



Drive Electric Vermont Informational Outline
Vermont Legislature House Transportation Committee
February 14, 2019

1. Drive Electric VT (DEV) Overview

- a. **VEIC Background** – Mission driven non-profit formed in 1991. Operate Efficiency Vermont (EVT) energy efficiency utility under VT PUC order of appointment. EVT not engaged in transportation efficiency due authorizing legislation limit to electric and thermal (heating) efficiency programs. Consulting group operates as fee-for-service, includes transportation expertise.
- b. **DEV Launch** – Formed with MOU signed by VEIC, VTrans, VT ANR, and DPS in April 2012.
- c. **Partnerships** – Stakeholder forum for State agencies, electric utilities, clean energy advocates, auto dealers, others.
- d. **Ongoing Work** – Broad goal to advance transportation electrification in the state. Includes consumer education (website, 130+ events, social media, marketing campaigns); stakeholder engagement (quarterly meetings, technical assistance); state support (VW EV charging, PUC investigation, etc).

2. Electric Vehicle Technology

a. Types of Vehicles

- i. All-Electric – powered solely by the battery; several have more than 200 miles of range which provides significant added convenience and usability.
- ii. Plug-in Hybrid – battery power for 10-80 miles, then gasoline (see attached Fact Sheet for listing of current new EVs).

b. Types of Charging

- i. Level 1 – 120V standard household outlet; 1-2kW power; +5 miles per hour
- ii. Level 2 – 208/240V; 3-20kW power; +10-20 miles per hour
- iii. DC Fast Charging – 3-Phase 480V; 25-300kW power +75-900 miles per hour

Level 1 Charging
 120V
 5 miles range / hr



Level 2 Charging
 240V
 10-20 miles / hr



DC Fast Charging
 480V
 70+ miles / hr



Plug Compatibility
 Automakers use “J1772” plug for level 1 and 2, but two different standards for DC Fast Charging - CHAdeMO & SAE CCS.

Tesla uses proprietary plug but has adaptors.

- iv. Home / Workplace / Public Charging Locations
 - 1. Most charging at home overnight
 - 2. If workplace charging is available that is popular
 - 3. Public charging fills a critical need, but used less frequently
- v. Managed charging benefits the grid
 - 1. With the right technology and/or price structures, EV charging loads are easily shifted to times that are most beneficial for the grid.

c. Cold Weather Operation

- i. Expect up to 50% less electric range in winter due to temporary effects of cold temperatures on battery and additional heating loads.
- ii. Some vehicles have more efficient heating systems that mitigate this.
- iii. Preheating the cabin while still plugged in, slowing down, using heated seats / steering wheel and other techniques can help increase range in cold conditions.
- iv. Gasoline cars also have lower efficiency in cold temperatures.
- v. Battery mass helps improve traction in snow.

3. Vermont EV Market Conditions / Tracking Success

a. **EV registrations** (see attached handouts for registration tracking information)

b. **Public charging infrastructure**

Year	Locations	L1 Ports	L2 Ports	DCFC Ports	Port Trend
2011	3	0	4	0	—
2012	7	2	8	1	— — —
2013	12	5	20	0	— — —
2014	29	14	52	7	— — — —
2015	48	36	65	30	— — — — —
2016	40	0	84	13	— — — — —
2017	28	0	74	4	— — — — —
2018	40	5	100	2	— — — — —
2019	2	1	6	0	— — — — —
TOTAL	209	63	413	57	

Vermont Public Charging Map

As of February 2019



Charging Map Resources

Drive Electric Vermont

<https://www.driveelectricvt.com/charging-stations/public-charging-map>

PlugShare

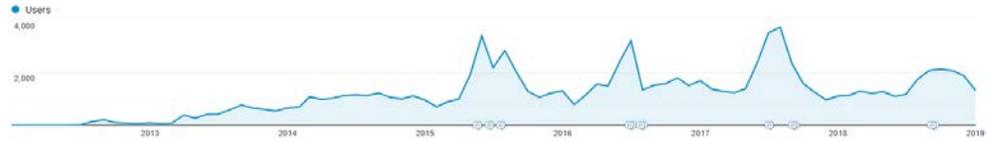
<https://www.plugshare.com/>

 Fast Chargers

 Level 1/2 Chargers

c. Drive Electric Vermont outreach

- i. Website users – about 34,000 users over past 6 years; currently around 1,000-2,000 visits per month. Chart below shows site usage from 2012-2019.



- ii. Social Media – Facebook (1,600 followers), Twitter, Instagram
- iii. Community Events – Participated in 130 events touching about 49,000 people to date.

d. **Available EV Models** – 42 unique models in registration database; about 40 different models currently available new. All-wheel drive available on 12 models. Pickup trucks and SUVs were about 80% of the new vehicle market in Vermont in 2018 (VT VADA). There are limited EV options in this segment, but many more models are anticipated in the next few years.

e. **Dealers Selling EVs** – 45 new EV dealers; several more Subaru dealers about to be added. Additional dealers selling used, but to our knowledge there are no used EV specialists yet.

