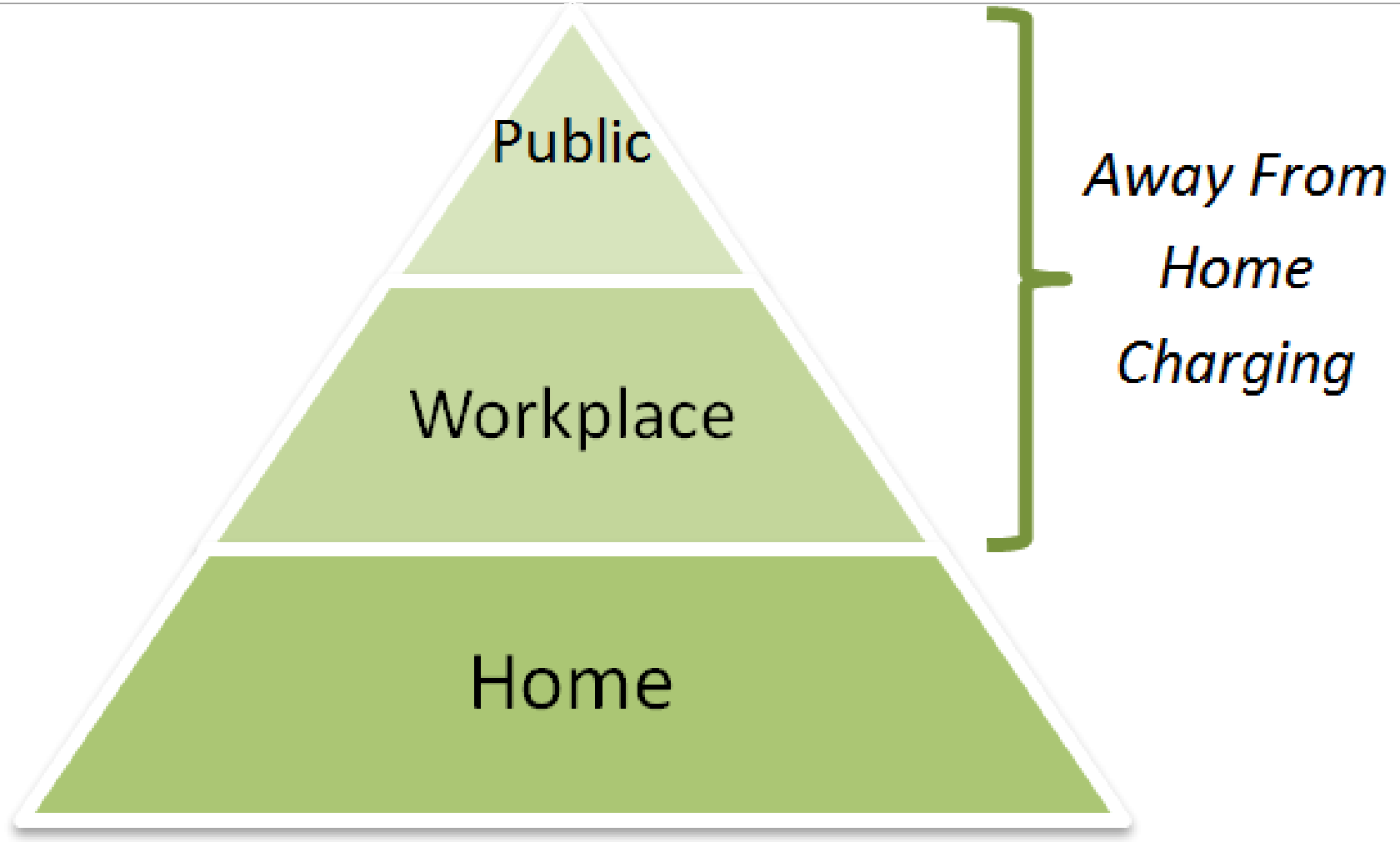
EV Total Cost of Ownership Savings = Fuel Savings + Maintenance Savings - Depreciation

"Typical total ownership savings over the life of most EVs ranges from $6,000 to $10,000"

AND EV purchase incentives available to Vermonters can boost these savings

https://www.consumerreports.org/hybrids-evs/evs-offer-big-savings-over-traditional-gas-powered-cars/

EV Charging



Charging Equipment

Level 1 Charging	Level 2 Charging	DC Fast Charging
120V	240V	480V
5 miles range / hr	10-20 miles / hr	Up to 1,000 miles / hr

