June 16, 2023

The Honorable Michael Regan, Administrator
U.S. Environmental Protection Agency
Air and Radiation Docket and Information Center
EPA Docket Center, EPA WJC West Building
1301 Constitution Avenue, NW Room 3334
Washington, DC 20004
Attention: Docket ID No. EPA-HQ-OAR-2022-0985

Re: Proposed Rule – Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3

Dear Administrator Regan:

The Northeast States for Coordinated Air Use Management (NESCAUM) and the Ozone Transport Commission (OTC) are submitting comments to the U.S. Environmental Protection Agency (EPA) in response to its request for comment on the Notice of Proposed Rulemaking (NPRM) entitled *Proposed Rule – Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3* [(88 Fed. Reg. 25926 (April 27, 2023)].

NESCAUM is the regional association of state air pollution control agencies in New England, New Jersey, and New York. Our member agencies have the primary responsibility in their states for implementing clean air programs that achieve the public health and environmental protection goals of the federal Clean Air Act and state climate laws. Most of our member states are signatories to the Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding (MHD ZEV MOU), a collaboration of 19 jurisdictions committed to fostering a self-sustaining market for zero-emission trucks and buses.[1]

Congress created the OTC in Section 184(a) of the Clean Air Act (CAA) to advise the EPA on ozone transport issues and to address ground-level ozone problems in the Northeast and Mid-Atlantic regions.[2] In addressing their collective regional ozone problem, the OTC members are responsible for developing and implementing initiatives to reduce nitrogen oxides (NOx) and

[1] Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding, July 2020, https://www.nescaum.org/documents/mhdv-zev-mou-20220329.pdf.
[2] The OTC jurisdictions are: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia. NESCAUM is under contract to the OTC to manage its activities.

volatile organic compounds (VOCs), the emitted precursor air pollutants that contribute to the formation of ground-level ozone pollution.

NESCAUM and OTC strongly support EPA's initiative to develop Phase 3 heavy-duty vehicle (HDV) greenhouse gas (GHG) emissions standards. The proposed standards, when implemented, have the potential to substantially reduce HDV emissions of GHGs, NOx, VOCs, fine particulate matter ($PM_{2.5}$), and air toxics.[3]

The Need for GHG and Criteria Air Pollutant Reductions from Heavy-Duty Vehicles

Earth's climate is changing faster than it has at any point in the history of modern civilization, driven primarily by GHG emissions from human activities. The impacts—including more frequent and intense precipitation and wind events, flooding, heat waves, drought, wildfires, retreating snow and ice packs, ocean warming and acidification, accelerating sea level rise, and large-scale biodiversity loss—are being felt by communities across the globe and will worsen in coming years. Because GHGs can persist in the atmosphere for decades to centuries, the degree to which these impacts will worsen depends on how deeply and rapidly humanity can decarbonize all economic sectors.[4] The transportation of freight and people is the largest source of GHGs in the United States.

In addition to being a major contributor to GHG emissions, on-road diesel vehicles, including HDVs, are the third largest NOx emissions source in the Northeast and Mid-Atlantic[5] and contribute the majority of on-road tailpipe-related $PM_{2.5}$ emissions. They also emit air toxics such as formaldehyde and acetaldehyde. Though emission control devices including particulate filters and selective catalytic reduction can be used to reduce emissions, these technologies cannot eliminate emissions. And, efforts to reduce NOx and direct $PM_{2.5}$ may lead to other emissions such as ammonia, additional GHGs, or the creation of additional particulates through secondary processes.[6]

The NESCAUM and OTC regions include the New York City (NYC) Combined Statistical Area (CSA) – the largest CSA in the United States by population – with over 20 million people living across portions of Connecticut, New Jersey, New York, and Pennsylvania. The NYC metropolitan area and surrounding regions continue to persistently exceed federal health-based air quality standards for ground-level ozone. The chronically persistent high ozone concentrations compromise the health and welfare of the individuals living in the NYC CSA and elsewhere in the region.

