Section 46 Vehicle Feebate and Vehicle Incentive Programs Funding Report

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SENATE COMMITTEE ON FINANCE

Report Purpose & Requirements

Purpose
- To determine whether Vermont should establish a time-of-acquisition vehicle feebate program to act as a self-funding incentive program

Report Requirements
- Whether vehicle feebates should be structured in steps—one or multiple—or as a continuum;
- Whether there should be separate vehicle feebates for different classes of vehicles and, if so, whether there should be different pivot points for where a fee crosses over to a rebate;
- If vehicle feebates should apply to both new and used vehicles and purchased and leased vehicles.
- How a time-of-acquisition vehicle feebate program or other funding mechanism could function with the vehicle incentive programs established in Sec. 34.
- The level of investment, incentives, feebates, and other monetary incentives and disincentives needed to reach the number of plug-in electric vehicles in Vermont's Comprehensive Energy Plan.

Feebate Definition and Structure

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- A Feebate *is a market-based policy approach aimed at lowering transportation-related fuel consumption and carbon emissions using two primary elements*:
  - ➤ A fee assessed on the purchase of vehicles that emit more GHGs and are less energy efficient.
  - ➤ A corresponding rebate awarded to purchasers of low-emissions vehicles.

- Feebate programs are typically designed to be self-funding, so that the cost of incentivizing cleaner vehicles is offset by the corresponding fee portion of the policy.

- Feebates can be applied in conjunction with incentives targeted at specific technologies. For example, EVs could be awarded higher rebate levels than internal combustion engine (ICE) vehicles to explicitly encourage their adoption.

Feebate Examples

- No examples in the United States (the focus has been on EV incentives).

- **France** - France's system was implemented in stepwise fashion, but uses a high number of different gradations between the CO_2 grams per kilometer (g/km) equivalents of 21 MPG and 96 MPG (the outer bands of the program), and completely covers the new automobile market in the country.

- **Canada** - Ontario's *Tax for Fuel Conservation*, which was implemented in the Canadian province between 1991 and 2010. The program was eventually terminated due to changes in the political climate. The program targeted only the worst and best performing vehicles and utilized a benchmark metric of liters per 100 kilometers, a measure of fuel efficiency rather than fuel economy.

Alternatives for Consideration & Evaluation Criteria

- Alternative #1: An all-vehicle feebate.
- Alternative #2: A feebate differentiated by vehicle class.
- Alternative #3: An EV rebate paired with short-term other revenue.
- Alternative #4: An EV-focused feebate that includes a feebate system for all vehicles, with a larger rebate for EVs.
- Alternative #5: A program that applies to leased and/or used vehicles as well new vehicle purchases.

Evaluation Criteria

- Effectiveness at achieving program goals (reducing GHGs and increasing EVs).
- Administrative cost/level of effort.
- Equity and other consumer acceptance considerations.

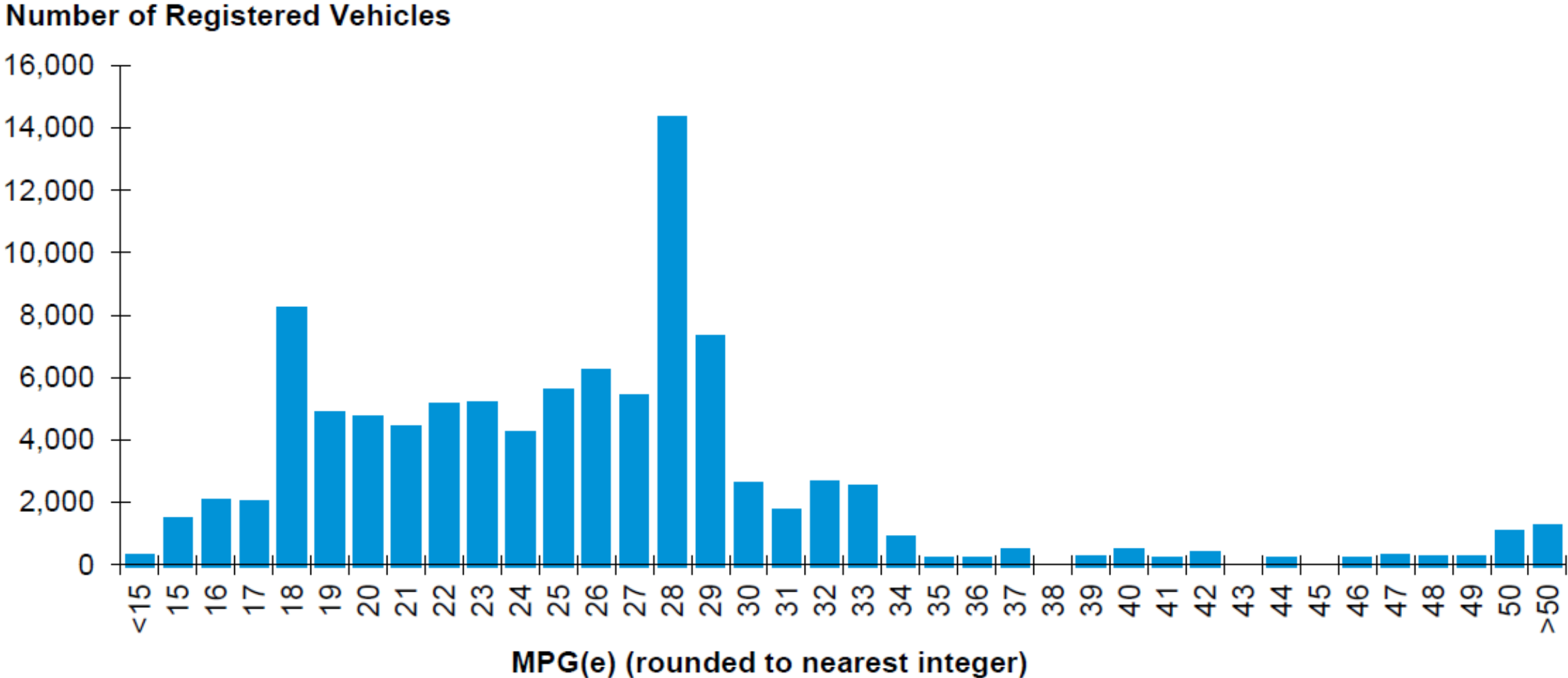Figure ES.1 Model Year 2016 to 2019 Registrations in Vermont by MPG(e)[1]

