

**Vermont Low Emissions and Zero Emission Vehicle Rule  
Final Proposed Rule  
Responsiveness Summary - Nov. 2022**

## Table of Contents

Administrative Procedure Act Requirement.....	1
Background and Opportunities for Public Comment.....	1
Acronyms .....	2
Comments and Responses.....	3
General Comments .....	3
Technology.....	8
Purchase cost and Total Cost of Ownership .....	10
Alternatives to the Regulation .....	12
Electric Vehicle Supply Equipment (EVSE) .....	13
Electric Grid Impacts .....	16
Batteries – Recycling and Environmental Impacts.....	18
Environmental Justice .....	19
Workforce Development .....	22
Economic Impacts .....	23
Legal and Procedural.....	24
Other changes to the rule text.....	25

## Administrative Procedure Act Requirement

This Responsiveness Summary meets the Agency of Natural Resources’ (ANR) obligations under the Vermont Administrative Procedure Act to consider fully all written and oral submissions concerning the proposed rule and issue an explanation on why the agency overruled the arguments and considerations against the rule. Specifically, “[w]hen an agency decides in a final proposal to overrule substantial arguments and considerations raised for or against the original proposal or to reject suggestions with respect to separate requirements for small businesses, the final proposal shall include a description of the reasons for the agency’s decision.” 3 V.S.A. §841(b)(2).

## Background and Opportunities for Public Comment

On August 12, 2022, ANR filed the Proposed Rules with the Secretary of State’s office. Following the filing, ANR hosted a series of five public events pursuant to its obligations under the Vermont Global Warming Solutions Act (GWSA), 10 V.S.A. §593(c), including an informational meeting on the proposed medium- and heavy-duty truck regulations for stakeholders. ANR also held two public hearings on

September 21 and 23, pursuant to its obligations under the Administrative Procedures Act, 3 V.S.A. §840. Verbal comments were made and recorded at all of the above events and hearings. Audio files of the recordings of the above public events are available from ANR upon request. Written comments were solicited and collected via email, mail, and fax. Written comments were collected from a total of 340 individuals and entities, and are included in this filing.

Written and verbal comments received are categorized below into sections that represent the subject area of the comment received. Due to the volume of comments received and recorded, and the fact that many commenters raised similar or the same arguments and considerations for or against the original proposal, ANR has paraphrased similar comments and provides responses in the following Responsiveness Summary.

Note that many of the public comments received are considered “out of scope” of the regulation. However, ANR, along with its state Agency partners, has responded to these comments in this summary recognizing that they are in the scope of the broader implications of the direct and indirect impacts of the proposed rule on Vermont’s transportation fleet and sector.

## Acronyms

Advanced Clean Cars II (ACCII)

Advanced Clean Truck (ACT)

Agency of Natural Resources (ANR)

Argonne National Laboratory (ANL)

Capacity, Energy, Loads, and Transmission (CELT)

Clean fuels standard (CFS)

Direct current fast charger (DCFC)

Electric vehicle (EV)

Environmental justice (EJ)

Environmental Protection Agency (EPA)

Fine particulate matter (PM2.5)

Greenhouse gas (GHG)

Global Warming Solutions Act (GWSA)

Gross Vehicle Weight Rating (GVWR)

Internal combustion engine vehicles (ICEVs)

Long-Range Transmission Plan (LRTP)

Near zero emission vehicles (NZEV)

Nitrogen oxide (NO<sub>x</sub>)

Northeast States for Coordinated Air Use Management (NESCAUM)

Plug-in hybrid vehicles (PHEV)

Social cost of carbon (SC-CO<sub>2</sub>)

Total cost of ownership (TCO)

Vehicle to Grid (V2G)

Vermont Electric Power Company (VELCO)

Zero emission vehicle (ZEV)

## Comments and Responses

### General Comments

**Comment-G1:** The majority of comments received were generally supportive of the rules, as proposed, citing concerns about climate change, air quality, and the benefits of phasing-in/transitioning to electric vehicle technology as a way to mitigate the impacts of climate change and improve air quality, specifically from the transportation sector in Vermont. Many commenters requested that ANR implement the proposed rules as soon as possible. Some commenters, that represent the auto manufacturing industry, commented that their vehicles currently being manufactured are proof that the proposed regulations are achievable. Many commenters feel that transitioning to EVs represents a cost savings when compared to the total cost of ownership of owning a conventional fossil fueled vehicle.

**Response-G1:** ANR acknowledges these comments. No changes were made in response to these comments.

**Comment-G2:** Some commenters support the rules as proposed due to their significant positive impact on public health and in protection of the 63,000 Vermont adults and children that suffer from asthma.

**Response-G2:** ANR acknowledges this comment and agrees that the proposed rule will have a significant positive impact on the health of Vermonters.

**Comment-G3:** One commenter is concerned that the rules focus too heavily on reducing petroleum use to power motor vehicles, and that there is not enough policy focused on climate change being caused primarily by population growth.

**Response-G3:** ANR agrees that policies to reduce emissions from the transportation sector cannot be restricted to fuel switching. ANR works with its agency partners including, the Agency of Transportation (VTrans), the Agency of Commerce and Community Development, and the Department of Public Service, to identify and implement policies that increase efficiency of our transportation system and reduce the number of vehicle miles traveled in the state. A focus on coordinating land-use, transportation, and

environmental policy will be critical to ensure emissions continue to go down despite potential increases in population. No changes were made in response to this comment.

**Comment-G4:** One commenter thinks electrification of transportation should be driven by innovation, research and efficiency, and not regulations and prohibitions.

**Response-G4:** Historically, the Low and Zero Emission Vehicle rules have been considered “technology forcing”, meaning that they require automakers to incorporate emission reduction technology into the vehicles they manufacture to meet air quality goals in the participating states. Overtime, as consumer demand for cleaner vehicles has increased and advancements in battery technology and vehicle efficiency have progressed, automakers have made commitments regarding vehicle production and sales that now mirror ANR’s proposed rules. Therefore, ANR regards these proposed rules as a codification of the commitments that automakers have already made, and therefore the rules regarding vehicle electrification are being driven by innovation, research and efficiency. No changes were made in response to this comment.

**Comment-G5:** Some commenters are concerned that if they purchase a vehicle outside of Vermont, that they won’t be able to register it in Vermont.

**Response-G5:** Since the adoption of this program over 20 years ago, all new motor vehicles up to 14,000 pounds Gross Vehicle Weight Rating (GVWR) must be California certified in order to be registered in Vermont regardless of where they are purchased. Used vehicles – or those not meeting the definition of “new” – can be purchased in or outside of Vermont and registered in Vermont regardless of California certification. Under the proposed rules, the applicability of this requirement expands to cover heavier vehicles; therefore, light-, medium- and heavy-duty vehicles that meet the definition of “new” – having 7,500 miles or less on the odometer – will need to be certified by California in order to be sold and registered in Vermont. Starting with MY2026, new heavy-duty trucks purchased outside of Vermont and subsequently registered must be California certified.

Note that California certified new diesel heavy-duty trucks will continue to be available for sale in Vermont beyond 2035, and California certified new light-duty gasoline vehicles will continue to be available for sale until 2035. California certification is also not required for emergency vehicles, new purchases made by nonresidents prior to establishing Vermont residency, inherited vehicles, vehicles exclusively for off-highway use, and other exempted vehicles listed in Section 5-1103 (b) and (c).

Travel of purchasers to other states is currently taking place for a number of reasons unrelated to whether the vehicle is a zero emission vehicle (ZEV), plug-in hybrid electric vehicle (PHEV), or internal combustion engine vehicle (ICEVs). Buyers may purchase a vehicle over state lines for a number of reasons including convenience (*i.e.*, the closest dealer to the buyer may be located in another state) or to find a specific make, model, or different cost. No changes were made in response to this comment.

**Comment-G6:** One commenter asserted that other states are declining to adopt similar amendments to their motor vehicle emissions standards.