Plug Types

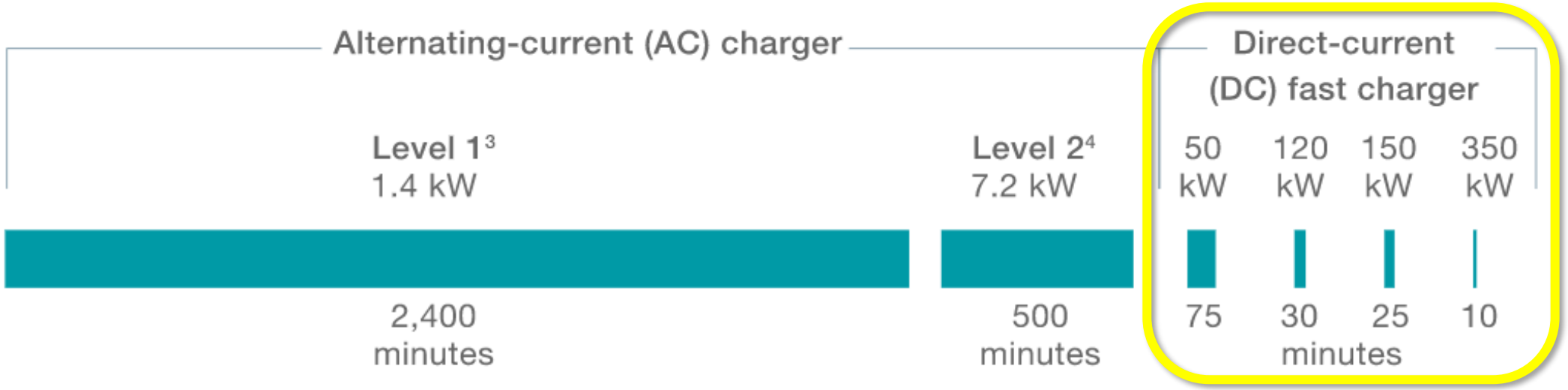
J1772 NACS / Tesla

J1772 NACS

CCS CHAdeMO NACS

Charging Time Comparison

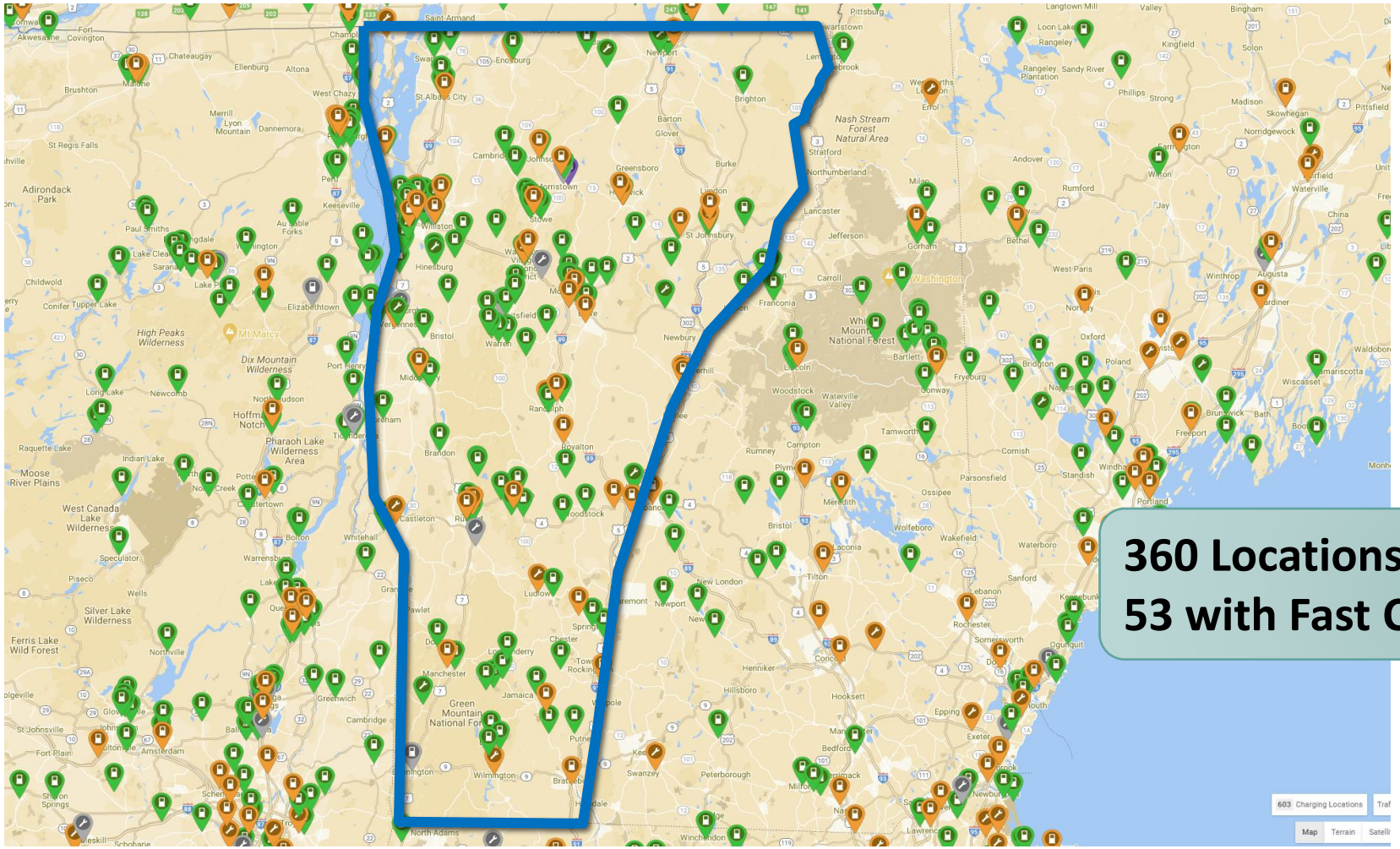
Time to "fill up" a 60-kWh electric-vehicle (EV)[1] battery using different chargers[2]