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[3] U.S. EPA, "Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3," Draft Regulatory Impact Analysis, April 27, 2023, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10178RN.pdf, p. 328. According to EPA's RIA, implementation of the proposed standards will reduce HDV CO_2 30%, NOx by 28%, $PM_{2.5}$ by 39%, VOC by 37%, formaldehyde by 31%, and 1,3-butadiene by 51% by 2055.

[4] Intergovernmental Panel on Climate Change (IPCC), AR6 Synthesis Report, Climate Change 2023, https://www.ipcc.ch/report/ar6/syr/.

[5] National Emissions Inventory Collaborative (2019). 2016v1 Emissions Modeling Platform. Retrieved from http://views.cira.colostate.edu/wiki/wiki/10202.

[6] Kuternowski, F.; Staszak, M.; Staszak, K. "Modeling of Urea Decomposition in Selective Catalytic Reduction (SCR) for Systems of Diesel Exhaust Gases Aftertreatment by Finite Volume Method," *Catalysts*, 10:749 (2020). DOI: 10.3390/catal10070749, https://www.mdpi.com/2073-4344/10/7/749.

Epidemiological studies provide strong evidence that exposure to ground-level ozone is associated with respiratory effects, including increased asthma attacks, as well as increased hospital admissions and emergency department visits for people suffering from respiratory diseases. Ozone can cause chronic obstructive pulmonary disease (COPD), and long-term exposure may result in permanent lung damage, such as abnormal lung development in children. There is also consistent evidence that short-term exposure to ozone increases risk of death from respiratory causes.[7]

While ozone is largely a summertime issue in the Northeast, NOx emissions are a year-round problem. NOx emissions contribute to acid deposition, eutrophication, and visibility impairment in the NESCAUM and OTC regions. During colder seasons, NOx emissions play a role in producing secondary $PM_{2.5}$ through the formation of nitrates.

Both tailpipe and secondary $PM_{2.5}$ exposure from HDVs is associated with a variety of health effects, including reduced lung function, irregular heartbeat, asthma attacks, heart attacks, and premature death in people with heart or lung disease.[8] Low-income communities and communities of color are often located near trucking corridors, ports, fleet garages, warehouses, and other trucking hubs. Consequently, these communities are affected by disproportionate amounts of diesel exhaust emissions and worsened health burdens due to poor air quality in US cities.[9,10] Health and economic impacts include increases in asthma and other respiratory illnesses, especially in children and older adults, leading to additional trips to doctors and emergency rooms, missed days of school and work, and thousands of premature deaths each year.

Truck ton-miles are projected to grow by approximately 30 percent over the next 25 years (Figure 1). This growth in activity, if not counteracted by increased stringency of new emission standards, will result in significantly increased HDV emissions. We also note that highway trucks often travel long distances and can be registered in states far from where they operate. Therefore, a strong national program is needed to reduce highway truck emissions and maximize public health benefits in our regions and nationally.

[7] U.S. EPA, "Health Effects of Ozone Pollution," last updated May 24, 2023, https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution (accessed June 2, 2023).
[8] U.S. EPA, "Health and Environmental Effects of Particulate Matter (PM)," last updated August 30, 2022, https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm (accessed June 2, 2023).
[9] Demetillo, M.A.G.; Harkins, C.; McDonald, B.C.; Chodrow, P.S.; Sun, K.; Pusede, S. E. "Space-Based Observational Constraints on NO_2 Air Pollution Inequality From Diesel Traffic in Major US Cities," *Geophys. Res. Lett.* 48: e2021GL094333 (2021). DOI: 10.1029/2021GL094333, https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021GL094333.
[10] Hunter Kerr, G.; Goldberg, D.L.; Anenberg, S.C. "COVID-19 pandemic reveals persistent disparities in nitrogen dioxide pollution," *PNAS* 118(30): e2022409118 (2021). DOI: 10.1073/pnas.2022409118, https://www.pnas.org/doi/suppl/10.1073/pnas.2022409118.