**Response-G6:** Eighteen states have adopted motor vehicle emission standards that are more stringent than the federal government’s standards. To date, Vermont is joined by California, Massachusetts, New York, Oregon, and Washington in undergoing a rulemaking process to adopt the ACCII amendments. California, Colorado, North Carolina, Massachusetts, New Jersey, New York, Oregon, and Washington have adopted, or are in the process of adopting, the medium- and heavy-duty truck rules. No changes were made in response to this comment.

**Comment-G7:** One commenter thinks that vehicles delivered pursuant to the proposed rule should be designed to be accessible to all persons.

**Response-G7:** ANR appreciates this comment and agrees that physical accessibility is important. Physical accessibility requirements of motor vehicles, however, are outside of the scope of this regulation. Standards related to physical accessibility are within the jurisdiction of the Federal Department of Transportation. No changes were made in response to this comment.

**Comment-G8:** Some commenters note that the language of the rule and statements made in the summary documents indicate that the rules require that individuals and businesses buy electric vehicles (EVs), or in other words, there is a “sales” requirement. This is inconsistent with ANR’s statements that this rule only applies to automakers.

**Response-G8:** The Advanced Clean Cars II (ACCII) regulation imposes requirements on vehicle manufacturers to produce and deliver for sale ZEVs in Vermont, while the Advanced Clean Truck (ACT) regulation imposes requirements on vehicle manufacturers to produce and sell ZEVs in Vermont. Individuals and businesses are not required to purchase electric vehicles under the proposed regulations. Under the ACCII rule, new ICEVs will be available for sale in Vermont until model year 2035 and under the ACT regulation new diesel heavy-duty trucks will continue to be available for sale in Vermont before and after 2035 while providing an increased choice for fleets when making decisions about what vehicle will best suit their needs. The ACT regulation includes flexibility for manufacturers to produce and sell new ZEVs into the market segments they deem to be most suitable for the products they manufacture, ensuring that manufacturers develop competitive ZEV products at price points that will meet fleet needs. Used vehicles are outside of the scope of the rules and used ICEVs will continue to be available for sale in Vermont. Based on this comment, ANR has revised the technical support document, entitled *Supplemental Information for Vermont’s Low Emission Vehicle and Zero Emission Vehicle Proposed Rules*, and *Regulation Summary Document* to further clarify that the ACCII and ACT regulations impose requirements on vehicle manufacturers and that individuals and businesses are not required to purchase electric vehicles.

**Comment-G9:** Some commenters are concerned that if a dealer’s lot is required to have a certain percentage of zero-emission trucks for sale, when a dealer sells all the diesel trucks on their lot, the ACT regulation would not allow for them to then sell additional diesel trucks if there is a demand for them and, as a result, Vermont businesses needing a truck after the allotment of diesel trucks are sold will be forced to purchase a ZEV.

**Response-G9:** The above scenario is inaccurate because the ZEV sales structure used under the ACT regulation is comprised of a credit and deficit system that includes flexibility that can be used to avoid

such a scenario. Selling diesel trucks into Vermont generates deficits, while selling ZEVs or NZEVs (near zero emission vehicles) into Vermont generates credits. Credits can be banked and traded, and manufacturers having more deficits than credits in a given model year are provided additional time to comply as they must make up the deficit by the end of the following model year. In addition, the credit and deficit system uses weight class modifiers, which allow for heavier vehicles that produce more emissions to generate more deficits and, as ZEVs, generate more credits. The use of weight class modifiers gives manufacturers flexibility and maintains emissions benefits. A manufacturer also has the option of using credits from a weight class to make up deficits in other weight classes. Also, manufacturers can choose to build ZEVs in one weight class or across all weight classes. No changes were made in response to these comments.

**Comment-G10:** With the recent setbacks in implementing the Transportation Climate Initiative Program in the Northeast, and the lack of any other clear policy or regulatory tools to achieve certain and significant pollution reductions in the transportation sector, adopting the Rules in a timely fashion is critical to meeting Vermont's emissions requirements.

**Response-G10:** ANR acknowledges this comment. The adoption of the proposed rules is a cornerstone in the Transportation sector emission reduction strategy in Vermont's Climate Action Plan. Emission reductions expected via the adoption of the proposed rules is included in the technical support document, entitled *Supplemental Information for Vermont's Low Emission Vehicle and Zero Emission Vehicle Proposed Rules*. Pursuant to the GWSA, ANR is required to adopt these rules by December 1, 2022.

**Comment-G11:** Enacting the Rules will reduce the sources of toxic air pollution, providing meaningful benefits to Vermonters.

**Response-G11:** ANR acknowledges this comment and agrees that the proposed rules will reduce the emission of GHGs and air contaminants and will result in improvements in public health and air quality.

**Comment-G12:** One commenter requested that ANR adopt a fleet reporting requirement for Advanced Clean Trucks in a subsequent 2023 rulemaking.

**Response-G12:** ANR considered adding a fleet reporting requirement, as other jurisdictions have done, to better understand the number and size of fleets with five or more vehicles in Vermont. A reporting program of any size requires additional staff resources, as well as administrative tools and information technology (IT) resources. For example, Oregon stood up a reporting program with their ACT rule that required the addition of two full-time employees (FTEs) to their existing staff. Similarly, New Jersey estimates they will need five additional FTEs. Currently, ANR's Mobile Sources Program does not have capacity to implement or manage a reporting requirement. ANR hopes that, with additional resources, a reporting program can be implemented in the future. No changes were made in response to this comment.

**Comment-G13:** Comments were made requesting that ANR modify the early action credit program in Advanced Clean Trucks to limit it to only one year before the rule is enforced. Conversely, one

commenter requested the rule be revised to allow for automakers to generate early compliance credits as early as model year 2023 under ACT, instead of 2024 as currently proposed.

**Response-G13:** Early action credits allow EV makers to begin earning compliance credits ahead of the formal regulatory obligation and incentivize accelerated deployment of EVs in the state. As a result, reductions in air pollution and greenhouse gas emissions are realized sooner, which include important benefits for public health and Vermont’s climate goals. Additionally, growing the zero-emission truck industry more quickly to large-scale production will help to move costs down the cost curve. To be consistent with California and incentivize early EV deployment in Vermont, ANR is revising the proposed rule to allow manufacturers to earn early compliance credits starting in model year 2023 under the ACT regulation. Early credits may be earned starting in model year 2021 in California in advance of the 2024 model year start date. Similarly, with this revision, early credits may be earned in model year 2023 in Vermont in advance of the 2026 model year start date. The 2023 start date for early credits in Vermont now reflects the interval between California and Vermont adoptions. This change has been made to Section 40-106(a)(11) of the proposed rule.

**Comment-G14:** One commenter recommends that Vermont take additional steps beyond this rulemaking, including implementing a clean fuels standard (CFS) and establishing durable and effective EV purchase incentives that includes medium-duty vehicles.

**Response-G14:** ANR, in coordination with other state agencies and the Vermont Climate Council, continues to investigate the feasibility and cost-effectiveness of other greenhouse gas (GHG) emission reduction policies to compliment the proposed rules. ANR acknowledges that complimentary policies, especially incentive programing for all vehicle weight classes, will be necessary to ensure that vehicles delivered to Vermont are placed in service, and ideally replace a conventional vehicle, to realize the emission reduction benefits outlines in the technical support document. No changes were made in response to this comment.

**Comment-G15:** One commenter stated that the proposed rules should not be adopted until: at least one half of the member states of Northeast States for Coordinated Air Use Management (NESCAUM) have adopted the rules, the federal government has adopted rules that are the same as ANR’s proposed rules, and California has demonstrated that their rules are workable within their electric infrastructure.

**Response-G15:** Vermont has worked closely with NESCAUM states in adopting and implementing motor vehicle emission standards since the 1990s. All but one of the NESCAUM states, and 18 states in total, have adopted some of California’s regulatory programs, and several have already or are currently updating their rules to be consistent with ANR’s proposed rules. President Biden’s Executive Order (EO) No. 14037, *Strengthening American Leadership in Clean Cars and Trucks*, establishes new federal targets increasing the percentage of all new passenger car and light truck sales that are ZEVs. The EO directs the Environmental Protection Agency (EPA) to coordinate setting standards with California, “as well as other States that are leading the way in reducing vehicle emissions, including by adopting California’s standards.” This EO is a supportive of California’s ZEV standards and the language in the EO suggests that the states adopting California’s standards may be better positioned to ensure their state priorities are considered in federal policies. While California has made statements about the feasibility of its rule,

the opportunity for revisions to the proposal will occur during periodic reviews to evaluate rule applicability and feasibility. Vermont will participate in those review opportunities. Further, delay in rules adoption would cause a delay in the modeled air quality and public health benefits that ANR anticipates will result from the proposed rules. No changes were made in response to this comment.