[1]This assumes that the EV can charge at the higher kW direct-current fast-charging stations; most EVs today cannot charge faster than 100 kW.
[2]This assumes that the EV can charge at maximum speed during the entire charge. In reality, the charging speed varies.
[3]Level 1 equipment provides charging through a 120-volt AC plug; it generally refers to a household outlet.
[4]Level 2 equipment provides charging through a 240-volt AC plug and ranges from 16 to 40 amps. The most common is the 240-volt, 30-amp charger, which is 7.2 kW.

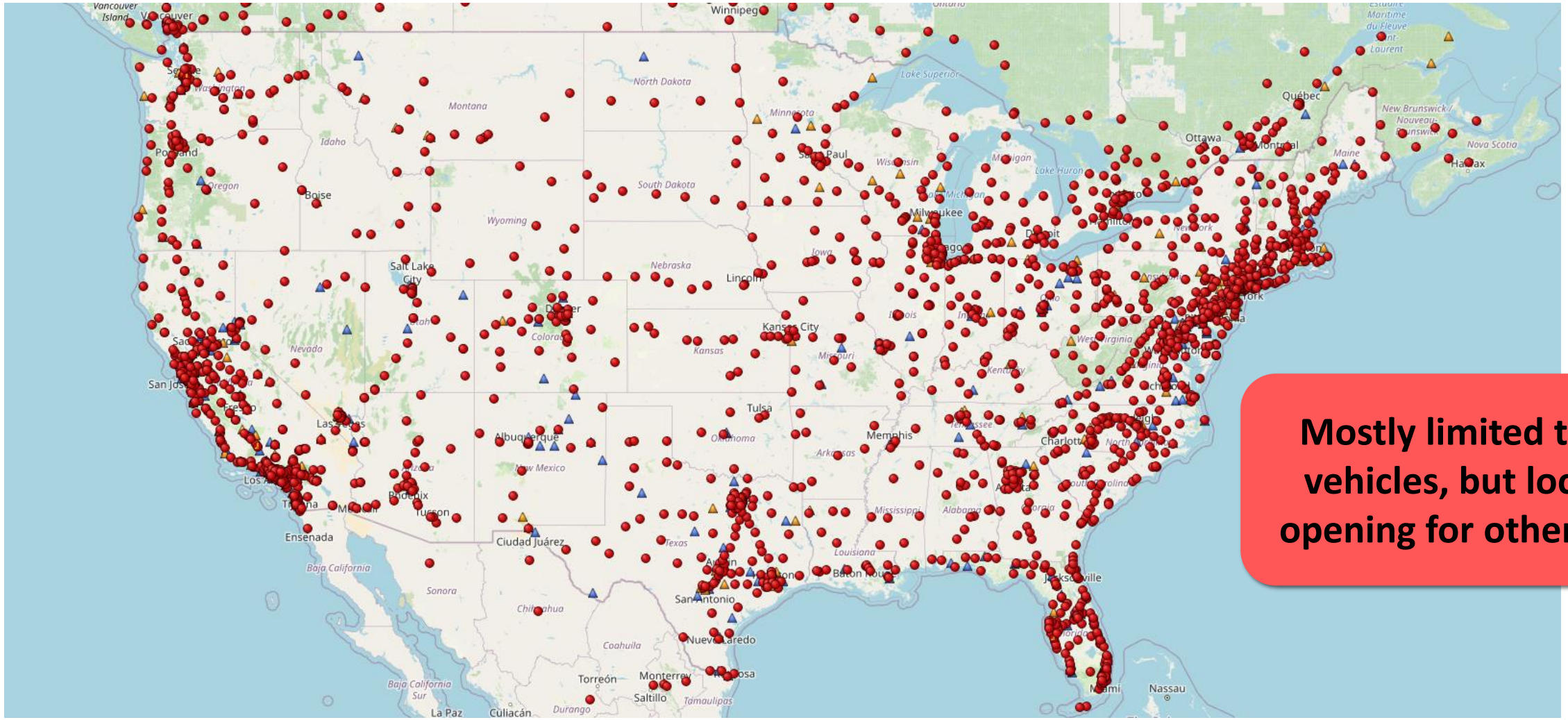
https://www.mckinsey.com/capabilities/sustainability/our-insights/how-battery-storage-can-help-charge-the-electric-vehicle-market

