

Proposed Filing - Coversheet

Instructions:

In accordance with Title 3 Chapter 25 of the Vermont Statutes Annotated and the “Rule on Rulemaking” ([CVR 04-000-001](#)) adopted by the Office of the Secretary of State, this filing will be considered complete upon filing and acceptance of these forms and enclosures with the Office of the Secretary of State, and the Legislative Committee on Administrative Rules.

All forms shall be submitted to the Office of the Secretary of State, no later than 3:30 pm on the last scheduled day of the work week.

The data provided in text areas of Proposed Filing Coversheet will be used to generate a notice of rulemaking in the portal of “Proposed Rule Postings” online, and the newspapers of record. Publication of notices will be charged back to the promulgating agency.

**PLEASE REMOVE ANY COVERSHEET OR FORM NOT
REQUIRED WITH THE CURRENT FILING BEFORE DELIVERY!**

Certification Statement: As the adopting Authority of this rule (see 3 V.S.A. § 801 (b) (11) for a definition), I approve the contents of this filing entitled:

Vermont Low and Zero Emission Vehicle Regulations

 _____, on 6/24/2022
(signature) (date)

Printed Name and Title:

Julie Moore, Secretary, Agency of Natural Resources

RECEIVED BY: _____

- ☐ Coversheet
- ☐ Adopting Page
- ☐ Economic Impact Analysis
- ☐ Environmental Impact Analysis
- ☐ Strategy for Maximizing Public Input
- ☐ Scientific Information Statement (if applicable)
- ☐ Incorporated by Reference Statement (if applicable)
- ☐ Clean text of the rule (Amended text without annotation)
- ☐ Annotated text (Clearly marking changes from previous rule)
- ☐ ICAR Filing Confirmed

1. TITLE OF RULE FILING:

Vermont Low and Zero Emission Vehicle Regulations

2. ADOPTING AGENCY:

Agency of Natural Resources

3. PRIMARY CONTACT PERSON:

(A PERSON WHO IS ABLE TO ANSWER QUESTIONS ABOUT THE CONTENT OF THE RULE).

Name: Megan O'Toole

Agency: Agency of Natural Resources

Mailing Address: 1 National Life Dr. Davis 4 Montpelier,
Vermont 05620

Telephone: (802) 249-9882 Fax:

E-Mail: megan.otoole@vermont.gov

Web URL *(WHERE THE RULE WILL BE POSTED)*:

<https://dec.vermont.gov/air-quality/laws>

4. SECONDARY CONTACT PERSON:

(A SPECIFIC PERSON FROM WHOM COPIES OF FILINGS MAY BE REQUESTED OR WHO MAY ANSWER QUESTIONS ABOUT FORMS SUBMITTED FOR FILING IF DIFFERENT FROM THE PRIMARY CONTACT PERSON).

Name: Deirdra Ritzer

Agency: Agency of Natural Resources

Mailing Address: 1 National Life Dr. Davis 4 Montpelier,
Vermont 05620

Telephone: (802) 233-8052 Fax:

E-Mail: deirdra.ritzer@vermont.gov

5. RECORDS EXEMPTION INCLUDED WITHIN RULE:

(DOES THE RULE CONTAIN ANY PROVISION DESIGNATING INFORMATION AS CONFIDENTIAL; LIMITING ITS PUBLIC RELEASE; OR OTHERWISE, EXEMPTING IT FROM INSPECTION AND COPYING?) No

IF YES, CITE THE STATUTORY AUTHORITY FOR THE EXEMPTION:

PLEASE SUMMARIZE THE REASON FOR THE EXEMPTION:

6. LEGAL AUTHORITY / ENABLING LEGISLATION:

(THE SPECIFIC STATUTORY OR LEGAL CITATION FROM SESSION LAW INDICATING WHO THE ADOPTING ENTITY IS AND THUS WHO THE SIGNATORY SHOULD BE. THIS SHOULD BE A SPECIFIC CITATION NOT A CHAPTER CITATION).

10 V.S.A. Sections 554, 558, 567.

7. EXPLANATION OF HOW THE RULE IS WITHIN THE AUTHORITY OF THE AGENCY:

10 V.S.A. §§558 and 567 of the Vermont Air Pollution Control Laws allow 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.

8. CONCISE SUMMARY (150 WORDS OR LESS):

Advanced Clean Cars II, Advanced Clean Trucks, Low NOx Heavy-Duty Omnibus, and the Phase 2 Greenhouse Gas Rule. In this rulemaking, ANR proposes to amend existing rules and adopt new rules that reduce greenhouse gas and criteria air pollutant emissions from passenger cars, light-duty trucks, and medium- and heavy-duty vehicles and engines that are delivered for sale or placed in service in Vermont.

9. EXPLANATION OF WHY THE RULE IS NECESSARY:

In response to the threat of climate change, in September 2020 the General Assembly enacted the Global Warming Solutions Act (GWSA), Act 153, which set goals to achieve greenhouse gas emission reductions and created a Climate Council charged with adopting an Initial Climate Action Plan in December 2021. The Initial Climate Action Plan directed ANR to adopt California's Advanced Clean Cars II, Advanced Clean Trucks, the Low NOx Heavy-Duty Omnibus, and the Phase 2 Greenhouse Gas emission standards for trucks and trailers because these rules are critical to meet Vermont's required reductions of greenhouse gas emissions from the transportation sector. ANR must adopt these regulatory amendments before the end of 2022 to meet the deadlines in the GWSA and mirror California's implementation of the rules.

10. EXPLANATION OF HOW THE RULE IS NOT ARBITRARY AS DEFINED IN 3 V.S.A. § 801(b)(13)(A):

The decision made by the Agency to adopt or amend the proposed rules is rationally connected to the fact that reducing emissions of air contaminants, including greenhouse gases, will benefit public health and mitigate the impacts of climate change.

**11. LIST OF PEOPLE, ENTERPRISES AND GOVERNMENT ENTITIES
AFFECTED BY THIS RULE:**

Individuals, businesses, automobile manufacturers, the Agency of Transportation, the Public Service Department, and Public Utilities Commission, and local governments.

12. BRIEF SUMMARY OF ECONOMIC IMPACT (150 WORDS OR LESS):

The proposed rules would provide a positive economic impact to individuals and entities in Vermont in the form of cost savings related to vehicle ownership and monetized public health benefits. See supplemental Technical Support Document for further information.

13. A HEARING WILL BE SCHEDULED.

IF A HEARING WILL NOT BE SCHEDULED, PLEASE EXPLAIN WHY.

14. HEARING INFORMATION

(THE FIRST HEARING SHALL BE NO SOONER THAN 30 DAYS FOLLOWING THE POSTING OF NOTICES ONLINE).

IF THIS FORM IS INSUFFICIENT TO LIST THE INFORMATION FOR EACH HEARING, PLEASE ATTACH A SEPARATE SHEET TO COMPLETE THE HEARING INFORMATION NEEDED FOR THE NOTICE OF RULEMAKING.

Date:

Time: AM

Street Address:

Zip Code:

Date:

Time: AM

Street Address:

Zip Code:

Date:

Time: AM

Street Address:

Zip Code:

Date:

Time: AM

Street Address:

Zip Code:

15. DEADLINE FOR COMMENT (NO EARLIER THAN 7 DAYS FOLLOWING LAST HEARING):

16. KEYWORDS (PLEASE PROVIDE AT LEAST 3 KEYWORDS OR PHRASES TO AID IN THE SEARCHABILITY OF THE RULE NOTICE ONLINE).

climate change

greenhouse gas emissions

air pollutants

motor vehicle emissions

transportation electrification

Adopting Page

Instructions:

This form must accompany each filing made during the rulemaking process:

Note: To satisfy the requirement for an annotated text, an agency must submit the entire rule in annotated form with proposed and final proposed filings. Filing an annotated paragraph or page of a larger rule is not sufficient. Annotation must clearly show the changes to the rule.

When possible, the agency shall file the annotated text, using the appropriate page or pages from the Code of Vermont Rules as a basis for the annotated version. New rules need not be accompanied by an annotated text.

1. TITLE OF RULE FILING:

Vermont Low and Zero Emission Vehicle Regulations

2. ADOPTING AGENCY:

Agency of Natural Resources

3. TYPE OF FILING (*PLEASE CHOOSE THE TYPE OF FILING FROM THE DROPDOWN MENU BASED ON THE DEFINITIONS PROVIDED BELOW*):

- **AMENDMENT** - Any change to an already existing rule, even if it is a complete rewrite of the rule, it is considered an amendment if the rule is replaced with other text.
- **NEW RULE** - A rule that did not previously exist even under a different name.
- **REPEAL** - The removal of a rule in its entirety, without replacing it with other text.

This filing is **A NEW RULE** .

4. LAST ADOPTED (*PLEASE PROVIDE THE SOS LOG#, TITLE AND EFFECTIVE DATE OF THE LAST ADOPTION FOR THE EXISTING RULE*):

This rule was previously adopted in CVR 12-031-001 and is being moved to a new Chapter of the Department of Environmental Conservation rules (CVR 12-030-040) via this rule filing.

Economic Impact Analysis

Instructions:

In completing the economic impact analysis, an agency analyzes and evaluates the anticipated costs and benefits to be expected from adoption of the rule; estimates the costs and benefits for each category of people enterprises and government entities affected by the rule; compares alternatives to adopting the rule; and explains their analysis concluding that rulemaking is the most appropriate method of achieving the regulatory purpose. If no impacts are anticipated, please specify “No impact anticipated” in the field.

Rules affecting or regulating schools or school districts must include cost implications to local school districts and taxpayers in the impact statement, a clear statement of associated costs, and consideration of alternatives to the rule to reduce or ameliorate costs to local school districts while still achieving the objectives of the rule (see 3 V.S.A. § 832b for details).

Rules affecting small businesses (excluding impacts incidental to the purchase and payment of goods and services by the State or an agency thereof), must include ways that a business can reduce the cost or burden of compliance or an explanation of why the agency determines that such evaluation isn’t appropriate, and an evaluation of creative, innovative or flexible methods of compliance that would not significantly impair the effectiveness of the rule or increase the risk to the health, safety, or welfare of the public or those affected by the rule.

1. TITLE OF RULE FILING:

Vermont Low and Zero Emission Vehicle Regulations

2. ADOPTING AGENCY:

Agency of Natural Resources

3. CATEGORY OF AFFECTED PARTIES:

LIST CATEGORIES OF PEOPLE, ENTERPRISES, AND GOVERNMENTAL ENTITIES POTENTIALLY AFFECTED BY THE ADOPTION OF THIS RULE AND THE ESTIMATED COSTS AND BENEFITS ANTICIPATED:

For categories of affected parties potentially affected by this rule, please refer to the Economic Impact Statement Supplemental Information, attached.

4. IMPACT ON SCHOOLS:

INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON PUBLIC EDUCATION, PUBLIC SCHOOLS, LOCAL SCHOOL DISTRICTS AND/OR TAXPAYERS CLEARLY STATING ANY ASSOCIATED COSTS:

For a discussion of impacts on schools, please refer to the Economic Impact Statement Supplemental Information, attached.

5. **ALTERNATIVES:** *CONSIDERATION OF ALTERNATIVES TO THE RULE TO REDUCE OR AMELIORATE COSTS TO LOCAL SCHOOL DISTRICTS WHILE STILL ACHIEVING THE OBJECTIVE OF THE RULE.*

For a discussion of alternatives, please refer to the Economic Impact Statement Supplemental Information, attached.

6. **IMPACT ON SMALL BUSINESSES:**

INDICATE ANY IMPACT THAT THE RULE WILL HAVE ON SMALL BUSINESSES (EXCLUDING IMPACTS INCIDENTAL TO THE PURCHASE AND PAYMENT OF GOODS AND SERVICES BY THE STATE OR AN AGENCY THEREOF):

For a discussion of impacts to small businesses, please refer to the Economic Impact Statement Supplemental Information, attached.

7. **SMALL BUSINESS COMPLIANCE:** *EXPLAIN WAYS A BUSINESS CAN REDUCE THE COST/BURDEN OF COMPLIANCE OR AN EXPLANATION OF WHY THE AGENCY DETERMINES THAT SUCH EVALUATION ISN'T APPROPRIATE.*

For a discussion of small business compliance assistance, please refer to the Economic Impact Statement Supplemental Information, attached.

8. **COMPARISON:**

COMPARE THE IMPACT OF THE RULE WITH THE ECONOMIC IMPACT OF OTHER ALTERNATIVES TO THE RULE, INCLUDING NO RULE ON THE SUBJECT OR A RULE HAVING SEPARATE REQUIREMENTS FOR SMALL BUSINESS:

For a discussion of the comparison of the proposed rule to other alternatives, please refer to the Economic Impact Statement Supplemental Information, attached.

9. **SUFFICIENCY:** *DESCRIBE HOW THE ANALYSIS WAS CONDUCTED, IDENTIFYING RELEVANT INTERNAL AND/OR EXTERNAL SOURCES OF INFORMATION USED.*

For a discussion of the supporting resources for the proposed rule, please refer to the Economic Impact Statement Supplemental Information, attached.

Environmental Impact Analysis

Instructions:

In completing the environmental impact analysis, an agency analyzes and evaluates the anticipated environmental impacts (positive or negative) to be expected from adoption of the rule; compares alternatives to adopting the rule; explains the sufficiency of the environmental impact analysis. If no impacts are anticipated, please specify “No impact anticipated” in the field.

Examples of Environmental Impacts include but are not limited to:

- Impacts on the emission of greenhouse gases
- Impacts on the discharge of pollutants to water
- Impacts on the arability of land
- Impacts on the climate
- Impacts on the flow of water
- Impacts on recreation
- Or other environmental impacts

1. TITLE OF RULE FILING:

Vermont Low and Zero Emission Vehicle Regulations

2. ADOPTING AGENCY:

Agency of Natural Resources

3. GREENHOUSE GAS: *EXPLAIN HOW THE RULE IMPACTS THE EMISSION OF GREENHOUSE GASES (E.G. TRANSPORTATION OF PEOPLE OR GOODS; BUILDING INFRASTRUCTURE; LAND USE AND DEVELOPMENT, WASTE GENERATION, ETC.):*

For a discussion of greenhouse gas emission impacts of the proposed rule, please refer to the Environmental Impact Statement Supplemental Information, attached.

4. WATER: *EXPLAIN HOW THE RULE IMPACTS WATER (E.G. DISCHARGE / ELIMINATION OF POLLUTION INTO VERMONT WATERS, THE FLOW OF WATER IN THE STATE, WATER QUALITY ETC.):*

For a discussion of water impacts of the proposed rule, please refer to the Environmental Impact Statement Supplemental Information, attached.

5. **LAND:** *EXPLAIN HOW THE RULE IMPACTS LAND (E.G. IMPACTS ON FORESTRY, AGRICULTURE ETC.):*

For a discussion of land-use impacts of the proposed rule, please refer to the Environmental Impact Statement Supplemental Information, attached.

6. **RECREATION:** *EXPLAIN HOW THE RULE IMPACT RECREATION IN THE STATE:*

For a discussion of recreation impacts of the proposed rule, please refer to the Environmental Impact Statement Supplemental Information, attached.

7. **CLIMATE:** *EXPLAIN HOW THE RULE IMPACTS THE CLIMATE IN THE STATE:*

For a discussion of climate impacts of the proposed rule, please refer to the Environmental Impact Statement Supplemental Information, attached.

8. **OTHER:** *EXPLAIN HOW THE RULE IMPACT OTHER ASPECTS OF VERMONT'S ENVIRONMENT:*

For a discussion of other impacts to Vermont's environmental, please refer to the Environmental Impact Statement Supplemental Information, attached.

9. **SUFFICIENCY:** *DESCRIBE HOW THE ANALYSIS WAS CONDUCTED, IDENTIFYING RELEVANT INTERNAL AND/OR EXTERNAL SOURCES OF INFORMATION USED.*

For a discussion of the sources used to inform this analysis, please refer to the Environmental Impact Statement Supplemental Information, attached.

Public Input Maximization Plan

Instructions:

Agencies are encouraged to hold hearings as part of their strategy to maximize the involvement of the public in the development of rules. Please complete the form below by describing the agency's strategy for maximizing public input (what it did do, or will do to maximize the involvement of the public).

This form must accompany each filing made during the rulemaking process:

1. TITLE OF RULE FILING:

Vermont Low and Zero Emission Vehicle Regulations

2. ADOPTING AGENCY:

Agency of Natural Resources

3. PLEASE DESCRIBE THE AGENCY'S STRATEGY TO MAXIMIZE PUBLIC INVOLVEMENT IN THE DEVELOPMENT OF THE PROPOSED RULE, LISTING THE STEPS THAT HAVE BEEN OR WILL BE TAKEN TO COMPLY WITH THAT STRATEGY:

In addition to complying with the public engagement requirements of the APA, the Agency is creating additional opportunities for public engagement in accordance with the rulemaking outreach requirements of the Global Warming Solutions Act. The GWSA requires that the Agency conduct public hearings across the state and in areas that are disproportionately impacted by climate change. Updates and information about the proposed rules have been, and will continue to be, provided routinely at meetings of the Climate Council and its subcommittees and task groups, which are publicly accessible and recorded.