## Technology

**Comment-T1:** The requirements of the rule are being implemented too quickly. There are not enough EVs available (light, medium, or heavy-duty) and not enough charging infrastructure to support EV adoption.

**Response-T1:** ANR acknowledges that shifting the way in which we power and fuel our modes of transport is a massive and significant undertaking. These rules support this transition by requiring automakers to manufacture and deliver more electric vehicles to Vermont in a phased and measured manner spanning a thirteen-year period. For both Advanced Clean Cars II and Advanced Clean Trucks, the phase in of vehicles that will be delivered reflect the expected developments in supply, technology, application, and feasibility. Many automakers have made commitments related to the phase-in of EVs that are consistent with, or in some cases more stringent than, the proposed rule. It also reflects the fact that EV fueling infrastructure is not yet as prevalent as gasoline or diesel fueling infrastructure. For ACT, a total phase in of EV technology is not contemplated in the proposed rule. The percent of EV trucks that automakers will deliver is capped at 75%, which represents the most stringent percentage as applied to a limited range of weight classes. And even then the 75% requirement for automakers will not take place until 2035.

**Comment-T2:** Some commenters noted EV technology concerns for medium- and heavy-duty vehicles including reduced payload due to increased vehicle weight, long charging times, and limited range. State of the art heavy duty electric vehicle technology does not come close to performing the daily requirements of a feed truck, particularly in Vermont. Cold temperatures, hilly roads and onsite delivery demands will quickly reduce heavy duty truck performance to well below required performance rates. Further, recharging times, even if recharging infrastructure is available, would require hours per day to recharge in contrast to minutes per day for diesel refueling. Other commenters indicated heavy-duty electrification may not be appropriate for certain applications such as milk-hauling, logging trucks, grain trucks, and sap trucks. One commenter noted that ANR is forcing the use of heavy-duty electric vehicles in the commercial truck industry before the technology has proven to be available, effective, economically competitive, and practically appropriate.

**Response-T2:** The proposed ACT regulation imposes requirements on vehicle manufacturers to produce and sell on-road ZEVs in Vermont and does not impose requirements on fleets to make EV purchases. The proposed rules do not apply to off-road equipment. Equally important to note is that the regulation does not prescribe requirements specific to vocation; therefore, manufacturers are free to decide which vehicles they should electrify based on business drivers specific to the manufacturer such as product portfolio and customer base. Because the proposed regulation does not obligate manufacturers to sell EVs to vocations that are not well-suited for electrification, it is highly unlikely that manufacturers will focus their product offerings to fleets poorly suited for electrification. Accordingly, heavy-duty EV



adoption is expected in well-suited fleets first, and then broadening over time as costs decline and fleet experience with the technology improves.

Under the ACT regulation, new diesel heavy-duty trucks will continue to be available for sale in Vermont before and after 2035 while providing an increased choice for fleets when making decisions about what vehicle will best suit their needs. The ACT regulation includes flexibility for manufacturers to produce and sell new ZEVs into the market segments they deem to be most suitable for the products they manufacture, ensuring that manufacturers develop competitive ZEV products at price points that will meet fleet needs. Used vehicles are outside of the scope of the rules and used ICEVs will continue to be available for sale in Vermont. No changes were made in response to these comments.

**Comment-T3:** Some commenters are concerned that there is limited vehicle availability for both EVs (all-wheel and 4-wheel drive models, in particular) and ICEVs.

**Response-T3:** Vehicle supply, both EV and ICEV types, is lower than normal currently due to pandemic recovery and associated supply chain issues. Supply of EVs is expected to increase as manufacturers ramp up production to meet demand, supply issues are alleviated, and to meet the increasing stringency of the ZEV sales requirements of the proposed rule. Pick-up trucks, sport utility vehicles (SUVs) and hatchbacks with two-wheel drive and four-wheel drive options are available in EV models now, with even more coming in the next year or two to meet a variety of applications and needs. To see models currently available in Vermont, visit: <https://www.driveelectricvt.com/find-your-ev/compare-models>. No changes were made in response to this comment.

**Comment-T4:** Plug-in hybrid vehicles (PHEV) should be counted towards an automaker meeting its annual ZEV percent sales requirement.

**Response-T4:** Manufacturers can meet a portion of their annual ZEV requirement under ACCII and ACT with PHEVs, note that ACT refers to PHEVs as Near Zero Emission Vehicles (NZEV). No changes were made in response to the comment.

**Comment-T5:** PHEVs should NOT be counted towards an automaker meeting its annual ZEV percent sales requirements.

**Response-T5:** PHEVs are powered by both an internal combustion and battery-electric powertrain, which have the ability to operate as a zero-emission vehicle for some distance. These vehicles are considered a bridge technology, especially as applied in ACT, which will help the advancement of the full ZEV market by electrifying more challenging sectors and supporting the ZEV supply chain. Under ACCII, up to 20% of a manufacturer's ZEV requirement can be met with PHEV values in a given model year and under ACT, up to 50% of a manufacturer's ZEV requirement can be met with NZEV credits. The amount of PHEV credits that can be used in a given model year to meet a manufacturer's ZEV requirement are capped to preserve emissions reductions achieved while providing for a level of compliance flexibility. No changes were made in response to this comment.

**Comment-T6:** The range of an EV is reduced in colder temperatures, reducing range and efficiency of the vehicle.

**Response-T6:** Not unique to electric vehicles, cold weather reduces efficiency of all vehicle types. Electric vehicles can be driven in both extremely hot and cold weather. Cold weather can reduce range, but with longer-range electric vehicles on the market, with a little planning this won't impact the vehicles' ability to get you where you need to go. Also, some auto makers are adding technologies that help control the temperature of the battery to counteract impacts from extremely hot or cold weather. Electric vehicles are already popular and feasible for drivers in the Northeast and East Coast and make up over 70% of all car sales in Norway.

Electric vehicles are designed to perform the same or better than the gasoline vehicles they replace. Electric vehicles have high torque which help them accelerate quickly and get up steep inclines. Today's vehicles have more electric range, leaving plenty of margin for mountain driving. And electric vehicles benefit from downhill driving which allows regenerative braking to put energy back into the battery, extending how far you can go. No changes were made in response to this comment.

### Purchase cost and Total Cost of Ownership

**Comment-TCO1:** Some commenters have concerns regarding the upfront vehicle cost for an EV being more than a conventional ICE vehicle. One commenter stated that for medium- and heavy-duty vehicles, the cost of owning an EV includes battery replacement costs. Some commenters are concerned that the rules will reduce affordability of vehicles and reduce the choice consumers have when purchasing a vehicle.

**Response-TCO1:** ANR acknowledges that a significant barrier to EV adoption *today* is the increased upfront cost of an EV compared to a conventional fossil-fuel powered vehicle. However, as the cost of batteries continues to drop, the price of a battery-electric vehicle will eventually become the same as a combustion engine vehicle. And while, for now, the up-front cost is higher, ANR's analysis in the *Supplemental Information for Vermont's Low Emission Vehicle and Zero Emission Vehicle Proposed Rules* shows that the "total cost of ownership" or "TCO" of an EV compared to a conventional vehicle can be lower due to lower fuel and vehicle maintenance costs. There are also several incentive programs available in Vermont and from the federal government that help to bring the upfront costs of EVs down to be comparable to conventional vehicles, and in some cases less expensive<sup>1</sup>.