EV Public Charging Availability



360 Locations in Vermont
53 with Fast Charging (orange)

Tesla Supercharging



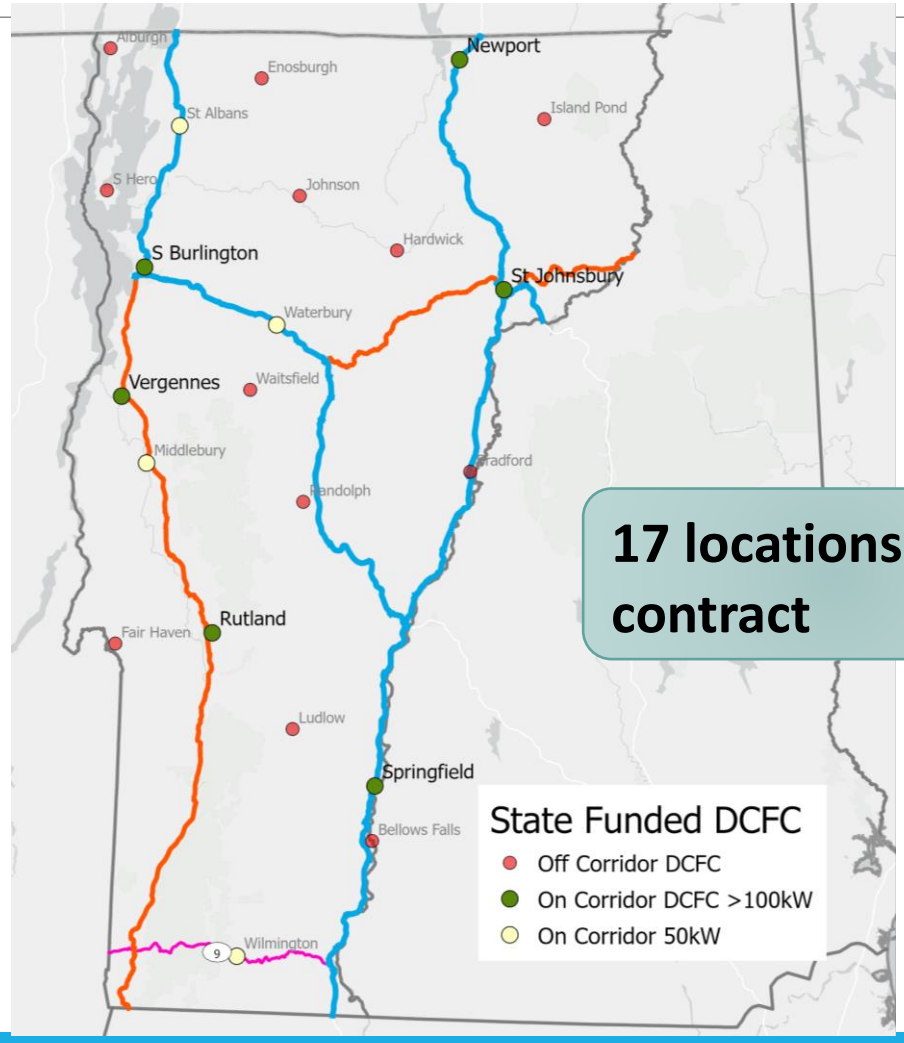
Mostly limited to Tesla vehicles, but locations opening for other drivers

https://www.tesla.com/supercharger

Vermont Corridors and State Funded Charging

Volkswagen Settlement Funding

- Vermont has invested over $3.5 million since 2014
- Recent funding focused on fast charging
- Under contract with Blink Charging and Norwich EV to build out 17 locations in the next year
- Each location on the map shown will have at least 2 fast chargers
- Once completed, almost all VT households will be within 30 miles to a DCFC