4. BEYOND GENERAL ADVERTISEMENTS, PLEASE LIST THE PEOPLE AND ORGANIZATIONS THAT HAVE BEEN OR WILL BE INVOLVED IN THE DEVELOPMENT OF THE PROPOSED RULE:

The Vermont Climate Council and its subcommittees and task groups.

Public Input

The Vermont Agency of Transportation and the Public Service Department.

The Northeast States for Coordinated Air Use Management

The California Air Resources Board

Scientific Information Statement

THIS FORM IS ONLY REQUIRED IF THE RULE RELIES ON SCIENTIFIC INFORMATION FOR ITS VALIDITY.

PLEASE REMOVE THIS FORM PRIOR TO DELIVERY IF IT DOES NOT APPLY TO THIS RULE FILING:

Instructions:

In completing the Scientific Information Statement, an agency shall provide a summary of the scientific information including reference to any scientific studies upon which the proposed rule is based, for the purpose of validity.

1. TITLE OF RULE FILING:

Vermont Low and Zero Emission Vehicle Regulations

2. ADOPTING AGENCY:

Agency of Natural Resources

3. BRIEF EXPLANATION OF SCIENTIFIC INFORMATION:

For an explanation of scientific information, please see the Scientific Information Statement Supplemental Information document, attached.

4. CITATION OF SOURCE DOCUMENTATION OF SCIENTIFIC INFORMATION:

For citations of source documentation, please see the Scientific Information Statement Supplemental Information document, attached.

5. INSTRUCTIONS ON HOW TO OBTAIN COPIES OF THE SOURCE DOCUMENTS OF THE SCIENTIFIC INFORMATION FROM THE AGENCY OR OTHER PUBLISHING ENTITY:

To obtain copies of source documents, please contact megan.otoole@vermont.gov.

Incorporation by Reference

THIS FORM IS ONLY REQUIRED WHEN INCORPORATING MATERIALS BY REFERENCE. PLEASE REMOVE PRIOR TO DELIVERY IF IT DOES NOT APPLY TO THIS RULE FILING:

Instructions:

In completing the incorporation by reference statement, an agency describes any materials that are incorporated into the rule by reference and how to obtain copies.

This form is only required when a rule incorporates materials by referencing another source without reproducing the text within the rule itself (e.g., federal or national standards, or regulations).

Incorporated materials will be maintained and available for inspection by the Agency.

1. TITLE OF RULE FILING:

Vermont Low and Zero Emission Vehicle Regulations

2. ADOPTING AGENCY:

Agency of Natural Resources

3. DESCRIPTION (*DESCRIBE THE MATERIALS INCORPORATED BY REFERENCE*):

Please see the attached supplemental Scientific Information.

4. FORMAL CITATION OF MATERIALS INCORPORATED BY REFERENCE:

Please see the attached supplemental Scientific Information.

5. OBTAINING COPIES: (*EXPLAIN WHERE THE PUBLIC MAY OBTAIN THE MATERIAL(S) IN WRITTEN OR ELECTRONIC FORM, AND AT WHAT COST*):

Contact megan.otoole@vermont.gov for copies of referenced materials.

6. MODIFICATIONS (*PLEASE EXPLAIN ANY MODIFICATION TO THE INCORPORATED MATERIALS E.G., WHETHER ONLY PART OF THE MATERIAL IS ADOPTED AND IF SO, WHICH PART(S) ARE MODIFIED*):

N/A

Run Spell Check



STATE OF VERMONT

Agency of Natural Resources

Chapter 40: Vermont Low Emission Vehicle and Zero Emission Vehicle Rules

Effective Date: [DATE]



VERMONT

Air Quality and Climate Division
Department of Environmental Conservation
1 National Life Drive – Davis 4
Montpelier, VT 05620-3704
Tele: (802) 828-1288

40-101 DEFINITIONS

The terms defined in this Chapter shall apply to this Chapter only, and for purposes of this Chapter shall supersede definitions contained in any other regulation. The definitions contained in *Air Pollution Control Regulations* Section 5-101 shall govern in the absence of a superseding definition in this section.

- (a) “*California-certified*” means approved by *CARB* for sale in California.
- (b) “*CARB*” means the California Air Resources Board.
- (c) “*Dealer*” means any *person* engaged in the business of selling, offering to sell, soliciting or advertising the sale of new *vehicles* who holds a valid sales and service agreement, franchise or contract, granted by the *manufacturer* or distributor for the retail sale of said *manufacturer’s* or distributor’s new *vehicles*.
- (d) “*Emergency Vehicle*” means any authorized *vehicle* publicly owned and operated that is used by a peace officer, used for fighting fires or responding to emergency fire calls, used by emergency medical technicians or paramedics, used for towing or servicing other *vehicles*, or used for repairing damaged lighting or electrical equipment.
- (e) “*Emission Control Label*” means a paper, plastic, metal or other permanent material, welded, riveted or otherwise permanently attached to an area within the engine compartment (if any), or to the engine, in such a way that it will be visible to the average *person* after installation of the engine in *new vehicles* certified for sale in California, in accordance with Title 13, California Code of Regulations.
- (f) “*Environmental Performance Label*” means a paper or plastic decal securely affixed by the manufacturer to a window of all passenger cars, light-duty trucks, and medium-duty passenger vehicles which discloses the global warming and smog score for the vehicle in accordance with Title 13, California Code of Regulations.
- (g) “*Fleet Average Emission*” means a vehicle manufacturer’s average vehicle emissions of all greenhouse gases, non-methane organic gases (NMOG), or NMOG plus oxides of nitrogen (NOx), as applicable, from all *new vehicles* delivered for sale or lease in Vermont in any *model-year*.
- (h) “*Greenhouse gas*” means the following gases: carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons.
- (i) “*GHG Credit*” means *greenhouse gas credit*.
- (j) “*Gross Vehicle Weight Rating*” or “GVWR” is as defined in Title 13, California Code of Regulations Section 1900 or Title 17, California Code of Regulations Section 95662, as applicable.
- (k) “*Heavy-duty Vehicle*” is as defined in Title 13, California Code of Regulations Section 1900 or Title 17, California Code of Regulations Section 95662, as applicable..
- (l) “*Heavy-duty Engine*” is as defined in Title 13, California Code of Regulations Section 1900 or Title 17, California Code of Regulations Section 95662, as applicable.
- (m) “*Light-duty Truck*” is as defined in Title 13, California Code of Regulations Section 1900..
- (n) “*Manufacturer*” means any independent low volume, small, intermediate or large volume *vehicle* manufacturer as defined in Title 13, California Code of Regulations Section 1900.
- (o) “*Medium-duty Engine*” is as defined in Title 13, California Code of Regulations Section 1900 or Title 17, California Code of Regulations Section 95662, as applicable.
- (p) “*Medium-duty passenger vehicle*” is as defined in Title 13, California Code of Regulations Section 1900.

- (q) “*Medium-duty Vehicle*” is as defined in Title 13, California Code of Regulations Section 1900 or Title 17, California Code of Regulations Section 95662, as applicable.
- (r) “*Model Year*” means the manufacturer’s annual production period which includes January 1 of a calendar year or, if the *manufacturer* has no annual production period, the calendar year. In the case of any *vehicle* manufactured in two or more stages, the time of manufacture shall be the date of completion of the chassis, except for a vehicle or engine subject to Title 17, California Code of Regulations Section 95662(a)(16).
- (s) “*New Vehicle*” means any *vehicle* with 7,500 miles or fewer on its odometer.
- (t) “*Near-zero-emission vehicle*” or “*NZEV*” means one of the following: (A) An on-road plug-in hybrid electric vehicle which has the same definition as that in 40 CFR section 86.1803-01, amended on July 1, 2011, incorporated by reference herein, that achieves all-electric range as defined in Title 13, California Code of Regulations Section 1963(c)(1); or (B) An on-road hybrid electric vehicle that has the capability to charge the battery from an off-vehicle conductive or inductive electric source and achieves all-electric range as defined in Title 13, California Code of Regulations Section 1963(c)(1).
- (u) “*NMOG Credit*” means non-methane organic gas credit.
- (v) “*NMOG + NOx Credit*” means non-methane organic gas plus oxides of nitrogen credit.
- (w) “*Passenger Car*” is as defined in Title 13, California Code of Regulations Section 1900..
- (x) “*Qualifying Community-based Clean Mobility Program*” means a program determined by the Vermont Air Pollution Control Officer to qualify as a community-based clean mobility program pursuant to guidance issued by the Vermont Department of Environmental Conservation. The Vermont Air Pollution Control Officer must determine that a program qualifies as a community-based clean mobility program before a manufacturer may earn vehicle value pursuant to the requirements of Title 13, California Code of Regulations Section 1962.4.
- (y) “*Recall*” means:
 - (1) The issuing of notices directly to consumers that *vehicles* in their possession or control should be corrected, and/or
 - (2) Efforts to actively locate and correct *vehicles* in the possession or control of consumers.
- (z) “*Smog Index Label*” means a decal securely affixed by the *manufacturer* to a window of all *passenger cars* and *light-duty trucks* which discloses the smog index for the vehicle in accordance with Title 13, California Code of Regulations Section 1965.
- (aa) “*Trailer*” is as defined in Title 17, California Code of Regulations Section 95662.
- (bb) “*VECs*” means *vehicle* equivalent credits.
- (cc) “*Vehicle*” or “*motor vehicle*” means any passenger car, light-duty truck, medium-duty passenger vehicle, medium-duty vehicle, or heavy-duty vehicle, as appropriate.
- (dd) “*Zero-emission Vehicle*” or “*ZEV*” means a vehicle that produces zero exhaust emissions of any criteria pollutant (or precursor pollutant) or greenhouse gas, excluding emissions from air conditioning systems, under any possible operational modes or conditions.
- (ee) “*ZEV Credit*” or “*ZEV value*” means a unit, expressed numerically, generated in accordance with Title 13 California Code Regulations, Sections 1962.2, 1962.4, and 1963.2.

40-102 INCORPORATION BY REFERENCE

- (a) This Chapter incorporates by reference certain sections of Titles 13 and 17, California Code of Regulations. Section 201 of this Chapter lists the sections of Titles 13 and 17, California Code of Regulations incorporated by reference. The sections of Titles 13 and 17, California Code of Regulations incorporated by reference in this Chapter are the version of the section adopted as of the incorporation by reference date in Section 201, herein.
- (b) For purposes of applying the incorporated sections of the California Code of Regulations, unless clearly inappropriate or alternatively defined in this Chapter, “California” shall mean “Vermont”. For example, “delivered for sale in California” and “placed in service” are interpreted, except for determinations of whether a manufacturer is a large, medium, small or independent low volume manufacturer, as referring to *vehicles* in “Vermont”.

40-103 NEW VEHICLE EMISSION REQUIREMENTS

- (a) No *person*, including a *manufacturer* or *dealer*, shall deliver for sale or lease, offer for sale or lease, sell or lease, import, acquire, receive, purchase, or rent a *new vehicle* that is a 2000 or subsequent *model-year passenger car* or *light-duty truck* or a 2004 or subsequent *model-year medium-duty vehicle* in Vermont unless the *vehicle* is *California-certified* and complies with the following criteria:
 - (1) The exhaust emissions standards, as applicable, in Title 13, California Code of Regulations, including:
 - (A) The Low Emission Vehicle Program, Sections 1900, 1956.8, 1960.1, 1961, 1961.2, and 1961.4;
 - (B) The Greenhouse Gas Emission Standards Program, Sections 1961.1 and 1961.3; and
 - (C) The Zero Emission Vehicle Program, Sections 1962, 1962.1, 1962.2, 1962.4, 1962.5, and 1962.6.
 - (2) The *emission control label* requirements, the *smog index label* or the *environmental performance label* requirements for 2002 through 2009 *model-year vehicles*, and the *environmental performance label* requirements for 2010 and subsequent *model year vehicles* in accordance with Title 13, California Code of Regulations Section 1965, except as otherwise provided by 10 V.S.A. §579(d).
 - (3) The evaporative emissions standards in Title 13, California Code of Regulations Sections 1976.
 - (4) The refueling emissions standards in Title 13, California Code of Regulations Section 1978.
 - (5) The malfunction and diagnostic system requirements in Title 13, California Code of Regulations Sections 1968.1 and 1968.2.
 - (6) The assembly-line testing procedure requirements in Title 13, California Code of Regulations Section 2062.
 - (7) The specifications for fill pipes and openings of *motor vehicle* fuel tanks in Title 13, California Code of Regulations Section 2235.
- (b) Effective for model year 2026 and subsequent *model years*, any *manufacturer* that certifies on-road *vehicles* over 8,500 pounds *GVWR* for sale or lease in Vermont must comply with:
 - (1) The Advanced Clean Trucks rule as incorporated by reference in Section 201 and in Title 13, California Code of Regulations Sections 1963 through 1963.5.

- (c) No *person*, including a *manufacturer* or *dealer*, shall deliver for sale or lease, offer for sale or lease, sell or lease, import, acquire, receive, purchase, or rent a *new vehicle* that is a 2026 or subsequent *model-year medium- and heavy-duty engine or vehicle*, or *trailer* in Vermont unless the *vehicle* is *California-certified* and complies with the following:
 - (1) All applicable emissions standards, testing procedures, warranty, reporting, recall and other applicable requirements of the Heavy-Duty Engine and Vehicle Omnibus Regulation as incorporated by reference in Section 201 of this Chapter and specified in Titles 13 and 17, California Code of Regulations; and
 - (2) All applicable emission standards, testing procedures, warranty, reporting, recall and other applicable requirements of the California Greenhouse Gas Emissions Standards for Medium- And Heavy-Duty Engines, Vehicles, and Trailers (Phase 2) as incorporated by reference in Section 201 of this Chapter and specified in Titles 13 and 17, California Code of Regulations.
- (d) Subsections 40-103(a-x) shall not apply to a *new vehicle*:
 - (1) Defined as an emergency *vehicle*;
 - (2) For the purposes of Advanced Clean Trucks only, a *vehicle* defined as an “excluded bus” pursuant to Title 13, California Code of Regulations Section 1963(c)(11);
 - (2) With a right-hand drive configuration that is not available in a California-certified model, purchased by a rural route postal carrier and used primarily for work;
 - (3) Designed exclusively for off-highway use; or
 - (4) Certified to standards promulgated pursuant to the authority contained in 42 U.S.C. 7521 and which is in the possession of a *vehicle* rental agency in Vermont and is next rented with a final destination outside of Vermont.
- (e) Subsections 40-103(a-c) shall not apply to *new vehicles* in the following transactions:
 - (1) A transfer by court decree;
 - (2) A transfer by inheritance;
 - (3) A purchase by a nonresident prior to establishing residency in Vermont; or
 - (4) A sale for the purpose of being wrecked or dismantled.

40-104 WARRANTY

- (a) For *California-certified vehicles* delivered for sale or lease in Vermont, each *manufacturer* shall provide a warranty for the ultimate purchaser and each subsequent purchaser that complies with the applicable warranty requirements of Title 13, California Code of Regulations Sections 1962.8, 2035 through 2038, 2040 and 2046.
- (b) Each *manufacturer* shall include the emission control system warranty statement required by Title 13, California Code of Regulations Sections 2039, modified by some means (e.g. printed within the text or a sticker) to clearly inform Vermont owners of *California-certified vehicles* that the California Warranty applies to the *vehicle*. This statement shall provide a telephone number appropriate for Vermont.

40-105 RECALL

For all *California-certified vehicles* registered in Vermont, each *manufacturer* shall undertake an action equivalent to that which is required by any order or enforcement action taken by *CARB*, or any voluntary or influenced emission related *recall* initiated by any *manufacturer* pursuant to Title 13, California Code of Regulations Sections 1962.7, 2101 through 2120, 2122 through 2133, 2135 through 2149, 2167, and 2168 unless within 30 days of *CARB* approval of said *recall*, the *manufacturer* demonstrates to the *Agency* that such *recall* is not applicable to *vehicles* registered in Vermont. Each *manufacturer* must send to owners of Vermont registered *California-certified vehicles* the same notice that is used for California owners required by Title 13, California Code of Regulations Sections 2118 or 2127, except that it should contain a telephone number appropriate for Vermont.