Across all vehicle weight classes, ACCII and ACT will mean that consumers have *increased* choice when making decisions about what vehicle will best suit their needs. For passenger cars and light-duty trucks, the phase-in proposed in ACCII reflects the fact that EV technology will be appropriate and feasible for most applications of these types of vehicles. For medium- and heavy-duty vehicles, the phase-in proposed in ACT reflects the fact that EV technology and its application across all uses of these types of vehicles will take longer. For heavier vehicles, ANR recognizes that EV technology may not be feasible for all applications in the time horizon (up to 2035) contemplated by ACT, and that's why the rule still allows automakers to deliver conventional vehicle technologies to Vermont indefinitely. The proposed rule will give consumers and fleet owners access to electric vehicles in order to recognize the significant total cost of ownership savings associated with EVs compared to conventional vehicles.

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<sup>1</sup> Drive Electric Vermont Incentives: <https://www.driveelectricvt.com/incentives>

**Comment-TCO2:** One commenter believes the potential profits seen from vehicle to grid should be considered in ANR's cost analyses.

**Response-TCO2:** ANR considers vehicle to grid (V2G) to be a developing opportunity where unused power from the vehicle is put back into the electric grid. There is potential for V2G integration to help supply electricity during peak hours, provide an extra power source during times when renewable energy sources, such as solar, are unavailable, and supply power during electrical outages. EV owners can be compensated for sending electricity back into the grid at peak demand events, thereby reducing demand. Currently there are multiple pilots underway in Vermont and ANR will continue to consider benefits from V2G as the technology evolves. No changes were made in response to this comment.

**Comment-TCO3:** Some commenters expressed concerns regarding uncertainty about the cost of electricity and Vermont's GHG emissions from electricity going up with vehicle electrification.

**Response-TCO3:** The residential price of electricity depends on a combination of costs related to generating power, ensuring sufficient generation and transmission capacity, maintaining poles, wires, and the crews that service them, and other factors. These electricity price components will move in different directions with additional EV charging and the net effect is unclear. Unrelated factors are most impactful on the price of electricity, such as the price of natural gas used for a portion of New England's power generation and the outcome of capacity auctions used to ensure sufficient generation resources.

Looking solely at its effects, additional EV charging will have upward rate pressure on generation (because more generation will be required), unknown rate pressure on capacity and transmission costs (because much charging will occur outside peak hours), and unknown rate pressure on distribution system costs (because existing fixed costs and the cost of system upgrades will be balanced by additional electricity sales occurring during off-peak hours).

While the net effect on electricity price is unknown, it is likely that the equivalent cost of fueling a vehicle with electricity will remain lower than the cost of fueling with gasoline or diesel. Again, it should be emphasized that off-peak load growth through EV charging will be a minor factor in the price of electricity compared to external factors such as market power prices influenced by national natural gas prices and the interconnection of additional price-competitive generation resources (namely off-shore wind). No changes were made in response to this comment.

**Comment-TCO4:** The increased cost of electricity that businesses must bear in order to charge these vehicles, the cost of which has only been increasing in recent years, will drive up the cost of goods and services in Vermont, especially for small businesses.

**Response-TCO4:** ANR has evaluated and included "total cost of ownership" analyses as part of the economic analysis that show that the most significant savings in owning and operating an EV comes from saving money on the cost of fuel. Operating a vehicle using electricity is less expensive than operating a vehicle with gasoline or diesel. The price of electricity tends to be less volatile, and is regulated by the Public Utilities Commission in Vermont. The price of fossil fuels is more volatile than electricity, is unregulated, and is subject to frequent market impacts. Any costs related to electrical

upgrades to accommodate home vehicle charging have been taken into account in ANR’s TCO analysis in the *Supplemental Information for Vermont’s Low Emission Vehicle and Zero Emission Vehicle Proposed Rules*. No changes were made in response to this comment.

**Comment-TCO5:** Some commenters are concerned that the maintenance and upkeep costs of an EV are higher, especially considering battery replacement costs.

**Response-TCO5:** The costs of maintenance and scheduled repairs for ZEVs and PHEVs are expected to be lower than that of an equivalent ICEV. The Argonne National Laboratory (ANL) has provided estimates of incremental maintenance costs that are below that of an ICEV based on vehicle technology type and miles driven.<sup>2</sup> For battery electric vehicles (BEVs), a type of ZEV, the average cost of maintenance and planned repairs is approximately 40% lower than a gasoline passenger car, for example, due to fewer oil changes, oil filters, timing belts and other replacement parts (spark plugs and oxygen sensors, for example). The per-mile maintenance savings for this analysis was extracted from the ANL study for passenger vehicles of each drivetrain type and then adjusted using incremental vehicle costs to estimate the per mile savings for the other vehicle types.

Estimated incremental maintenance costs for each vehicle classification and powertrain type, in dollars per mile (values in parentheses are negative values, indicating savings relative to a comparable internal combustion engine vehicle):

Vehicle Types	Average dollar per mile savings 2026 - 2035
BEV – Passenger Car	(0.040)
BEV – Light Duty Truck 1	(0.039)
BEV – Light Duty Truck 2	(0.053)
BEV – Medium duty vehicle	(0.091)
PHEV – Passenger Car	(0.007)
PHEV – Light Duty Truck 1	(0.009)
PHEV – Light Duty Truck 2	(0.007)
PHEV – Medium Duty Vehicle	(0.007)

While the cost of battery replacement may be incurred, it is important to note that the durability and warranty requirements of the proposed rule ensure that consumers will not have to bear the cost of a battery replacement in advance of the battery’s useful life within the warranty period. No changes were made in response to this comment.

### Alternatives to the Regulation

**Comment-A1:** Some commenters think that consideration should be given to other fuel types including renewable fuels, alternative fuels, low-carbon fuels and technologies for on-board capture of combustion-related carbon dioxide.

**Response-A1:** The goal of the proposed ACT regulation is to accelerate the widespread adoption of zero-emission medium- and heavy-duty vehicles to reduce harmful vehicle emissions. Alternative,

<sup>2</sup> ANL 2021 Report: <https://publications.anl.gov/anlpubs/2021/05/167399.pdf>

renewable, and/or low carbon fuels may play a role in furthering reduction of vehicle emissions under the Low-NOx Omnibus regulations, which is part of ANR's proposed rule package. Provisions that allow manufacturers to earn credit for deploying cleaner internal combustion engines earlier than required or engines meeting more stringent emissions standards than required are included in the proposed Low-NOx Omnibus regulation. These credit opportunities are open to any fuel type cleaner engine and the advances already made by natural gas and propane engines that currently certify to CARB's optional reduced nitrogen oxide (NOx) standard (0.02 g/bhp-hr) provide a substantial head-start toward complying with all the proposed requirements as compared to other engines. Commenters' concerns about the rules not supporting or accommodating alternative fuel technologies is addressed in the proposed Low-NOx Omnibus regulation, therefore no changes were made in response to this comment.

Further, Vermont's Climate Action Plan does include the use of alternative fuels to decarbonize Vermont's fleet, but strategies including fuel shifting shouldn't exclude electrification<sup>3</sup>. From a cost-per-ton of emission reduction perspective, strategies to increase use of these alternative fuels are comparably more costly to implement based on the cost-per-ton of emissions reduced than the deployment of electric vehicles at the scale we need to meet our GHG reduction requirements in the Global Warming Solutions Act.<sup>4</sup>

### Electric Vehicle Supply Equipment (EVSE)

**Comment-EVSE1:** Some commenters are concerned about the cost of installing EV charging infrastructure, both for individuals and businesses, and some are concerned that chargers available today are not reliable and experience too much "down time".

**Response-EVSE1:** The most convenient and affordable place for private, passenger vehicles to charge is expected to be at home, where vehicles are often parked overnight for many hours at a time. Charging a car at home can be as easy as plugging in the convenience cord that comes with an electric vehicle into a 110 Volt plug. This type of charging is known as Level 1 and can provide about 3-6 miles of range for each hour a car is plugged in. When plugged in overnight a Level 1 charge may provide enough range to meet shorter daily driving trips. However, if your daily driving distances are longer, and you need a faster charge to fully re-charge your battery every night, you may want to install a Level 2 charger at your home which provides about 14-35 miles of range per hour of charging. Many electric utilities in Vermont offer free or subsidized Level 2 chargers with the purchase of an EV<sup>5</sup>. With the new Advanced Clean Cars II proposal, starting with model year 2026, electric vehicles will be required to come with a convenience cord that can charge at both Level 1 and 2 and will reduce the cost for home charging. Installing EV charging in private or public parking lots, such as workplace parking lots, multiunit residential parking lots, and public parking lots can be more challenging and expensive to install. To help overcome these cost barriers and ensure access to a network of chargers that can meet all EV driver's

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<sup>3</sup> Vermont Initial Climate Action Plan, 2021:

<https://outside.vermont.gov/agency/anr/climatecouncil/Shared%20Documents/Initial%20Climate%20Action%20PIan%20-%20Final%20-%2012-1-21.pdf>.