17 locations under contract

https://accd.vermont.gov/community-development/funding-incentives/electric-vehicle-supply-equipment-evse-grant-program

State EV Charging Funding Program

- Vermont ACCD-DHCD contracted with Green Mountain Power to administer $7 million in State funds for:
  - Multifamily - $3M;
  - Workplace - $2M; and
  - Public attraction EV charging - $2M
- First-come, first-served with caps on funding per county
- Pre-application doesn't require detailed cost info

https://www.vermontevchargers.com

VT EVSE Incentive Program

Program Overview – Fund Allocation and Caps

	Multiunit - $3M	
	Level 1	Level 2
Design and make ready	$3,600	$20,000
OCPP port	$500	$3,000
Non OCPP port	-	$2,000
3-9 units: (design, make ready + 4 ports)	$5,600	$32,000
10-20 units: (design, make ready + 8 ports)	$7,600	$44,000
21+ units: (design, make ready + 12 ports)	$9,600	$56,000
Applicant cap	$100,000	

	Workplaces - $2M	
	Level 1	Level 2
Design and make ready	$3,600	$20,000
OCPP port	$500	$3,000
Non OCPP port	-	$2,000
1-50 employees: (design, make ready + 4 ports)	$5,600	$32,000
51-100 employees: (design, make ready + 8 ports)	$7,600	$44,000
101+ employees: (design, make ready + 12 ports)	$9,600	$56,000
Applicant cap	$100,000	

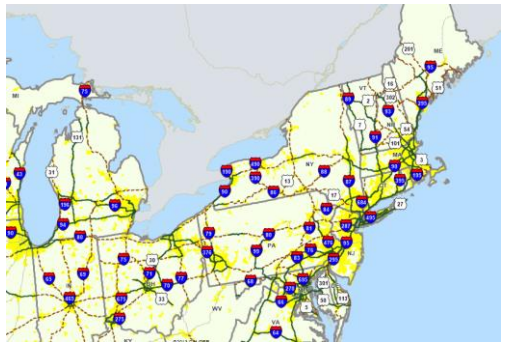
	Public Attractions - $2M	
	Level 2	Level 3
Design and make ready	$20,000	$40,000
OCPP port	$3,000	$30,000
Design, make ready + 12 ports	$56,000	-
Design, make ready + 4 ports	-	$160,000
Applicant cap	$100,000	$640,000

