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BACKGROUND DOCUMENT

ON EMERGENCY REGULATION AMENDMENTS TO

310 CMR 7.40

Low Emission Vehicle Program

REGULATORY AUTHORITY:
M.G.L. c. 21A, §§ 2, 8 and 16; M.G.L. c. 21N; and M.G.L. c. 111, §§ 2C and 142A–142M

December 30, 2022

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I. SUMMARY

On December 30, 2022, the Massachusetts Department of Environmental Protection (MassDEP) filed emergency regulations with the Massachusetts Secretary of the Commonwealth that amended 310 CMR 7.40, *Low Emission Vehicle Program,* as described below. These amendments were effective upon filing and are available along with a public hearing notice on MassDEP's website at the link indicated on page 14 of this document. The public hearing notice will be published in the Massachusetts Register on January 20, 2023. To make the regulations permanent, MassDEP is soliciting public comment on the amendments to comply with the public review process requirements under Massachusetts General Laws (M.G.L.) Chapter 30A, Section 2. MassDEP will hold public hearings on the amendments to 310 CMR 7.40 on January 30, 2023, and the deadline to submit public comments is February 9, 2023.

To comply with the Massachusetts Clean Air Act,[1] and applicable provisions of the federal Clean Air Act[2], MassDEP amended 310 CMR 7.40 *Low Emission Vehicle Program* to adopt California's Zero Emission Vehicle (ZEV) and Low Emission Vehicle (LEV) IV regulations, together known as the Advanced Clean Cars II (ACC II) Program. ACC II combines 1) ZEV standards that require increasing numbers of battery electric vehicles (BEVs), hydrogen fuel cell electric vehicles (FCEVs), and the cleanest possible plug-in hybrid-electric vehicles (PHEVs) starting in model year (MY) 2026 for passenger cars and light-duty trucks (together, light-duty vehicles (LDVs)); and 2) LEV IV requirements that reduce smog-forming and particulate emissions from new internal combustion engine vehicles (ICEVs) starting in MY 2026 for LDVs and medium-duty vehicles (MDVs). In addition, ACC II includes charging and ZEV and PHEV assurance measures that set minimum warranty and durability requirements that will help ensure consumers successfully replace their ICEVs with new or used ZEVs and PHEVs. MassDEP's adoption of these provisions will drive the sales of ZEVs and PHEVs to 100% in Massachusetts in MY 2035, which will reduce emissions of criteria and toxic air pollutants and greenhouse gases (GHG), improving air quality and reducing the adverse effects of climate change.

[1] The Massachusetts Clean Air Act, M.G.L. c.111, §142K, provides in relevant part:

> "…the department, shall adopt motor vehicle emissions standards based on the California's duly promulgated motor vehicle emissions standards of the state of California unless, after a public hearing, the department establishes, based on substantial evidence, that said emissions standards and a compliance program similar to the state of California's will not achieve, in the aggregate, greater motor vehicle pollution reductions than the federal standards and compliance program for any such model year."

Massachusetts General Laws, Chapter 111: Section 142K. Motor vehicle emissions standards. http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleXVI/Chapter111/Section142k

[2] 42 U.S.C. 7507 provides in part "any State which has plan provisions approved under this part [42 USCS §§ 7501 et seq.] may adopt and enforce for any model year standards relating to control of emissions from new motor vehicles or new motor vehicle engines and take such other actions as are referred to in section 209(a) [42 USCS § 7543(a)] respecting such vehicles if—

(1) such standards are identical to the California standards for which a waiver has been granted for such model year, and

(2) California and such State adopt such standards at least two years before commencement of such model year (as determined by regulations of the Administrator).

II. BACKGROUND

Massachusetts is committed to protecting public health and the environment through programs and policies that address air pollution and climate change. Although significant progress has been made in addressing air pollution in Massachusetts, continued reductions of criteria pollutant emissions are needed to maintain state and federal ambient air quality standards.

On-road LDV and MDV emissions are major contributors to air pollution and climate change. Emissions from motor vehicle engines cause harm to public health, welfare, the environment, and the climate in multiple interrelated ways. Nitrogen oxides (NOx) emissions lead to ozone formation and secondary particulate matter (PM) formation. Exposure to ozone and PM with a diameter equal to or less than 2.5 micrometers ($PM_{2.5}$) is associated with increases in premature death and hospitalizations due to exacerbation of chronic heart and lung diseases and other adverse health conditions. These pollutants pose serious health concerns and increase the incidence of cardio-pulmonary diseases, asthma, and cancer, especially for sensitive groups of people including children, older adults, and people with heart or lung diseases.