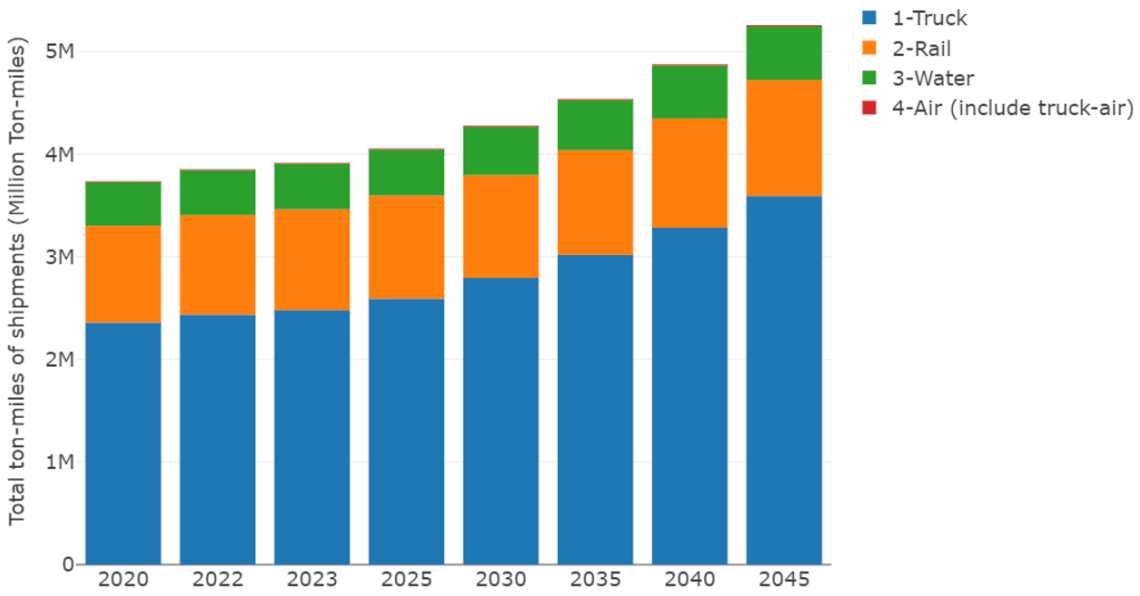

Figure 1: U.S. freight growth projections from 2020 to 2045. Source: Freight Analysis Framework Data Tabulation Tool.[11]

Efforts to Advance the Adoption of Zero-Emission Trucks and Buses

Due to the substantial contribution of heavy-duty vehicles to the region's air pollution, in 2020 NESCAUM coordinated the signing of the MHD ZEV MOU through the Multi-state ZEV Task Force. Pursuant to the MHD ZEV MOU, 17 states, the District of Columbia, and the Canadian province of Quebec are working collaboratively to accelerate electrification of MHD trucks and buses to eliminate harmful emissions from these vehicles. Their collective goal is to ensure that 100 percent of all new truck and bus sales are ZEVs by no later than 2050, with an interim target of at least 30 percent by 2030. To provide a framework for meeting these goals, the participating jurisdictions working through the Multi-State ZEV Task Force published a MHD ZEV Action Plan.[12] The Action Plan recommends strategies for state policymakers and key partners to support the rapid, equitable, and widespread deployment of MHD ZEVs. The strategies include sales and fleet purchase requirements, vehicle and infrastructure purchase incentives, electric utility and utility regulator actions, innovative financing mechanisms, outreach and education, economic equity and workforce development, community air monitoring, long-haul and community infrastructure planning and deployment, and areas for ongoing research and evaluation. Examples of the ongoing work to spur MHD ZEV adoption are provided below.

[11] Oak Ridge National Laboratory, Center for Transportation Analysis, "Freight Analysis Framework Data Tabulation Tool (FAF4)."
[12] ZEV Task Force, "Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Action Plan," July 2022, https://www.nescaum.org/documents/multi-state-medium-and-heavy-duty-zev-action-plan.pdf.