40-106 MANUFACTURER FLEET REQUIREMENTS

- (a) Each *manufacturer* shall meet the following fleet requirements for the *new vehicles* delivered for sale or lease, or for the purposes of Advanced Clean Trucks sold to the ultimate purchaser, in Vermont.
 - (1) Effective for the 2004 through 2014 *model-years*, each *manufacturer* shall comply with the *fleet average* NMOG emission requirements (or NMOG + NOx for 2014 model year only) and LEV II phase-in requirements for passenger cars and light-duty trucks and, for 2000 and subsequent model-years, may earn and bank *NMOG credits*, both in accordance with Title 13, California Code of Regulations Section 1961, except *NMOG credits* earned prior to model-year 2004 shall be treated as though they were earned in model-year 2004.
 - (2) Effective for the 2004 through 2014 *model-years*, each *manufacturer* shall comply with the LEV II *medium-duty vehicle* phase-in requirements and, for 2004 through 2014 model-years, may earn and bank VECs, both in accordance with Title 13, California Code of Regulations Section 1961, except VECs earned prior to model-year 2007 shall be treated as though they were earned in model-year 2007. Starting with model-year 2007 through model year 2014, all medium-duty vehicles are subject to the LEV II standards in accordance with Title 13, California Code of Regulations Section 1961.
 - (3) Effective for the 2015 through 2025 *model-year* passenger cars and light-duty trucks, and 2015 through 2028 model-year medium-duty vehicles, each *manufacturer* shall comply with the *fleet average* NMOG + NOx emission requirements and the LEV III phase-in requirements, and may earn and bank NMOG + NOx credits or VECs as applicable, all in accordance with Title 13, California Code of Regulations Section 1961.2.
 - (4) Effective for the 2026 and subsequent model-years, each manufacturer shall comply with the fleet average NMOG + NOx emission requirements and the LEV IV phase-in requirements for passenger cars, light-duty trucks, and medium duty vehicles, and may earn and bank NMOG + NOx credits or VECs as applicable, in accordance with Title 13, California Code of Regulations Section 1961.4.
 - (5) Effective for the 2007 through 2008 model years, each manufacturer shall comply with the Zero Emission Vehicle sales requirement and, starting with 2000 model year *vehicles*, may earn and bank ZEV credits, both in accordance with Title 13, California Code of Regulations Sections 1962.
 - (6) Effective for the 2009 through 2017 *model years*, each *manufacturer* shall comply with the Zero Emission Vehicle sales requirement and, and starting with 2000 model year *vehicles*, may earn and bank ZEV credits, both in accordance with Title 13, California Code of Regulations Section 1962.1.
 - (7) Effective for 2018 through 2025 model years, each manufacturer shall comply with the Zero Emission Vehicle sales requirement and, and starting with 2000 model year *vehicles*, may earn and bank ZEV credits, both in accordance with Title 13, California Code of Regulations Section 1962.2.
 - (8) Effective for 2026 and subsequent model years, each manufacturer shall comply with the Zero Emission Vehicle sales requirements and, starting with 2024 model year vehicles, may earn and bank ZEV value, both in accordance with Title 13, California Code of Regulations Section 1962.4.

- (9) Effective for the 2009 through 2016 model-years, each manufacturer shall comply with the fleet average emission greenhouse gas requirements for passenger cars, light-duty trucks, and medium-duty passenger *vehicles*, and for 2000 and subsequent model-years may earn and bank GHG credits, in accordance with Title 13, California Code of Regulations Section 1961.1.
- (10) Effective for the 2017 and subsequent model years, each manufacturer shall comply with the fleet average emission greenhouse gas requirements for passenger cars, light-duty trucks, and medium-duty passenger *vehicles*, and may earn and bank GHG credits, in accordance with Title 13, California Code of Regulations Section 1961.3.
- (11) Effective for the 2026 and subsequent *model years*, each manufacturer shall comply with the Advanced Clean Trucks sales requirement for medium and heavy-duty vehicles as applicable, and for 2024 and subsequent model years may earn, bank, and trade ZEV and NZEV credits both in accordance with Title 13, California Code of Regulations Sections 1963 through 1963.5.
- (12) Effective for the 2026 and subsequent model years, each manufacturer shall comply with the Heavy-Duty Engine and Vehicle Omnibus Regulation emissions standards for applicable medium- and heavy-duty engines and vehicles, and for 2024 and subsequent model years may earn, bank, and trade credits in accordance with Title 13, California Code of Regulations Sections 1956.8.
- (13) Effective for the 2026 and subsequent model years, each manufacturer shall comply with the Phase 2 greenhouse gas emissions standards for applicable medium and heavy-duty vehicles, and trailers, and for 2024 and subsequent model years may earn, bank and trade credits, in accordance with Title 17, California Code of Regulations Sections 95660 through 95664.

40-107 MANUFACTURER REPORTING REQUIREMENTS

(a) Delivery Reporting.

Each *manufacturer* shall submit annually, to the *Agency*, by March 1 following the end of each *model-year*, a report, itemized by test group and emission standard, documenting total *new vehicles* delivered for sale or lease in Vermont, as applicable.

(b) Fleet Reporting.

- (1) Each *manufacturer* shall submit annually to the *Agency*, by no later than May 1 following the end of each *model-year*, a report, itemized by test group and emission standard, that demonstrates that the *manufacturer* has met the fleet requirements of subsection 40-106(a) in Vermont.
- (2) If a *manufacturer* wants to bank *VECs* or GHG, NMOG, NMOG + NO_x, ZEV, or NZEV *credit* or *value*, the *manufacturer* shall submit annually, by no later than May 1 following the end of the *model-year*, a report which demonstrates that such *manufacturer* has earned *VECs* or GHG, NMOG, ZEV, or NZEV *credits* or *values* in Vermont. Credits or value are to be calculated in the same manner as required by CARB.

(c) Recall Reporting.

- (1) For information and not for approval by Vermont, each *manufacturer* shall submit, within 30 days of CARB approval, a copy of any CARB approved voluntary, influenced or ordered *recall* plan specified by Title 13, California Code of Regulations Sections 1962.7, 2114, 2125, and 2169 supplemented with the number of affected *vehicles* registered in Vermont.
- (2) For information and not for approval by Vermont, each *manufacturer* shall, upon request, submit *recall* campaign progress reports for *vehicles* registered in Vermont, within the timelines of, and containing the information required by, Title 13, California Code of Regulations Sections 1962.7,

2119, 2133, and 2169.7. Reports need not be submitted to the *Agency* if the equivalent reports have been waived by *CARB*.

- (d) Documentation.

A *manufacturer*, a *dealer* or a transporter of *new vehicles* shall, upon request, provide to the Agency of Natural Resources or the Agency of Transportation any documentation, including but not limited to Vehicle Identification Numbers, which either Agency determines to be necessary for the effective administration and enforcement of this Chapter.

- (e) Reports and other information required by this subsection must be submitted to:

Director, Air Quality and Climate Division
Davis 4
One National Life Drive
Montpelier, VT 05620-3802.

40-108 INSPECTIONS

- (a) The Secretary of the Agency of Natural Resources or the Secretary of the Agency of Transportation or their designees may conduct inspections of any new and used *vehicles* and any related documentation for the purpose of determining compliance with the requirements of this Chapter.
- (1) Inspections may be conducted on any conveyance used to transport *new vehicles* or on any premises owned or controlled by any *dealer* or *manufacturer*.
- (2) Inspections may extend to all emission-related parts and may require the on-premises operation and testing of an engine or *vehicle*.
- (3) Inspections may include functional tests and other tests as necessary to verify compliance with this Chapter.
- (b) Upon request, during an inspection, such *dealer* or *manufacturer* must make available to either Agency any related records, including records documenting *vehicle* origin, certification, delivery, or sales and records of *emission* related part repairs performed under warranty.

40-109 SEVERABILITY

Each provision of this Chapter is severable, and in the event that any provision of this Chapter is held to be invalid, the remainder of the Chapter shall continue in full force and effect.

40-201 PROVISIONS OF THE CALIFORNIA CODE OF REGULATIONS INCORPORATED BY REFERENCE

Incorporation by reference date: [DATE].

| Title 13 CCR | Title |
|--------------|---|
| Chapter 1 | Motor <i>Vehicle</i> Pollution Control Devices. |
| Article 1 | General Provisions. |
| 1900 | Definitions. |
| 1903 | Plans Submitted. |
| 1904 | Applicability to Vehicles Powered by Fuels Other Than Gasoline or Diesel. |

| Title 13 CCR | Title |
|---------------------|---|
| Article 2 | Approval of Motor <i>Vehicle</i> Pollution Control Devices (<i>New Vehicles</i>). |
| 1956.8 | Exhaust <i>Emissions</i> Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and <i>Vehicles</i> , 2021 and Subsequent Zero-Emission Powertrains, and 2022 and Subsequent Model Heavy-Duty Hybrid Powertrains. |
| 1960.1 | Exhaust <i>Emissions</i> Standards and Test Procedures - 1981 and through 2006 Model <i>Passenger Cars</i> , Light-Duty and <i>Medium-Duty Vehicles</i> . |
| 1960.5 | Certification of 1983 and Subsequent Model-Year Federally-Certified Light-Duty Motor Vehicles for Sale in California. |
| 1961 | Exhaust Emission Standards and Test Procedures – 2004 through 2019 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles. |
| 1961.1 | Greenhouse Gas Exhaust Emission Standards and Test Procedures – 2009 through 2016 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles. |
| 1961.2 | Exhaust Emission Standards and Test Procedures - 2015 through 2025 Model Passenger Cars and Light-Duty Trucks, and 2015 through 2028 Model Year Medium-Duty Vehicles. |
| 1961.3 | Greenhouse Gas Exhaust Emission Standards and Test Procedures - 2017 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles. |
| 1961.4 | Exhaust Emission Standards and Test Procedures - 2026 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles |
| 1962 | Zero-Emission <i>Vehicle</i> Standards for <u>2005</u> and through 2008 Model Year <i>Passenger Cars</i> , <i>Light-Duty Trucks</i> , and <i>Medium-Duty Vehicles</i> . |
| 1962.1 | Zero-Emission Vehicle Standards for 2009 through 2017 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles. |
| 1962.2 | Zero-Emission Vehicle Standards for 2018 through 2025 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles. |
| 1962.3 | Electric Vehicle Charging Requirements. |
| 1962.4 | Zero-Emission Vehicle Requirements for 2026 and Subsequent Model Year Passenger Cars and Light-Duty Trucks |
| 1962.5 | Data Standardization Requirements for 2026 and Subsequent Model Year Light-Duty Zero Emission Vehicles and Plug-in Hybrid Electric Vehicles |
| 1962.6 | Battery Labeling Requirements |
| 1962.7 | In-Use Compliance, Corrective Action and Recall Protocols for Zero Emission for 2026 and Subsequent Model Year Passenger Cars and Light-Duty Trucks |
| 1962.8 | Warranty Requirements for Zero Emission and Batteries in Plug-in Hybrid Electric 2026 and Subsequent Model Year Passenger Cars and Light-Duty Trucks |
| 1963 | Advanced Clean Trucks Purpose, Applicability, Definitions, and General Requirements |

| Title 13 CCR | Title |
|---------------------|---|
| 1963.1 | Advanced Clean Trucks Deficits |
| 1963.2 | Advanced Clean Trucks Credit Generation, Banking, and Trading |
| 1963.3 | Advanced Clean Trucks Compliance Determination |
| 1963.4 | Advanced Clean Trucks Reporting and Recordkeeping |
| 1963.5(a)(1)-(3) | Advanced Clean Trucks Enforcement |
| 1964 | Special Test Procedures for Certification and Compliance – New Modifier Certified Motor Vehicles. |
| 1965 | Emission Control, Smog Index, and Environmental Performance Labels — 1979 and Subsequent <i>Model-Year Motor Vehicles</i> . |
| 1968.1 | Malfunction and Diagnostic System Requirements - 1994 and Subsequent Model-Year <i>Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles</i> and Engines. |
| 1968.2 | Malfunction and Diagnostic System Requirements – 2004 and Subsequent Model-Year <i>Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles</i> and Engines. |
| 1971.1 | On-Board Diagnostic System Requirements - 2010 and Subsequent Model-Year Heavy-Duty Engines |
| 1976 | Standards and Test Procedures for Motor Vehicle Fuel Evaporative <i>Emissions</i> . |
| 1978 | Standards and Test Procedures for <i>Vehicle</i> Refueling <i>Emissions</i> . |
| Article 6 | <i>Emission Control</i> System Warranty. |
| 2035 | Purpose, Applicability, and Definitions. |
| 2036 | Defects Warranty Requirements for 1979 Through 1989 Model <i>Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles</i> ; 1979 and Subsequent Model Motorcycles and Heavy-Duty <i>Vehicles</i> ; and Motor Vehicle Engines Used in Such <i>Vehicles</i> , and 2020 and Subsequent Model Year Trailers. |
| 2037 | Defects Warranty Requirements for 1990 and Subsequent Model <i>Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, and Motor Vehicle Engines Used in Such Vehicles</i> . |
| 2038 | Performance Warranty Requirements for 1990 and Subsequent Model <i>Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles and Motor Vehicle Engines Used in Such Vehicles</i> . |
| 2039 | <i>Emissions Control</i> System Warranty Statement. |
| 2040 | <i>Vehicle</i> Owner Obligations. |
| 2041 | Mediation; Finding of Warrantable Condition. |
| 2046 | Defective Catalyst. |
| 2047 | Certification procedures for Used Modifier-certified Motor Vehicles. |
| Chapter 2 | Enforcement of <i>Vehicle</i> Emission Standards and Surveillance Testing. |
| Article 1 | Assembly-Line Testing. |

| Title 13 CCR | Title |
|---------------------|--|
| 2062 | Assembly-Line Test Procedures - 1998 and Subsequent <i>Model-years</i> . |
| Article 1.5 | Enforcement of Vehicle Emission Standards and Surveillance Testing for 2005 and Subsequent Model Year Heavy-Duty Engines and Vehicles |
| 2065 | Applicability of Chapter 2 to 2005 and Subsequent Model Year Heavy-Duty Engines and Vehicles |
| Article 2 | Enforcement of New and In-Use <i>Vehicle</i> Standards. |
| 2101 | Compliance Testing and Inspection - New <i>Vehicle</i> Selection, Evaluation and Enforcement Action. |
| 2109 | New <i>Vehicle Recall</i> Provisions. |
| 2110 | Remedial Action for Assembly-Line Quality Audit Testing of Less Than a Full Calendar Quarter of Production Prior to the 2001 <i>Model-year</i> . |
| Article 2.1 | Procedures for In-Use <i>Vehicle</i> Voluntary and Influenced <i>Recalls</i> . |
| 2111 | Applicability. |
| 2112 | Definitions. |
| | Appendix A to Article 2.1. |
| 2113 | Initiation and Approval of Voluntary and Influenced Emission-Related <i>Recalls</i> . |
| 2114 | Voluntary and Influenced <i>Recall</i> Plans. |
| 2115 | Eligibility for Repair. |
| 2116 | Repair Label. |
| 2117 | Proof of Correction Certificate. |
| 2118 | Notification. |
| 2119 | Recordkeeping and Reporting Requirements |
| 2120 | Other Requirements Not Waived. |
| 2121 | Penalties. |
| Article 2.2 | Procedures for In-Use Vehicle Ordered <i>Recalls</i> . |
| | |
| 2122 | General Provisions. |
| 2123 | Initiation and Notification of Ordered Emission-Related <i>Recalls</i> . |
| 2124 | Availability of Public Hearing. |
| 2125 | Ordered <i>Recall</i> Plan. |
| 2126 | Approval and Implementation of <i>Recall</i> Plan. |
| 2127 | Notification of Owners. |
| 2128 | Repair Label. |
| 2129 | Proof of Correction Certificate. |
| 2130 | Capture Rates and Alternative Measures. |

| Title 13 CCR | Title |
|--------------|---|
| 2131 | Preliminary Tests. |
| 2132 | Communication with Repair Personnel. |
| 2133 | Recordkeeping and Reporting Requirements. |
| 2134 | Penalties. |
| 2135 | Extension of Time. |
| Article 2.3 | In-Use <i>Vehicle</i> Enforcement Test Procedures. |
| 2136 | General Provisions. |
| 2137 | <i>Vehicle</i> , Engine, and Trailer Selection. |
| 2138 | Restorative Maintenance. |
| 2139 | Testing. |
| 2140 | Notification and Use of Test Results. |
| Article 2.4 | Procedures for Reporting Failures of Emission-Related Components. |
| 2141 | General Provisions. |
| 2142 | Alternative Procedures |
| 2143 | Failure Levels Triggering <i>Recall</i> and corrective action. |
| 2144 | <i>Emission</i> Warranty Information Report. |
| 2145 | Field Information Report. |
| 2146 | <i>Emissions</i> Information Report. |
| 2147 | Demonstration of Compliance with <i>Emission</i> Standards. |
| 2148 | Evaluation of Need for <i>Recall</i> . |
| 2149 | Notification of Subsequent Action. |
| Article 5 | Procedures for Reporting Failures of Emission-Related Equipment and Required Corrective Action |
| 2166 | General Provisions |
| 2167 | Required Recall and Corrective Action for Failures of Exhaust After-Treatment Devices, On-Board Computers or Systems, Urea Dosers, Hydrocarbon Injectors, Exhaust Gas Recirculation Valves, Exhaust Gas Recirculation Coolers, Turbochargers, Fuel Injectors. |
| 2168 | Required Corrective Action and Recall for Emission-Related Component Failures |
| 2169 | Required Recall or Corrective Action Plan. |
| 2169.1 | Approval and Implementation of Corrective Action Plan. |
| 2169.2 | Notification of Owners. |
| 2169.3 | Repair Label. |
| 2169.4 | Proof of Correction Certificate. |
| 2169.5 | Preliminary Tests. |
| 2169.6 | Communication with Repair Personnel. |
| 2169.7 | Recordkeeping and Reporting Requirements. |
| 2169.8 | Extension of Time. |

| Title 13 CCR | Title |
|---------------------|--|
| Chapter 4 | Criteria for the Evaluation of Motor Vehicle Pollution Control Devices and Fuel Additives. |
| Article 2 | Aftermarket Parts. |
| 2222 | Add-On Parts and Modified Parts. |
| Chapter 4.4 | Specifications for Fill Pipes and Openings of Motor <i>Vehicle</i> Fuel Tanks. |
| 2235 | Requirements. |

| Title 17 CCR | Title |
|---------------------|--|
| Chapter 1 | Air Resources Board |
| Subchapter 10 | Climate Change |
| Article 4 | Regulations to Achieve Greenhouse Gas Emission Reductions |
| Sub-article 12 | Greenhouse Gas Emission Requirements for New 2014 and Subsequent Model Heavy-Duty Vehicles |
| 95660 | Purpose |
| 95661 | Applicability |
| 95662 | Definitions |
| 95663 | Greenhouse Gas Exhaust Emission Standards and Test Procedures for New 2014 and Subsequent Model Heavy-Duty Vehicles. |

Supplemental Information

for

Advanced Clean Cars II, Advanced Clean Trucks, Low NOx Heavy-Duty Omnibus, and Phase 2 Greenhouse Gas emission standards for trucks and trailers

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Background

This document includes technical support and supplemental information for the Agency of Natural Resources proposed rules for Advanced Clean Cars II, Advanced Clean Trucks, the Low NOx Heavy-Duty (HD) Omnibus, and Phase 2 Greenhouse Gas emission standards for trucks and trailers. Supplemental information as referenced and required in the Economic Impact Statement, the Environmental Impact Statement, and Scientific Information Statement in the Standardized Rule Forms required by the Vermont Administrative Procedure Act is included herein.