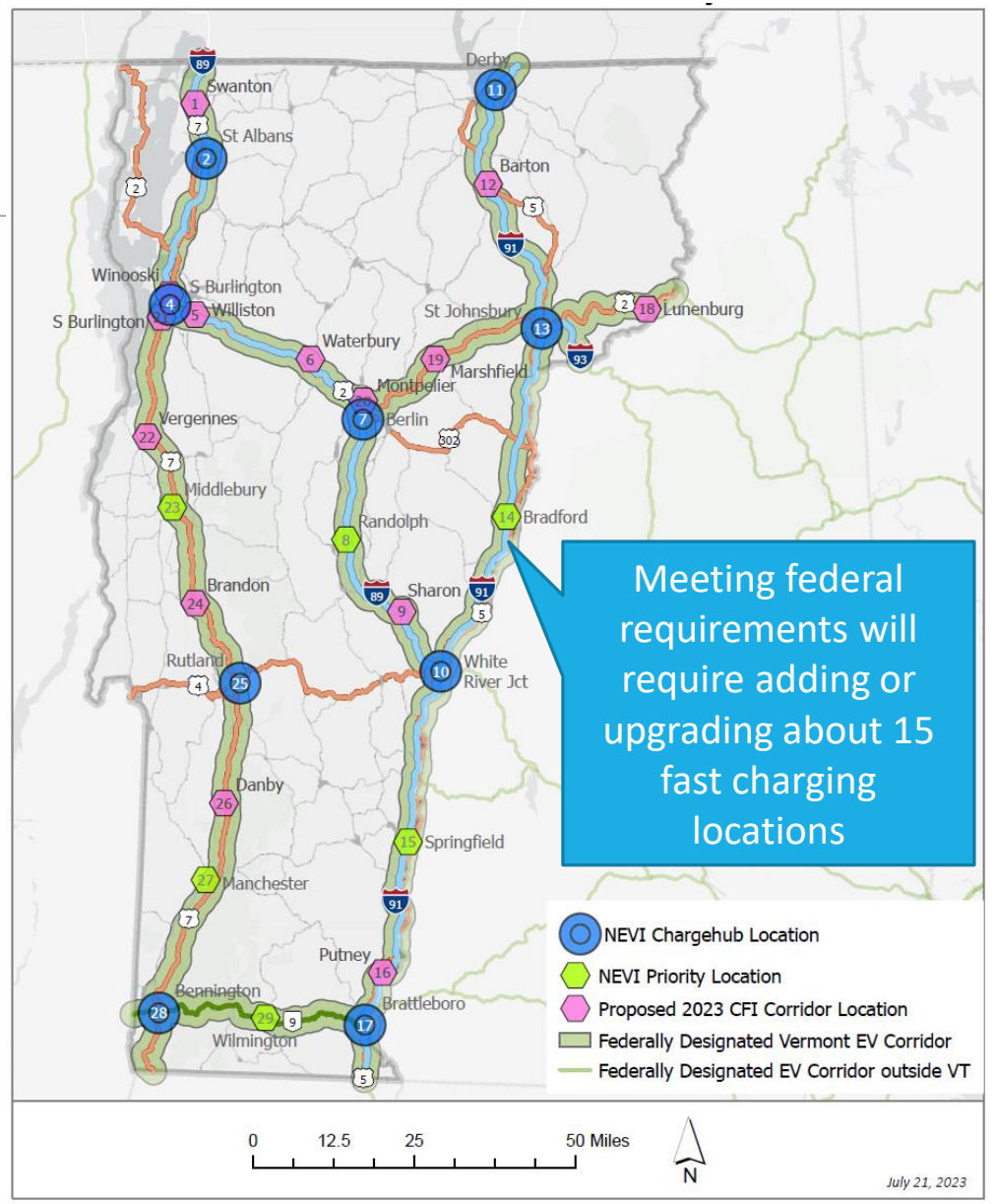
Federally Funded Charging

Federal Alternative Fuel Corridors

- Vermont has federally designated alternative fuel corridors covering all interstates along with US 7, VT 9 and part of US 2
- Federal infrastructure bill providing about $20 million to VT for more fast charging along these corridors
- Four 150kW DCFC every 50 miles along corridors
- Part of a national network

https://vtrans.vermont.gov/planning/nevi





Public Charging Pricing & Payment Options

- Pricing is set by host location - usually around $0.20/kWh or $1/hour for level 2 charging
- Fast charging is more expensive $0.30-$0.43/kWh – about $20 per session
- Roaming agreements between charging provides can streamline access
- Payment options listed below not available at every location – sign up with charging networks before a trip!
  https://www.driveelectricvt.com/about-evs/charging-map
- Plug & Charge may streamline access and payments in the future (Tesla already offers this)