<sup>4</sup> Vermont Pathways Marginal Abatement Cost Curve Report, 2022:

<https://outside.vermont.gov/agency/anr/climatecouncil/Shared%20Documents/MAC%20Curve%20Deliverable%20Memo%20Clean%20Version.pdf>.

<sup>5</sup> <https://www.driveelectricvt.com/incentives#charging>

charging needs, both at home and when on the go, Governor Scott and the Legislature have allocated \$10 million in funding to help reduce the cost of installing charging stations in multiunit residential properties, workplaces, and public attractions.

Vermont is on the fast track to build out both electric vehicle charging stations with policies, investments, and regulatory streamlining, to ensure everyone can charge and refuel when and where they need to. Publicly funding chargers also have to comply with “up time” requirements and have to adhere to higher standards related to accessibility and interoperability. To ensure a successful transition to electric transportation, Governor Scott and the Legislature allocated millions to zero-emission vehicles to help make these vehicles more affordable and convenient for all Vermonters, while building out the infrastructure and charging stations needed to facilitate this transition. Incentives and grants are now or soon to be available for multi-unit dwelling owners and employers to provide access to charging at apartment buildings and workplaces. No changes were made in response to these comments.

**Comment-EVSE2:** Some commenters are concerned that there is not enough EV charging infrastructure. Some also would like to see more investments in charging infrastructure in designated downtown areas and at workplaces. Also, commenters are concerned about availability of charging if you do not have a garage or if you don’t own your home.

**Response-EVSE2:** Vermont is building out a network of electric vehicle charging stations with policies, investments, and regulatory streamlining, to ensure everyone can access reliable, convenient, and affordable charging options when at home and around town, and when traveling longer distances. While the [investments made to date](#) have resulted in one of the highest numbers of chargers per capita, 114 charging ports per 100,000 people, the State recognizes the network needs to continue expanding.

Governor Scott and the Legislature have allocated \$10 million to support the build out of electrical infrastructure and charging stations in multiunit residential properties, workplaces, and community attractions, including Vermont’s downtowns. Incentive programs that reduce the cost of installing EV charging in these locations will soon be available. This program is building on a \$1 million pilot program to provide residents of multiunit residential properties access to home EV charging. The pilot program funds have been fully obligated and are expected to result in 84 new Level 2 charging ports at 37 different affordable multiunit residential properties across the state, providing access to home charging for over 6,000 Vermont households.

To support the buildout of fast charging that meets EV drivers need to re-charge more quickly when traveling longer distances, the State has set a goal to have a direct current fast charger (DCFC) within 1 mile of every interstate exit, and within 25 miles of the next DCFC on the State highway network. In support of achieving this goal, Governor Scott and the Legislature have allocated \$2 million in fiscal year (FY) 2023. The State will also receive \$21.2 million over the next 5 years from the Federal Highway Administration. This network of public DCFC chargers can provide 30-90 miles of range per 10 minutes of charging. No changes were made in response to these comments.

**Comment-EVSE3:** Some commenters are in favor of EVs being standardized to only use one type of charging cable.

**Response-EVSE3:** ANR agrees that standardized charging cables provide certainty and convenience to consumers and will continue to work with other jurisdictions and stakeholders to promote more standardization related to EV charging. With the new Advanced Clean Cars II proposal, starting with model year 2026, electric vehicles will be required to come with a convenience cord that can charge at both Level 1 and 2 and will reduce the cost for home charging.

Currently, Vermont requires that all publicly funded EV chargers be equipped with both a CHAdeMO and a SAE CCS connector so most cars can access the charging station. No changes were made in response to this comment.

**Comment-EVSE4:** One commenter noted that the time it takes a business to charge vehicles during a delivery is lost time and money.

**Response-EVSE4:** The ACT regulation imposes requirements on vehicle manufacturers to produce and sell ZEVs in Vermont. Businesses are not required to purchase electric vehicles under the proposed regulations. Under the ACT regulation new diesel heavy-duty trucks will continue to be available for sale in Vermont before and after 2035 while providing an increased choice for fleets when making decisions about what vehicle will best suit their needs. The ACT regulation includes flexibility for manufacturers to produce and sell new ZEVs into the market segments they deem to be most suitable for the products they manufacture, ensuring that manufacturers develop competitive ZEV products at price points that will meet fleet needs. Used vehicles are outside of the scope of the rules and used ICEVs will continue to be available for sale in Vermont.

Many vehicles, depending on their use and application, will not need to re-fuel during the day. For example, delivery vans are an application considered to be well-suited for electrification because they tend to serve predictable routes, generally travel less than 100 miles per day roundtrip, and return to a centralized fleet depot, which enables fleet operators to strategically deploy vehicles and manage vehicle charging operations. Today, there are more than 20 electric cargo and/or step delivery vans on the market with estimated ranges from 105-210 miles.

ANR anticipates that businesses will determine when and where regular dwell times occur so that drivers and staff are not “on the clock” when trucks or other delivery vehicles are charging. This planning could potentially result in saved time and money, as well as safer driving conditions with reduced risk to drivers. No changes were made in response to this comment.

**Comment-EVSE5:** One commenter noted that if the expansion and availability of charging is not keeping pace with the increase in EVs then the requirement to deliver 100% light-duty EVs by 2035 under Advanced Clean Cars II should be adjusted. There should be an independent study on a continuing basis to be sure, not just that highways and large workplaces are charger ready, but the side streets of Burlington for the low wage worker in a basement apartment or the trailer on a rural road.

**Response-EVSE5:** Vermont participates in a number of multi-state workgroups on air quality and climate change issues and will continue to work closely with California and the other Section 177 States on reducing motor vehicle emissions standards. The opportunity for revisions to the adopted rule will occur

during periodic reviews to evaluate rule applicability and feasibility. Vermont will participate in those review opportunities, and availability of charging will likely be a consideration. No changes were made in response to this comment.

## Electric Grid Impacts

**Comment-EG1:** Some commenters are concerned that Vermont’s power grid cannot handle the additional demand for electricity that EVs will require. One commenter stated that the proposed rules should not be adopted until the Vermont Comprehensive Energy Plan and the Vermont Electric Power Company (VELCO) Long-Range Transmission Plan demonstrate that the electrical infrastructure in Vermont will be adequate to handle the electrical vehicles being added to the system.

**Response-EG1:** Significant load planning takes place at the regional, state, and utility level, with updated forecasts and analyses completed every 1-3 years. These planning efforts use market data, technology adoption curves, and third-party input to understand the future mix of load and generation resources impacting the electric grid. Each plan informs equipment and infrastructure upgrades that are implemented to ensure the grid operates in a reliable and cost-effective manner.

ISO New England, the independent regional grid operator, prepares an annual long-term forecast for electricity demand in each state, including demand for EV charging. The 10-year projections are published in its annual Capacity, Energy, Loads, and Transmission (CELT) Report, and are used in power system planning and reliability studies. ISO New England’s Regional System Plan, last updated in 2021, summarizes system needs for generation resources and transmission facilities. Sufficient resources are expected through 2030 (the time horizon of the plan). The plan anticipates new resource development (namely on- and off-shore wind, solar, and battery resources) and identifies transmission system investments needed to improve reliability and reduce congestion. The report accounts for state policy initiatives and increasing electrification of heating and transportation loads.

