

THE CLASS OF 1964 POLICY RESEARCH SHOP

Celebrating 10 Years of Service to New Hampshire and Vermont

INCENTIVIZING ZERO EMISSION VEHICLE PURCHASES IN VERMONT

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OVERVIEW

- Context and methodology
- Financial programs
 - Rebates
 - Tax credits and refunds
- Non-financial programs
 - Marketing
 - Raffles
 - Parking
- Economic benefits of incentives
- Market limitations



CONTEXT

- 2013 Zero Emission Vehicle (ZEV) Memorandum of Understanding (MOU)
- 2014 Vermont Action Plan
 - Recognizing importance of consumer incentives and outreach
- Vermont's current programs

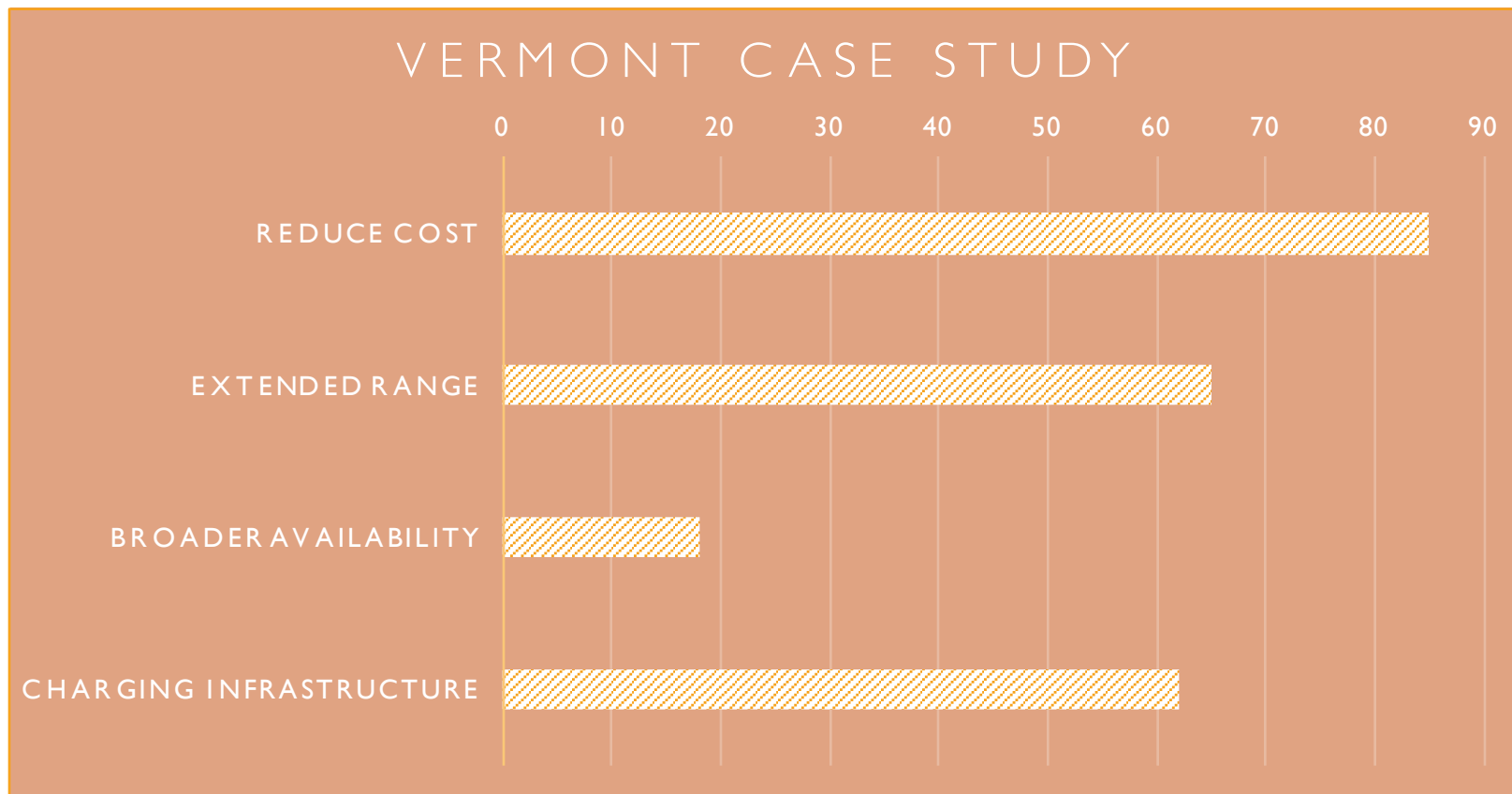


METHODOLOGY

- Collect and analyze data provided by internal and external reports
- Interviews with representatives from various state agencies, public-private coalitions, nonprofit organizations, and other key ZEV stakeholders
 - **Josh Boone**, California PEV Collaborative
 - **Keith Malone**, California PEV Collaborative
 - **Lisa Macumber**, California Air Resource Board
 - **Elise Keddie**, California Air Resource Board
 - **Lyz Hoffman**, Santa Barbara County Air Pollution Control District
 - **Adam Ruder**, NYSERDA
 - **Justin Mabrey**, Maryland Department of the Environment