Table 4.2   Illustrative Linear Feebate Scenario

Pivot Point	373 g/mi CO_2
Carbon Price (feebate slope)	$14.55 per g/mi
Maximum Fee	$5,000
Maximum Rebate	$5,419
Fee for equivalent of 20 MPG vehicle (2019 Dodge Grand Caravan)	$1,059
Rebate for equivalent of 30 MPG vehicle (2019 Mazda CX3)	$1,379

Table 4.3 Illustrative Stepwise Feebate Program
Example 1

MPG(e) Bin	Number of Vehicles	Percentage of New Vehicles	Feebate Amount	3 ½ Year Revenue
< 15	205	0.22%	$1,500	$307,500
15 to < 20	21,595	23.67%	$800	$17,276,000
20 to < 25	23,293	25.53%	$200	$4,658,600
25 to < 30	35,670	39.1%	-$200	-$7,134,000
30 to < 35	7,302	8.00%	-$1,000	-$7,302,000
35 to < 40	641	0.70%	-$1,500	-$961,500
40 to < 45	295	0.32%	-$2,000	-$590,000
45 to < 50	1,154	1.27%	-$2,500	-$2,885,000
>= 50	1,105	1.21%	-$3,000	-$3,315,000
Total[1]				$54,600

1 The goal would be to have a "total" net revenue as close to $0 as possible, but since the feebate schedule must be set before the actual distribution of vehicles is known, the net is unlikely to be exactly $0 in practice. Also, a small amount of revenue will need to be reserved to cover administrative costs.

Table 4.4   Illustrative Stepwise Feebate Program
Example 2

MPG(e) Bin	Number of Vehicles	Percentage of New Vehicles	Feebate Amount	3 ½ Year Revenue
< 15	205	0.22%	$5,000	$1,025,000
15 to < 20	21,595	23.67%	$1,500	$32,392,500
20 to < 25	23,293	25.53%	$1,000	$23,293,000
25 to < 30	35,670	39.10%	-$1,000	-$35,670,000
30 to < 35	7,302	8.00%	-$1,500	-$10,953,000
35 to < 40	641	0.70%	-$2,000	-$1,282,000
40 to < 45	295	0.32%	-$2,500	-$737,500
45 to < 50	1,154	1.27%	-$3,000	-$3,462,000
>= 50	1,105	1.21%	-$5,000	-$5,525,000
Total[1]				-$919,000

1   As can be seen in this example as well as in the example in Table 4.7, even a small variance in the feebate schedule can have nontrivial net revenue effects. Setting the rebate amount for the 20 to 25 MPG bin at $974 results in a net total revenue of $0; setting it at an even $1,000 results in a net revenue of -$919,000 or about -$262,000 a year.