Economic Impact Statement Supplemental Information

Summary of the rules

Emissions from mobile sources are the greatest contributor to emissions of criteria pollutants¹ and greenhouse gases (GHG) in Vermont, accounting for about 51%² of non-biogenic ozone precursor emissions (including nitrogen oxides (NOx) and volatile organic compounds) and approximately 40% of statewide GHG emissions. In this rulemaking, the Agency of Natural Resources (ANR) proposes to adopt or amend key regulations that reduce greenhouse gas and criteria pollutant emissions from passenger cars, light-duty trucks, and medium- and heavy-duty vehicles that are delivered for sale or placed in service in Vermont. This suite of rules includes the adoption of California's Advanced Clean Trucks Rule, the Low NOx Heavy-Duty Omnibus Rule, and the Phase 2 Greenhouse Gas Rule, and amendments to California's Advanced Clean Cars program which was originally adopted by Vermont in 2012³ and incorporates previously adopted rules to control criteria and GHG emissions. The Advanced Clean Trucks Rule (ACT) requires the sale of at least 30% zero-emission trucks by 2030 (depending on vehicle classification). The Low NOx Heavy-Duty Vehicle Omnibus Rule (HD Omnibus) requires a 90% reduction in NOx emissions for model year (MY) 2027 engines. The Phase 2 Greenhouse Gas Rule (Phase 2 GHG) sets greenhouse gas emission standards for heavy duty trucks and truck trailers. Advanced Clean Cars II (ACCII) requires that all passenger car and light-duty truck vehicles delivered for sale by 2035 meet the definition of zero-emission vehicle and will further reduce smog-forming and GHG emissions from new internal combustion engine vehicles (ICEVs). For a more detailed summary of each rule and adopting authority, see the Regulation Summary Document.

Background and analysis

The proposed regulations will result in reduced NOx, PM2.5 and GHG emissions. Each of these pollutants presents a distinct set of challenges and risks to public health and the environment.

NOx are a group of highly reactive compounds that pose direct human health impacts, such as irritation of the respiratory tract, and the worsening or triggering of asthma.⁴ These gases are also precursor pollutants that undergo complex chemical reactions in the atmosphere to form other air pollutants of concern, such as PM2.5 and ground-level ozone (also known as smog). Breathing air with elevated

¹ Criteria pollutants are those classified as such pursuant to the Clean Air Act: Oxides of nitrogen, Sulphur dioxide, Carbon monoxide, lead, ozone, and particulate matter.

² EPA - 2017 National Emissions Inventory: <https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data#dataq>

³ Prior to 2012, Vermont adopted California vehicle emissions standards that were later combined into California's Advanced Clean Cars program.

⁴ EPA – Basic Information about NO2 webpage: <https://www.epa.gov/no2-pollution/basic-information-about-no2>

concentrations of ozone is especially harmful to children, the elderly, and people of all ages who have asthma and other respiratory impairments. Breathing ozone can trigger a variety of health issues ranging from coughing to chest pain, to reduced lung function or damage.⁵ NOx also contributes to the formation of acid rain⁶ and visibility impairment (haze)⁷ in Vermont.

PM2.5 is emitted directly from vehicle exhaust and formed through secondary reactions with NOx and other pollutants in the atmosphere. PM2.5 can be inhaled deeply into the lungs and transferred into the bloodstream resulting in significant health problems, such as reduced lung function, worsened asthma, non-fatal heart attacks, and premature death in individuals with heart or lung disease.⁸

GHGs contribute to climate change causing increased risks to public health and safety, food and water resources, infrastructure and ecosystems. Additional details on GHG emission impacts can be found in Environmental Impact Supplemental Information, below.

To complete a thorough and sophisticated analysis of the emissions and economic benefits and impacts of the suite of rules proposed, Vermont is collaborating with several other “Section 177 states” and the Northeast States for Coordinated Air Use Management (NESCAUM). This analysis uses models such as the MOtor Vehicle Emission Simulator (MOVES)⁹, the CO-benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA)¹⁰, and other tools to aid in understanding the how implementation of these rules will benefit Vermonters, and what economic impacts may result.

This Technical Support Document (TSD) also relies on the comprehensive analysis of costs and other impacts performed by the California Air Resources Board, and is extrapolated here to apply to Vermont and the expected impacts from the adoption of this suite of rules locally.

Affected parties

Costs and benefits to individuals: ACCII

The proposed regulation will benefit Vermonters mainly from the reductions in NOx resulting in reduced ozone exposure and reduced PM exposure from the secondary formation of NOx and PM2.5, improving Vermont air quality and reducing adverse health impacts. The reduction of GHG emissions, while being a global pollutant, will also benefit Vermont residents monetarily by reducing the future social costs of carbon emissions as discussed below.

The proposed ACCII regulation will reduce NOx, PM2.5, and GHG emissions. Reductions in NOx and PM2.5 emissions result in health benefits for individual Vermonters, including reduced instances of premature deaths, hospitalizations for cardiovascular and respiratory illnesses, and emergency room visits.

⁵ EPA – Health Effects of Ozone Pollution webpage: <https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution>

⁶ EPA – Acid Rain webpage: <https://www.epa.gov/acidrain>

⁷ EPA – Visibility and Regional Haze website: <https://www.epa.gov/visibility>

⁸ EPA – Health and Environmental Effects of Particulate Matter (PM): <https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm>

⁹ <https://www.epa.gov/moves>

¹⁰ <https://www.epa.gov/cobra>

Using U.S. EPA’s COBRA screening model, NESCAUM assisted Vermont in calculating the estimated economic value of the health benefits associated with the adoption of the proposed rules. Utilizing the COBRA model is generally consistent with EPA practice for estimating avoided health impacts and monetized benefits. The COBRA model estimates impacts to PM air pollution concentrations, which are translated into health outcomes. Table 1 shows the estimated total cost savings from avoided premature deaths, avoided hospitalizations for cardiovascular and respiratory illnesses, and avoided emergency room visits due to the proposed ACCII regulation for the year 2040 in Vermont, relative to the baseline.

| Proposed Regulations | Valuation | Year | Total Costs Avoided |
|----------------------|-----------|------|---------------------|
| ACC II | \$2018 | 2040 | \$276,000-621,000 |

Table 1: Annual COBRA-estimated economic values of Vermont adopting ACCII, in US dollars for the year 2040

Notes:

1. COBRA version 4.0.
2. Discount rate of 3%.

The proposed ACCII regulations account for GHG benefits in terms of carbon dioxide (CO₂) emissions avoided. 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 as a result of a single metric ton increase in CO₂ emissions in a given year.¹¹

This analysis utilizes the Vermont Climate Council recommended SC-CO₂ values and discount rates, which is a method of placing a present value on costs or benefits that will occur at a future date, identified in the *Initial Vermont Climate Action Plan*.¹² Because the SC-CO₂ is highly sensitive to the discount rates applied, the range of discount rates from 1% to 3% is used to illustrate the varying magnitude of possible economic outcomes, however, the Council determined it was reasonable to use the SC-CO₂ value developed using the central discount rate of 2% for the Vermont Climate Action Plan. Table 2 shows the estimated avoided social costs based on the GHG emissions reductions benefits from the proposed ACC II regulation from 2026 through 2050.

¹¹ The National Academy of Sciences defines the Social Cost of Carbon as “an estimate, in dollars, of the present discounted value of the future damage caused by a metric ton increase in carbon dioxide (CO₂) emissions into the atmosphere in that year or, equivalently, the benefits of reducing CO₂ emissions by the same amount in that year.”

¹² Vermont Climate Council, *Initial Vermont Climate Action Plan*, December 2021.
<https://climatechange.vermont.gov/sites/climatecouncilsandbox/files/2021-12/Initial%20Climate%20Action%20Plan%20-%20Final%20-%202012-1-21.pdf>

Table 2: 2026-2040 Statewide Estimated Avoided Social Cost of CO2 from ACCII vehicle rules

| Year | 3% Average Discount Rate | | 2% Average Discount Rate | | 1% Average Discount Rate | |
|--------------|--|---------------|--|-----------------|--|-----------------|
| | Value (2020\$/metric ton CO ₂) | Cost Avoided | Value (2020\$/metric ton CO ₂) | Cost Avoided | Value (2020\$/metric ton CO ₂) | Cost Avoided |
| 2026 | 57 | \$1,120,057 | 131 | \$2,574,167 | 421 | \$8,272,704 |
| 2027 | 59 | \$3,143,369 | 132 | \$7,032,622 | 423 | \$22,536,355 |
| 2028 | 60 | \$5,859,615 | 134 | \$13,086,473 | 426 | \$41,603,266 |
| 2029 | 61 | \$9,107,725 | 136 | \$20,305,748 | 428 | \$63,903,383 |
| 2030 | 62 | \$13,103,796 | 137 | \$28,955,161 | 430 | \$90,881,164 |
| 2031 | 63 | \$18,104,944 | 139 | \$39,945,828 | 433 | \$124,435,566 |
| 2032 | 64 | \$23,756,056 | 141 | \$52,337,562 | 435 | \$161,466,946 |
| 2033 | 65 | \$30,003,907 | 142 | \$65,546,997 | 437 | \$201,718,574 |
| 2034 | 66 | \$37,055,282 | 144 | \$80,847,889 | 440 | \$247,035,215 |
| 2035 | 67 | \$44,637,440 | 146 | \$97,269,646 | 442 | \$294,473,859 |
| 2036 | 69 | \$53,215,702 | 147 | \$113,372,583 | 444 | \$342,431,474 |
| 2037 | 70 | \$60,891,694 | 149 | \$129,612,321 | 446 | \$387,967,081 |
| 2038 | 71 | \$68,280,353 | 151 | \$145,215,961 | 449 | \$431,801,103 |
| 2039 | 72 | \$75,327,513 | 152 | \$159,024,749 | 451 | \$471,843,169 |
| 2040 | 73 | \$81,995,546 | 154 | \$172,976,904 | 453 | \$508,821,673 |
| TOTAL | | \$525,602,998 | | \$1,128,104,609 | | \$3,399,191,532 |

The proposed regulation will have an impact on individual vehicle owners in Vermont in the form of operation and ownership costs. These costs include the costs impacts of installing an electrical receptacle for electric vehicles supply equipment (EVSE) for purchasers of ZEVs, fuel costs, difference in maintenance costs, registration costs, and insurance costs over a ten-year period. These costs are combined with the incremental vehicles prices to estimate the total cost of ownership (TCO) during the period of proposed regulation. An analysis¹³ of the TCO for individual vehicle owners conducted by the California Air Resources Board concludes that operational savings will offset and incremental costs of the initial electric vehicle purchase. For example, a passenger car battery electric vehicle (BEV) with a 300-mile range will have initial annual savings occur in the first year for the 2026 model year technology. For the 2035 model year technology, the initial savings are nearly immediate and cumulative savings over ten years exceed \$7,500. Cost trends differ for fuel-cell EVs (FCEVs) and plug-in hybrid EVs (PHEVs). Neither the FCEV nor PHEV technologies will have a payback within a ten-year period. As of the date of writing, the average price of a gallon of gasoline or diesel have reached record high levels in Vermont¹⁴. The TCO analysis conducted in California uses lower fuel prices that pre-date this price increase, therefore an updated analysis using today's average prices would show that the difference in TCO

¹³ California Air Resources Board – Advanced Clean Cars II Initial Statement of Reasons, at Pg 144.

¹⁴ See <https://gasprices.aaa.com/?state=VT>. As of June 15, 2022, the average price of a gallon of gasoline in Vermont was \$5.05. The average price of a gallon of diesel was \$6.14.

between a BEV and an ICEV is more beneficial for the BEV owner, with a likely sooner date for initial savings to occur.

| | BEV (300-mile range) | | FCEV | PHEV |
|--|----------------------|-------------------|---------------------|---------------------|
| | With home charger | No home charger | | With home charger |
| Incremental vehicle price | \$ 3,102 | \$ 3,102 | \$ 10,448 | \$ 4,681 |
| Home Level 2 circuit (not including the charger) | \$ 680 | | | \$ 680 |
| Finance costs & sales tax (for incr veh price and Level 2 circuit) | \$ 798 | \$ 655 | \$ 2,205 | \$ 1,131 |
| Incremental Fuel costs | \$ (5,068) | \$ (3,306) | \$ 8,670 | \$ (649) |
| Incremental Maintenance costs | \$ (4,540) | \$ (4,540) | \$ (1,249) | \$ (1,249) |
| Incremental Insurance | \$ 631 | \$ 631 | \$ 2,124 | \$ 952 |
| Incremental Registration | \$ 758 | \$ 758 | \$ 952 | \$ 800 |
| Total (10 years) | \$ (4,267) | \$ (3,216) | \$ 21,416 | \$ 5,456 |
| Initial annual savings | 1 year | 1 year | >10 years | >10 years |

*Finance costs include a 5-year loan at 5-percent interest; operation and ownership costs over 10 years (~150,000 miles) shown as net present value for 2026 at a discount rate of 10-percent.

Figure 1: Total cost of ownership over 10 years for individual ZEV and PHEV buyer compared to baseline ICEV, 2026 MY passenger car in a single-family home.

Increasing access to ZEVs and clean mobility in low-income and frontline communities is of utmost importance. The proposed ACC II regulations will reduce exposure to vehicle pollution in communities that are often disproportionately impacted by motor vehicle pollution, such as near-roadway communities, by reducing emissions from ICEVs and accelerating the transition to ZEVs. Further, the proposed ZEV assurance measures will ensure these emissions benefits are long lasting and support the development of a robust used ZEV market. In addition, the ZEV regulation incentivizes automakers to invest in community carshare programs, produce more affordable ZEVs, and ensure that more used ZEVs are available. While the proposed ACC II regulations will advance equity, a whole-of-government approach is needed to maximize access, ensure affordability, and direct benefits to low-income and frontline communities. Thus, other policies and programs beyond ACC II will be needed in California and the Section 177 states to ensure these communities benefit from and have direct access to ZEVs.

Costs and Benefits to Individuals: ACT/Low NOx HD Omnibus/Phase 2

The proposed ACT regulation will reduce NOx, PM2.5, and GHG emissions, while the proposed HD Omnibus regulation will reduce NOx and secondary PM2.5 formation since NOx is a precursor to secondary PM2.5 formation. The proposed Phase 2 GHG regulations will require heavy duty trucks and trailers to reduce greenhouse gas emissions. Reductions in NOx and PM2.5 emissions result in health

benefits for Vermonters, including reduced instances of premature deaths, hospitalizations for cardiovascular and respiratory illnesses, and emergency room visits.

Using U.S. EPA's COBRA screening model, NESCAUM assisted Vermont in calculating the estimated economic value of the health benefits associated with the adoption of the proposed rules. Utilizing the COBRA model is generally consistent with EPA practice for estimating avoided health impacts and monetized benefits. The COBRA model estimates impacts to PM air pollution concentrations, which are translated into health outcomes. Table 3 shows the estimated total cost savings from avoided premature deaths, avoided hospitalizations for cardiovascular and respiratory illnesses, and avoided emergency room visits due to the proposed ACT, HD Omnibus, and Phase 2 GHG regulations for the year 2040 in Vermont, relative to the baseline.