VELCO, Vermont’s transmission system operator, works with the Vermont System Planning Committee to forecast changes in electric load and model the ability of Vermont’s grid to accommodate electric demand under various scenarios. The results are published in the Long-Range Transmission Plan (LRTP) updated every three years; the most recent LRTP was published on July 1, 2021, and looks out 20 years. The plan concluded that Vermont’s transmission system has sufficient capacity for expected demand through 2030, and that—by managing 75% of EV load to reduce charging during peak periods—significant transmission upgrades would not be needed. This is also true through 2040, even when considering a higher-than-expected rate of electrification of the transportation and heating sectors. Three distribution utilities already offer EV load management programs, and all utilities will be required to offer rates for EV management by June 30, 2024 (per Act 55 of 2021). The Department of Public Service estimates that 31% of residential EV charging is currently managed and this percentage is consistently growing.

In addition, each electric distribution utility completes an Integrated Resource Plan to meet the need for electricity in a safe, reliable manner with the lowest possible economic and environmental costs. These plans are also updated every three years and account for recent and projected trends in electric loads and economic activity. Distribution utilities monitor equipment capabilities as load grows and anticipate



which substations and circuits will require upgrades. Infrastructure investments do incur costs, but load growth moderates rate impacts by spreading expenses across additional electricity sales. EV charging is typically a flexible load that can be scheduled when the grid is less stressed and wholesale electricity costs are below average. Although early in development, some Vermont distribution utilities have begun testing vehicle-to-grid energy storage services that may further reduce ratepayer costs and improve system reliability.

The LRTP also found that many distribution substation transformers may not require upgrades to accommodate electrification load growth. Comprehensive analysis by the distribution utilities of all circuits to determine their load hosting capacity has not yet been conducted, but it is believed that many existing roadside power lines will be sufficient. The capacity and availability pole-top service transformers is a key consideration. Upgrades of these transformers may be necessary for some households that wish to connect electric vehicles, and global supply chain issues currently cause delays in obtaining them. However, protocols are in place and in development to address this issue.

While electricity demand and transmission are outside the scope of this regulation, ANR did consider these impacts and consulted with the Department of Public Service in developing the proposed rule. These impacts are within the jurisdiction and purview of the Department of Public Service. No changes were made in response to this comment.

**Comment-EG2:** Some commenters are concerned that Vermont’s power grid is not reliable enough to be used to reliably fuel our vehicle fleet.

**Response-EG2:** Response EG-1 addresses generation, transmission, and distribution system adequacy in relation to serving EV loads. In terms of service interruptions, the Public Utility Commission regulates electric service quality including reliability and outages. According to the U.S. Energy Information Administration’s reliability metrics, during 2020, on average, Vermont customers incurred 1.9 outages lasting 2 hours and 15 minutes each, equating to a total outage time of 4 hours and 16 minutes (known as the System Average Interruption Duration Index, or SAIDI).

This value varies by location and is susceptible to variation based on major weather events (such as wind or ice storms) that occur on a less-than-annual basis but cause significant damage. During 2017, a year which included major windstorms in May and in October, customers of the two largest utilities (Green Mountain Power and Vermont Electric Coop) experienced an average total outage time of 14 hours and 23 minutes across 2.5 outages over the course of the year.

It should be noted that, when a power outage occurs, gas stations in the affected area are typically unable to serve consumer demand for gasoline as electricity is used to pump gasoline from on-site storage tanks into the customer’s vehicle. With adequate weather forecasting, storm preparation, and communications, such as is conducted by the distribution utilities, it should be possible for EV owners to ensure that their vehicles are fully charged prior to a significant weather event. While grid reliability is outside the scope of this regulation, ANR did consider these impacts and consulted with the Department of Public Service in developing the proposed rule. No changes were made in response to this comment.

## Batteries – Recycling and Environmental Impacts

**Comment-B1:** Many commenters are concerned about the materials used in electric vehicle batteries and how used batteries will be handled at the end of their life. Some commenters are also concerned about the energy needs, environmental harms, and human rights issues associated with mining battery materials, and availability of those materials. Some commenters are supportive of automakers that have already developed battery technology to transition away from materials that are of concern, and others noted that battery research and development should focus on using other alternatives and end-of-life considerations such as recycling and reuse of materials.

**Response-B1:** The proposed Advanced Clean Cars II regulation includes durability requirements for batteries that lead to reduced battery degradation and therefore less battery replacements. This has a benefit of reducing battery manufacturing impacts of facility emissions and sourcing of raw minerals, as well as slowing down the need for battery recycling and reuse activities.

Regarding the energy needs and environmental impacts of producing an EV battery, and how that compares to emissions and impact from a fossil fuel vehicle, ANR conducted a life-cycle analysis that shows that the life-cycle emissions of an EV is lower than an ICEV. See the discussion of life-cycle emissions in *Supplemental Information for Vermont’s Low Emission Vehicle and Zero Emission Vehicle Proposed Rules* on Page 28.

Electrification of the on-road vehicle fleet will likely result in increased demand for lithium, among other semiprecious metals, such that global supply may not be capable of meeting this demand. There are also likely potential adverse environmental effects from increased mining activity of lithium and other semi-precious metals. Vermont cannot, without speculating, predict the location of these impacts or account for the regulatory environment that may be capable of reducing impacts from these activities. For instance, mining activities that occur overseas in countries that may have fewer regulations in place to mitigate environmental impacts are beyond Vermont’s authority to mitigate or regulate. Nevertheless, these potential impacts are identified and discussed here.

The Agency recognizes that its rules and regulations related to the use of zero-emission technology may induce new demand for various metals including lithium, graphite, cobalt, nickel, copper, manganese, chromium, zinc, and aluminum; however, Vermont’s rules are not solely responsible for an increase in demand for these metals. The federal government recently enacted legislation providing significant support for ZEVs. The Inflation Reduction Act of 2022 provides significant tax credits for new and used ZEVs and electric vehicle charging infrastructure. It provides an advanced manufacturing tax credit for production of critical minerals used in ZEV batteries, appropriates \$500 million for “enhanced use” under the Defense Production Act to incentivize critical mineral production. It authorizes the Department of Energy to commit up to an additional \$40 billion in loan guarantees (on top of an existing program of \$24 billion) for innovative technologies - which includes projects that avoid GHGs and other air pollutants or that employ new or improved technologies. Various international efforts are also underway to electrify the mobile-source sector pursuant to commitments made in the European Union, United Nations (UN) Paris Accord, Kyoto Protocol, and by members of the Under2 Coalition, among others. It is also important to note that ICEVs require aluminum alloys, magnesium, iron, and steel, which are all metals that already require extensive mining with similar physical impacts to the

environment, including loss of habitat, agricultural resources, and forests; water, air, and noise pollution; and erosion.

Retired battery systems can be used in several ways based on their physical characteristics, state of health, and performance, or they will be recycled or disposed if no longer useable. Some battery modules removed from vehicles can be refurbished and reused directly as a replacement battery pack for the same model vehicle. Battery recycling is improving and will continue to improve overtime. New industries are developing ways to recover the most valuable materials from batteries with the intention of reuse. They are also looking at a closed-loop battery production process in which batteries are recycled, remanufactured and returned to the same factory.

Also, the proposed Advanced Clean Cars II regulation would require manufacturers of ZEVs, plug-in hybrid-electric vehicles, and hybrid-electric vehicles to include a label on the vehicle battery that provides key information about the battery system. This will ensure that used batteries can be sustainably and properly managed at their end of life and critical battery materials are efficiently recovered. All of this will help reduce the need for additional mining to supply critical energy materials for ZEV batteries in the amounts needed to displace internal combustion vehicles.

In some cases, after use in a vehicle, lithium battery packs could deliver additional years of service in a stationary application. Examples include backup power for homes or cellular towers as well as for large buildings like sports arenas or electric utility grids. Second-life batteries reduce the demand for newly mined materials used in the production of new energy storage batteries. No changes were made in response to this comment.

**Comment-B2:** One commenter has concerns about EVs being safe, and specifically references EV battery fires.

**Response-B2:** Electric vehicles meet the same safety standards as ICEVs. In fact, a gasoline car is more likely to catch on fire than an electric vehicle. A recent study found that fully electric vehicles, were deemed far safer than both hybrids and gas cars; they are far less likely to catch fire, with just 25.1 fires per 100,000 sales. That's compared to 3,474 hybrid fires and 1,529 internal combustion engine fires per 100,000 sales respectively. No changes were made in response to this comment.