CRITICAL FACTORS FOR ZEV PURCHASE



Source: "Drive Electric Vermont Case Study," U.S. Department of Energy (2016)



EFFICACY OF FINANCIAL INCENTIVES

- U.S. Department of Energy report
 - Decreasing purchase price of vehicle by little as 10% would increased market share by to 80%
- State of Oregon study
 - Concluded that robust rebate program is required to meet its 10-Year Energy Action Plan and benchmarks per the ZEV MOU
 - Found correlation between states with highest financial incentives and highest ZEV sales (e.g., California and Washington)



FUNDING DEDICATED TO REBATE PROGRAMS

State	Program Inception	Funding Dedicated (\$)	ZEVs Sold, 2011–2016	ZEV Target by 2025
California	2010	~438,000,000	247,515	1,500,000
Connecticut	2015	~5,000,000	4,994	154,000
Maryland*	N/A	8,937,188	8,080	304,210
Massachusetts	2014	~10,200,000	8,745	302,000
New York	N/A	N/A	20,139	843,000
Oregon	N/A	N/A	11,077	33,000
Rhode Island	2016	500,000	862	43,000
Vermont	2014	~200,000	1,601	35,000



REBATE AMOUNT BY STATE

State	FCEV	BEV	PHEV
California	5,000	2,500	1,500
Connecticut	5,000	Up to 3,000	Up to 3,000
Maryland	Up to 3,000 excise tax credit		
Massachusetts	N/A	2,500	1,500
New York*	2,000	2,000	2,000
Oregon	N/A		
Rhode Island	Up to 2,500		
Vermont	Up to 1,000		

REBATES

- Vehicle subsidies, particularly rebates and point-of-purchase incentives, are the leading factor in motivating consumers to purchase ZEVS
- Largest Nissan LEAF markets emerged in states (California, Georgia, and Washington respectively) with the relatively strongest financial incentives
 - MSRP of new 2017 Nissan LEAF is \$30,680



REBATES: INCOME CAP

- Income cap
 - Cost-effective and maximizing utility
 - Equalize and broaden market for lower income brackets (and thereby more consumers)
 - Median income of consumers in MA is between \$150,000 and \$199,999
 - Conduct detailed demographic research



TAX INCENTIVES

- Implementations in different states
- Mediocre performance on boosting ZEV sales
- Not as effective as rebates
- U.S. Department of Energy report
 - Tax credits are likely to be half as effective as a rebate in incentivizing
 - Present value for consumer is higher with rebates than future tax decrease
 - Tax liability may affect whether a consumer is eligible or not for a credit



THE NEED FOR MARKETING

- Low consumer awareness of incentives
 - California: 35%
 - Oregon: 18%
 - Washington: 17%
 - Maryland: 16%
- Over 60% of MA respondents learned about rebate program through dealership
 - Self-selective
 - Dealership challenges in VT
 - Maryland solution





Electric Vehicle Incentives

Plug-in electric vehicles offer lower operating costs and cleaner air for all Marylanders. Read below for incentives available to Maryland citizens and businesses that purchase or lease these vehicles.

1. Federal Income Tax Credit

A federal tax credit is available to buyers of new plug-in electric vehicles based on battery capacity and ranges. The credit ranges from **\$2,500 to \$7,500**. For model year 2015, the credits are as follows:

Toyota Prius Plug-In Hybrid: **\$2,500**

Ford Fusion Energi & C-Max Energi: **\$4,007**

Chevrolet Volt, Nissan Leaf, Tesla Model S, and others: **\$7,500**

Note that this credit, which became available in 2009, will begin to phase out once auto manufacturers meet their sales quota.

To get this credit: Complete IRS Form 8936, Qualified Plug-in Electric Drive Motor Vehicle Credit and submit with your income tax return:
<http://www.irs.gov/pub/irs-pdf/t8936.pdf>



2. Maryland Excise Tax Credit

A Maryland excise titling tax credit of \$125/kWh of battery capacity up to \$3,000 is available to buyers and lessors of qualifying new plug-in electric vehicles. The credit is effective July 1, 2014 through June 30, 2017 and credits are processed subject to the availability of funds. Business entities may also qualify for the tax credit on up to ten vehicles.

To get this credit: Complete Form VR 334 and submit to the Maryland Motor Vehicle Administration. Your dealership can assist you with this.
http://www.mva.maryland.gov/_resources/docs/VR-334.pdf



3. Use of High Occupancy Vehicle (HOV) Lanes

As a driver of a plug-in electric vehicle titled and registered in Maryland, you are allowed to use all HOV lanes in Maryland regardless of the number of passengers provided you obtain and display an HOV permit on the vehicle. The permit will be valid from October 1, 2010 through September 30, 2017.