Table 3: Annual COBRA-estimated economic values of Vermont adopting ACT/Omnibus/Phase 2 Rules, in US dollars for the year 2040

| Proposed Regulations | Valuation | Year | Total Costs Avoided |
|---------------------------|-----------|------|---------------------|
| ACT/Omnibus/Phase 2 Rules | \$2018 | 2040 | \$304,000-685,000 |

Notes:

1. COBRA version 4.0.
2. Discount rate of 3%.

The proposed ACT and Phase 2 GHG regulations account for GHG benefits in terms of carbon dioxide (CO₂) emissions avoided. 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 as a result of a single metric ton increase in CO₂ emissions in a given year.¹⁵

This analysis utilizes the Vermont Climate Council recommended SC-CO₂ values and discount rates, which is a method of placing a present value on costs or benefits that will occur at a future date, identified in the *Initial Vermont Climate Action Plan*.¹⁶ Because the SC-CO₂ is highly sensitive to the discount rates applied, the range of discount rates from 1% to 3% is used to illustrate the varying magnitude of possible economic outcomes, however, the Council determined it was reasonable to use the SC-CO₂ value developed using the central discount rate of 2% for the Vermont Climate Action Plan. Table 4 shows the estimated avoided social costs based on the GHG emissions reductions benefits from the proposed ACT and Phase 2 GHG standard regulations from 2025 through 2050.

¹⁵ The National Academy of Sciences defines the Social Cost of Carbon as "an estimate, in dollars, of the present discounted value of the future damage caused by a metric ton increase in carbon dioxide (CO₂) emissions into the atmosphere in that year or, equivalently, the benefits of reducing CO₂ emissions by the same amount in that year."

¹⁶ Vermont Climate Council, *Initial Vermont Climate Action Plan*, December 2021.
<https://climatechange.vermont.gov/sites/climatecouncilsandbox/files/2021-12/Initial%20Climate%20Action%20Plan%20-%20Final%20-%202012-1-21.pdf>

Table 4: 2025-2050 Statewide Estimated Avoided Social Cost of CO₂ from Medium- and Heavy-duty vehicle rules

| Year | 3% Average Discount Rate | | 2% Average Discount Rate | | 1% Average Discount Rate | |
|--------------|--|----------------------|--|----------------------|--|------------------------|
| | Value (2020\$/metric ton CO ₂) | Cost Avoided | Value (2020\$/metric ton CO ₂) | Cost Avoided | Value (2020\$/metric ton CO ₂) | Cost Avoided |
| 2025 | 56 | \$491,268 | 129 | \$1,131,670 | 418 | \$3,666,962 |
| 2026 | 57 | \$903,723 | 131 | \$2,076,977 | 421 | \$6,674,865 |
| 2027 | 59 | \$1,353,279 | 132 | \$3,027,676 | 423 | \$9,702,324 |
| 2028 | 60 | \$1,801,145 | 134 | \$4,022,558 | 426 | \$12,788,131 |
| 2029 | 61 | \$2,263,175 | 136 | \$5,045,768 | 428 | \$15,879,329 |
| 2030 | 62 | \$2,739,370 | 137 | \$6,053,124 | 430 | \$18,998,856 |
| 2031 | 63 | \$3,629,188 | 139 | \$8,007,256 | 433 | \$24,943,465 |
| 2032 | 64 | \$4,545,851 | 141 | \$10,015,078 | 435 | \$30,897,582 |
| 2033 | 65 | \$5,489,360 | 142 | \$11,992,141 | 437 | \$36,905,390 |
| 2034 | 66 | \$6,459,715 | 144 | \$14,093,923 | 440 | \$43,064,764 |
| 2035 | 67 | \$7,456,915 | 146 | \$16,249,396 | 442 | \$49,193,377 |
| 2036 | 69 | \$8,800,151 | 147 | \$18,748,147 | 444 | \$56,627,056 |
| 2037 | 70 | \$10,064,572 | 149 | \$21,423,160 | 446 | \$64,125,699 |
| 2038 | 71 | \$11,361,475 | 151 | \$24,163,137 | 449 | \$71,849,329 |
| 2039 | 72 | \$12,690,861 | 152 | \$26,791,818 | 451 | \$79,494,143 |
| 2040 | 73 | \$14,052,729 | 154 | \$29,645,483 | 453 | \$87,203,922 |
| 2041 | 74 | \$15,262,572 | 156 | \$32,175,151 | 456 | \$94,050,443 |
| 2042 | 75 | \$16,499,910 | 158 | \$34,759,811 | 459 | \$100,979,450 |
| 2043 | 77 | \$17,998,491 | 160 | \$37,399,461 | 461 | \$107,757,198 |
| 2044 | 78 | \$19,304,568 | 162 | \$40,094,103 | 464 | \$114,837,432 |
| 2045 | 79 | \$20,638,141 | 164 | \$42,843,737 | 467 | \$122,000,152 |
| 2046 | 80 | \$21,761,337 | 166 | \$45,154,773 | 469 | \$127,575,836 |
| 2047 | 81 | \$22,906,081 | 167 | \$47,226,117 | 471 | \$133,194,617 |
| 2048 | 82 | \$24,072,374 | 169 | \$49,612,575 | 472 | \$138,562,931 |
| 2049 | 84 | \$25,564,555 | 170 | \$51,737,790 | 474 | \$144,257,133 |
| 2050 | 85 | \$26,784,720 | 172 | \$54,199,669 | 476 | \$149,994,433 |
| TOTAL | | \$304,895,525 | | \$637,690,498 | | \$1,845,224,820 |

The ACT and HD Omnibus regulations impose requirements on vehicle manufacturers to produce and sell vehicles with higher upfront costs and these costs are expected to be passed on to Vermont vehicle fleets and individuals who purchase these vehicles. The Phase 2 GHG regulation imposes requirements on medium- and heavy-duty engines, vehicles, and trailer manufacturers, which results in increased compliance costs that are also expected to be passed on to Vermont vehicle fleets and individuals who purchase these vehicles and trailers. There are no direct costs onto individuals as a result of these regulations.

For the ACT rule, individuals may see health benefits due to ZEVs displacing ICE vehicles and providing statewide, regional, and local emission benefits. Individuals are also likely to benefit from cost savings as a result of reduced fuel consumption and fuel costs. Cost savings are also likely due to the enhanced warranty requirements of ACT and the HD Omnibus Rules. These warranty provisions should result in longer useful life of the subject vehicles, and broader coverage of warranty-repairs within the subject vehicle's warranty period.

Costs and benefits to businesses, including small businesses: ACCII

Businesses that will be directly affected by the proposed regulation include light- and medium-duty vehicle manufacturers because they are entities directly regulated and required to comply. ZEV-only manufacturers are likely to directly benefit from the regulation because they do not manufacture ICEV and will be able to over comply and sell surplus credits to other manufacturers. Auto manufacturing is currently not occurring in Vermont. Businesses that may be indirectly affected, and likely exist in Vermont, are suppliers of Tier 1 components supplied directly to auto manufacturers, electric vehicle service providers, electric utilities, electric charging and hydrogen infrastructure providers.

Suppliers of Tier 1 components would benefit from increased opportunities created by the need to develop, sell, and support technology to decrease emissions from ICEVs. Many of these companies are also changing their business models to include components for vehicle electrification, as demand for conventional vehicle components declines.

The proposed regulation will increase the total amount of electric vehicle miles traveled in the state, and the charging of those electric vehicles will increase Vermont's overall electric load. Electric infrastructure needed to charge BEVs and PHEVs represents a significant area of expected increased load for electric utility companies, as traditional areas of growth have slowed due to energy conservation and energy efficiency efforts. Understanding the grid impacts of the additional load expected from electrification of the transportation system is an important consideration. The Vermont-wide transmission operator (VELCO) releases a Long-Range Transmission Plan every three years that incorporates various scenarios of building and transportation electrification with a requirement of the plan to meet mandatory reliability standards. This plan will help to better understand and implement any necessary grid modifications related to this increase in number of electric vehicles¹⁷.

In addition to the electric utilities that will supply additional electricity to power BEVs and PHEVs under the proposed regulation, ZEV infrastructure businesses will benefit as well. This includes companies that manufacturer, install, operate, and maintain EV charging stations and hydrogen dispensing equipment. Electric Vehicle Supply Equipment (EVSE) providers, and hydrogen station operators will all benefit from increased demand for their equipment with home and public fueling stations. The Proposed Regulation will increase the total amount of electric vehicle miles travelled in the state, which in turn will likely increase utilization of charging and hydrogen stations across the state and lead to increased revenue for these businesses, making the business model for their investment more stable and predictable. This allows investor capital and venture capital funds to be accessed for increased deployment rates of ZEV infrastructure. Increased use of public charging stations may also have benefits to retail businesses operating or close to charging stations. Many charging stations are located in areas with available

¹⁷ Vermont Comprehensive Energy Plan, Pg. 65, available at https://publicservice.vermont.gov/sites/dps/files/documents/2022VermontComprehensiveEnergyPlan_0.pdf

shopping, food, or other services such as dry cleaning. Additionally, Vermont businesses that are contracted to install stations will benefit from the rapidly growing network.

Typical passenger car rental businesses could see increasing incremental purchase costs for vehicles over the course of the regulation as stringency increases. At the same time, rental firms would benefit from operational savings due to the reduction in repair and maintenance costs. There may also be an increased cost for electricity depending on whether the rental business or the driver ends up bearing the costs of vehicle charging, though reduced gasoline usage leads to net fuel savings in nearly all cases.

ZEVs inherently have far fewer propulsion-related parts especially mechanical moving parts as electric motors and power electronics dominate the electric drive propulsion system instead of mechanical internal combustion engines and automatic transmissions comprised of mechanical components like valves, springs, and gears. As a result, it is expected that individual ZEVs will likely need fewer propulsion-related repairs than gasoline vehicles. While this will be a benefit to individual vehicle owners, the vehicle repair and maintenance service industry is estimated to see negative impacts, including dealerships that have service departments, as ZEVs become a greater portion of the fleet. This trend would suggest that the number of businesses providing the services may decrease along with the reduced demand.

The Proposed Regulation would provide operational savings to small businesses and small fleet owners, although the Proposed Regulation could increase initial vehicle prices and incremental costs on small fleet owners in the early years of the regulation. The proposed ZEV assurance measures would help owners of small fleets by eliminating or greatly limiting subsequent out-of-pocket costs for vehicle repairs during the time the vehicle is under warranty. In addition, the enhanced useful life and warranty reporting and battery warranty provisions would encourage manufacturers to produce more durable components, resulting in fewer failures and less downtime for the small fleet owner. Small businesses would also benefit from the operational and fuel savings discussed above in (3)(a)(i). In an example analysis conducted by CARB¹⁸, a cost example for a small business that purchases a typical full-size light truck for business use is considered and the total cost of ownership analyzed over time. This result shows that the business owner breaks even at year six as annual savings accumulate sufficient to compensate for expenses. By the tenth year, the owner has saved nearly \$5,500 in total ownership costs.

¹⁸ Standardized Regulatory Impact Assessment for Advanced Clean Cars II, CARB, at page 102. Available at: <https://dof.ca.gov/wp-content/uploads/Forecasting/Economics/Documents/ACCII-SRIA.pdf>.

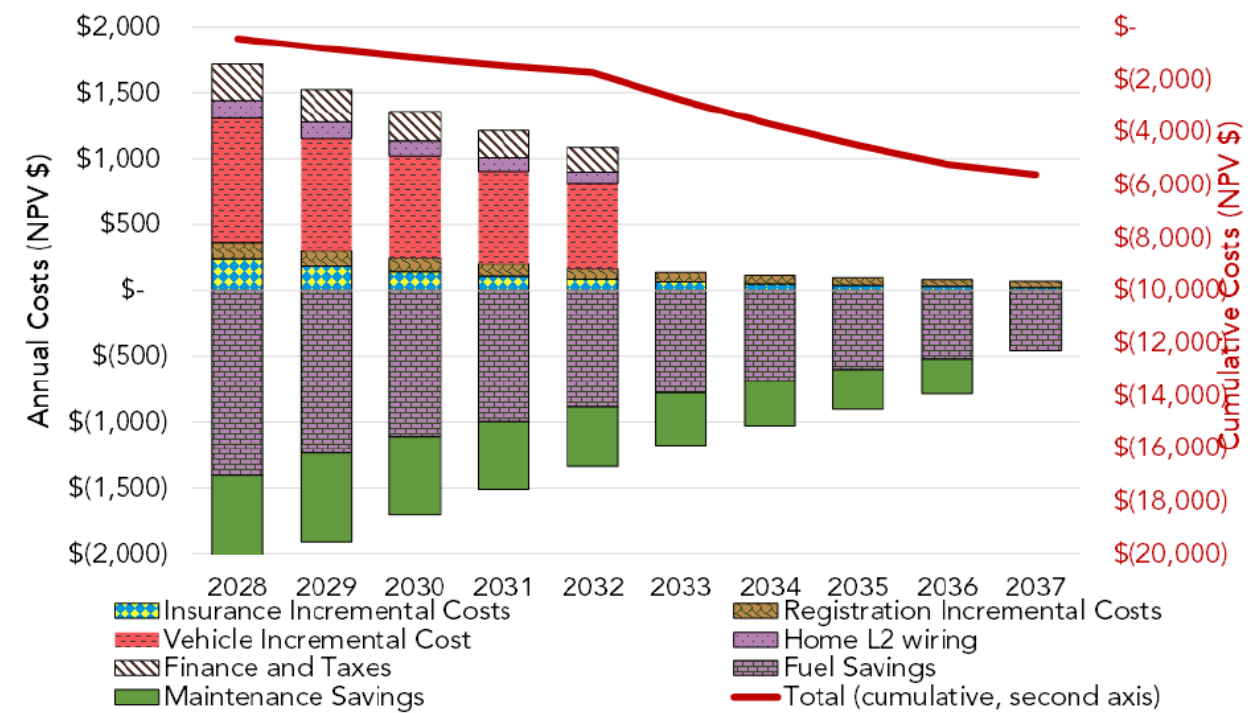


Figure 2: Small business light-duty fleet purchase cost example.

Costs and benefits to businesses, including small businesses: ACT/Low NOx HD Omnibus/Phase 2 Advanced Clean Trucks

Manufacturers sell trucks to trucking fleets who operate the vehicles and incur costs following the point of sale including taxes, fueling, maintenance, midlife costs, and registration fees. Adding electric trucks to their fleet will also cause fleets to incur costs relating to EVSE, infrastructure, maintenance bay upgrades, workforce training, and other transitional costs.

The proposed ACT Regulation is likely to increase the supply of ZEVs and will provide another vehicle option for fleets to consider in meeting their needs. Individual businesses that have operations that are well suited for using ZEVs will likely be able to lower their total cost of ownership by taking advantage of the operational cost savings of battery-electric vehicles. Reduced costs to the overall state's trucking fleet are forecast as the operational cost savings of the ZEVs likely outweigh the potential infrastructure and vehicle prices. Amortizing the vehicle and infrastructure investments will help with these companies' cash-flow to realize positive cash-flow shortly after purchase.

Figure 3 illustrates an example where a reference fleet purchases 20 Class 4-5 trucks in 2024 for usage in last mile delivery applications over twelve years.¹⁹ The costs for 20 diesel vehicles, 20 battery-electric vehicles and the difference between them is shown. The costs over the twelve-year period are lower for the battery-electric fleet as compared to the diesel fleet; however, the upfront capital expenses are significantly higher for the BEV fleet. Access to capital or financing will be critical for fleets to take advantage of the overall savings of BEVs.

¹⁹ California Air Resources Board – Advanced Clean Trucks Initial Statement of Reasons, at Pg IX-33.

| Cost line items | Diesel | Battery-Electric | Difference |
|--|------------------------|------------------------|------------------------|
| Amortized Vehicle Price | \$ 1,270,361.00 | \$ 1,747,840.00 | \$ 477,479.00 |
| Sales Tax | \$ 93,280.00 | \$ 135,896.00 | \$ 42,616.00 |
| Amortized EVSE Cost | \$ - | \$ 104,315.00 | \$ 104,315.00 |
| Amortized Infrastructure Upgrades | \$ - | \$ 417,261.00 | \$ 417,261.00 |
| Charger Maintenance | \$ - | \$ 120,000.00 | \$ 120,000.00 |
| Fuel Costs | \$ 2,220,329.00 | \$ 947,961.00 | \$ (1,272,368.00) |
| Maintenance costs | \$ 1,914,913.00 | \$ 1,436,185.00 | \$ (478,728.00) |
| Midlife Costs | \$ - | \$ 259,200.00 | \$ 259,200.00 |
| Maintenance Bay Upgrades | \$ - | \$ 20,000.00 | \$ 20,000.00 |
| Transitional Costs and Workforce development | \$ - | \$ 12,564.00 | \$ 12,564.00 |
| Registration Fees | \$ 245,823.00 | \$ 232,840.00 | \$ (12,983.00) |
| Total | \$ 5,744,706.00 | \$ 5,434,062.00 | \$ (310,644.00) |

Figure 3: Advanced Clean Trucks Fleet Cost Example.

The proposed ACT Regulation will increase the number of ZEVs deployed, which will in turn increase the amount of electricity supplied by utility providers. Increased electricity usage from ZEVs provides an opportunity for a number of benefits to the utilities, their customers, and the overall grid itself. Electric vehicles are capable of shifting load to off-peak periods, stabilizing voltage frequency, and potentially reducing the use of temporary frequency regulation through emergency generators, while also increasing overall demand, creating a more efficient, highly utilized grid with storage potential. Studies have found that light-duty ZEVs provide a benefit to all utility customers as their electricity utilization drives down rates for all other ratepayers²⁰.