f. Vermont Annual Net EV Registration Change by Automaker

Automaker	2013	2014	2015	2016	2017	2018	Six Year Trend
BMW	0	4	8	24	23	20	-----
Fiat Chrysler	0	0	0	0	4	10	-----
Ford	131	156	132	169	180	-30	■ ■ ■ ■ ■ ■ ■ ■
GM	40	34	47	100	200	134	----- ■ ■ ■ ■ ■ ■
Honda	0	0	0	1	1	67	----- ■ ■ ■ ■ ■ ■
Hyundai	0	0	0	1	0	5	----- ■ ■ ■ ■ ■ ■
Kia	0	0	0	1	4	20	----- ■ ■ ■ ■ ■ ■
Mercedes	4	6	0	1	4	6	----- ■ ■ ■ ■ ■ ■
Mitsubishi	19	7	-6	2	0	37	----- ■ ■ ■ ■ ■ ■
Nissan	43	50	24	24	188	47	----- ■ ■ ■ ■ ■ ■
Tesla	13	9	24	34	41	168	----- ■ ■ ■ ■ ■ ■
Toyota	159	16	10	14	147	145	■ ----- ■ ■ ■ ■ ■ ■
Volvo	0	0	0	7	7	15	----- ■ ■ ■ ■ ■ ■
VW	0	1	8	34	7	3	----- ■ ■ ■ ■ ■ ■
TOTAL	409	283	247	412	806	647	

4. Other Information

a. Federal EV tax credit

- i. Up to \$7,500 on *new* vehicle depending on battery size (see fact sheet)
- ii. Sunset process begins after each individual automaker reaches 200,000 EV sales
 - 1. Reduced by 50% for six months and then 75% of original amount for another six months

2. Tesla is in first phase of sunset through June
3. GM (Chevrolet) will begin sunset in April
- iii. Purchaser must have significant tax liability to receive full benefit.
- iv. Does not roll over into future years.
- v. Congressman Welch has introduced legislation to extend and improve.

b. Used EVs

- i. Supply is limited but growing. Typically 15-20% of quarterly growth in EV registrations. Vehicles coming off 2-3-year leases are primary source.
- ii. 2012 Nissan LEAF and Chevrolet Volt vehicles available for \$10,000 or less.
- iii. 2013 Ford CMax Energi also in \$10,000 range.

c. Purchase vs Lease

- i. More EVs leased than typical with gasoline cars, especially all-electric models.
- ii. Leasing can bundle in value of federal tax credit, streamlining access to this incentive.
- iii. Leasing protects from rapid depreciation.
- iv. Leasing protects against battery issues as warranty should apply for any issues during lease period.
- v. Purchasing generally provides lowest total cost of ownership as long as tax credit can be claimed.
- vi. Some automakers starting to offer vehicle subscription programs.

d. Incentive Opportunities

- i. Market benefits of incentives
 1. Potentially significant influence on purchasers – addresses most critical price barrier.
 2. Research indicates a mix of incentives, marketing and policy (e.g. California Zero Emission Vehicle program) is the best approach to raising EV sales.
 3. Larger incentives increase interest. A 2016 Vermont consumer survey found a \$2,500 incentive could double purchase consideration from 20% to 40% of consumers. Point of sale preferred, especially for lower income purchasers.
https://www.driveelectricvt.com/Media/Default/docs/dev_2016_consumer_survey_report.pdf
- ii. Incentives in other states / provinces
 1. *New York* - \$500 - 2,000 for EVs with 120+ mile range
 - a. \$500 if MSRP over \$60,000
 - b. New AEV and PHEV models
 - c. Purchase or lease
 - d. Rebate applied at point of sale
 2. *Massachusetts* - \$1,500 for all-electric vehicles
 - a. Price less than \$50,000
 - b. New AEV models only
 - c. Purchase or lease

- d. Recent changes reduced max amount from \$2,500 and disallowed PHEVs due to funding constraints
 - e. Online rebate
3. *Connecticut* - \$500 - 2,000 depending on range; 200+ miles required for maximum rebate.
 - a. Base MSRP must be less than \$50,000 (recently decreased from \$60,000)
 - b. Purchase or lease
 - c. New AEV and PHEV models
 - d. Online rebate
 - e. Dealer receives additional rebate (about 10% of consumer rebate)
 4. *Oregon* - \$1,500 - \$2,500 based on battery size
 - a. Base MSRP less than \$50,000
 - b. New AEV and PHEV models
 - c. Purchase or lease
 - d. Online rebate (still in development)
 - e. Additional \$2,500 Charge Ahead incentive for low-to-moderate income
 - i. Up to 120% of area median income
 - ii. New or Used AEV and PHEV models
 5. *Colorado* - \$5,000 EV tax credit
 - a. No MSRP restrictions
 - b. Purchase or lease (incentive for lease can be lower)
 - c. Credit can be assigned to financing entity
 - d. New AEV and PHEV models
 - i. Used were eligible prior to 2017
 6. *California* - \$1,500 for PHEV; \$2,500 for AEV
 - a. No MSRP restrictions
 - b. Purchase or lease
 - c. New AEV and PHEV models
 - d. Online rebate
 - e. Income cap - \$150k single to \$300k joint
 - f. Low income (up to 300% poverty level) qualify for added \$2,000
 - i. Other regional low income “cash for clunker” programs in CA have much higher incentive levels and include used and non-plug-in hybrid eligibility.
 7. *Quebec* - \$500 – 8,000 CAD
 - a. No federal EV incentive in Canada
 - b. MSRP over \$75,000 have reduced rebate
 - c. Purchase or lease (lower lease incentives)
 - d. AEV and PHEV models (incentive varies based on battery size)
 - e. Online rebate
 - f. New and Used
 - i. Used pilot program provides \$4,000 for used AEVs
 - g. Plus up to \$600 rebate for home EV charging