## Environmental Justice

**Comment-EJ1:** ANR should immediately begin developing and implementing programs that will be eligible for Environmental Justice (EJ) credits under the ACC II Rule. The Agency should also continue to develop and fund complementary policies and programs. ANR should commit to immediately beginning work and engagement with community members and environmental justice organizations to develop and implement EJ programs that will be eligible for these programs.

**Response-EJ1:** ANR plans to begin developing criteria for the review and approval of Clean Mobility Programs that will be eligible for EJ credits post-rule adoption.

**Comment-EJ2:** Some commenters think that the proposed Environmental Justice Credit provisions of the rule would commodify low-income communities while increasing the financial and environmental burdens of those communities. One commenter thinks that Environmental Justice Credits should be allowed but should be valued in a way that makes up for the shortfalls in emission reduction that will occur due to fewer vehicles being delivered.

**Response-EJ2:** ANR's approach to environmental justice in this proposal is multi-faceted. The significant pollution reductions from the proposal as a whole will reduce exposure to vehicle pollution in communities throughout Vermont, including in low-income and disadvantaged communities that are often disproportionately exposed to vehicular pollution. ZEVs can also be cheaper to own and maintain, reducing transportation costs that comprise a disproportionate share of the spending for lower-income Vermonters. Further, the ZEV assurance measures, such as minimum warranty and durability standards, will ensure these emissions benefits are realized and long-lasting, while supporting more reliable ZEVs in the used vehicle market. Durable and better performing used ZEVs can help increase access to clean vehicle technologies for communities that may not be buying new vehicles, but which do need reliable mobility options. Vermont's many incentive programs, though beyond the scope of this proposal, also further enhance ZEV access. As part of this overall portfolio approach to equity measures, the proposed rule also includes regulatory flexibilities that will further enhance ZEV access. Optional Environmental Justice Credits may be awarded to manufacturers under the ZEV regulation who help increase affordable access to ZEVs for disadvantaged communities as part of the portfolio of equity approaches described above.

The Environmental Justice Credits would be a distinct category under the ZEV regulation where vehicle values earned can be banked, traded, and used in the 2026 through 2031 model years, further speeding affordable ZEV access in these communities during the critical early years of the program. The proposal includes a 5% cap on EJ Credits that could be used in any given year to fulfill a manufacturer's annual ZEV requirement under the regulation. After the 2031 model year these optional EJ Credits would expire. The EJ Credits are aimed at providing manufacturers additional vehicle values for voluntary actions that would help achieve more equitable outcomes and that would increase access and exposure to ZEV technologies for underserved communities.

Under the proposal, EJ Credits can be earned in two ways: 1) Allowance for ZEVs and PHEVs remaining in Vermont after leasing term. A 2026 through 2028 model-year ZEV or PHEV could earn an additional 0.25 or 0.20 vehicle value, respectively, after the vehicle is registered for operation on public roads in Vermont beyond its first qualifying lease term and placed with a household located in a disadvantaged community. 2) Discounted ZEVs and PHEVs placed in a community-based Clean Mobility Program. 2026 through 2031 model-year ZEVs and 6-passenger (or more) PHEVs that are sold at a minimum discount of 25% off of the manufacturer's suggested retail price to a community-based Clean Mobility Program could earn an additional 0.50 and 0.40 vehicle ZEV credit value, respectively. Eligible Clean Mobility Programs will be determined eligible via a set of criteria developed by ANR in coordination with VTrans and other community stakeholders after the rule is adopted. Existing programs may be eligible if they meet the qualifying criteria.

Environmental justice and equity have been taken into consideration for the deployment of medium- and heavy-duty electric vehicles as well. Earlier in 2022, seventeen U.S. states, the District of Columbia, and the Canadian province of Quebec worked together through the Multi-State ZEV Task Force, a coalition facilitated by the Northeast States for Coordinated Air Use Management, to produce a bold *Action Plan* for accelerating a transition to zero-emission trucks and buses<sup>6</sup>. To inform the development of the *Action Plan*, the ZEV Task Force directly [engaged many public and private sector experts, partners, and stakeholders](#)—including equity and environmental justice organizations, truck and bus manufacturers, industry and technology experts, charging and fueling providers, utility companies, public and private fleet representatives, commercial financing experts, and environmental advocates. The ZEV Task Force also received [public comments on the draft Action Plan](#). Vermont intends to adopt its own Action Plan stemming from the multi-state plan, which will undergo its own stakeholder engagement process and will be informed by the equity and environmental justice considerations incorporated into the multi-state plan. No changes were made in response to these comments.

**Comment-EJ3:** As there are only limited EJ provisions in the ACC II regulation, Vermont—as part of its engagement with community members and environmental justice organizations—must continue to develop and fund complementary policies and programs that will ensure the benefits of a transition to zero-emission vehicles are realized by all Vermonters, especially those who have been historically overburdened with transportation pollution, by building on the work done to stand up initiatives like MileageSmart, Replace Your Ride, and the multi-unit dwelling EVSE grant program.

**Response-EJ3:** This past year, the legislature has continued to build upon the State's cleaner transportation incentive programs with its highest levels of investment ever--\$12 million for the Incentive Program for New EVs, \$3 million for MileageSmart, \$3 million for Replace Your Ride, \$55,000 for the eBike Incentive Program and another \$10 million for community charging and to extend the pilot program for charging at affordable Multiunit Dwellings. (Act 185: [Bill Status H.740 \(Act 185\) \(vermont.gov\)](#)) All income-sensitized, the programs have provided even greater benefits to households with lower incomes and now have funding to extend well beyond previous one-time appropriations. The existence and performance of such targeted programs in Vermont helps ensure that all Vermonters will benefit from these proposed rules.

VTrans is currently working on two analyses to help enhance transportation and incentive programming to better serve low-income residents. The *Transportation Equity Framework* recognizes that equitable transportation investments have not always been prioritized, resulting in disparities in transportation access from community to community, and will guide VTrans in how investments and services are carried out throughout the state. Also, VTrans is working with its contractor implementing the vehicle purchase incentive programs to optimize these programs to meet both climate and equity goals. No changes were made in response to this comment.

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<sup>6</sup> <https://www.nescaum.org/documents/multi-state-medium-and-heavy-duty-zero-emission-vehicle-action-plan/>

**Comment-EJ4:** These rules will give higher-income Vermonters access to EVs and a cleaner environment while the positive economic, health and environmental impacts will not be felt by lower-income Vermonters and communities for many years, if ever.

**Response-EJ4:** See responses to other environmental justice comments, above. The provisions of the proposed rule are designed to benefit all Vermonters, by improving air quality in areas disproportionately impacted by harmful motor vehicle emissions, and with a specific focus on making EVs more accessible to lower income communities. Facilitating a robust used EV market sooner and incentivizing automakers to deliver affordable EVs will make this technology accessible and improve air quality. Enhanced durability and warranty requirements and state and federal incentives also better serve and prioritize lower income motorists. No changes were made in response to this comment.

## Workforce Development

**Comment-WF1:** Some commenters support electric vehicle adoption as a way to attract and train a new generation of auto technicians to Vermont to support operation and maintenance of EVs. Commenters also want Vermont to invest in the next generation of auto technicians and support them through the transition.

**Response-WF1:** ANR agrees that training and equipping automotive technicians to be ready and able to service electric vehicles is a component of the broader economic opportunity that accompanies the adoption of initiatives and technologies to reduce air pollution and greenhouse gas emissions. Preparing and training the Vermont workforce for this transition is a critical component of ensuring that EVs are properly maintained and cost-effective for consumers. Some federal funding via the Inflation Reduction Act may be available to help directly support this type of workforce training in the future. Additionally, VTrans is using funds to implement a study that identifies workforce development needs related to EV charger installation and maintenance, as well as EV repairs. ANR also supports the automotive workforce through free trainings related to the diagnose and repair of motor vehicle emissions technology, and this training could be expanded upon to also focus on electric vehicle and hybrid technologies. No changes were made in response to this comment.

**Comment-WF2:** Some commenters expressed concerns about workforce impacts to the vehicle repair industry relating to independent repair shops' ability to access EV repair information and tools.