Recognizing that emissions from LDVs and MDVs pose significant threats to public health and contribute to climate change, California adopted the ACC II regulations for these vehicles. MassDEP adopted the California ACC II regulations to reduce harmful air pollution and ensure the transition to 100% ZEVs and PHEVs by 2035 in support of the Commonwealth's climate goals. MassDEP's adoption of the ACC II regulations is required by the Massachusetts Clean Air Act, supports implementation of the Global Warming Solutions Act, and complies with the federal Clean Air Act, as described below. The regulations also will lead to reduced fuel consumption and fuel costs due to more fuel-efficient vehicles and next generation zero-emission vehicles, which will positively affect consumers, businesses, and fleet owners.

Massachusetts Clean Air Act

In 1967, the federal Clean Air Act (CAA) established the framework for controlling mobile source emissions in the United States. Although most states were preempted by Section 209 of the CAA from adopting state emissions standards, California was granted a special exemption to the federal preemption due to the state's unique air quality problems. 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. A subsequent amendment to the CAA added Section 177 that allows other states to adopt the California standards if they are identical to California's standards.

In 1990, the Massachusetts legislature enacted M.G.L. c. 111, section 142K, which requires MassDEP to adopt California motor vehicle emissions standards except in certain cases. Under Massachusetts law, M.G.L. c. 111, section 142K states in part:[3]

> …the department, shall adopt motor vehicle emissions standards based on the California's duly promulgated motor vehicle emissions standards of the state

[3] Massachusetts General Laws, Chapter 111: Section 142K. Motor vehicle emissions standards. http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleXVI/Chapter111/Section142k

> of California unless, after a public hearing, the department establishes, based on substantial evidence, that said emissions standards and a compliance program similar to the state of California's will not achieve, in the aggregate, greater motor vehicle pollution reductions than the federal standards and compliance program for any such model year.

In 1991, MassDEP adopted the California Low Emission Vehicle (LEV) program by promulgating 310 CMR 7.40 *Low Emission Vehicle Program*. As required by M.G.L. c. 111, section 142K, MassDEP has amended its regulations many times to remain consistent with California. Section 7.40 contains regulations for ZEVs as well as for other types of LEVs.

MassDEP has analyzed the emission benefits of the ACC II regulations in Massachusetts and has determined that the regulations are clearly more stringent than federal regulations and provide, in the aggregate, greater emission reductions than the current federal program. MassDEP therefore must adopt the ACC II regulations. See section IV.1 for a description of emission reductions and health benefits.

Global Warming Solutions Act

In response to the threat of climate change, in 2008 Massachusetts enacted the *Global Warming Solutions Act* (GWSA), containing M.G.L. Chapter 21N, which set goals to achieve GHG reductions of 10-25% below 1990 levels in 2020 and at least 80% in 2050 from all sources. In 2021, Governor Baker signed *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* that amended the GWSA to require emissions reduction limits from 1990 levels, of 50% in 2030, 75% in 2040, and net zero GHG emissions in 2050. The amendments to M.G.L. c. 21N also require the Secretary of Energy and Environmental Affairs (EEA) to establish statewide limits for 2025, 2035 and 2045 and sector sublimits for specified sectors, as well as roadmap plans to achieve the statewide limits and sector sublimits.

EEA set sector sublimits for 2025 and 2030 on June 30, 2022 in the *Massachusetts Clean Energy and Climate Plan for 2025 and 2030* (the *2025/2030 CECP*).[4] Currently, GHG emissions for the transportation sector are the largest of any sector. Massachusetts' 2019 GHG emissions for the transportation sector are estimated at 30.8 million metric tons of carbon dioxide equivalents ($MMTCO_2e$), which is 43% of the total GHG statewide emissions in the 2019 inventory.[5] Adopting California's Advanced Clean Car II Program is one of the enumerated strategies in the *2025/2030 CECP* to meet the 2025 and 2030 sector sublimits for the transportation sector.[6] That *2025/2030 CECP* states: "California is now moving forward with post-2025 regulations that would for the first time set a pathway for 100% of all passenger vehicle sales to be zero-emission, as well as new sales requirements on medium- and heavy-duty vehicles. The Commonwealth is in the process of following suit" (p.39). It also states that "Massachusetts was the first participating state to endorse this goal and will promulgate the next round of regulation by the end of 2022" (p.39).