HOV lanes in Maryland:

- The I-270 southbound HOV lane extends from I-370 to the Capital Beltway (I-495) in Montgomery County and is operational during the morning peak period from 6:00 a.m. to 9:00 a.m.
- The I-270 northbound HOV lane operates on a 19-mile stretch from the Capital Beltway to MD 121 (Clarksburg Road) and is operational during the evening peak period from 3:30 p.m. to 6:30 p.m.
- The HOV lanes run east and west on a 7.5-mile stretch of US 50 between the Capital Beltway (I-95 / I-495) and US 301 (Crain Highway) in Prince George's County and are in operation 24 hours / day.

To get this benefit: Complete Form VR 335 and submit to the Maryland Motor Vehicle Administration then put the decal on your car. Your dealership can assist you with this. http://www.mva.maryland.gov/_resources/docs/VR-335.pdf



4. Rebates and Grants for Charging Stations

Plug-in electric vehicles can be charged through regular 120-volt household electrical outlets (known as Level 1 charging), 240-volt systems (Level 2 charging) and higher voltage DC Fast Charge stations. Rebates are available for all of these charging systems and cover 50 percent of the equipment and installation cost up to a limit (\$900 for residential, \$5,000 for commercial and \$7,500 for service stations) for systems purchased and installed between July 1, 2014 and June 30, 2017.

To get the charging station rebate: Complete the Electrical Vehicle Supply Equipment (EVSE) rebate forms on the Maryland Energy Administration website. http://energy.maryland.gov/transportation/Pages/incentives_evse rebate.aspx

Grants are also available for solar photovoltaic canopies installed at parking garages where the array is charging at least four electric vehicle charging stations.

To get the parking lot solar PV charging station grant: Complete the forms on the Maryland Energy Administration website:
<http://energy.maryland.gov/business/Pages/incentives/PVEVprogram.aspx>



MARKETING SOLUTIONS

- Need for outreach but mindful of **cost**
- Taking advantage of public spaces (e.g., state offices, courthouses, motor vehicle agencies, town halls)
- Direct mass mailers
- One-on-one direct consumer interface is key
 - Staff booths at community events (e.g., wine and beer festivals, farmers' markets)
- Partnerships
 - Possibility of Vermont or Northeast partnership with California PEV Collaborative and its members, including critical members of auto, utilities, and EV supply industries



CA PEV COLLABORATIVE'S MEMBERS

- **Auto manufacturers**

- Tesla
- Honda
- Daimler AG
- Nissan
- BMW Group
- Kia
- General Motors
- Ford
- Subaru
- Toyota

- **Utilities and supplier sector**

- Advanced Energy Economy
- Chargepoint
- Pacific Gas and Electric Company
- PlugShare
- Southern California Edison

- **Other stakeholders**

- UC Davis, Institute of Transportation Studies
- UCLA Luskin Center for Innovation
- Union of Concerned Scientists
- The Greenlining Institute
- Natural Resources Defense Council
- Center for Sustainable Energy



RAFFLES

- Economic incentive to participate
- Incorporate into popular auto-related events
- Promote awareness of ZEV
- Inform public of benefits
- Raise money



FREE, PREFERENTIAL PARKING

- Uncommon practice among states
- Inexpensive and easy to administer
- VT context of having few urban centers
- Assess appeal of the program by analyzing demand for parking



RETURN ON INVESTMENT

- Financial returns
 - Positive economic impact for states
 - University of Michigan and U.C. Berkeley studies
 - Vehicle electrification would contribute about \$80 million annually to the Oregon economy by 2020 (offsets lost gas tax revenue)

ADOPTION RATE	EMPLOYMENT	LABOR INCOME	LOW GDP ESTIMATE	HIGH GDP ESTIMATE	REVENUE
15% of new car sales	1,544.5	\$62,960,474	\$113,322,919	\$182,338,780	\$11,997,795
45% of new car sales	1,912.3	\$77,987,435	\$140,074,117	\$225,769,644	\$14,745,577

Source: "The Returns to Vehicle Electrification," Drive Oregon (2015)





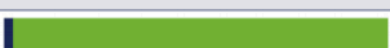







RETURN ON INVESTMENTS (CONTINUED)

- Long-term gain for short-term spending
 - States found that incentives can be funded through predicted revenue from ZEV adoption
 - E.g., Oregon could fund the purchase of 21,000 ZEVs (4.5 times as many ZEVs registered currently)
 - **Necessary** to expand nascent market
- Taking advantage of a positive feedback loop
 - Critical mass of ZEVs will lead to even more adoption (e.g., through private investment in ZEV technology, infrastructure, etc.)



MARKET LIMITATIONS

State	ZEVs sold since 2011 (cumulatively)	ZEV target by 2025 (cumulatively)	Progress made toward target
California	247,515	1,500,000	
Connecticut	4,994	154,000	
Maine	1,184	65,000	
Maryland	8,080	289,000	
Massachusetts	8,745	302,000	
New Jersey	11,153	635,000	
New York	20,139	843,000	
Oregon	11,077	133,000	
Rhode Island	862	43,000	
Vermont	1,601	35,000	

Source: "ZEV Market Report: November 2016," Drive ZEV (2016)



CONCLUSION