iii. Vermont Electric Utility Incentives

1. Nearly all Vermont utilities offer incentives as part of their Renewable Energy Standard Energy Transformation (“Tier 3”) programs.
2. Range from \$250 – 1,200.
3. Lower incentives for PHEVs based on their decreased fossil fuel offsets.
4. Only VT Electric Coop offering incentives on used EVs.
5. GMP’s current incentive is a free level 2 charger (approximately \$600 value).
6. Several offer added incentives for low-to-moderate income households.
7. Several also offer “Fleetail” discounts in partnership with Nissan offering \$5,000 discounts on the LEAF. The discount is through Nissan corporate and does not involve utility contributions.
8. Some utilities offering time-of-use or EV-specific rates for charging at lower costs during off-peak periods.
9. Details at: <https://www.driveelectricvt.com/buying-guide/purchase-incentives>

iv. Targeting incentives – MSRP caps vs Income tests

1. Many incentive programs address free ridership by putting a cap on price.
2. A few use income tests instead of or in addition to price caps; several have added incentives for low-to-moderate income households.
3. Incentive administrator for CA, MA and CT program has observed MSRP caps are easier to administer and market to consumers.

e. Emission Reductions / Environmental Issues

- i. EV operating emissions are much lower than comparable gasoline cars, even considering upstream emissions of electric generation.
- ii. All-electric vehicles have no tailpipe emissions – including the variety of pollutants commonly found in gasoline tailpipe emissions (CO₂, CO, NO_x, air toxics, etc).
- iii. Union of Concerned Scientists estimates an EV charged with New England grid energy has the carbon emissions equivalent of a 102 mpg gasoline vehicle. <https://blog.ucsusa.org/dave-reichmuth/new-data-show-electric-vehicles-continue-to-get-cleaner>
- iv. This is likely more favorable in Vermont and will continue to improve as more renewables and lower emission generation connect to the grid.
- v. EV manufacturing has a larger environmental footprint than comparable gasoline cars. Added emissions are generally offset within the first 18 months of ownership (or less) depending on the vehicle, power source and amount of driving (UCS).
- vi. Lithium used in batteries is plentiful but added supplies likely necessary to meet future demand.
- vii. Cobalt is also commonly used in Li-ion batteries and has more significant social and environmental issues due to large quantities coming from the Democratic Republic of Congo (DRC). Some of the DRC supply comes through smaller “artisanal” mines that use child labor. This issue affects many devices using Li-ion batteries including smartphones, laptops and EVs. Industry suppliers are improving sourcing requirements to address the issue, but more work needs to

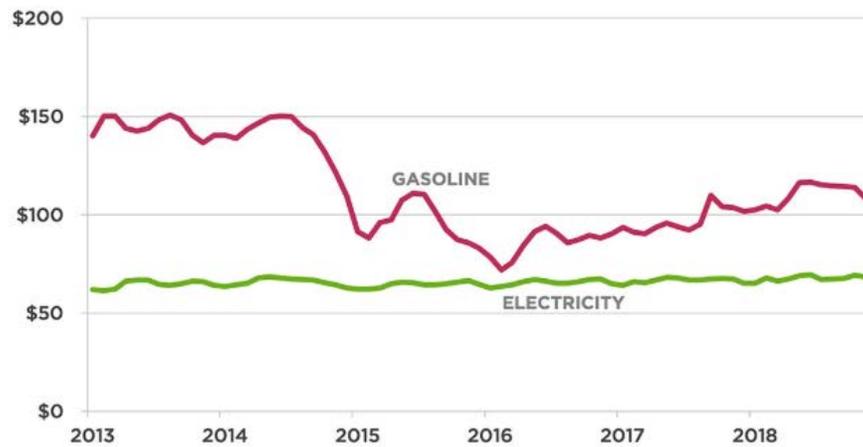
be done. Battery researchers are also developing new chemistries that may reduce or eliminate cobalt in future EV batteries.

- viii. Vermont ANR and/or the Energy Action Network may have estimates of potential Vermont GHG emission reductions associated with EV adoption in Vermont.

f. Cost of Ownership

- i. Energy costs of an EV are significantly lower than comparable gasoline vehicles. On average it is the equivalent of about \$1.50 per gallon gasoline to travel on electricity in Vermont. Analysis of the last five years of price history for gasoline and electricity suggests about \$2,400 in savings for an EV (chart below). Savings could be higher with special EV utility rates. Electricity prices are regulated and much more stable than gasoline.

MONTHLY TRANSPORTATION ENERGY EXPENSES

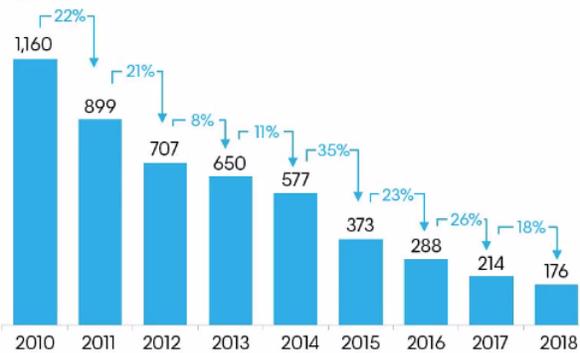


Source: US Energy Information Administration and VEIC
 Assumptions: 25 mpg gasoline vehicle; 3 mile per kWh EV; 1,000 miles per month

- ii. Maintenance costs are significantly lower, especially for all-electric vehicles which do not have internal combustion engines to maintain. AAA estimates 17% savings.
- iii. Total cost of ownership, including depreciation costs, can vary depending on model and whether it was purchased new or used, incentives, etc, but many owners find they are able to get significant savings without compromising performance.