[4] See p. xiii in https://www.mass.gov/doc/clean-energy-and-climate-plan-for-2025-and-2030/download.
[5] See https://www.mass.gov/doc/statewide-greenhouse-gas-emissions-level-proposed-1990-baseline-update-appendix-c/download.
[6] See p. 39 of https://www.mass.gov/doc/clean-energy-and-climate-plan-for-2025-and-2030/download.

M.G.L. c. 21N, Section 2, as amended, requires that:

> The department shall establish programs to monitor and reduce emissions of greenhouse gases and shall promulgate regulations regarding sources or categories of sources that emit greenhouse gases in order to achieve greenhouse gas emissions limits and sublimits and implement the roadmap plans established by this chapter.

MassDEP adoption of California's ACC II will reduce Massachusetts GHG emissions and will also contribute to achieving the statewide greenhouse gas emissions limits of 50% reduction in emissions in 2030, 75% in 2040 and net zero in 2050, as well as any additional interim statewide limits or sector sublimits that are established pursuant to the GWSA.

Section 177 of the Federal Clean Air Act

Section 177 of the CAA requires that if a state adopts the California motor vehicle emission standards, the standards must be "identical to the California standards" for which California received a waiver of preemption from implementing the federal motor vehicle emission standards from EPA[7]. *American Auto. Mfrs Assoc., et al. v. Commissioner, Massachusetts Dep't of Envtl Protection,* 31 F.3d 18, 21 (1st. Cir. 1994). MassDEP's amendments to 310 CMR 7.40 directly cite and/or incorporate by reference applicable standards within sections of Titles 13 and 17 of the California Code of Regulations (CCR), ensuring that the Massachusetts standards are identical to California's standards.

Section 177 also requires that states adopting the California motor vehicle emission standards provide vehicle manufacturers with a lead time of at least two MYs before the standards may be enforced. *Id*. MassDEP has adopted the California ACC II standards in 310 CMR 7.40 starting with MY 2026:

1) ZEV: Zero-Emission Vehicle Standards for 2026 and Subsequent Model Year Passenger Cars and Light-duty Trucks; and
2) LEV IV: Exhaust Emission Standards and Test Procedures - 2026 and Subsequent Model Year Passenger Cars, Light-duty Trucks, and Medium-duty Vehicles.

MY 2026 begins on January 1, 2025. Since the amendments to 310 CMR 7.40 were filed with the Secretary of the Commonwealth and effective as of December 30, 2022 through the Emergency Regulation procedure in M.G.L. c. 30A, Section 2, MassDEP has provided vehicle manufacturers with at least two MYs' lead time before the standards will be enforced.

[7] 42 U.S. EPA, Title I – Air Pollution Prevention and Control, Part D – Section 177, 42 U.S.C. §7507, https://www.govinfo.gov/content/pkg/USCODE-2010-title42/pdf/USCODE-2010-title42-chap85-subchapI-partD-subpart1-sec7507.pdf

III. DESCRIPTION OF AMENDMENTS

1. ZEV Standards

California adopted its ZEV regulation on November 30, 2022 by amending 13 CCR 1962.2 and adopting new provisions in 13 CCR 1962.3, 1962.4, 1962.5, 1962.6, 1962.7, and 1962.8. On December 30, 2022, MassDEP adopted all these amended and new sections with one exception. MassDEP did not adopt 13 CCR 1962.4(m)(3) (Enforcement of ZEV Requirements, Penalties) because MassDEP has its own enforcement authority based on Massachusetts law. MassDEP added 310 CMR 7.40(7)(g), which describes Massachusetts' authority for enforcing the regulation, rather than adopting 13 CCR 1962.4(m)(3).