Utility Planning for Heavy-Duty Vehicle Charging Infrastructure

Utilities in MHD ZEV MOU signatory states have approved or filed over $2 billion in funding for medium- and heavy-duty vehicle infrastructure.[13] In addition, over $4 billion has been approved and filed for chargers intended for transportation electrification, some of which could be applicable to medium- and heavy-duty vehicle charging infrastructure. There are several examples of utilities planning to assess the extent of medium- and heavy-duty charging infrastructure that will be needed to fuel electric trucks and buses.

On the East Coast, National Grid has initiated analysis and planning to support investments in MHD charging infrastructure. The utility's Electric Highway Study projected power demand growth across 71 highway charging sites in New York and Massachusetts.[14] A companion Electric Fleets study examined grid capacity needed to support electrification of fleets.[15]

On the West Coast, nine utilities and two agencies representing over two dozen municipal utilities are collaborating to accelerate development of corridor charging facilities for trucks along the Interstate 5 (I-5) corridor between the Mexico and Canada borders. The utilities recognize that early and coordinated investments are needed to build out a robust and seamless charging network. An initial report issued in 2020 proposes a phased approach to developing 27 multi-station charging sites along the 1,300-mile I-5 corridor at 50-mile intervals, and 41 sites on other major connecting highways, with stations designed to serve medium-duty trucks in the first phase and tractor trailers in the second phase. The report highlights the need for additional electric grid capacity to support interconnections in rural areas and recommends standardization of charging equipment.[16] Building on the West Coast study, utilities are conducting grid readiness assessments to prepare for corridor infrastructure installations and upgrades of 3.5 megawatts or greater.

In addition, three West Coast states are collaborating on a large-scale application to the Federal Highway Administration's Charging and Fueling Infrastructure Grant Program for funding to develop charging sites for MHD vehicles.

Another planning effort was commissioned by the West Coast Collaborative Alternative Fuel Infrastructure Corridor Coalition. The planning process involved broad stakeholder engagement that included utilities, such as Pacific Gas and Electric Company, and fleets. The plan recommends 62 projects to deploy MHD charging, including their proposed locations and the number of vehicles that charging stations should serve.[17]

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[13] Atlas Public Policy, Electric Utility Filings, Atlas Public Policy EV Hub, https://www.atlasevhub.com/materials/electric-utility-filings/.
[14] National Grid, CALSTART, RMI, Stable, GEOTABits, "Electric Highways: Accelerating and Optimizing Fast-Charging Deployment for Carbon-Free Transportation," November 2022, https://www.nationalgrid.com/document/148616/download.
[15] National Grid, Hitachi Energy, "The Road to Transportation Decarbonization: Understanding Grid Impacts of Electric Fleets," The Road to Transportation Decarbonization: Understanding Grid Impacts of Electric Fleets (nationalgridus.com).
[16] West Coast Clean Transit Initiative, "Interstate 5 Corridor Final Report," June 2020, https://westcoastcleantransit.com/.
[17] West Coast Collaborative, "AFICC Medium and Heavy-Duty Alternative Fuel Infrastructure Strategic Development Plan," March 2020, https://www.westcoastcollaborative.org/workgroup/wkgrp-fuels.htm#plan, (*see* Proposal Listings by Site beginning on page 87).

These initiatives have laid the foundation for a much broader planning effort on the East Coast with involvement from utilities. U.S. Department of Energy grants awarded in November 2022 are funding two projects to assess charging infrastructure needs for electrified freight transport from Canada to Florida and in port areas, and to begin identifying specific projects and sites. National Grid is leading a project focused on freight transport in the Northeast, and CALSTART is simultaneously leading a project focused on freight transport in the Mid-Atlantic and South. Both projects include strategies for involving state governments and utilities in study design and in the development of actionable roadmaps that will recommend specific sites for near term deployment of MHD charging stations. There is some overlap in participating partners, and the two projects will coordinate with each other.

The programs and initiatives described above will facilitate the development of corridor and depot charging. Importantly, the establishment of charging networks along highway corridors will allow for tractor opportunity charging.