Lithium-ion battery price survey results: volume-weighted average

Battery pack price (real 2018 \$/kWh)



BloombergNEF. Note: The data in this chart has been adjusted to be in real 2018 dollars.

- iv. Batteries are the most expensive components in EVs. Prices have decreased significantly over the past 8 years and this trend is expected to continue (see chart). This will

help bring down EV pricing to parity (or lower) with comparable gasoline vehicles over the next 10 years.

g. EV Battery Life

- i. Warranties vary depending on the vehicle
 1. Most AEVs have 8 year / 100k mile battery warranties at 60-70% of the original capacity.
 2. PHEVs required to offer 10-15 year, 150k warranties on powertrain (including batteries) as part of the California ZEV program requirements.
- ii. Heat is the primary cause of premature battery cell degradation. Models with liquid battery cooling systems (Tesla, Chevrolet) appear to be holding up better than passive air cooling (Nissan).
- iii. There are many Tesla and Chevrolet EVs going hundreds of thousands of miles with less than 10% capacity loss.
- iv. Advances in battery chemistry should continue to improve battery life in the future.
- v. Little data available on long term trends for EV battery replacement. Servicing individual modules within the battery could provide significant savings compared to a full replacement.
- vi. Automakers working on second life applications for batteries as stationary storage once they are no longer adequate for vehicle use. Also working with recycling companies to develop techniques to reclaim valuable battery component materials.
- vii. Consumers considering a used EV purchase should request / perform battery tests to understand remaining life.



Electric vehicles have arrived.

Are you ready to drive?



TYPES OF EVS

- All Electric Vehicle (AEV)**
also known as Battery Electric Vehicle (BEV):
Powered solely by an electric battery
- Plug-in Hybrid Electric Vehicle (PHEV):**
Powered by an electric battery, and supplemented by conventional fuels (like gas or diesel)



IF ALL VERMONT CARS WERE ELECTRIC,

we would save over **\$800 million** in gasoline costs **EVERY YEAR.**

Over half of Vermont communities have plug-in Electric Vehicles (EVs) registered—find out why below!

Save Money

- Spend the equivalent of about \$1.50 per gallon of gas to charge your vehicle.
- Save \$1,200 or more on maintenance costs.
- Receive up to \$7,500 in federal tax credits toward your purchase.
- ...Or get a great lease deal through several Vermont dealers.

Increased Convenience

- Just plug in at night and wake up to a full charge each morning (no more trips to the gas pump!)
- To refuel away from home, visit one of Vermont’s many public charging stations. See the map of public charging stations on our website.
- Indulge in luxuries such as smartphone vehicle management apps, preheating and cooling systems, heated seats and even solar panels.

Great Performance

- Accelerate faster than you would in most equivalent gas-powered cars.
- Expect increased traction due to heavy batteries (great for winter driving conditions).

Great for Vermont

- EVs increase our energy independence and can be powered with renewable energy.
- Breathe deep. EVs produce zero tailpipe emissions and have significantly less overall impact than gasoline vehicles (even factoring in emissions from manufacturing and electricity generation).
- Reduce noise pollution (EVs are incredibly quiet).

DRIVING AN EV IS LIKE PAYING **\$1.50/GALLON** FOR GAS AT THE PUMP

Drive Electric Vermont is a project of the Vermont Energy Investment Corporation (VEIC) in partnership with the State of Vermont, and a broad array of stakeholders advancing electric vehicle technology.