The ZEV regulations require manufacturers to sell an increasing number of ZEVs and PHEVs annually. To ensure that motorists will be able to utilize these vehicles over their full useful lives, the ZEV regulation includes "assurance" requirements, as described below. The assurance requirements will provide motorists with the ability to rely on these vehicles when new and upon resale. Below is a summary of the ZEV requirements:

a) ZEV Stringency: Annual Percentage Requirement

MY	Minimum ZEV and PHEV % of New Vehicle Sales
2026	35%
2027	43%
2028	51%
2029	59%
2030	68%
2031	76%
2032	82%
2033	88%
2034	94%
2035+	100%

b) Including a simplified vehicle accounting system by revising the currency of ZEV "credits" to "values" with each vehicle sold earning one vehicle value.
c) Allowing manufactures that overcomply with the annual requirement to bank or trade vehicle values with other manufacturers for use within the next four MYs.
d) Allowing "Pooled" ZEV and PHEV vehicle values from California and other Section 177 states to meet a portion of the manufacturer's annual state requirement, dropping 5% per year, from 25% in MY 2026 to 0% in MY 2031.
e) Requiring that all new ZEVs and PHEVs be equipped with a dual-capable Level 1/Level 2 charging cord at the time of vehicle purchase. The cord must be at least 20 feet in length and tested and listed by a nationally recognized testing lab as meeting the UL Standards for Electric Vehicle Supply Equipment.
f) Including Environmental Justice (EJ) vehicle values designed to provide more affordable vehicles to disadvantaged and low-income communities. This is especially important in the earlier years of the ACC II program when battery costs are higher. EJ vehicle values

can only be used by manufacturers in the state in which they are earned (i.e., EJ vehicle values earned in other states cannot be used in Massachusetts). Thus, the benefits of EJ vehicle values are created and retained locally. Manufacturers can earn EJ vehicle values by:

1) selling new ZEVs and PHEVs to a Community-based Clean Mobility Program approved by MassDEP at a discount. A Community-based Clean Mobility Program must:
    a. provide access to clean mobility solutions other than vehicle ownership including car sharing, ride-sharing, vanpools, ride-hailing, or on-demand first-mile/last-mile services;
    b. serve a community in which at least 75 percent of the census block groups in the project area (where community residents live and services operate) are a disadvantaged community, low income community or a tribal community; and
    c. be implemented by a community-based organization; Native American Tribal government or a public agency or nonprofit organization that has received a letter of support from a project-related community-based organization or local community group that represents community members that will be impacted by the project or has a service background related to the type of project;
2) selling new ZEVs and PHEVs to consumers at a lower manufacturer's suggested retail price (MSRP) (≤$20,275 for passenger cars and ≤$26,670 for light-duty trucks, adjusted annually by the Consumer Price Index); and
3) ensuring that used ZEVs and PHEVs that sold for ≤$40,000 MSRP when new are sold at the end of a lease to dealerships and consumers participating in a financial assistance program.

g) ZEV assurance measures that include a minimum battery warranty (BEVs and PHEVs maintain a minimum 70% battery state of health for MY 2026-2030 and 75% for MY 2031+ for 8 years/100,000 miles) and durability standards (BEVs maintain a minimum 70% of certified range for MY 2026-2029 and 80% for MY 2030+ for 10 years/150,000 miles, and PHEVs provide a warranty for 15 years/150,000 miles on emission related parts) designed to ensure that as ZEVs age, they continue to serve as full replacement vehicles for conventional vehicles.
h) Battery labeling that includes a label on the vehicle battery that provides key information about the battery system. The label will include information on the battery chemistry, manufacturer, voltage, and capacity. The physical label will also include a digital identifier used to connect the label to a record in a digital repository of battery information. Labeling will support greater battery reuse and recycling and help promote availability of battery materials at lower cost and with reduced need for obtaining raw materials.

For more information on the ZEV regulation provisions MassDEP adopted, see CARB's Final Statement of Reasons and other supporting material.[8]

[8] Final Statement of Reasons for Rulemaking, Air Resources Board, October 24, 2022 at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/fsor.pdf

2. LEV IV Exhaust and Evaporative Standards

California adopted its LEV IV regulation on November 30, 2022 by amending 13 CCR 1900, 1961.2, 1961.3, 1965, 1968.2, 1976, 1978, 2037, 2038, 2112, 2139, 2140, 2147 and adopting new 13 CCR 1961.4.[9] On December 30, 2022, MassDEP adopted all these amended and new sections.[10]