A recent study by Synapse evaluated the costs of utility distribution upgrades and make ready programs to meet New York State's MHD electrification goal of 100% MHD ZEV by 2045.[18] It found that the costs of make ready and distribution system upgrades are unlikely to cause ratepayer bills to increase. This was due to investments realizing a positive net present value at two assumed discount rates.

In addition to the utility-related planning efforts, examples of other heavy-duty infrastructure initiatives in the MHD ZEV MOU signatory jurisdictions are listed below:

- In April 2023, New York's Governor Kathy Hochul announced a Public Service Commission (PSC) proceeding to implement policies and programs related to medium- and heavy-duty charging infrastructure planning (Case 233-E-0070).
- In 2020, the New York PSC approved $701 million (Case 18-E-0138) to support the development of electric infrastructure and equipment necessary to accommodate an increased deployment of electric vehicles (EVs) within New York State by reducing the upfront costs of building charging stations for EVs.
- New York State PSC Case 18-E-0138 authorizes $15 million dedicated to medium- and heavy-duty Make-Ready funding, $10 million dedicated to transit Make-Ready, and $85 million in Clean Transportation Prizes. The order requires applicable utilities to provide fleet assessment services to aide fleet owners with site feasibility and rate analysis and access to load capacity service maps.
- The New Jersey Board of Public Utilities authorized the Medium- and Heavy-Duty Electric Vehicle Charging Program in 2022, using funds from the Regional Greenhouse Gas Initiative.[19] The program provides incentives to support the purchase of eligible direct-current fast charging (DCFC) equipment.

[18] Metz, L.; Whited, M.; Rhodes, P.; Carlson, E. "Distribution System Investments to Enable Medium- and Heavy-Duty Vehicle Electrification, A Case Study for New York," Synapse, April 2023.
[19] State of New Jersey Board of Public Utilities, "Medium- and Heavy-Duty Electric Vehicle Charging Program," October 2022, https://njcleanenergy.com/files/file/EV/RGGI_MHD_Application_Final_1_12.pdf.

- The Massachusetts Department of Public Utilities filing 21-90 approves funding for MHD charging stations. NSTAR electric will administer the fleet pilot to support charging infrastructure for fleets serving environmental justice communities.
- In Colorado, the Clean Fleet Enterprise, Community Access Enterprise, and Clean Transit Enterprise provide over $700 million for zero emission fleet vehicles and infrastructure for zero emission vehicles, including MHD vehicles. Colorado is also finalizing an MHD charging infrastructure study that will identify the number, type, cost, and locations of needed MHD charging stations through 2030.
- California's PUC R18-12-006 is a 5-year, $1 billion statewide transportation electrification program for 2025-2029, with 70% of funds going toward customer-side (behind the meter) rebates for EV infrastructure investments for MHD vehicles. This is just one example of numerous programs in California.
- NYS PSC Case 22-E-0236 aims to improve the economics of DCFC stations through a commercial managed charging program and an EV phase-in rate that blends in demand charges with a time-of-use rate as the charging station's load factor increases. As an immediate solution, utilities will develop a 50% demand charge rebate for all commercial EV charging use cases upstate and fast charging downstate.[20]
- NYS PSC Case 23-E-0070 is an ongoing proceeding to "Address Barriers to Medium- and Heavy-Duty Electric Vehicle Charging Infrastructure." The proceeding will initiate a process for proactive investment in the utility infrastructure required to serve transportation electrification, prioritizing MHD charging infrastructure investments in disadvantaged communities.
- In Nevada, over $100 million has been approved for MHD fleet and corridor charging programs and transit and school bus electrification.
- Massachusetts' Electric Vehicle Incentive Program (MASSEVIP) helps fleet owners acquire EV charging stations and covers up to $50,000 per street address to install charging stations for fleets.