For more information on EVs in Vermont, visit www.driveelectricvt.com



New Plug-in Cars Available in Vermont

Make / Model	Vehicle Type	Electric Range (miles)†	Total Electric & Gas Range (miles)	Battery Size (kWh)	MPGe Electric Efficiency	All Wheel Drive	DC Fast Charging	Seats	Cargo (ft ³)	MSRP for base model	Federal Tax Credit Amount	Standard Monthly Lease Price	Lease Down Payment
Plug-in Hybrid Vehicles (Gasoline + Electric)													
Audi A3 e-tron	Plug-in Hybrid	16	380	8.8	83	--	--	5	9.9	\$ 39,500	\$ 4,502	\$ 369	\$ 4,259
BMW 330e	Plug-in Hybrid	14	350	7.6	71	--	--	5	13.0	\$ 45,600	\$ 4,001	\$ 539	\$ 3,000
BMW 530e	Plug-in Hybrid	19	404	9.2	72	Optional	--	5	14.5	\$ 53,400	\$ 4,585	\$ 599	\$ 3,500
BMW i3 REx	Plug-in Hybrid	97	180	33.0	100	--	SAE Combo	4	9.2	\$ 48,850	\$ 7,500	\$ 379	\$ 3,000
BMW X5 xDrive40e	Plug-in Hybrid	14	540	9.0	56	Standard	--	5	17.7	\$ 63,750	\$ 4,668	\$ 759	\$ 3,500
Chevrolet Volt	Plug-in Hybrid	53	420	18.4	106	--	--	5	10.6	\$ 34,095	\$ 7,500	\$ 199	\$ 3,349
Chrysler Pacifica Hybrid	Plug-in Hybrid	33	570	16.0	82	--	--	7	140.0	\$ 39,995	\$ 7,500	\$ 549	\$ 3,249
Ford Fusion Energi	Plug-in Hybrid	21	610	7.6	103	--	--	5	8.2	\$ 31,400	\$ 4,007	\$ 229	\$ 4,104
Honda Clarity PHEV	Plug-in Hybrid	47	340	17.0	110	--	--	5	15.5	\$ 34,200	\$ 7,500	\$ 209	\$ 2,299
Hyundai Ioniq PHEV	Plug-in Hybrid	29	630	8.9	119	--	--	5	23.0	\$ 24,950	\$ 4,543	\$ 269	\$ 1,999
Hyundai Sonata PHEV	Plug-in Hybrid	27	600	9.8	99	--	--	5	9.9	\$ 34,600	\$ 4,919	\$ 289	\$ 1,699
Kia Niro PHEV	Plug-in Hybrid	26	560	8.9	105	--	--	5	19.4	\$ 27,900	\$ 4,543	\$ 259	\$ 2,499
Kia Optima PHEV	Plug-in Hybrid	29	610	9.8	103	--	--	5	10.0	\$ 35,210	\$ 4,949	\$ 289	\$ 2,499
Mercedes-Benz C350e	Plug-in Hybrid	8	410	6.2	51	--	--	5	11.8	\$ 47,900	\$ 3,501	\$ 399	\$ 4,223
Mercedes-Benz GLC350e	Plug-in Hybrid	9	350	8.7	56	Standard	--	5	19.4	\$ 49,990	\$ 4,460	\$ 479	\$ 4,463
Mini Countryman SE All4	Plug-in Hybrid	12	270	8.0	65	Standard	--	5	15.9	\$ 36,900	\$ 4,001	\$ 359	\$ 2,999
Mitsubishi Outlander PHEV	Plug-in Hybrid	22	310	12.0	74	Standard	CHAdeMO	5	78.0	\$ 34,595	\$ 5,836	\$ 289	\$ 4,088
Subaru Crosstrek Hybrid+++	Plug-in Hybrid	17	480	8.8	90	Standard	--	5	15.9	\$ 34,995	\$ 4,502	TBD	TBD
Toyota Prius Prime	Plug-in Hybrid	25	640	8.8	133	--	--	5	19.8	\$ 27,100	\$ 4,502	\$ 336	\$ 2,999
Volvo XC60 T8 PHEV	Plug-in Hybrid	17	370	10.4	58	Standard	--	5	17.8	\$ 52,900	\$ 5,002	\$ 615	\$ 4,065
Volvo XC90 T8 PHEV	Plug-in Hybrid	19	380	10.4	58	Standard	--	7	15.4	\$ 64,950	\$ 5,002	\$ 685	\$ 4,785
All Electric Vehicles													
Audi e-tron+++	All Electric	200+	200+	95.0	TBD	--	SAE Combo	5	28.5	\$ 74,800	\$ 7,500	TBD	TBD
BMW i3	All Electric	114	114	33.0	113	--	SAE Combo	4	9.2	\$ 44,450	\$ 7,500	\$ 349	\$ 3,000
Chevrolet Bolt	All Electric	238	238	60.0	119	--	SAE Combo option	5	16.9	\$ 37,495	\$ 7,500	\$ 399	\$ 4,209
Ford Focus Electric	All Electric	115	115	33.5	107	--	SAE Combo	5	14.5	\$ 29,120	\$ 7,500	\$ 212	\$ 1,847
Hyundai Ioniq EV	All Electric	124	124	28.0	136	--	SAE Combo	5	23.8	\$ 29,815	\$ 7,500	\$ 239	\$ 2,500
Hyundai Kona EV+++	All Electric	258	258	64.0	120	--	SAE Combo	5	19.2	\$ 37,495	\$ 7,500	TBD	TBD
Jaguar I-Pace++	All Electric	234	234	90.0	76	Standard	SAE Combo	5	25.3	\$ 69,500	\$ 7,500	\$ 1,006	\$ 2,500
Kia Niro Electric+++	All Electric	239	239	64.0	112	--	SAE Combo	5	19.0	\$ 37,500	\$ 7,500	TBD	TBD
Kia Soul EV	All Electric	111	111	30.0	108	--	CHAdeMO	5	18.8	\$ 33,950	\$ 7,500	\$ 199	\$ 1,999
Nissan LEAF	All Electric	151	151	40.0	112	--	CHAdeMO option	5	23.6	\$ 29,990	\$ 7,500	\$ 199	\$ 2,929
Nissan LEAF e Plus+++	All Electric	220+	220+	62.0	TBD	--	CHAdeMO option	5	23.6	\$ 37,000	\$ 7,500	TBD	TBD
Smart Electric Drive++	All Electric	58	58	17.6	108	--	--	2	12.4	\$ 25,290	\$ 7,500	\$ 129	\$ 999
Tesla Model 3 Standard+++	All Electric	220	220	50.0	TBD	TBD	Tesla Supercharger	5	14.0	\$ 35,000	\$ 3,750	TBD	TBD
Tesla Model 3 Mid Range++	All Electric	260	260	60.0	123	--	Tesla Supercharger	5	14.0	\$ 42,900	\$ 3,750	TBD	TBD
Tesla Model 3 Long Range++	All Electric	310	310	75.0	116	Standard	Tesla Supercharger	5	14.0	\$ 49,900	\$ 3,750	TBD	TBD
Tesla Model S++	All Electric	310	310	100.0	102	Standard	Tesla Supercharger	5 (+2)	26.0	\$ 85,000	\$ 3,750	\$ 1,273	\$ 7,000
Tesla Model X++	All Electric	270	270	100.0	87	Standard	Tesla Supercharger	7	26.0	\$ 88,000	\$ 3,750	\$ 1,325	\$ 7,000
Volkswagen e-Golf	All Electric	125	125	35.8	119	--	SAE Combo option	5	22.8	\$ 30,495	\$ 3,750	\$ 319	\$ 2,999