Table 4.5 Illustrative Class-Based Feebate Program
LDVs

MPG(e) Bin	Number of Vehicles	Percentage of New LDVs	Feebate Amount	3 ½ Year Revenue
< 18	1,703	2.90%	$2,000	$3,406,000
18 to < 21	2,924	4.98%	$1,500	$4,386,000
21 to < 24	8,540	14.53%	$1,000	$8,540,000
24 to < 27	16,078	27.36%	$300	$4,823,400
27 to < 30	20,427	34.76%	-$500	-$10,213,500
30 to < 35	7,198	12.25%	-$1,000	-$7,198,000
35 to < 40	418	0.71%	-$1,500	-$627,000
>= 40	1,477	2.51%	-$2,000	-$2,954,000
Total				**$162,900**

Table 4.6   Illustrative Class-Based Feebate Program
LDTs

MPG(e) Bin	Number of Vehicles	Percentage of New LDTs	Feebate Amount	3 ½ Year Revenue
< 16	2,412	7.15%	$1,500	$3,618,000
16 to < 18	9,501	28.16%	$800	$7,600,800
18 to < 20	7,580	22.47%	$200	$1,516,000
20 to < 22	5,808	17.22%	-$400	-$2,323,200
22 to < 26	4,233	12.55%	-$800	-$3,386,400
26 to < 28	3,771	11.18%	-$1,500	-$5,656,500
>= 30	430	1.27%	-$3,000	-$1,290,000
Total				$78,700

Table 4.7 Illustrative EV-Focused Incentive and Fee
Example 1

MPG(e) Bin	Number of Vehicles	Percentage of New Vehicles	Feebate Amount	3 ½ Year Revenue
< 15	205	0.22%	$2,500	$512,500
15 to < 20	21,595	23.67%	$1,100	$23,754,500
20 to < 25	23,292	25.53%	$500	$11,646,000
25 to < 30	35,669	39.10%	-$500	-$17,834,500
30 to < 35	7,302	8.00%	-$1,000	-$7,302,000
35 to < 40	641	0.70%	-$1,500	-$961,500
40 to < 45	295	0.32%	-$2,000	-$590,000
45 to < 50	1,154	1.27%	-$2,500	-$2,885,000
>= 50	421	0.46%	-$3,000	-$1,263,000
Electric	687	0.75%	-$5,000	-$3,435,000
Total				**$1,129,500**

Table 4.8   Illustrative EV-Focused Incentive and Fee
Example 2

MPG(e) Bin	Number of Vehicles	Percentage of New Vehicles	Feebate Amount	3 ½ Year Revenue
< 15	205	0.22%	$1,000	$205,000
15 to < 20	21,595	23.67%	$175	$3,782,900
20 to < 25	23,292	25.53%	$50	$1,164,600
Electric	687	0.75%	-$7,500	-$5,152,500
Total				**$0**

Table ES.1   Summary Evaluation of Sample Feebate Alternatives

Policy Alternative	Effectiveness at Achieving Program Goals		Manageable Administrative Cost/ Level of Effort	Fair and Equitable
	Reducing GHGs	Increasing EVs		
Alternative #1: All-Vehicle Feebate	+++	+	++	++
Alternative #2: Categories of Vehicles Feebate	++	+	++	+++
Alternative #3: EV Rebate Paired with Other Short-Term Revenue	+	+++	+++	–
Alternative #4: EV-Focused Feebate	++	+++	++	++
Alternative #5: Wider Net Leased and Used Vehicles	+++	+	+	– / +++[1]

Notes: +++   =   Strongly supports criterion.

++   =   Supports criterion.

+   =   Somewhat supports criterion.

–   =   Does not support criterion.

1   Expanding the program to include leased vehicles clearly improves the equity of the program but covering the used vehicle market could be viewed either as more equitable (everyone pays/benefits) or less equitable (lower income people with older vehicles might end up paying more).

Table ES.3 Feebate and Related Alternatives[a]

