Electric Cars 101
Upper Valley EV Expo

SEPTEMBER 9, 2017

It's time.
PLUG IN, VERMONT

Drive Electric Vermont
Why Electric Transportation?

- Clean Air
- Energy
- Affordability
- Climate Change

Drive Electric Vermont
Overview

1. Plug-in Electric Vehicle Overview
2. EV Charging
3. EV Market Trends
4. EV Purchase Considerations
5. Discussion
Vermont Greenhouse Gas Emissions

Transportation 45%

Agriculture
Industrial Processes
Electricity Supply
Industrial Fuel
Residential & Commercial Use
Waste Management
Electric cars are 2-3 times more efficient than gasoline.
Plug-in Vehicle Overview

- Types of Vehicles
- Cost of Ownership
- Charging Technology
Types of Plug-in Vehicles

All Electric

- Battery
- Electric Motor

70 - 300+ Mile Range on Battery

Plug-in Hybrid

- Battery
- Electric Motor
- Gasoline Tank
- Combustion Engine

15 - 80 Mile Range on Battery + 300 or More Miles on Gasoline
All-Electric Vehicles in Vermont

Compact to Full Size
Many Automakers
- Nissan
- Tesla
- Chevrolet
- Volkswagen
- Mitsubishi
- +4 others
Plug-in Hybrid Vehicles in Vermont

Wide range of models

Popular Automakers
- Ford
- Toyota
- Chevrolet
- BMW
Other Electric Options

Electric Buses

Electric Bikes
New arrivals

2017
- Chevrolet Bolt

Late 2017
- Tesla Model 3

Chrysler Pacifica Hybrid

30+ additional models in next 5 years
EVs in Vermont Conditions

Cold weather reduces electric range 20-40%
EV Charging

- Home
- Workplace
- Public

Away From Home Charging
Charging Equipment

**Level 1 Charging**
120V
5 miles range / hr

**Level 2 Charging**
240V
10-20 miles / hr

**DC Fast Charging**
480V
70+ miles / hr
DC Fast Charging Plugs

SAE Combo

Tesla Supercharger

CHAdeMO
EV Charging Power

**Level 1 Charging**
120V @ 1.2 kW
5 miles range / hr

**Level 2 Charging**
240V @ 3-20 kW
10-20 miles / hr
EV Public Charging Availability

September 2017

- About 160 Public Locations
- 23 with DC Fast Charging
EVs and the Grid
Monthly Cost Comparison

$3,700 Savings over 5 years

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

Total Passenger EVs in Vermont

2012 2013 2014 2015 2016 2017
EVs per 10,000 People by County

Highest Ownership Rates
As of July 2017

1. Lamoille
2. Washington
3. Chittenden
4. Caledonia
5. Grand Isle

VT ANR, VT DMV, VEIC
Regional EV Market Trends

EV Sales Share - July 2016-June 2017
EV Purchase Considerations

1. Available Incentives
2. Lease vs Buy
3. New vs Used
4. Shopping Tools
Purchase Incentives

1. Federal Tax Credit
   a. Up to $7,500, based on battery size
   b. Begins to sunset when manufacturer reaches 200,000 EV sales
   c. Claim on income taxes (unless leasing)
   d. Does not carry-over into future years

2. Electric Utility
   a. Some utilities offering customer incentives on EV purchase
   b. Nissan LEAF “Fleetail” deals for $10,000 discount on 2017 LEAF

3. Employee Benefit Programs

http://www.driveelectricvt.com/buying-guide/purchase-incentives
Lease vs Buy

1. Lease Benefits
   a. Over half of EVs leased
   b. Tax credit included in lease, offering good deals
   c. Rapid technology advancement
   d. Less worry over battery and other components since vehicle will be under warranty

2. Purchase Benefits
   a. Lowest total cost of ownership
   b. No mileage limitations like leasing
   c. Some manufacturers may not offer EV leases
New vs Used

1. New
   a. Tax credit available
   b. New vehicles generally have more range and better performance in Vermont conditions
   c. Less worry over battery and other components since vehicle will be under warranty

2. Used
   a. Growing availability, now about 20% of Vermont EV market
   b. Lowest total cost of ownership
   c. No federal tax credit
Shopping Tools

1. Drive Electric Vermont website
   http://www.driveelectricvt.com/

2. TrueCar (pricing info)
   http://truecar.com

3. FuelEconomy.Gov
   http://www.fueleconomy.gov/

4. Automaker / EV websites and forums
   http://www.greencarreports.com/
   http://www.insideevs.com/
Discussion

Clean Air

Energy

Climate Change

Affordability