There is no expected direct cost on small businesses, defined as businesses having 3 or fewer medium- and heavy-duty vehicles, under the ACT Regulation. No manufacturers or fleets who are regulated under this rule are considered to be small businesses. Small businesses who operate trucks will not be required to purchase zero-emission trucks but may independently decide to do so. This may enable cost savings for small businesses due to electric trucks' lower cost of operation.

HD Omnibus/Phase 2

Medium- and heavy-duty engine/vehicle manufacturers are the regulated entities under the HD Omnibus Rule. Because these manufacturers are located outside of Vermont, ANR assumes those manufacturers would pass the direct compliance costs onto the Vermont vehicle fleets that purchase the California-certified vehicles and engines that are subject to the HD Omnibus Rule. Typical businesses are defined here to be Vermont fleets with four or more medium- and heavy-duty vehicles (GVWR >10,000 pounds). The actual cost impact on fleets would depend on the number of new California-certified heavy-duty vehicles that fleets would purchase during the lifetime of this cost analysis. A lifetime analysis including initial purchase price increase, lifetime Diesel Exhaust Fluid (DEF)

²⁰ M.J. Bradley and Associates, MJB&A Analyzes State-Wide Costs and Benefits of Plug-in Vehicles in Five Northeast and Mid-Atlantic States, 2017. (<https://www.mjbradley.com/reports/mjba-analyzes-state-wide-costs-and-benefits-plug-vehicles-five-northeast-and-mid-atlantic>).

consumption for NOx control, lifetime savings from warranty, net lifetime cost impact, and percent increase in lifetime cost from the assumed purchase price is presented in Figure 4²¹.

| Engine MY | Lifetime Net Cost Per Vehicle | Lifetime Net Cost of 20 Vehicles |
|-----------|-------------------------------|----------------------------------|
| 2024 | \$2,839 | \$56,780 |
| 2027 | \$5,317 | \$106,340 |
| 2031 | \$5,814 | \$116,280 |

Figure 4: Lifetime Cost Analysis of 20 Medium Heavy-Duty Diesel Trucks

Similar to typical fleets, the actual cost impact on smaller businesses and their fleets would depend on the number of new California-certified heavy-duty vehicles that fleets would purchase during the lifetime of this cost analysis. As shown in Figure 4 above, for a small fleet that would buy one new medium heavy-duty diesel (MHDD) vehicle with a 2024, 2027, or 2031 MY engine, the net lifetime vehicle cost due to the HD Omnibus is estimated to be \$2,839, \$5,317, or \$5,814, respectively.

Costs and benefits to schools and school districts: ACCII

ACCII does not provide for the direct regulation of schools or school districts. To the extent schools or school districts have passenger cars and light duty trucks as part of their school transportation fleet, these entities should experience the same net benefit as described above when considering the total cost of ownership of a BEV when replacing an ICEV.

Costs and benefits to schools and school districts: ACT/Low NOx HD Omnibus/Phase 2

ACT, the HD Omnibus, and the Phase 2 rules do not provide for the direct regulation of schools and school districts. As most school districts have heavy-duty buses in their fleet, these entities are likely to experience the same cost savings and net lifetime vehicle cost as explained above in the discussion on the impact of these rules on medium- and heavy-duty fleets. Early adoption of school bus electrification has been identified as critical in reduction of children's exposure to criteria pollutants emitted by traditional fossil-fueled school buses. Several state and federal incentive programs for school bus replacement are currently available and are likely to be expanded in the future. Vermont has been a leader in investigating the feasibility of electric school buses in operation in a cold climate and rural setting via our on-going Electric School and Transit Bus Pilot project.

Alternatives to rule as proposed

As discussed above, the only alternative that ANR considered is to not amend Advanced Clean Cars or adopt Advanced Clean Trucks, the Low NOx HD Omnibus, or the Phase 2 Greenhouse Gas rules. Pursuant to Section 177 of the Clean Air Act, Vermont's adoption of California's motor vehicle emission standards must be identical to California's rules. If Vermont does not adopt or amend these rules, this will result in a reversion to the federal motor vehicle emission standards, which are less stringent and

²¹ California Air Resources Board – HD Omnibus Initial Statement of Reasons, at Pg. IX-52.

would represent significant backsliding in the progress Vermont has so far made in reducing criteria pollutant emissions and greenhouse gas emissions as a result of implementation of these rules.

Environmental Impact Statement Supplemental Information

Impact on Climate change and Air Quality

The *Initial Vermont Climate Action Plan* released in December 2021 includes a section devoted to understanding climate and climate change in Vermont. The key messages from the Climate Action Plan include the following:

- Across Vermont, the 11-year period of 2010-2020 was the warmest since records began in 1895, with the warmest winter and summer seasons occurring in the 2000-2020 period.
- Vermont's average annual temperature has increased over 2.5°F from the 1970s [1960s] to 2010s and over 3°F from the end of the last century.
- The rate of warming has increased through the last 120 years and is currently around +0.5°F a decade.
- Warming is having a number of notable effects, such as the lengthening of the growing season, less reliable winter snow cover, and shifting peak energy usage to the summertime.
- Seasonal temperature trends show the winter season warming nearly twice as fast [over 1.5 times faster] as the annual average, increasing over 4°F from the 1960s to the 2010s.
- Other observed seasonal shifts include an expanding warm season causing longer falls and winter to have more false starts, and more temperature fluctuation within seasons.
- Backward or false springs (during which snow and freezing rain can occur in April-June after the normal progression of warming temperatures) continue to be observed, even with the observation that freeze-free seasons are longer.
- As Vermont's climate warms there has been an observable shift in temperature extremes. Heat waves are becoming more likely while cold waves are decreasing. Evidence for this from Burlington shows a steady decline in cold waves peaking around nearly 6 per year in the 1970s to less than 2 per year in the 2010s. Heat waves have generally increased from around 3 to 4 per year in the 1960s/1970s to over 7 per year in the 2010s.
- Since the mid-2000s, a below average number of very cold nights (defined as nighttime temperatures of 0°F or less) have also been observed in winter, with a near to above average annual number of warm nights in the 2000-2020 period.
- As Vermont's climate warms, the overall amount of precipitation is also increasing. Warmer temperatures produce increased evaporation of water vapor from nearby bodies of water, resulting in a greater potential for weather systems to produce higher amounts of precipitation. In general, increases in annual precipitation changes are relatively small, on the order of +0.5" to +1.0" a decade, with the greatest increases in precipitation occurring during the winter season.
- Extreme precipitation (defined as greater than 2" over 24 hours) has also trended above the long-term average since 1995. These trends are reflected in the increases in stormflow between 1950-2006 as well as the increasing magnitudes of the 1% (100-year return interval) storms across timescales from 1 hour to 1 day.
- The Vermont Department of Health has documented the combined influence of warmer winters and longer warm seasons as contributing to both a more hospitable environment for blacklegged ticks, as well as their hosts, white-footed mice. There has been an exponential increase in probable Lyme disease cases between 1990 and 2016, with Vermont

and Maine being the states with the highest increases in actual reported case rates since 1991

Cause

The Intergovernmental Panel on Climate Change (IPCC) released “AR6 Climate Change 2021: The Physical Basis”²² as part of the Sixth Assessment Report (AR6) process. This report states that human influence on the climate system is now an established fact. “It is unequivocal that the increase of CO₂, methane (CH₄) and nitrous oxide (N₂O) in the atmosphere over the industrial era is the result of human activities and that human influence is the principal driver of many changes observed across the atmosphere, ocean, cryosphere and biosphere.”

Greenhouse gas emissions from motor vehicles in Vermont

Motor vehicles and other mobile sources in Vermont are the largest source of a number of air pollutants in the state. These pollutants include, but are not limited to, nitrogen oxides (NO_x) and volatile organic compounds (VOCs), which are precursors to ground level ozone formation (smog), carbon monoxide (CO), particulate matter (specifically PM_{2.5}), and greenhouse gases (GHGs). For information on the impacts of criteria pollutant emissions in Vermont, please refer to the discussion above in the Economic Impact Statement Supplemental Information. Impacts of greenhouse gas emissions are also explained above. Greenhouse gas emissions from mobile sources make up approximately 40% of Vermont’s total GHG emissions profile, or 3.43 million metric tons of CO₂ equivalent (CO₂e) in 2018, with light-duty vehicles accounting for over 70% of that total and the heavy-duty fleet contributing approximately 12%²³.

Although Vermont is a relatively small state it has one of the highest rates of GHG emissions per capita in the Northeast driven by high per capita vehicle miles traveled²⁴. In order to meet the mandatory GHG reductions set forth in the Vermont Global Warming Solutions Act of 2020 dramatic emissions reductions from the transportation sector, and especially from light and medium duty on-road vehicles, will be required. Reductions from the sector can be achieved through multiple strategies, but reducing criteria pollutant and greenhouse gas emissions via electrification of the vehicle fleet plays a critical role due to the general rural nature and non-centralized development patterns in the state.

GHG and Criteria pollutant emission reductions

ACCII

To understand the impact these regulations could have on passenger car and light-duty truck emissions in Vermont, Vermont partnered with NESCAUM and the International Council on Clean Transportation (ICCT) who commissioned Sonoma Technology, Inc. (STI) to estimate the cumulative avoided nitrogen

²² IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.

²³ Vermont DEC, 2021: Vermont Greenhouse Gas Emissions Inventory and Forecast 1990 – 2017:

https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/Vermont_Greenhouse_Gas_Emissions_Inventory_Update_1990-2017_Final.pdf

²⁴ Energy Action Network (EAN), 2020: 2019 Annual Progress Report for Vermont: <https://www.eanvt.org/wp-content/uploads/2020/03/EAN-report-2020-final.pdf>

oxides (NOx), fine particulate matter (PM2.5) and carbon dioxide equivalent (CO2e) emission reductions beginning in 2025 from the Advanced Clean Cars II Rule.

Table 5, below, estimates the cumulative emission reduction benefits of the zero-emission vehicles first sold in Vermont over various time periods. Since the current ACCII proposal requires 100% ZEV sales by 2035, emissions benefits are only modeled until 2040. Additional modeling to project emissions benefits further to 2050 could be conducted in the future.

Table 5: Cumulative Avoided Emissions of GHG, NOx and PM from ACCII Rule

| Avoided Passenger car and light-duty truck emissions, 2025-2030 | | | |
|--|------------------|--------------------|------------------------------|
| | NOx (short tons) | PM2.5 (short tons) | CO2e (million metric tonnes) |
| ACCII | (51) | (5) | (0.53) |
| Avoided Passenger car and light-duty truck emissions, 2025-2035 | | | |
| | NOx (short tons) | PM2.5 (short tons) | CO2e (million metric tonnes) |
| ACCII | (236) | (25) | (2.89) |
| Avoided Passenger car and light-duty truck emissions, 2025-2040 | | | |
| | NOx (short tons) | PM2.5 (short tons) | CO2e (million metric tonnes) |
| ACCII | (655) | (64) | (7.69) |

ACT/ Low NOx HD Omnibus / Phase 2

To understand the impact these regulations could have on medium- and heavy-duty vehicle emissions in Vermont, Vermont partnered with NESCAUM and the International Council on Clean Transportation (ICCT) who commissioned Sonoma Technology, Inc. (STI) to estimate the cumulative avoided nitrogen oxides (NOx), fine particulate matter (PM2.5) and carbon dioxide equivalent (CO2e) emission reductions beginning in 2025 from Advanced Clean Trucks, the HD Omnibus Rule, and the Phase 2 GHG Rule.

Table 6²⁵, below, estimates the emission reduction benefits of the zero-emission vehicles first sold in Vermont, whether or not the vehicle remains registered in Vermont through the end of its life. All sales that comply with ACT requirements are credited to the ACT, regardless of whether those zero-emission vehicles would have been sold without such regulation.

Table 6: Avoided Emissions of GHG, NOx and PM from ACT, HD Omnibus, and Phase 2 GHG Rules

| Avoided Medium- and Heavy-Duty Emissions, 2020-2040 | | | |
|--|------------------|--------------------|------------------------------|
| | NOx (short tons) | PM2.5 (short tons) | CO2e (million metric tonnes) |
| ACT | (1,820) | (16) | (1.22) |
| HD Omnibus ²⁶ | (1,710) | - | - |
| Phase 2 GHG Stds | - | - | (0.22) |
| Full Harmonization | (3,010) | (16) | (1.41) |
| Avoided Medium- and Heavy-Duty Emissions, 2020-2050 | | | |

²⁵ The ICCT and STI - Benefits of adopting California medium- and heavy-duty vehicle regulations under Clean Air Act Section 177 (<https://theicct.org/publication/state-level-hdv-emissions-reg-fs-dec21/>)

²⁶ Only NOx emissions benefits were quantified for this program. This is because technologies that reduce NOx (e.g., an improved selective catalytic reduction [SCR] catalyst) are expected to have minimal impact on particulate matter (PM) and greenhouse gas (GHG) emissions.

| | NOx (short tons) | PM2.5 (short tons) | CO2e (million metric tonnes) |
|---------------------------|------------------|--------------------|------------------------------|
| ACT | (5,590) | (44) | (3.77) |
| HD Omnibus | (4,330) | - | - |
| Phase 2 GHG Stds | - | - | (0.41) |
| Full Harmonization | (8,190) | (44) | (4.07) |

Emissions reductions in the context of the requirements of 10 V.S.A. §578

The GWSA requires that Vermont reduce greenhouse gas emissions by 26% by 2025, compared to the 2005 baseline emissions, 40% by 2030, compared to the 1990 baseline, and 80% by 2050, compared to the 1990 baseline. The suite of proposed rules does not take effect until 2026, so emissions reductions from these rules have been evaluated in the context of the 2030 emissions reduction requirement. While the GWSA does not mandate a specific level of emission reductions for the transportation sector alone, it does require that the Climate Council consider each sector's proportional contributions to GHG emissions in Vermont when making decisions about actions and strategies to adopt in the Climate Action Plan and its amendments. Based on the sector proportionality analysis conducted by the Vermont Climate Council in the *Initial Climate Action Plan*, Vermont would need to reduce its transportation GHG emissions to 2.06 MMTCO₂e by 2030. Assuming that transportation emissions from 2021, preliminarily estimated to be 2.93 MMTCO₂e, will represent Vermont's baseline transportation emissions in 2030, Vermont would need to reduce transportation GHG emissions by 0.87 MMTCO₂e by 2030 to meet the sector's proportional reduction target. ANR maintains 2021 emissions data as the 2030 baseline emissions due to a high level of uncertainty in emissions trends following the COVID-19 pandemic and a variety of factors including but not limited to increased auto-manufacturer EV commitments, record fuel prices, manufacturer supply chain issues, and expected increases in VMT. As depicted in Figure 5 below, emissions reductions from the proposed suite of rules are estimated to be 0.23 MMTCO₂e in 2030, leaving a "gap" of 0.64 MMTCO₂e in the transportation sector for 2030 emissions reductions. It is important to note that the anticipated reductions shown here assume that the vehicles that manufacturers are required to deliver to Vermont are all registered and operated (placed in service) in Vermont. Complimentary policies, such as vehicle purchase incentives and EV charging infrastructure deployment, will be necessary to ensure that vehicles required to be delivered in Vermont are placed in service in Vermont. Otherwise, the emissions reductions discussed here will not be realized via the regulatory requirements of this suite of rules.

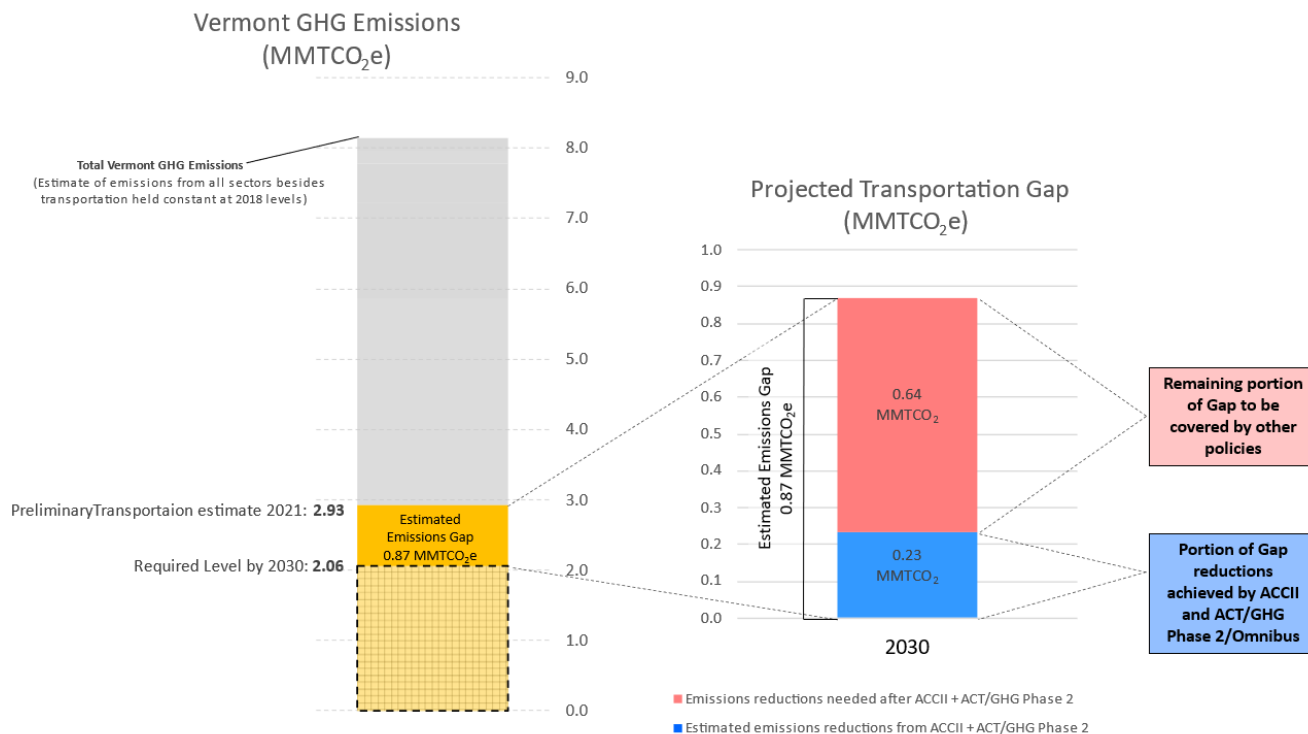


Figure 5: Estimation of ACCII, ACT, and Phase 2 Rules' Impact on Emissions in the Transportation Sector in 2030

Impacts on water quality

Increasing temperatures pose economic effects due to water contamination impacts and those related to heat waves. In terms of the former, beach closures in Vermont are the result of a combination of increased water temperatures and increased nutrient loads. There is no dollar estimate that specifically informs the climate change component, but Vermont spends tens of millions of dollars each year to address water quality contaminants in our large lakes.²⁷ Reductions of emissions from motor vehicles will help to mitigate the impacts of climate change, and therefore will have positive impacts to water quality in Vermont.