Program Alternative	Description	Options	Advantages	Disadvantages
Alternative #1: All-Vehicle Feebate	Apply a technology-neutral incentive to all light-duty vehicles purchased in Vermont. The feebate would be based on a standard of fuel efficiency or emissions. A pivot point would be set to determine whether the individual gets a rebate or contributes a fee. The pivot point would be based on new vehicle purchases registered in Vermont over the past three years.	Rebate and fee amounts could be assessed on a linear basis, with all new vehicle purchases subject to either a fee or rebate proportional to emissions or MPG; or through a stepwise function (e.g., incentive or fee values grouped into bins of 5 MPG). This would apply to any fuel/engine technology type.	A linear or stepwise feebate could provide an incentive across the market for all vehicle buyers to choose at least slightly more efficient vehicles.	Depending on how it is structured, this alternative might provide a weaker incentive for vehicle buyers to choose EVs, compared to an EV-focused incentive. A linear function or stepwise function with small bins might be more difficult for consumers to understand and slightly more complicated to administer than a system with a few large bins.
Alternative #2: Categories of Vehicles Feebate	Like Alternative 1, this feebate policy would be based on a measure of efficiency or emissions, and not fuel source. However, a different fee/rebate schedule would be set for different categories of vehicles (e.g., cars versus light trucks) rather than a single schedule applying to all vehicles.	Grouping into two categories—cars and light trucks—would be the simplest approach, but a larger number of categories could be defined based on weight, body style, or footprint (wheelbase times track width). Similar to Alternative 1, the feebate structure within each category could vary from a more linear to more stepwise.	A category-based feebate system would have less impact on people who require larger vehicles. It also would incentivize consumers of larger vehicles (whether needed or desired) to choose more efficient vehicles.	A category-based vehicle feebate may reduce or remove the incentive for new vehicle purchasers to shift from less-efficient vehicle categories to more efficient vehicle categories.
Alternative #3: EV Rebate Paired with Short-Term Other Revenue	Expansion of the income-qualified EV purchase credit in Section 34 of the 2019 Transportation Bill to all purchases of EVs. New York's "Drive Clean" rebate, in which each purchaser of a new EV is awarded a rebate of up to $2,000 at the point of sale, could serve as a model.	Rebates for EVs could vary on the type of technology used (battery electric, plug-in hybrids, etc.). Different rebate amounts or fees could be awarded based on income level, in order to ensure that low- and moderate-income Vermonters are benefiting from the program. This option would build on knowledge gained from the Sec. 34 Income-Qualified EV Incentives Program.	This program would explicitly incentivize Vermonters to purchase EVs. This style of broad-based EV purchase incentives has proved popular and effective in several States. Funding through other revenues instead of levying a fee on purchases of new less-efficient vehicles might make the program more acceptable to consumers.	This program is not self-funding as it relies on other funding sources. This program would likely only influence vehicle purchases by a small percentage of Vermonters, at least at the outset.

Program Alternative	Description	Options	Advantages	Disadvantages
Alternative #4: EV-Focused Feebate	A fee is applied to purchases of all new internal combustion engines (ICE) that funds rebates applied to all new EV purchases. At first, the fees applied to ICEs would likely be relatively small in magnitude, while EV rebates would be relatively high. As EVs gain in popularity, the ICE fee amount would be adjusted upward and the rebate downward.	A uniform feebate could be applied. For example, a $300 fee on all new ICE purchases and a $3,000 rebate on all new EV purchases. Different fees could be applied to ICEs as described in Alternative 1. For the EV rebates, different amounts could be awarded for fully electric versus plug-in hybrid electric vehicles.	This program would explicitly incentivize Vermonters to purchase EVs, with intent to reach the number of plug-in EVs in in the state's Comprehensive Energy Plan.	The current relative lack of diversity in EV offerings might make this alternative less desirable since not all consumers might find an EV that suits their needs or price point. The diversity of EV options is expected to increase in the near term. If all ICEs are subject to the same fee there is no incentive to purchase a higher-efficiency ICE compared to a lower-efficiency one.
Alternative #5: Wider Net: Leased and Used Vehicles	To reach ambitious GHG reduction goals, it may be necessary to incorporate not just new car purchases, but also leases and possibly purchases of used cars.	There are various options such as adding only leased vehicles, sales of used vehicles only by dealers, moving beyond a point-of-sale model to one that occurs at vehicle registration, or other options. This could be phased in building on program experience and enhancements in administrative capacity.	This alternative would have more effect to reduce GHG emissions. Nationwide, leases are approximately 30% of new car transactions. The volume of used car sales is more than double that of new car sales. A more-encompassing approach might be less subject to "gaming," or less distorting of markets among new, leased, and used vehicles, and across state lines.	This alternative would be significantly more complicated to design and administer than the other ones. The option with the most question marks about methodology and value is incorporating used car sales.

Consultant's Recommendations

- Undertake a robust, inclusive discussion of what basic approach to pursue, if any. This process should include a range of stakeholders, including auto dealers, manufacturers, municipal officials, environmental community, partner agencies, and neighboring state officials, to gather feedback on alternatives and options.

- Develop specific program designs and implementation options in greater detail and consider administrative level of effort by examining the specific implementation activities that would need to be conducted both up front and on an ongoing basis.

- Conduct additional data analysis to more fully simulate the impact of each potential alternative on GHG emissions, EV adoption, and consumer costs.

- Once a program design is fully developed and adopted, continue education efforts for a range of audiences, including auto dealership staff, the public at large, and other key stakeholders.

Questions / Comments?