Low Volume PHEVs not shown: BMW i8; BMW 740e; Mercedes-Benz GLE550e; Porsche Cayenne S e-Hybrid; Porsche Panamera 4 e-Hybrid; Volvo S90

MPGe, or Miles per Gallon equivalent, is a measure of vehicle efficiency based on the number of miles an electric car travels on the energy equivalent of 1 gallon of gasoline, or 33.7 kWh

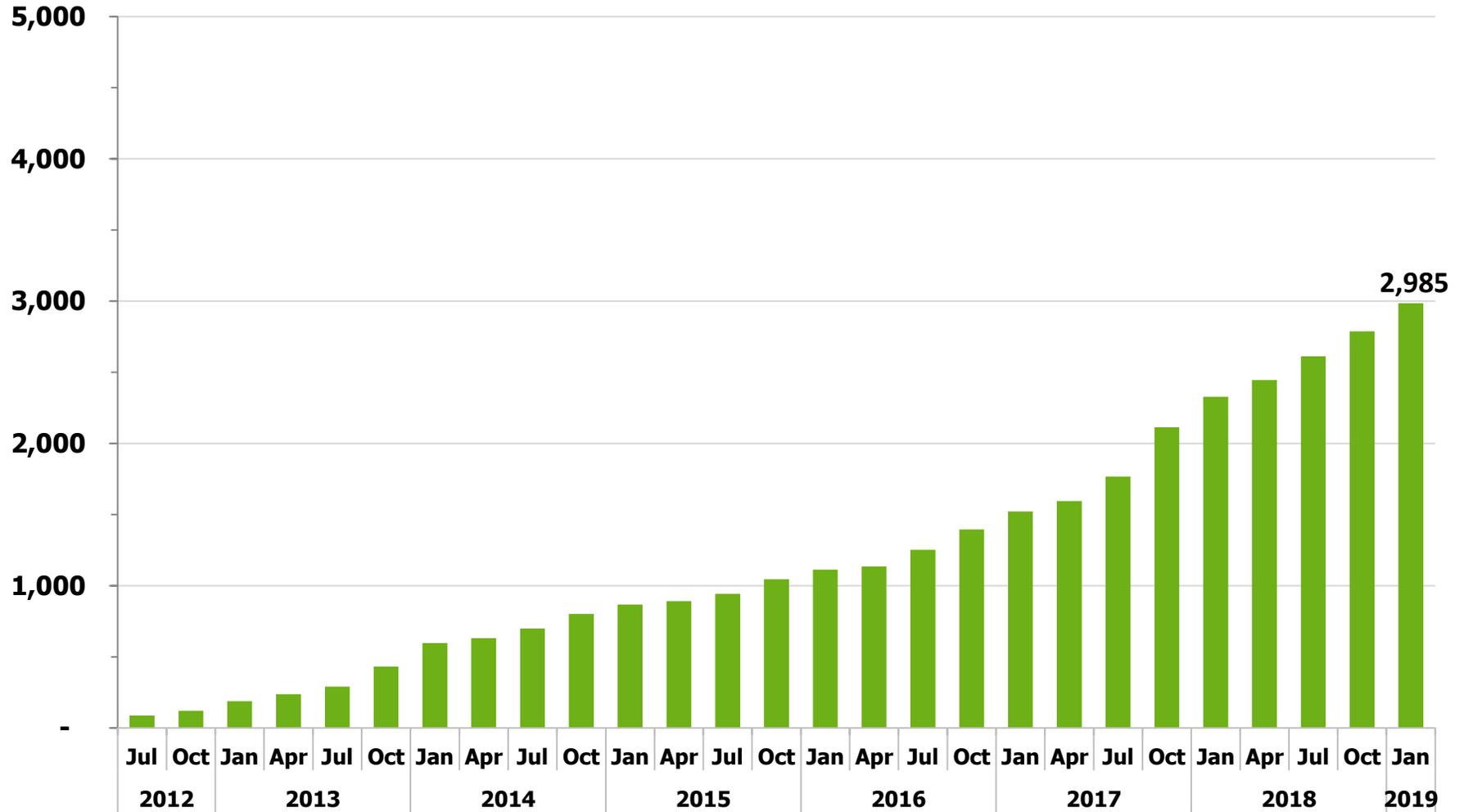
†Electric range is from official manufacturer ratings for current new vehicles. Range is generally 20-50% less in coldest winter conditions and can be lower in older model years.

as of 2/13/2019

++No Vermont dealerships, but vehicles are available to Vermonters in nearby states or online. +++Coming in 2-6 months.