State and Private Sector Planning for Heavy-Duty ZEVs and Charging Infrastructure

The preceding section features just a sample of efforts that are underway to establish charging infrastructure for medium- and heavy-duty vehicles. In addition to charging infrastructure planning and investments, states in the Northeast and Mid-Atlantic regions have established purchase incentives for MHD ZEVs and requirements for fleets to transition to ZEVs. Examples of these programs are below:

- New York State's Truck Voucher Incentive Program provides vouchers or discounts to fleets across New York State that purchase or lease medium- and heavy-duty zero emission vehicles. Voucher incentive amounts differ by vehicle type, vehicle weight class, and location where the vehicle is domiciled.
- New Jersey exempts new and used electric MHD vehicles from state sales tax.

[20] New York State Department of Public Service, "Proceeding to Establish Alternatives to Traditional Demand-Based Rate Structures for Commercial Electric Vehicle Charging," Matter Master: 22-00836/22-E-0236 (Case Number 22-E-0236), NYSDPS-DMM: Matter Master.

- The Massachusetts MOR-EV for Trucks program provides rebates ranging from $5,500 to $90,000 for companies purchasing qualified electric heavy-duty vehicles.
- In New York State, Executive Order 22 requires applicable New York State agencies, departments, and public authorities to convert their medium- and heavy-duty vehicle fleets to ZEVs by 2040.[21]
- New York State passed a law requiring 100% of MHD vehicle sales to be ZEV by 2045.[22]

In addition to the above examples of state programs to accelerate the transition to medium- and heavy-duty zero-emitting vehicles, some notable examples of private sector investments to deploy infrastructure development are provided below:

- Daimler Trucks NextEra Energy Resources, and BlackRock Renewable Power announced a $650 million joint venture to develop a nationwide charging network for battery electric and fuel cell commercial vehicles.[23] In addition, Daimler Trucks partnered with Portland General Electric (PGE) and Electric Vehicle Station Providers to develop a public truck charging site at Swan Island in Portland.
- The Volvo Low-Impact Green Heavy Transport Solutions (LIGHTS) Project in Southern California led by the South Coast Air Quality Management District and Volvo Group North America brought together 14 diverse partners—private fleets, government agencies, ports, community colleges, equipment suppliers, a utility, and others—to develop and test a model for successful deployment of class 8 battery-electric trucks. The $90 million project was funded by California Climate Investments. It deployed 58 chargers, and local site solar power generation.

NESCAUM and OTC Recommendations

Strong federal action to reduce GHGs and criteria air pollutants from the nation's fleet of HDVs is essential to achieve the public health and air quality goals of the states and to allow the nation to achieve its climate goals. Given this, NESCAUM and OTC support EPA's proposal for the Phase 3 regulation. We offer the following suggestions on approaches to strengthen the proposed regulation.

Summary of NESCAUM and OTC comments on the NPRM:

- Finalize more stringent tractor and vocational vehicle CO_2 standards that align with the requirements of the California Air Resources Board (ARB) Advanced Clean Trucks (ACT) regulation for model years (MYs) 2027 through 2035;[24]

[21] New York State, "No. 22: Leading by Example: Directing State Agencies to Adopt a Sustainability and Decarbonization Program," September 20, 2022, https://www.governor.ny.gov/executive-order/no-22-leading-example-directing-state-agencies-adopt-sustainability-and.
[22] New York Consolidated Laws § 19-0306-b (2022).
[23] Daimler Truck Global Media Site, January 31, 2022, https://media.daimlertruck.com/marsMediaSite/en/instance/ko/Daimler-Truck-North-America-NextEra-Energy-Resources-and-BlackRock-Renewable-Power-Announce-Plans-To-Accelerate-Public-Charging-Infrastructure-For-Commercial-Vehicles-Across-The-US.xhtml?oid=51874160.
[24] California Air Resources Board, Advanced Clean Trucks Regulation, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2019/act2019/fro2.pdf.

- Increase the stringency of CO_2 standards for urban buses, school buses, concrete mixers, and refuse hauling trucks;
- Eliminate Averaging Banking and Trading (ABT) of CO_2 credits between tractors and vocational vehicles in the final rule and retain the current definition for the U.S.-Directed Production Volume;
- Evaluate emissions from hydrogen (H_2) internal combustion engines more closely before finalizing the proposed standards;
- Complete migration of material from Section 1037.550 to Section 1036.545;
- Establish a sunset date for the interim standards;
- Phase out the fuel cell advanced technology credit multipliers in 2026; and
- Maintain the proposed locomotive preemption changes in the final rule.