**Response-WF2:** ANR agrees that to determine a vehicle's need for repair and conduct subsequent needed repairs properly, automotive repair technicians need to be able to access vehicle data, diagnostic tools, and manufacturer developed diagnostic and repair information. Following the earlier adoption of service information requirements by California, Massachusetts and the U.S. EPA, auto manufacturers have voluntarily provided access to all repair information nationwide over the past decade. However, these earlier California and the U.S. EPA service information requirements have not pertained to ZEVs and now in this proposed ACCII regulation, CARB is requiring the access and disclosure of repair information and tooling for ZEVs. More specifically, for ZEVs, the scope of the required information is for all propulsion-related parts to ensure that, at a minimum, a vehicle can be repaired to make such that it can continue to be operated as a ZEV. Manufacturers must provide repair information and make available the necessary tooling to non-dealer repair shops. This requirement ensures that

independent technicians have access to basic information needed to help diagnose and repair vehicles, which further supports consumer confidence in purchasing new and used ZEVs. Therefore, ANR is modifying the proposed rule to include CCR, title 13, section 1969, Motor Vehicle Service Information - 1994 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Engines and Vehicles, and 2007 and Subsequent Model Heavy-Duty Engines in the incorporation by reference table in §40-201 of the proposed rule.

## Economic Impacts

**Comment-E1:** Some commenters are concerned about how Vermont will fund the maintenance of its roads and bridges if less motorists are paying the fuel tax because of the broader use and adoption of electric vehicle technology and fewer vehicles paying fuel tax.

**Response-E1:** In 2021, VTrans studied the possibilities for implementing a road usage charge for light-duty EVs in recognition of this issue. Like all states, Vermont is currently losing fuel tax revenue due to the increasing efficiency of all vehicles, but this will grow exponentially as the transportation sector electrifies. The 2021 study recommended that Vermont investigate further the feasibility and cost-effectiveness of implementing a mileage-based user fee for light-duty PEVs through the State's existing vehicle inspection system. Work has begun on this second assessment phase in full preparation for higher EV adoption and associated revenue losses. The results of that study are documented in the final report: [Final Report of VT RUC vfinal \(vermont.gov\)](#). While funding for road maintenance is outside the scope of this regulation, ANR did consider these impacts and consulted with the VTrans in developing the proposed rule. No changes were made in response to this comment.

**Comment-E2:** ANR's economic impact statements regarding the direct and indirect impacts of the proposed rule are inadequate. Stakeholders should have an opportunity to evaluate the data, costs, and assumptions underlying such its analysis before ANR finalizes its proposed rulemaking.

**Response-E2:** As a general matter, ANR's economic analysis is based on data, modeling, and assumptions sourced and developed with internal and outside expertise. Pursuant to the Vermont Administrative Procedure Act, ANR is required to disclose to the public the economic impact of the proposed rules, as well as scientific information and materials incorporated by reference in the proposed rules. ANR included the discussion and analysis required in the APA in the rulemaking forms and additional technical supporting documents that accompany the proposed rule. The data, costs, and assumptions are all included or cited in the above-mentioned documentation and has been available for public review since August 12, 2022. No changes were made in response to this comment.

**Comment-E3:** One commenter is concerned with the cost that will be incurred by our generation if we do not take steps today to mitigate climate change.

**Response-E3:** Such costs were considered as part of ANR's economic impact analysis of this rule. The estimated reduction of GHG emissions resulting from the adoption of these regulations will benefit Vermont residents monetarily by reducing the future social costs of carbon emissions. The social cost of carbon (SC-CO2) is an estimate of the monetized value of long-term impacts (economic, health and environmental) from climate change. Adoption of ACCII provides an estimated cost savings of more

than \$1.1 billion by 2040, while adoption of the medium – and heavy-duty truck regulations provide an estimated cost savings of more than \$600 million by 2050. A more detailed discussion is included in the *Supplemental Information for Vermont’s Low Emission Vehicle and Zero Emission Vehicle Proposed Rules*.

Additionally, the proposed rule will reduce NOx and fine particulate matter (PM2.5) emissions, which will result in health benefits for Vermonters, including reduced instances of premature deaths, hospitalizations for cardiovascular and respiratory illnesses, and emergency room visits. The estimated total health cost savings from due to a reduction in criteria pollutant emissions resulting from the proposed ACCII regulation for the year 2040 in Vermont ranges from \$373,000 to \$840,000. The estimated total health cost savings from due to a reduction in criteria pollutant emissions resulting from the proposed medium – and heavy-duty truck regulations ranges from \$11 million to \$24 million by 2050. A more detailed discussion is included in the *Supplemental Information for Vermont’s Low Emission Vehicle and Zero Emission Vehicle Proposed Rules*. No changes were made in response to this comment.

### Legal and Procedural

**Comment-LP1:** Some commenters note that the rule process should be more transparent, the rule text and associated public events should be made available in languages other than English, and the public should be made more aware of the impacts of the rule. Another commenter stated that the rule process did not allow for public input because the rule must be “identical” to California standards.

**Response-LP1:** ANR is committed to providing all Vermonters meaningful and equitable access to its programs, services, and activities. The public engagement process for this rulemaking was conducted consistent with the Vermont Administrative Procedure Act, the Global Warming Solutions Act, ANR’s Interim Limited English Proficiency Plan, and the latest proposed Language Access Plan which describes how the agency provides language access services. ANR’s public engagement process for this rulemaking also incorporated feedback collected during several meetings of the Vermont Climate Council Transportation Task Group, Just Transition Subcommittee, and the Interagency Committee on Administrative Rules (ICAR). Throughout the process, ANR’s website included the schedule for public events, information about the proposed rules and supplemental materials, and notice of the availability of language access services. The RSVP page for the public meetings also included public notice of language access services. ANR did not provide the rule text in languages other than English because ANR did not receive requests for language translation. After filing the proposed rule, ANR hosted more public meetings than required by law, including five in-person meetings around Vermont, one virtual public hearing, and one virtual stakeholder meeting for businesses and fleet owners impacted by the medium- and heavy-duty rules. While the Clean Air Act requires the rules to be “identical” to California, there are aspects of Vermont’s proposed rules that can and have been changed based on public comment, for example see Response-WF2 and Response G-13. No changes were made in response to these comments.

**Comment-LP2:** Some commenters stated that ANR does not have legal authority to adopt the rules.

**Response-LP2:** ANR has legal authority to adopt the rules pursuant to the Vermont Air Pollution Control Law, 10 V.S.A. §§ 554, 558, 567; the federal Clean Air Act, 42 U.S.C. § 7507, and the Global Warming



Solutions Act, 10 V.S.A. § 593(b). The Vermont Air Pollution Control Law allows the ANR Secretary to set emission control requirements on sources of air contaminants in Vermont and specifically to control such emissions from motor vehicles through the prescription of requirements for the use of equipment that will reduce or eliminate emissions. Vermont law also allows the use of vehicle registration and inspection as an enforcement mechanism for these rules. *See* 23 V.S.A. Ch. 7, 10 V.S.A. §567. The federal Clean Air Act allows states to adopt and enforce any model year standards relating to control of emissions from new motor vehicles and engines, so long as such standards are identical to California's standards, are adopted at least two years before commencement of the model year, and the adopting jurisdiction has a plan approved pursuant to Part D of the Act. States may adopt these rules prior to EPA granting a waiver to California under Clean Air Act Section 209(b). Once EPA has granted a waiver to California, Section 177 states may enforce standards to control motor vehicle emissions using certification, inspection, registration, or some other approval process. The Global Warming Solutions Act requires ANR to adopt these rules by December 1, 2022 because the rules were included in the Climate Action Plan adopted by the Vermont Climate Council in December 2021. No changes were made in response to these comments.

### Other changes to the rule text

Section 40-102(b), Incorporation by Reference, of the proposed rule was changed to clarify the scope of applicability of the rules as it relates to auto manufacturers that produce different volume of motor vehicles. The term "low volume" was added to the list of manufacturer types to ensure consistency with the definitions used in the Advanced Clean Trucks rule.

No other changes were made to the proposed rule text.