<http://driveelectricvt.com/buying-guide/compare-vehicles>

Vermont Electric Vehicle Registrations



 Total Passenger EVs in Vermont

Source:
VT Agency of Natural Resources;
VT Dept of Motor Vehicles

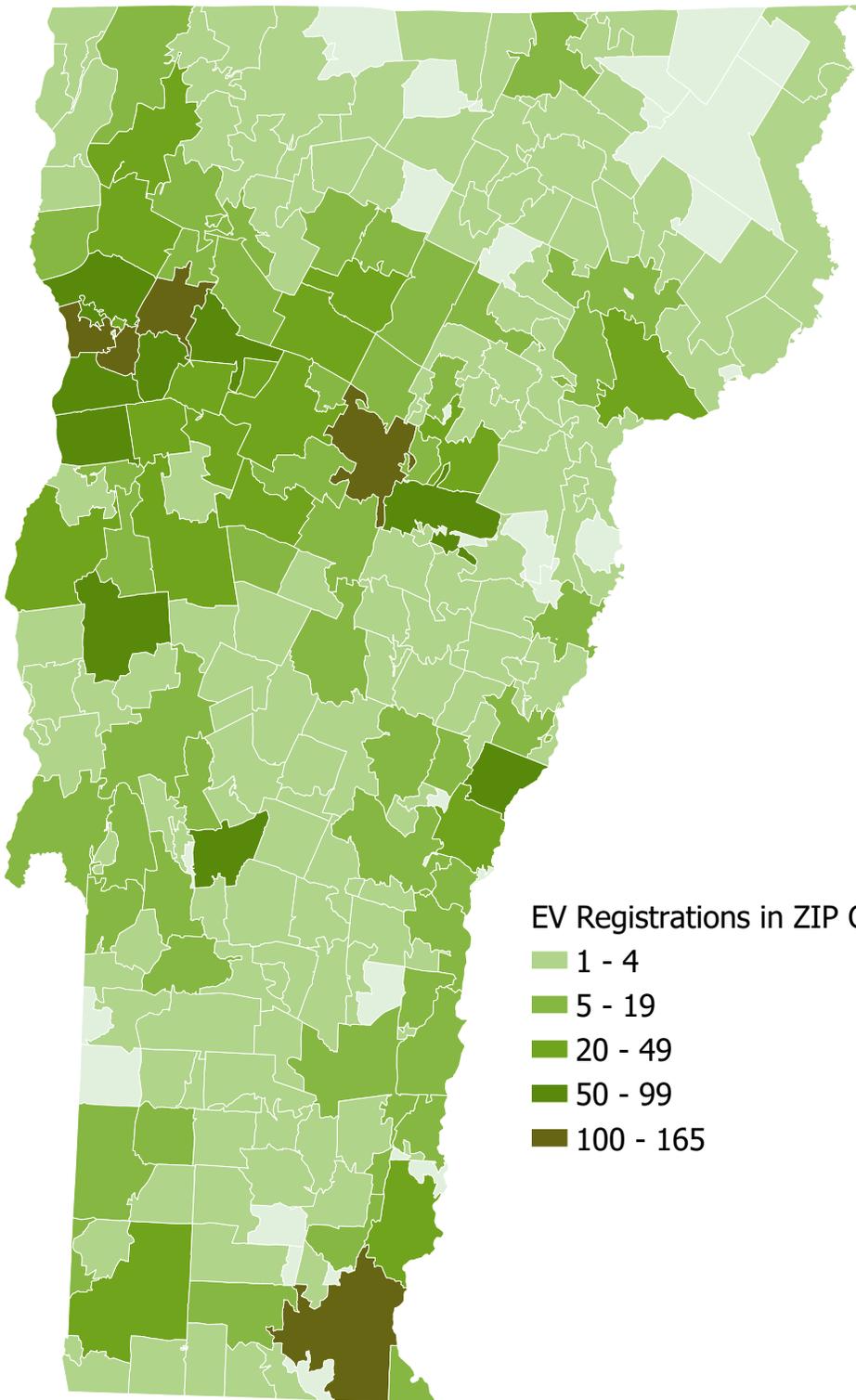


January 2019 EV Registration Updates

- Plug-in electric vehicles (EVs) are registered in 87% of Vermont communities.
- Chittenden County has the most EVs registered at 1,072.
- Chittenden County also has the highest rate of ownership with about 1 EV for every 145 people.
- The number of EVs in the state increased by 658 vehicles or 28% over the past year.
- Plug-in vehicles comprised 5.8% of new passenger vehicle registrations over the past quarter.
- About 22% of plug-in vehicles registered in the last quarter were leased, a popular and affordable way to obtain an electric car.
- Used EV registrations continue to grow as an estimated 12% of EVs registered in the last quarter were used.
- About two-thirds of the EVs are plug-in hybrid electric vehicles (PHEVs) which can run on both electricity and gasoline, providing flexibility to run on gasoline when needed.
- There are 42 unique models of plug-in cars registered in the state.
- The Tesla Model 3 was the most popular model, with 83 new registrations in the quarter. This was followed by the Honda Clarity PHEV (40), Toyota Prius Prime plug-in hybrid (37), Nissan LEAF (31), Chevrolet Bolt (27), Chevrolet Volt (21), and Mitsubishi Outlander PHEV (11).
- There are now 209 locations with public charging for electric vehicles across the state.
- Vermont has 25 DC Fast Chargers available for EVs equipped with this technology to quickly recharge in about 30–45 minutes for longer trips.

Electric Vehicles Registered in Vermont

As of January 2019



EV Registrations in ZIP Code

- 1 - 4
- 5 - 19
- 20 - 49
- 50 - 99
- 100 - 165

Make & Model	Number Registered Statewide
Passenger Cars	
Plug-in Hybrids (1,975)	
Toyota Prius Plug-in/Prime	579
Ford CMax Energi	486
Chevrolet Volt	391
Ford Fusion Energi	227
Honda Clarity PHEV	68
Mitsubishi Outlander PHEV	37
BMW i3 REX	33
BMW X5 XDrive40e	27
Audi A3 e-Tron	25
Volvo XC90 T8	24
Kia Niro PHEV	14
Chrysler Pacifica Hybrid	13
Mini Countryman SE	12
BMW 530e	8
Volvo XC60 T8	5
Hyundai Ionic PHEV	3
Hyundai Sonata PHEV	3
Kia Optima PHEV	3
Mercedes-Benz GLE550e	3
Other	11
All Electric Vehicles (1,010)	
Nissan Leaf	391
Chevrolet Bolt	209
Tesla Model S	125
Tesla Model 3	112
Tesla Model X	54
Ford Focus Electric	26
Mitsubishi i-MiEV	26
Volkswagen e-Golf	26
Smart Electric Drive	16
Kia Soul EV	8
BMW i3 BEV	7
Tesla Roadster	6
Other	4
TOTAL PASSENGER CARS	2,985
Other Electric Vehicles	
<i>(not shown on map)</i>	
Neighborhood EVs (GEMs)	65
Electric Motorcycles and Mopeds	25
TOTAL PLUG-IN VEHICLES	3,075