Charging company RFID card

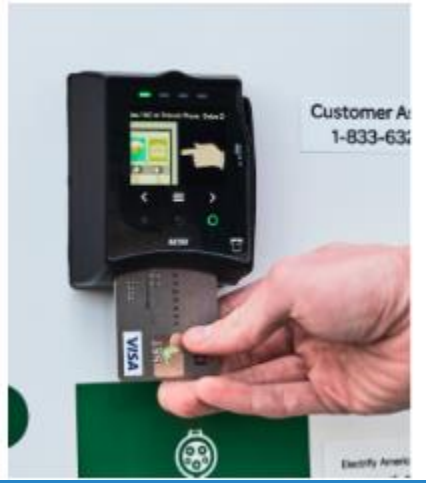
Charging company smartphone app

Phone support

Android and Apple pay

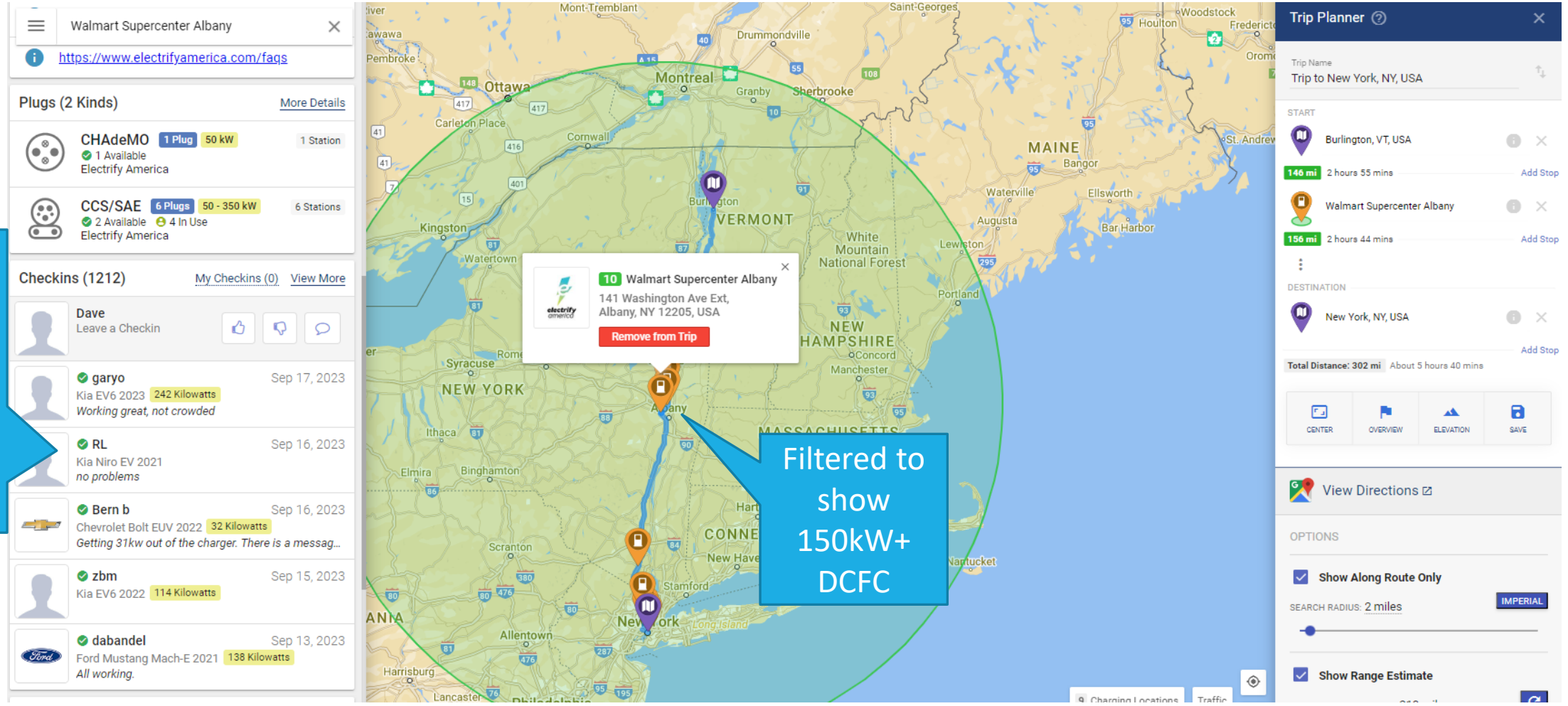
Contactless credit card

Chip / swipe credit card



EV Trip Planning – Burlington to NYC example

Check PlugShare details and check-ins before relying on charger



https://www.plugshare.com/trip-planner.html

Vehicle Incentive Overview

1. Federal Tax Credit
   a. New vehicles eligible for up to $7,500; Used EV 30% up to $4,000 for vehicles priced at $25,000 or less
   b. Customers claim on income taxes (unless leasing); Dealer pass-through starts 1/1/2024
   c. Does not carry-over into future years; additional income eligibility requirements apply
2. State of Vermont
   a. New EV incentives for income-eligible Vermonters up to $5,000
   b. Used EV incentives for pre-approved income-eligible Vermonters, 25% up to $5,000 through MileageSmart
   c. Replace Your Ride incentives for income-eligible Vermonters up to $5,000 for scrapping 10+ year old cars
3. Electric Utility Incentives
   a. Vary depending on the utility, Burlington Electric, Green Mountain Power, and VPPSA offer dealer point-of-sale options

Replace Your Ride / Flood Adders

$2,500-$5,000 incentive available for scrapping at 10+ year old operable internal combustion engine (ICE) vehicle

REPLACE YOUR RIDE

New EV

- Stacks with New EV Incentive
- Only at participating dealer

Used EV

- Stacks with MileageSmart
- AEV/PHEV only
- Only at participating dealer

Other Clean Mobility

- Prepaid card for
  - Bike / eBike
  - Carshare
  - Transit
- Only at participating providers