LEV IV is intended to work in concert with the transition to ZEVs by ensuring the cleanest-possible new PHEVs and ICEVs until new ICEVs can no longer be sold in Massachusetts beginning with MY 2035. This is important because many new ICEVs sold in Massachusetts prior to MY 2035 will remain in use on Massachusetts roads beyond MY 2035. LEV IV will reduce air emissions from these ICEVs. The LEV regulations require manufacturers to conduct certification testing of gasoline and diesel vehicles to demonstrate compliance with exhaust (also known as tailpipe) and evaporative emissions standards. Below is a summary of the LEV IV requirements:

a) A fleet average non-methane organic gases (NMOG) plus NOx (NMOG+NOx) exhaust emission limit must be met for each MY. Under LEV IV, an increasing portion of each manufacturer's ZEV sales must be excluded from the fleet average over time to ensure that the remaining ICEVs cannot emit more as the ZEV portion of the fleet increases due to the ZEV regulation.

FLEET AVERAGE REQUIREMENTS
(150,000 mile Durability Vehicle Basis)

MY	NMOG + NOx (grams/mile)	Maximum Percent ZEVs + emission-adjusted PHEVs*
2025	0.030	100%
2026	0.030	60%
2027	0.030	30%
2028	0.030	15%
2029+	0.030	0%

*For each model year, a manufacturer may only include up to the specified percentage of its total ZEVs + emission-adjusted PHEVs in the fleet average calculation.

b) Cold-start conditions generally have been understood to generate the highest emissions during vehicle operations since all the key emission control components are cold, resulting in the formation of pollutant by-products of combustion. However, recent testing data has shown higher emissions when control equipment was neither hot nor

[9] Some of these sections are not LEV IV requirements but were amended for consistency and to sunset the LEV III standards.

[10] Note that California amended three sections MassDEP has not adopted: 13 CCR 1969 (Motor Vehicle Service Information - 1994 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Engines and Vehicles, and 2007 and Subsequent Model Heavy-Duty Engines) due to ongoing litigation; 13 CCR 2317 (Clean Fuels Program; Satisfaction of Designated Clean Fuel Requirements with a Substitute Fuel) that no state other than California is eligible to adopt; and 13 CCR 2903 (Certification Fees for Mobile Sources; Definitions) that Massachusetts does not need because California certifies ACC II vehicles.

cold, but warm, LEV IV therefore changes the vehicle certification test to apply when a vehicle has been parked for 10 or more minutes, rather than the previous 12 or more hours. A second LEV IV change to reduce cold start emissions requires manufacturers to consider emissions starting 8 seconds after the engine starts, rather than the previous 20 seconds after engine start, to address real world data showing that the majority of trips begin less than 20 seconds after the engine starts ("quick drive-aways"). In addition, a new LEV IV standard applies to blended PHEVs, which use both the battery and engine at startup, to reduce emissions during these high-power cold starts.

c) LEV IV specifies that the PM emission standard for aggressive driving drops from 6 to 3 milligrams/mile for LDVs and from 7-10 to 5-8 milligrams/mile for MDVs of various weight and horsepower on a phase-in schedule starting with MY 2027.
d) Evaporative emissions are fuel vapors escaping from a vehicle; running loss emissions are a type of evaporative emissions that occur when fuel vapors escape from the vehicle during driving. LEV IV requires that running loss emissions drop from 0.05 to 0.01 grams of hydrocarbons/mile on a phase-in schedule starting with MY 2026.

For more information on the LEV IV regulation provisions MassDEP adopted, see CARB's Final Statement of Reasons and other supporting material.[11]

3. Harmonizing Edits

In addition to adopting the California ACC II regulations described above, MassDEP made several other amendments to 310 CMR Chapter 7.00 to update and clarify the regulation as described below.

- 310 CMR 7.00 *Definitions* – deleted definitions that were duplicated in 310 CMR 7.40.
- 310 CMR 7.00 *Definitions* and 310 CMR 7.40(1) *Applicability and Definitions* – deleted terms no longer used in 310 CMR 7.00 and added or amended definitions used in 310 CMR 7.40.
- 310 CMR 7.40(1)(c): Table 1 – updated operative or effective dates of California regulation sections incorporated by reference to reflect California's update of those dates, and edited section titles to match California's update of those titles to ensure consistency with California's regulations.
- 310 CMR 7.40(1)(d) was amended to update the current model years and California programs included in 310 CMR 7.40 and deleted specific citations in 310 CMR 7.40(1)(d)1.a., to be parallel to 310 CMR 7.40(1)(d)2.-4. and not inadvertently leave out any citations for ACC I. The primary purpose of this section is to inform the regulated community of the effective model years for each program.
- 310 CMR 7.40(1)(h) was added to clarify that the term "Executive Officer" in incorporated sections of the California Code of Regulations shall mean the MassDEP "Commissioner."
- 310 CMR 7.40(1)(i) was added to clarify that when enforcing the CCR sections and California Test Procedures incorporated by reference in 310 CMR 7.40, MassDEP will