Impacts on forest and agricultural land use and recreation

Climate change has impacted the duration and frequency of several natural hazards that impact land use and recreation in Vermont. These include severe storms, winter storms, drought, flooding, wildfires, air pollution, ground-level ozone, temperature extremes, localized winds, and biotic elements (insects and disease)²⁸. While mitigation of air contaminants from motor vehicles, including greenhouse gases will help to mitigate the impacts of climate change, implementation of adaptation and resilience strategies will also be a critical component of addressing climate change in Vermont.

²⁷ Initial Vermont Climate Action Plan, 2021, Page 29.

²⁸ Initial Vermont Climate Action Plan, 2021, Page 18.

Scientific Information Statement Supplemental Information

List of material incorporated by reference (IBR)

Proposed Rule Record, available at: <https://ww2.arb.ca.gov/rulemaking/2022/advanced-clean-cars-ii>

Title 13 California Code of Regulations available at:

<https://govt.westlaw.com/calregs/Index?transitionType=Default&contextData=%28sc.Default%29>

Title 17 California Code of Regulations available at:

<https://govt.westlaw.com/calregs/Index?transitionType=Default&contextData=%28sc.Default%29>

Summary of record and documentation developed by CARB

Initial Statements of Reason and Standardized Regulatory Impact Assessments

Advanced Clean Cars II, available at:

<https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/isor.pdf>

Advanced Clean Trucks, available at: <https://ww3.arb.ca.gov/regact/2019/act2019/isor.pdf>

Low NOx HD Omnibus, available at: <https://ww3.arb.ca.gov/regact/2020/hdomnibuslownox/isor.pdf>

Phase 2 GHG Rules, available at: <https://www.arb.ca.gov/regact/2018/phase2/isor.pdf>

Other materials cited in Supporting Documents

The ICCT and STI - Benefits of adopting California medium- and heavy-duty vehicle regulations under Clean Air Act Section 177, December 2021, available at <https://theicct.org/publication/state-level-hdv-emissions-reg-fs-dec21/>

The ICCT and STI – Benefits of adopting California Advanced Clean Cars II regulations in Vermont, June 2022, available upon request from the Agency of Natural Resources

Agency of Natural Resources
REGULATION SUMMARY DOCUMENT
Advanced Clean Cars II, Advanced Clean Trucks, Low NO_x Heavy-Duty Omnibus, and
the Phase 2 Greenhouse Gas Rule

This document includes a summary of the Agency of Natural Resources proposed regulations for Advanced Clean Cars II, Advanced Clean Trucks, Low NO_x Heavy-Duty Omnibus, and the Phase 2 Greenhouse Gas Rule. In this rulemaking, ANR proposes to amend existing rules and adopt new rules that reduce greenhouse gas and criteria air pollutant emissions from passenger cars, light-duty trucks, and medium- and heavy-duty vehicles and engines that are delivered for sale or placed in service in Vermont.

ANR has authority to adopt and amend these regulations pursuant to Section 177 of the Clean Air Act (CAA) and 10 V.S.A. §§558 and 567 of the Vermont Air Pollution Control Laws, which allow 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.

The original adoption and previous amendments of rules adopted pursuant to Section 177 of the CAA are found in the Vermont Department of Environmental Conservation Regulations Chapter 5 (Air Pollution Control), Subchapter XI (Low Emission Vehicle Program), and Appendix F (Provisions of the California Code of Regulations). In this rulemaking, ANR has created a new Chapter 40, entitled *Vermont Low Emission Vehicle and Zero Emission Vehicle Rules*, which will include existing requirements, proposed amendments, and new rules adopted pursuant to Section 177 of the CAA. Creating a new chapter allows ANR to update these rules on a more regular basis, as necessary to align with California's mobile sources program.

Background

In 1967, the federal Clean Air Act (CAA) established the framework for controlling mobile source (i.e., cars, trucks, buses, and other vehicles) emissions in the United States. Although most states were preempted by Section 209 of the CAA from adopting state vehicle emissions standards, California was granted a special exemption to the federal preemption due to the state's long-standing mobile sources program and unique air quality problems.¹ This exemption gave California the authority to set its own vehicle emission standards as long as such standards are at least as protective as the federal standards. The California Air Resources Board (CARB) develops and adopts specific rules and regulations needed to achieve healthful air quality and address climate change. The relevant CARB regulations are found in Title 13 (Motor Vehicles) and Title 17 (Public Health) of the California Code of Regulations (CCR).²

¹ 42 U.S.C. §7543.

² California Code of Regulations, Title 13, *Motor Vehicles*, <https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I88D700E0D46911DE8879F88E8B0DAAAE&originationContext=documenttoc&transitionType=Default&contextData=%28sc.Default%29>; California Code of Regulations, Title 17, *Public Health*, <https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=IC39BB410D60711DE88AEDDE29ED1DC0A&originationContext=documenttoc&transitionType=Default&contextData=%28sc.Default%29>.

A subsequent amendment to the CAA added Section 177 that allows other states to adopt the California standards if they are “identical to the California standards” for which California received a waiver of preemption from implementing the federal motor vehicle standards from the U.S. Environmental Protection Agency (EPA).³ Section 177 also requires that states adopting the California vehicle emission standards provide vehicle manufacturers with at least two model years’ lead time before the standards may be enforced.⁴

Pursuant to Section 177, Vermont has the authority to regulate emissions from motor vehicles so long as those regulations are identical to California’s. Over the past two decades, Vermont has adopted many of California’s regulatory programs for light- and medium-duty vehicles, including the Low Emission Vehicle (LEV) program beginning with model year 2000 and Zero Emission Vehicle (ZEV) program for model year 2004 and beyond which were later combined into the Advanced Clean Cars (ACC) program for model years 2015 through 2025. The existing ACC requirements include a LEV program which focuses on the emissions of criteria air pollutants and greenhouse gases, and a ZEV program which requires auto manufacturers to deliver a certain percentage of battery electric and plug-in hybrid vehicles to Vermont.

Recognizing that emissions from medium- and heavy-duty vehicles and engines pose significant threats to public health and climate change, California has adopted regulations for these vehicles that aim to reduce criteria air pollutant and greenhouse gas emissions and are more stringent than federal regulations. Until this rulemaking, Vermont’s program has not focused on regulating emissions from heavy-duty vehicles.

In response to the threat of climate change, in September 2020 the General Assembly enacted the Global Warming Solutions Act (GWSA), Act 153, which set goals to achieve greenhouse gas emission reductions and created a Climate Council charged with adopting an initial Climate Action Plan in December 2021. The Initial Climate Action Plan directed ANR to adopt California’s Advanced Clean Cars II, Advanced Clean Trucks, the Low NOx Heavy-Duty Omnibus, and the Phase 2 Greenhouse Gas emission standards for trucks and trailers because these rules are critical to meet Vermont’s required reductions of greenhouse gas emissions from the transportation sector. ANR must adopt these regulatory amendments before the end of 2022 to meet the deadlines in the GWSA and mirror California’s implementation of the rules.

The deployment of ZEVs also supports meeting goals identified in the 2020 Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding, which sets a new medium- and heavy-duty vehicle sales goal of 100% ZEVs by 2050.

Advanced Clean Cars II

Advanced Clean Cars II (ACCII) is an amendment to Vermont’s existing ACC program which covers passenger cars and light-duty trucks. ACCII includes a Low-Emission Vehicle (LEV) regulation that reduces both criteria air pollutant and greenhouse gas emissions from new internal combustion engine vehicles (ICEVs) for model year 2026 and beyond, and a zero-emission vehicle (ZEV) regulation that increases the number of electric vehicles for sale in Vermont.

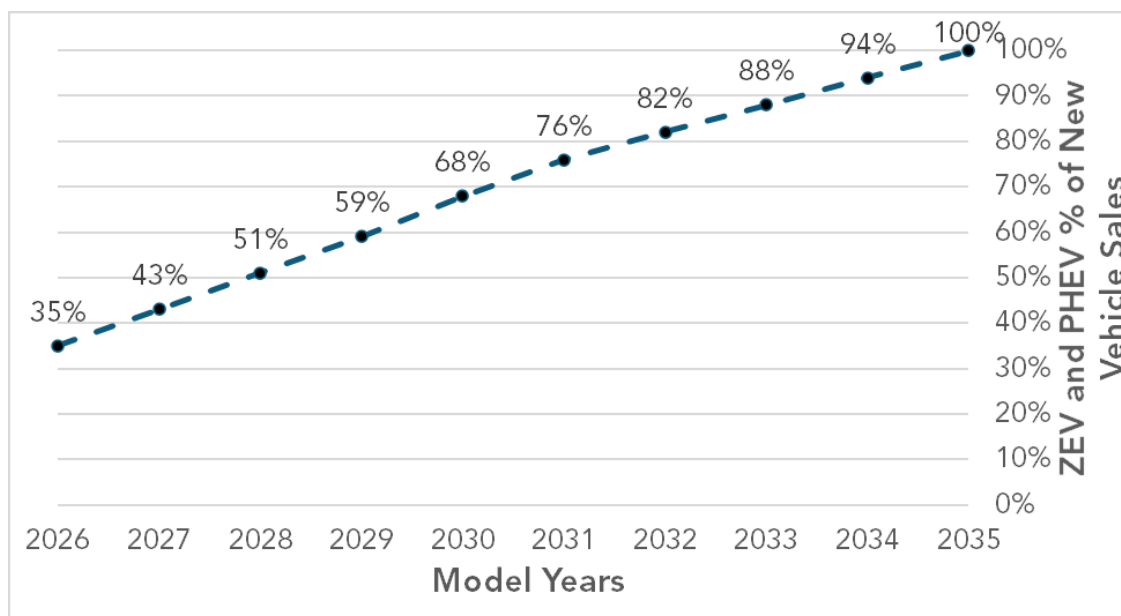
³ 42 U.S.C. § 7507.

⁴ A model year begins on January 2 of the prior calendar year.

The ACCII LEV regulation requires manufacturers to produce a percentage of vehicles certified to increasingly more stringent emission categories, according to schedules based on vehicle fleet emission averages for each manufacturer. The LEV regulation contains criteria air pollutant exhaust emission standards for 2026 and subsequent model year passenger cars, light-duty trucks, and medium-duty vehicles.⁵

The ACCII ZEV regulation requires that all passenger car and light-duty truck vehicles delivered by manufacturers for sale in Vermont by 2035 meet the definition of zero-emission vehicle (ZEV).⁶ A ZEV is a vehicle that produces zero vehicle exhaust emissions of any criteria air pollutant or greenhouse gas. The most common types of ZEVS are battery electric vehicles (BEV) and hydrogen fuel cell electric vehicles (FCEV). BEVs utilize batteries to store the electrical energy that powers the motor. FCEVs are fueled primarily by hydrogen stored on board to power a fuel cell in combination with a traction battery that produces electricity to power the electric motors, and may also have off-vehicle charge capability. Although not a ZEV by definition because of its internal combustion engine emissions, plug-in hybrid-electric vehicles (PHEV) use a battery to power an electric motor, as well as another fuel, such as gasoline or diesel, to power an internal combustion engine.

ACCII is not a requirement that consumers purchase an electric vehicle, or that dealers sell a required volume of electric vehicles. ACCII is a requirement imposed solely on auto manufacturers to deliver a certain annual percentage of ZEVs to Vermont, increasing to 100% ZEVs by 2035. The annual ZEV requirement aligns with where the market is expected to be in 2026 and continues to ramp up quickly. Small volume manufacturers must comply with the annual ZEV requirement beginning with the 2035 model year. Below is a table summarizing the ZEV requirement:



⁵ CARB Proposed Regulation Order, 13 CCR § 1961.4, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/appa1.pdf>; CARB Proposed Regulation Order, 13 CCR § 1961.2, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/appa2.pdf>.

⁶ CARB Proposed Order, 13 CCR § 1962.4, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/appa5.pdf>.

Manufacturers earn credits for each certified ZEV produced for sale in Vermont and partial credits for PHEVs. These credits may be earned previously by the manufacturer starting with model year 2024 or acquired from another party. ZEV credits can also be earned by early compliance with ZEV requirements and through the environmental justice vehicle value option. The environmental justice vehicles value option will incentivize automakers to invest in community carshare programs, produce more affordable ZEVs, and ensure that more used ZEVs are available. To provide flexibility for manufacturers for model years 2026 through 2030, ACCII includes “pooling” which allows manufacturers to move a specified percentage of excess ZEV and PHEV credit values earned in one state for use in another state where there is a shortfall relative to the requirement.

ACCII also includes enhanced consumer protection measures to improve vehicle warranties and ensure durability of battery technology. These ZEV assurance measures are necessary to ensure both that ZEVs function as expected over their lifetimes and that consumers are not deterred from purchasing them both new and used. For example, ZEVs must meet the following requirements:

- Minimum certification range value greater than or equal to 200 miles, determined by California according to the 2026 ZEV and PHEV Test Procedures.
- Minimum durability requirement for useful life, designed to maintain 80% or more of the certification range value for a useful life of 10 years or 150,000 miles, which occurs first, and comply with data reporting requirements.
- Battery labeling requirements for recyclability and repurposing.
- Data standardization including battery state of health to determine the current level of deterioration in the battery relative to when it was new.
- Service information requirements to disclose repair information to independent repair shops.
- Minimum warranty requirements to provide protection for consumers that experience failures or defects early in the life of the vehicle.
- Onboard diagnostics requirements to track and diagnose emission failures.
- Charging requirements, including an on-board charger with a minimum charging capability.

The ACCII regulations are not currently adopted in California but will be by the time ANR’s new regulations are adopted later this year. California proposed amendments to the existing ACC program on April 15, 2022, initiating the rulemaking process for ACCII. To adopt ACCII, California proposes to adopt CCR title 13, sections 1961.4, 1962.4, 1962.5, 1926.6, 1962.7, and 1962.8, and proposes to amend CCR title 13, sections 1900, 1961.2, 1961.3, 1962.2, 1962.3, 1965, 1968.2, 1969, 1976, 1978, 2037, 2038, 2112, 2139, 2140, 2147, 2317, 2903. These provisions will be incorporated by reference in Chapter 40 of the Vermont Department of Environmental Conservation Regulations. To adopt these standards for model year 2026, Vermont must adopt these regulations two years in advance of January 2, 2025, or January 2, 2023. For more information on ACCII, see CARB’s Initial Statement of Reasons and background materials.⁷

⁷ CARB, Advanced Clean Cars II, Initial Statement of Reasons, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/isor.pdf>; CARB, Advanced Clean Cars II, Public Materials, <https://ww2.arb.ca.gov/rulemaking/2022/advanced-clean-cars-ii>.

Advanced Clean Trucks

The Advanced Clean Trucks Rule (ACT) is a new regulatory program that has been adopted and implemented in California and a number of other states, including New York, Massachusetts, New Jersey, and Oregon. Vermont has had limited to no regulations covering emissions from medium- and heavy-duty vehicles in the past, so this would be a new rule and not an amendment.

The purpose of the ACT Rule is to accelerate the widespread adoption of ZEVs in the medium- and heavy-duty truck sector and reduce the amount of harmful emissions generated from on-road trucks. The ACT Rule applies to manufacturers of medium- and heavy-duty vehicles over 8,500 pounds gross vehicle weight rating (GVWR)⁸ which includes passenger vans, buses, pickups, vocational trucks, box trucks, and tractor trailer combinations used locally and for long-haul applications.