This material is based upon work supported by the Vermont Public Service Department, Vermont Agency of Natural Resources, Vermont Agency of Transportation, and the Vermont Department of Buildings and General Services.

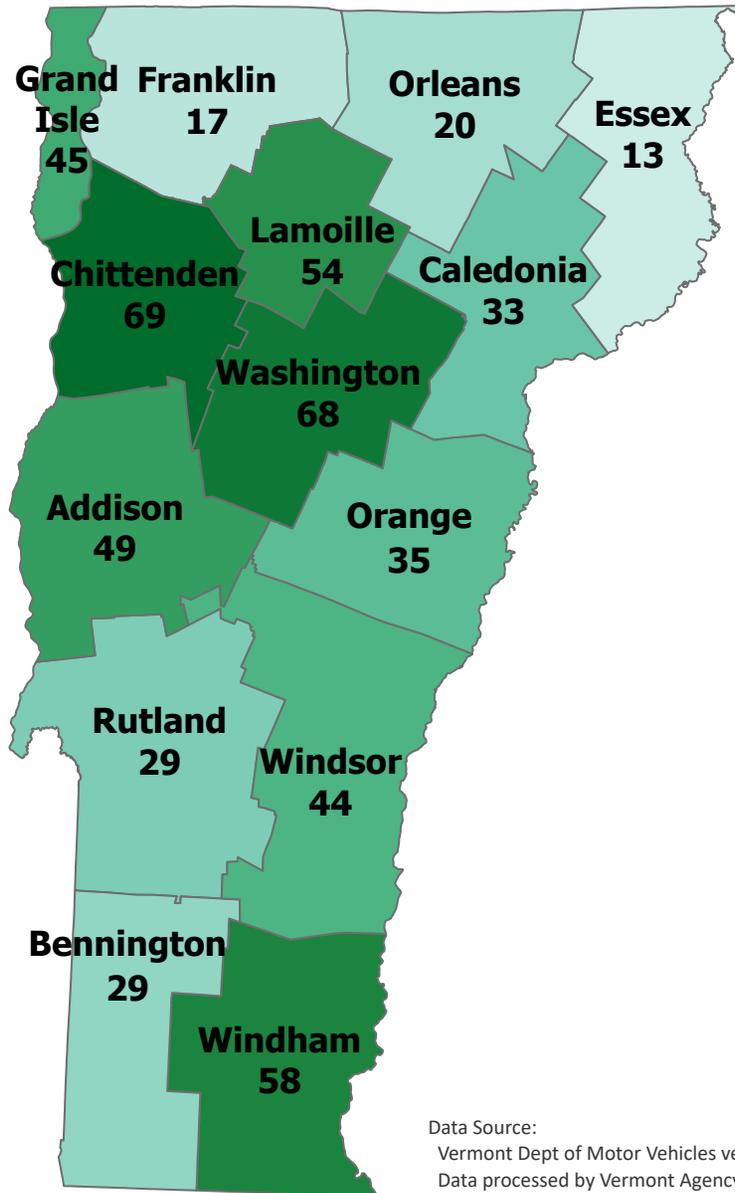
Data Source:

Vermont Dept of Motor Vehicles vehicle registration database as of 12/29/2018. Data processed by Vermont Agency of Natural Resources Dept of Environmental Conservation. Other vehicles include less than 3 registrations each of the BMW 330e, BMW i8, Cadillac ELR, Honda Accord PHEV, Porsche Cayenne PHEV, Mercedes-Benz GLC350e, Chevrolet Spark EV, Fiat 500e, Toyota RAV 4 EV and Azure Dynamics Transit Connect. EVs distinguished by fuel type, model and/or VIN.



Vermont Electric Vehicles Per 10,000 People

By County as of January 2019



County	Population	All Electric	Plug-in Hybrid	Total EVs	EVs per 10,000 People
Addison	36,821	73	106	179	48.6
Bennington	37,125	36	71	107	28.8
Caledonia	31,227	9	94	103	33.0
Chittenden	156,545	446	626	1072	68.5
Essex	6,306		8	8	12.7
Franklin	47,746	20	60	80	16.8
Grand Isle	6,970	10	21	31	44.5
Lamoille	24,475	31	102	133	54.3
Orange	28,936	37	65	102	35.3
Orleans	27,231	10	44	54	19.8
Rutland	61,642	46	135	181	29.4
Washington	59,534	118	286	404	67.9
Windham	44,513	56	203	259	58.2
Windsor	56,670	105	144	249	43.9

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 Vermont Dept of Motor Vehicles vehicle registration database as of 12/29/2018.
 Data processed by Vermont Agency of Natural Resources Dept of Environmental Conservation. EVs distinguished by fuel type, model and/or VIN.
 County data summarized from zip code geography. Population from 2010 US Census.
 Does not include 23 vehicles with registration zip codes outside of Vermont.