[11] Final Statement of Reasons for Rulemaking, Air Resources Board, October 24, 2022 at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/fsor.pdf

conduct enforcement in accordance with 310 CMR 7.40(7), which describes MassDEP's statutory and regulatory enforcement authority.

- 310 CMR 7.40(1)(j) was added to clarify that for purposes of implementing Title 13 CCR § 1962.4, the definitions of "Community-based Clean Mobility Program" and "Financial Assistance Program" in Title 13 CCR § 1962.4(l) are replaced with those in 310 CMR 7.40(1)(b). Minor edits were made to the two California Title 13 CCR definitions and definitions of "Disadvantaged Community" and "Low Income Community" (both used in the definition of "Community-based Clean Mobility Program"), were added to 310 CMR 7.40(1)(b) to ensure the environmental justice programs can be created and implemented in Massachusetts in a manner consistent with how Massachusetts defines environmental justice populations. In addition, definitions of "Environmental Justice Population" (used in the definition of "Disadvantaged Community") and "Neighborhood" (used in the definition of "Environmental Justice Population") were added to 310 CMR 7.00 Definitions.
- 310 CMR 7.40(5)(e) and (f) were renumbered to 310 CMR 7.40(5)(a) and (b), with the requirement that warranty and recall reporting be submitted electronically consolidated in renumbered 310 CMR 7.40(5)(e) (formerly 310 CMR 7.40(5)(k)).
- Language was added to 310 CMR 7.40(2)(a), (b) and (d) to clarify what entities and what actions by those entities are subject to the regulation.
- Out-dated and obsolete provisions 310 CMR 7.40(2)(a)1.-4., 6., 7., and 9., (5)(j)1.-3., (10) to (12), (13)(a) and (b) and (14), and (15) were deleted, and therefore 310 CMR 7.40(16) was renumbered to 310 CMR 7.40(10).
- In 310 CMR 7.40(2)(a)5., 8. and 10., (5)(a)-(d), (g), (j)4., (7)f., (13)(a) and (c), text similar to California regulatory text already incorporated by reference in 310 CMR 7.40 was deleted to streamline the regulation and ensure consistency with California's regulations. MassDEP did not add language to replace these sections as it is relying on language in the Title 13 CCR sections adopted and amended by MassDEP.
- 310 CMR 7.40(7)(g) was added to be transparent about what triggers enforcement for failure to meet the ZEV requirement in ACC II, which is similar to ACC I.
- Throughout 310 CMR 7.40, edits were made for internal consistency.

In addition, MassDEP is correcting an error. On December 30, 2021, MassDEP filed emergency regulation amendments to 310 CMR 7.40 *Low Emission Vehicle Program* that adopted California's Advanced Clean Trucks (ACT) regulation for medium- and heavy-duty (MHD) vehicles, Phase 2 Greenhouse Gas (GHG) regulation for MHD engines and vehicles, and Heavy-duty Omnibus regulation for heavy-duty engines and vehicles. On March 25, 2022, MassDEP filed a Notice of Compliance with the Secretary of the Commonwealth that made the December 30, 2021 emergency regulation amendments to 310 CMR 7.40 permanent. In the amendments MassDEP inadvertently updated the effective date of Title 13 CCR § 2222 *Add-on Parts and Modified Parts*. Since this regulation change was unintentional, MassDEP is restoring the effective date of Title 13 CCR § 2222 *Add-on Parts and Modified* to August 16, 1990, in the current emergency regulations adopting ACC II. MassDEP may consider updating Title 13 CCR § 2222 in a future rulemaking.

IV. IMPACTS OF AMENDMENTS

1. Emissions Reductions and Health Benefits

Air quality in Massachusetts currently meets all National Ambient Air Quality Standards (NAAQS). Although significant progress has been made in addressing air pollution, Massachusetts is required to maintain attainment with the NAAQS. The 310 CMR 7.40 amendments will help further reduce air pollutant emissions.