Flood Damaged Vehicles

New EV: +$1,000
Used EV: automatic $5,000
RYR: waiver of operability requirement

Through Dec 2023

Stacked EV Purchase Incentive Example

	New 2023 Chevrolet Bolt 259 Mile Range	
	Standard Incentive ($60-100k income)	< $60k Income Incentive
Starting Price	$26,500	$26,500
Federal Tax Credit	-$7,500	-$7,500
State EV Incentive	-$2,500	-$5,000
State Replace Your Ride	-$2,500	-$5,000
Utility Incentive (varies)	-$2,200	-$3,200
Price after Incentives	$11,800	$5,800

Dealer point-of-sale option available in Jan 2024

Requires scrapping a 10+ year old vehicle

Vermont Used EV Incentive Example

	Used 2020 Nissan LEAF S	
	Standard Incentive ($60-100k income)	< $60k Income Incentive
Starting Price	$13,970	$13,970
Federal Tax Credit	-$4,000	-$4,000
State Incentive - MileageSmart	-	-$3,493
State Replace Your Ride	-	-$5,000
Utility Incentive (varies)	-$1,500	-$2,500
Price after Incentives	$8,470	$0

30%, up to $4,000; must have tax liability to offset

25%, up to $5,000

Scrap 10+ year old vehicle with EV purchase

Drive Electric VT Incentive Calculator

This tool is in beta. *This information in this tool is based on the latest information available to Drive Electric Vermont, but actual incentive amounts may vary based on eligibility criteria. Please let us know if you encounter any issues using this tool.*

Update August 2023: *Enhanced State of Vermont incentives are available for residents to replace cars that were damaged by flooding with electric cars and other clean mobility options. These enhanced incentives are not included in the incentive calculator. Learn more here.*

Your Utility Burlington Electric Departme

Vehicle Type All-Electric (new)

Car Make Volkswagen

Tax Filing Status Individual filing as single

Adjusted Gross Income † 0 - $60,000

† Adjusted Gross Income can be found on your tax return

Estimated Utility Incentive: **$2,300 - 3,000 ***

* Bonus of ***$700*** available to income-qualified purchasers. Check your utility's website to see if you are eligible.

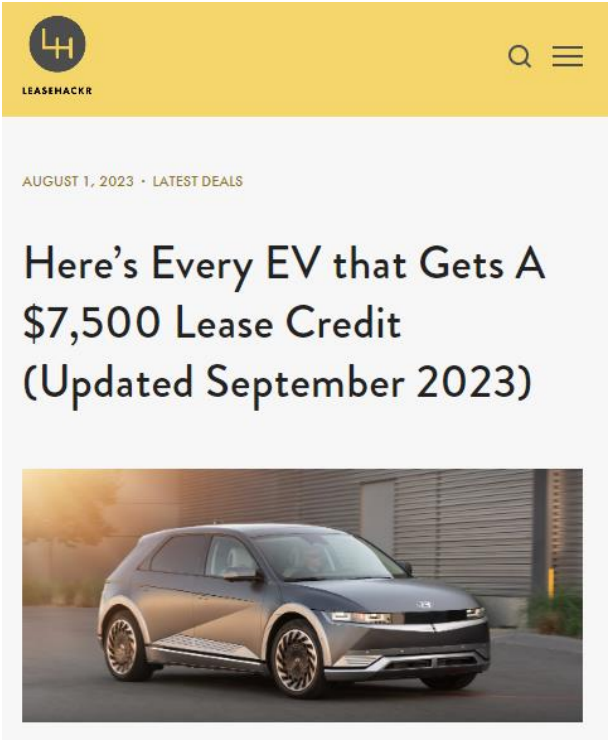
Estimated State Incentive: **$5,000**

Estimated Federal Incentive: **$7,500**

Estimated Total Incentive: **$14,800 - 15,500**

Additional automaker or dealership incentives may be available. Check with your dealership to learn more.

Trading in your old car? Get an additional incentive up to $5,000 through the Replace Your Ride incentive program.



https://leasehackr.com/blog/2023/2/18/list-of-every-ev-that-gets-a-7500-credit-on-leases

https://www.driveelectricvt.com/blog/leasing-versus-purchasing-an-electric-car

Drive Electric Vermont

https://www.driveelectricvt.com/incentives/incentive-calculator

Upcoming EV Events

National Drive Electric Week in-person events coming up:

1. 9/23 - BED Net Zero Festival
2. 9/23 - Bethel Community Forward Festival
3. 9/23 - Manchester Electric Drive-In
4. 9/30 - Bennington EV Show
5. 9/30 - South Burlington Energy Fair
6. 9/30 - Upper Valley EV expo

https://www.driveelectricvt.com/events

Discussion

Contact us at

info@DriveElectricVT.com