The ACT Rule has two main components, a manufacturers ZEV sales requirement and a one-time reporting requirement for large entities and fleets. In this rulemaking, ANR does not plan to adopt the one-time reporting requirement for large entities and fleets because ANR currently lacks the staff capacity and resources to facilitate data collection and then process the volume of data and information this requirement will generate. ANR intends to adopt this reporting requirement at a later date as resources allow.

The ACT Rule requires manufacturers to sell ZEV trucks as an increasing percentage of their annual sales from model years 2026 to 2035.⁹ Manufacturers with annual state sales less than 500 units are exempt from the ZEV sales requirement but can opt-in to earn credits for selling ZEVs. As with ACCII, this is not a requirement that fleet owners or truck operators purchase electric vehicles, but a requirement on the manufacturers of medium- and heavy-duty trucks to transition from diesel trucks and vans to electric zero-emission trucks beginning in model year 2026.

The ACT requires the sale of at least 30% zero-emission trucks by 2030 (depending on vehicle classification). By model year 2035, zero-emission truck sales would need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 truck sales, and 40% of truck tractor sales. Light-duty trucks (e.g., the F-150 Lightning) are covered under ACCII, discussed above.

| Model Year | Class 2b-3 | Class 4-8 | Class 7-8 Tractors |
|------------|------------|-----------|--------------------|
| 2026 | 10% | 13% | 10% |
| 2027 | 15% | 20% | 15% |
| 2028 | 20% | 30% | 20% |
| 2029 | 25% | 40% | 25% |
| 2030 | 30% | 50% | 30% |
| 2031 | 35% | 55% | 35% |
| 2032 | 40% | 60% | 40% |
| 2033 | 45% | 65% | 40% |
| 2034 | 50% | 70% | 40% |
| 2035+ | 55% | 75% | 40% |

⁸ GVWR generally refers to the weight specified by the manufacturer as the loaded weight of a single vehicle.

⁹ CARB, Final Regulation Order, Advanced Clean Trucks,
<https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2019/act2019/fro2.pdf>.



The Class 2b-3 group (GVWR of 8,501 - 14,000 lbs) consists mainly of full-size pickup trucks and vans.¹⁰ Examples of full-size vans include the Ford Transit, Mercedes Sprinter, and Chevrolet Express, and examples of heavy-duty pickup trucks include the Ford F250 and RAM 2500. Class 3 includes the same types as Class 2b with a higher payload, but also includes a higher fraction of incomplete vehicles and stripped chassis (with a frame and engine but has no cab or body) that often become walk-in vans and box trucks with final assembled by a body manufacturer. This market is primarily served by many of the same manufacturers of lighter duty vehicles including Stellantis, Ford, General Motors, Mercedes, and Nissan.

The Class 4-8 group (GVWR above 14,000 lbs, excluding tractors) mainly function in vocational applications as urban delivery vehicles, as work-site trucks, and numerous other fields. The top three manufacturers in Class 4-8 are Ford, Freightliner, and International. The Class 7-8 tractor group (GVWR above 26,000 lbs) consists of on-road semi-trucks that haul trailers.

To determine compliance with the sales requirement, affected manufacturers incur deficits for each non-ZEV vehicle sold into Vermont starting with model year 2026. The deficit is calculated as the product of the model year percentage requirement from the table above, and the appropriate weight class modifier for each vehicle. Every model year, the deficits generated by each vehicle are summed for each vehicle group.

These deficits must be met with compliance credits generated from producing and selling ZEVs to the ultimate purchaser in Vermont, starting with model year 2024. To qualify for credits, ZEVs sold by manufacturers must meet the Zero-Emission Powertrain (ZEP) Certification requirements. Partial credits from selling near-zero emission vehicles (NZEVs) can be used to offset up to half of the manufacturer's annual deficits through model year 2030. ZEV and NZEV credits may be traded, sold, or otherwise transferred between manufacturers. Compliance is achieved when the manufacturer's total credits offset their total deficits.

¹⁰ Class 2a and 2b are subsections of Class 2; Class 2a refers to vehicles with a GVWR of 6,001-8,500 lb. and Class 2b refers to vehicles with a GVWR of 8,501-10,000 lb.

California adopted the ACT regulation on January 26, 2021 at California Code of Regulations title 13 sections 1963 through 1963.5 and sections 2012 through 2012.2. These provisions will be incorporated by reference in Chapter 40 of the Vermont Department of Environmental Conservation Regulations. Vermont will not be able to adopt this rule in time to mirror the implementation date in California due to the two-model year lead time requirement explained in the background above. To maximize emission reductions projected to be achieved via the ACT rule starting with model year 2026, ANR must adopt this rule by the end of 2022. For more information on ACT, see CARB's Final Statement of Reasons.¹¹

Heavy-Duty Engine and Vehicle Omnibus Rule

The Heavy-Duty Engine and Vehicle Omnibus (HD Omnibus) Rule and associated amendments require NOx emissions reductions from new on road heavy-duty engines and vehicles, and ensure emission reductions are maintained as those engines and vehicles are operated.¹² The HD Omnibus Rule requires a 90% reduction in NOx emission from model year 2027 engines.

The HD Omnibus Rule includes the following amendments summarized below:

- Exhaust Emissions Standards and Test Procedures for 2024 and Subsequent Model Year Heavy-Duty Engines and Vehicles,
- Heavy-Duty On-Board Diagnostic System Requirements,
- Heavy-Duty In-Use Testing Program,
- Emissions Warranty Period and Useful Life Requirements,
- Emissions Warranty Information and Reporting Requirements, and Corrective Action Procedures,
- In-Use Emissions Data Reporting Requirements,
- Phase 2 Heavy-Duty Greenhouse Gas Regulations, and
- Powertrain Test Procedures.

The HD Omnibus includes exhaust emission standards for low oxides of nitrogen (NOx) and particulate matter (PM) that would apply to heavy-duty Otto-cycle and diesel engines intended for use in vehicle service classes with gross vehicle weight ratings (GVWR) greater than 10,000 pounds.

The HD Omnibus Rule includes an emissions averaging, banking, and trading program that would allow manufacturers that elect to produce and certify heavy-duty zero-emission vehicles (ZEV) to generate NOx credits, in order to incentivize the sales of heavy-duty ZEVs earlier than would be required by the Advanced Clean Trucks (ACT) Regulation.

To legally sell new engines, manufacturers must certify that their engines will comply with applicable emission standards throughout a specified period called the regulatory useful life. This ensures that manufacturers consider deterioration in emissions performance in the initial design of the engine. Manufacturers demonstrate that the emissions from engines meet emission standards at the time of

¹¹ CARB, Advanced Clean Trucks Regulation, Final Statement of Reasons, <http://ww2.arb.ca.gov/sites/default/files/barcu/regact/2019/act2019/fsor.pdf>.

¹² CARB, Title 13, Final Regulation Order, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2020/hdomnibuslownox/froa-1.pdf>; CARB, Title 17, Final Regulation Order, <https://ww2.arb.ca.gov/sites/default/files/barcu/board/rulemaking/hdomnibuslownox/froa-2.pdf>.

certification using a durability demonstration program (DDP) which simulates heavy-duty engine and emission-related control component aging throughout the applicable useful life period.

To help ensure that emission controls are sufficiently durable to control emissions over applicable useful life periods, and well-maintained and repaired when needed, the HD Omnibus Rule lengthens the criteria pollutant emissions warranty and useful life period requirements for heavy-duty vehicles and engines. For components that fail under warranty, manufacturers may be required to report certain data to CARB and Vermont. If failure rates are high enough, manufacturers are required to conduct corrective actions such as recalling faulty components.

The HD Omnibus Rule requires manufacturers to test engines while they are operated on the road using portable emissions measurement systems. All heavy-duty engine manufacturers must conduct heavy-duty in-use testing (HDIUT) on their engine families, as specified by CARB which evaluates the in-use test data via the not-to-exceed (NTE) method. CARB also has the ability to independently test any engine family through CARB's in-house Heavy-Duty In-Use Compliance Program (HDIUC). Engine families that fail test requirements are subject to potential recall.

The HD Omnibus provides manufacturers an option to certify hybrid powertrains to criteria pollutant emission standards using specified hybrid-powertrain testing procedures. The hybrid-powertrain testing procedures would align with federal powertrain testing procedures and would be based on the U.S. EPA Phase 2 GHG technical amendments for powertrain testing. Powertrain testing provides an alternative to testing just the engine of a vehicle and enables manufacturers to quantify the impact of vehicle technologies such as hybridization that cannot be easily tested on an engine dynamometer.

California adopted HD Omnibus regulations on September 9, 2021 by amending California Code of Regulations title 13 sections 1900, 1956.8, 1961.2, 1965, 1968.2, 1971.1, 1971.5, 2035, 2036, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2121, 2123, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2133, 2137, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2423, and 2485 and 17 CCR 95662 and 95663 and adopting new 13 CCR 2139.5, 2166, 2166.1, 2167, 2168, 2169, 2169.1, 2169.2, 2169.3, 2169.4, 2169.5, 2169.6, 2169.7, 2169.8, and 2170. These provisions will be incorporated by reference in Chapter 40 of the Vermont Department of Environmental Conservation Regulations. For more information on the HD Omnibus Rule, see CARB's Final Statement of Reasons.¹³

Phase 2 Greenhouse Gas (GHG) Rule

The Phase 2 GHG Rule sets standards to reduce GHG emissions associated with medium- and heavy-duty engines, vocational vehicles¹⁴, heavy-duty pick-up trucks and vans (PUVs)¹⁵, and applicable tractors and

¹³ CARB, Heavy-Duty Engine and Vehicle Omnibus Regulation, Final Statement of Reasons for Rulemaking,

<https://ww2.arb.ca.gov/sites/default/files/barcu/board/rulemaking/hdomnibuslownox/fsor.pdf>.

¹⁴ Vocational vehicles include, but are not limited to, delivery vehicles, refuse vehicles, and transit buses and have three regulatory categories according to GVWR: light heavy-duty (LHD) vehicles that range from 8,501 to 19,500 pounds, medium heavy-duty (MHD) vehicles that range from 19,501 to 33,000 pounds, and heavy heavy-duty (HHD) I-4 vehicles that have greater than 33,000 pounds.

¹⁵ In the U.S. EPA's Phase 2 GHG Rule, EPA uses the term "heavy-duty pickups and vans" while the California regulation uses the term PUVs for these same vehicle types (i.e., class 2b vehicles with GVWR of 8,501 to 10,000 pounds and class 3 vehicles with GVWR of 10,001 to 14,000 pounds).

trailers. The Phase 2 GHG Rule requires manufacturers to improve existing technologies or develop new technologies to meet the GHG emission standards.¹⁶ It also amends requirements for glider vehicles, glider engines, and glider kits.¹⁷

The Phase 2 GHG Rule sets new more stringent GHG emission standards for medium- and heavy-duty engines, tractors, vocational vehicles, PUVs, and trailers that are sold in Vermont.¹⁸ These emission standards largely harmonize with the structure, timing, and stringency of federal Phase 2 standards jointly adopted by the U.S. EPA and the Department of Transportation's National Highway Traffic Safety Administration in 2016, providing nationwide consistency for engine and vehicle manufacturers.¹⁹ The Phase 2 GHG requirements would apply to model year 2026 and newer Class 2b to 8 medium- and heavy-duty vehicles with greater than 8,500 pounds GVWR and the engines that power them, except for medium-duty passenger vehicles already covered in the light-duty regulations. To meet the proposed standards, regulated manufacturers are expected to apply GHG reducing technologies, and may additionally elect to take advantage of credit opportunities.

For medium- and heavy-duty vehicles, the Phase 2 GHG requirements would apply to model year 2026 and newer class 2b to 8 medium- and heavy-duty vehicles with greater than 8,500 pounds GVWR and the engines that power them, except for medium-duty passenger vehicles already covered in the light-duty regulations.

For vocational vehicles, the Phase 2 GHG Rule establishes CO₂ standards (in grams emitted from carrying a ton of cargo over a distance of one mile (g/ton-mile)) for vocational vehicles that fall within 15 subcategories, distinguished by GVWR, duty cycle, and engine type (diesel vs. gasoline). Manufacturers of motor homes, coach buses, other buses (excluding transit buses), school buses, refuse trucks, cement mixers, and emergency vehicles have an option to certify those vehicles with less stringent standards than the primary vocational standards.

For PUVs, the Phase 2 emission standards are based on a "work factor" attribute that combines truck payload and towing capabilities, with an added adjustment for 4-wheel drive vehicles. There are separate target curves for diesel-powered and gasoline-powered vehicles. The PUV standards are expressed in gCO₂/mile. PUVs, many of which are ¾ and 1-ton pick-up trucks, 12- and 15- passenger vans, and large work vans, are comprised of two classes of vehicles: Class 2b and 3. Heavy-duty vehicles with GVWR between 8,501 and 10,000 lbs. are classified in the industry as Class 2b motor vehicles. Heavy-duty vehicles with GVWR between 10,001 and 14,000 lbs. are classified as Class 3 motor vehicles.

¹⁶ CARB, Final Regulation Order for Phase 2 Greenhouse Gas Regulations and Tractor-Trailer GHG Regulations, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/phase2/finalatta.pdf>.

¹⁷ A "glider vehicle" is a vehicle where the chassis and cab assembly is produced by a vehicle manufacturer without a new engine, transmission, or rear axle and a third party installs an engine, transmission, and/or rear axle to complete the vehicle.

¹⁸ Greenhouse Gas Exhaust Emission Standards and Test Procedures for New 2014 and Subsequent Model Heavy-Duty Vehicles, 17 CCR § 95663.

¹⁹ Final Rule for Phase 2 Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles, <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-phase-2-greenhouse-gas-emissions-standards>. Note, CARB and U.S. EPA use different terminology for vehicles in various weight classes. The main difference is the use of the terms medium-duty vehicles and medium-duty engines.

For tractors, Phase 2 emissions standards apply to ten subcategories of tractors, Class 7 and 8 and above 26,000 pounds GVWR. The engine and vehicle technologies employed to meet these standards will vary by tractor subcategory.

For trailers, the Phase 2 GHG Rule establishes separate standards for full aero box vans, partial aero box vans, non-aero box vans, and non-box trailers. A full aero box van is a box van that does not have any side or rear work performing equipment that would inhibit the application of aerodynamic technologies. A partial-aero box van has either side or rear work-performing equipment, but not both. A non-aero box van has both side and rear work performing equipment. Examples of work performing equipment include lift gates, access doors, and belly boxes. Examples of non-box trailers include flatbed, tanker, and container chassis trailers. The federal Phase 2 regulation also establishes separate standards for long box vans and short box vans. A short box van is less than or equal to 50 feet in length. A long box van is greater than 50 feet in length.

The exhaust emission standards specified in this rule apply to trailers based on the effect of trailer designs on the performance of the trailer in conjunction with a tractor; this accounts for the effect of the trailer on the tractor's exhaust emissions, even though trailers themselves have no exhaust emissions. Trailer fleet owners have the option of either purchasing Phase 2 certified trailers, or installing Phase 2 approved aerodynamic technologies and low-rolling resistance (LRR) tires to meet the requirements.

Additional elements of the Phase 2 GHG Rule include:

- Phase 2 certification requires manufacturers to submit certification information directly to CARB for an independent review and approval. Engine and vehicle families for which U.S. EPA has issued a federal Certificate of Conformity would not be automatically “deemed to comply” with the California Phase 2 requirements.
- Additional vehicle labels are required for vocational vehicles and tractors to identify emission control systems that can be visually inspected by enforcement staff.
- Additional reporting of engine and A/C system-related information is required by manufacturers in initial certification information and each certified vehicle's end-of-year report.
- Manufacturers of motor homes, coach buses, school buses, refuse trucks, cement mixers, and emergency vehicles have an option to certify those vehicles with a less stringent process called “custom chassis”. Custom chassis standards are significantly less stringent than the primary vocational vehicle standards and include a simplified certification process. This optional less-stringent standard is not available for transit buses.
- Additional credit provisions would encourage the use of low global warming potential (GWP) refrigerants, the sale of PHEVs with a minimum all-electric range and low NOx emissions, and the manufacture of lower-emitting transit buses.
- Additional “light-duty style” consumer labels required for PUVs to provide consumers with easy to read information on the relative GHG emission performance of a particular PUV model as compared to other similar PUVs.

California adopted the federal Phase 2 GHG regulations plus California distinctions on December 11, 2018 by amending California Code of Regulations title 13 sections 1956.8, 1961.2, 1965, 2036, 2037, 2065, 2112, and 2141 and 17 CCR 95662 and 95663. ANR is proposing to adopt these amendments, as well as to adopt 17 CCR 95660 (Purpose) and 95661 (Applicability), which is part of California's Phase 2

GHG Standards, but which were pre-existing sections California did not need to amend. These provisions will be incorporated by reference in Chapter 40 of the Vermont Department of Environmental Conservation Regulations. For more information on the Phase 2 GHG Rule, see CARB's Final Statement of Reasons.²⁰

²⁰ CARB, Final Statement of Reasons for Rulemaking, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/phase2/fsor.pdf>; *see also* CARB, Initial Statement of Reasons, <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/phase2/isor.pdf>.