Implementation of ACC II for LDVs and MDVs will result in a substantial reduction in air pollution and CO_2 emissions in Massachusetts and will help the Commonwealth meet its air quality and climate goals. The regulations are expected to result in significant NOx, $PM_{2.5}$, volatile organic compound (VOC), and GHG emission reductions due to replacing older internal combustion powered vehicles with cleaner and zero-emission vehicles. In support of MassDEP's amendments, an analysis of program benefits was conducted by Sonoma Technology, Inc. (STI), with technical input on data and methods from the International Council on Clean Transportation (ICCT) and NESCAUM. The overall analysis approach is summarized below:

a) Baseline emissions modeling using EPA's MOVES3 model was conducted. MOVES was run at the County scale for the representative counties in Massachusetts used in EPA's National Emissions Inventory (NEI). MOVES input data and growth rates relevant to the analysis were provided by MassDEP, and these were used along with NEI input data. Emissions modeling was conducted for a 2017 base year, 2030, and 2040. Results for the representative counties were scaled to the statewide level using apportionment factors developed for the NEI.
b) The baseline MOVES output was adjusted in post-processing to account for the benefits of ACC II. The adjustment factors for NO_x, $PM_{2.5}$, VOCs and CO_2 were developed using baseline and ACC II rule emissions inventories provided by CARB. Adjustment factors for sulfur dioxide (SO_2) and ammonia (NH_3) were calculated from the in-use ZEV fractions resulting from the rule. The adjustments used in the health benefits analysis (below) assume that the program starts with model year 2026.
c) The in-use ZEV fractions were used to calculate ZEV electricity consumption, and emissions factors from the U.S. Department of Energy's GREET 2021 model, modified for Massachusetts electricity supply, were used to calculate grid emissions associated with ZEVs. In turn, the changes in LDV energy consumption and GREET CO_2e emissions were used to calculate net (well-to-wheel, or WTW) CO_2e emissions.
d) Projections of light-duty ZEV population over time were generated using Massachusetts' current in-use ZEV population, and CARB estimates of in-use ZEV increases due to the rule.
e) EPA's COBRA model was used to estimate the economic value of health benefits associated with implementation of the ACC II program in Massachusetts.

Table 1 summarizes the emissions benefits of adopting ACC II compared to a Business-as-Usual scenario based on MOVES3 output and current Massachusetts ZEV impacts. Cumulative reductions are provided for 2030, 2035 and 2040.

Table 1: Cumulative ACC II Emissions Benefits Compared to the Business-as-Usual Scenario, 2025-2040 (Model Year 2026 implementation)

	NOx	$PM_{2.5}$	WTW CO_2e
By 2030	855 US tons	74 US tons	8.6 million metric tons
By 2035	3,606 US tons	339 US tons	40.6 million metric tons
By 2040	8,551 US tons	770 US tons	94.6 million metric tons

The annual health benefits of Massachusetts' adoption of ACC II were estimated with COBRA. COBRA estimates the change in number of cases and their economic values for $PM_{2.5}$- and NOx-associated health effects from avoided premature deaths, avoided hospitalizations for cardiovascular and respiratory illnesses, and avoided emergency room visits in Massachusetts. The aggregated economic values combining all health effects are summarized in Table 2. In general, adopting ACC II reduces on-road mobile source emissions but would increase electric generation emissions. The net benefit of these emission changes in Massachusetts is $71.4 million dollars.

Table 2: Annual COBRA-estimated economic values of Massachusetts adopting ACC II

Analysis Year	Total NO_x Reduction	Total $PM_{2.5}$ Reduction	In-State Benefit**	Out-Of-State Benefit**	In-State Burden***	Out-Of-State Burden***	Net Benefit****
	TPY*		US $Million				
2040	1,169	94	58.1	23.9	-7.4	-3.2	71.4

* Emissions reduction in tons per year
** The benefit of reduced on-road emissions
*** The burden of increased electric generation emissions
**** The sum of in-state and out-of-state benefits and burdens

2. Economic Impacts

The standards under the ACC II regulations are expected to increase some costs to manufacture new vehicles; however, many of the technologies available to manufacturers to meet the standards also are expected to reduce fuel costs for consumers, among other benefits. While it is expected that much of the increased costs to manufacturers will be passed on to consumers, the overall direct cost savings to consumers from the use of the vehicles will be significant because of the fuel cost, maintenance, and longevity improvements. The useful life and battery warranty provisions require manufacturers to produce more durable components that will result in less vehicle downtime, savings on operation costs, and limiting or even eliminating out-of-pocket costs for vehicle repairs during the vehicle warranty period. The regulations also will result in indirect benefits such as improved health and quality of life, as well as reduced greenhouse gas emissions contributing to climate change.

Like individual consumers, businesses that purchase ACC II-compliant vehicles also are expected to see net savings over the vehicle's lifetime. Although the vehicle may cost more than its ICEV counterpart in the early years of the regulation, businesses, especially those with high mileage needs, likely will recoup the higher initial cost over the vehicle's lifetime.

For MY 2026 and MY 2035, CARB estimated incremental operation and ownership costs of a ZEV or PHEV (e.g., installing electric vehicles supply equipment, fuel, maintenance, registration, insurance, etc.) compared to an ICEV over a ten-year period and combined them with the incremental initial vehicle price to calculate the total cost of ownership (TCO) for consumers. Table 3 below shows the TCO over 10 years for an individual ZEV and PHEV buyer for MY 2026. Consumers purchasing BEVs experience initial annual savings (as compared to purchasing an ICEV) within one year of purchase. It is important to note that CARB's TCO analysis does not incorporate financial incentives because of the uncertainty of incentive availability during the time period of the regulation. To the extent that federal, state, local, utility, or other incentives are available, the savings would occur even sooner for BEVs, and would improve the TOC for PHEVs and FCEVs.

Table 3: Total cost of ownership over 10 years for individual ZEV and PHEV buyer compared to baseline ICEV, 2026 MY Passenger Car in Single-Family Home (SFH)*

	BEV (300-mile range)		**FCEV**	**PHEV**
	With home charger	No home charge		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 incremental vehicle 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. Source: Initial Statement of Reasons for Rulemaking, Air Resources Board, April 12, 2022, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/isor.pdf Table VI-6 p. 144.

CARB also estimated the average industry incremental costs of the ACC II regulations, as listed in Table 4. These costs include compliance with the ZEV Regulation, ZEV assurance measures, and LEV regulations.

Table 4: Average Incremental Costs under ACC II (2020 Dollars)

MY	Average Incremental Cost
2026	$440
2027	$563
2028	$661
2029	$819
2030	$1,092
2031	$1,181
2032	$1,161
2033	$1,129
2034	$1,075
2035	$1,119

Source: Final Statement of Reasons for Rulemaking, Air Resources Board, October 24, 2022, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/fsorappf.pdf Table VI-I p. 14.

3. Impacts on Massachusetts Municipalities

Pursuant to Executive Order 145, state agencies must assess the fiscal impact of new regulations on the Commonwealth's municipalities. Since the LEV program is primarily directed toward manufacturers, municipal facilities will be affected by the changes to 310 CMR 7.40 in the same manner as other consumers. While municipalities may see some initial increased costs for vehicles they purchase, those costs will be offset by savings in fuel costs and lower maintenance costs.

4. Massachusetts Environmental Policy Act (MEPA)

Pursuant to 301 CMR 11.03(12) (Massachusetts Environmental Policy Act Regulations), MassDEP is not required to file an Environmental Notification Form (ENF) regarding the amendments because the amendments do not reduce standards for environmental protection, nor do they reduce opportunities for public participation in review processes or public access to information generated or provided in accordance with the regulations.

V. PUBLIC HEARING AND COMMENT

After an emergency regulation is filed with the Massachusetts Secretary of the Commonwealth, in order for that regulation to remain in effect, M.G.L. c. 30A, § 2 requires MassDEP to complete the public process (i.e., the opportunity to review background and technical information for at least 21 days prior to a public hearing) be completed within three months, including filing the permanent regulation if the public comment and hearing process result in changes to the emergency regulation. MassDEP has provided notice at least 30 days in advance of the public hearings as required under federal regulations. The public hearings will be held on January 30, 2023. MassDEP will accept written comments until February 9, 2023. The public hearing notice and amendments are available on MassDEP's website at: https://www.mass.gov/service-details/massdep-public-hearings-comment-opportunities. For further information, please contact Ngoc Hoang at ngoc.hoang@mass.gov.