The following sections provide our specific suggestions on EPA's proposal.

Finalize GHG Standards that Align with the Requirements of the ARB ACT Regulation

We encourage EPA to finalize HD GHG standards that align with the requirements of the ARB ACT regulation for tractors and vocational vehicles through MY 2035. In developing final HDV CO_2 standards, we encourage EPA to re-evaluate its reference case for the status of the MHD ZEV market. Eight MOU signatory states – California, Colorado, Massachusetts, New Jersey, New York, Oregon, Vermont, and Washington – have already adopted the ACT regulation. These states comprise 25% of heavy-duty vehicle registrations in the U.S. Additional states are planning to adopt the ACT regulation in 2023, which if finalized, will bring the ACT state registrations to over 30% of the nation's total HDV registrations. Other states may follow suit. As more states adopt ACT, the requirement will represent an even greater share of the national HDV market. To fully capture current ACT adoptions, EPA's reference case should be updated to include Vermont and Colorado. ARB's adoption of the Advanced Clean Fleets (ACF) regulation should also be incorporated.

In addition, the substantial initiatives outlined above to spur the market for HD ZEVs should be taken into consideration in stringency setting. As was shown from the above examples, state energy, transportation and environmental departments, utilities, private industry, counties, and municipalities are planning for public and private infrastructure to support the transition to 100% zero emission heavy-duty vehicles. Moreover, the ACT requirements that eight MHD ZEV MOU states have adopted are aligned with industry announcements. Major original equipment manufacturers (OEMs) and fleets have made public commitments to phase out internal combustion engine vehicles by 2040.[25]

Finally, as EPA notes in its NPRM, many technologies and powertrains have been demonstrated and are considered technically feasible for HD vehicles. EPA's Draft Regulatory Impact

[25] *See, e.g.*, Cary, N., Reuters, "Daimler Truck 'All In' On Green Energy as it Targets Costs," May 2021, https://www.reuters.com/business/autos-transportation/daimler-truck-all-in-green-energy-shift-targets-costs-2021-05-20/; NPR, "From Amazon to FedEx The Delivery Truck is Going Electric," March 17, 2021, https://www.npr.org/2021/03/17/976152350/from-amazon-to-fedex-the-delivery-truck-is-going-electric; Navistar, "Environmental Footprint," Environmental Footprint | Navistar®.

Analysis (DRIA) states a diverse range of technologies may be used to comply with the proposed standards to reduce GHG emissions, including internal combustion engine (ICE), hybrid, and plug-in hybrid powertrains, hydrogen ICEs, battery electric vehicles (BEVs), and fuel cell electric vehicles (FCEVs).

Given the diverse range of technologies available to reduce HDV GHGs, and the rapidly advancing HD ZEV market, we urge EPA to increase stringency of the standards in the final rule. We encourage EPA to incorporate recent actions to spur the market for HD ZEVs into its reference case for HD ZEV adoption and more fully evaluate the potential for ICE vehicle CO_2 improvements.

Tractor CO_2 Standards

Tractor trailers are responsible for 60% of total heavy-duty truck fuel consumption even though they represent only 13% of the total U.S. heavy-duty fleet.[26] Given the outsized importance of tractor-related fuel consumption and GHG emissions to overall heavy-duty vehicle GHGs, it is important that EPA establish the most stringent technically feasible standards for this category of vehicles. As shown in Figure 1, freight truck ton-miles are projected to increase in future years. Projected growth in freight ton-miles will increase the associated emissions from these vehicles. Absent the most stringent regulation of tractors, GHG emission standards will be eclipsed by tractor vehicle miles travelled (VMT) increases over time.

NESCAUM and OTC respectfully request that EPA finalize tractor CO_2 emission standards that are aligned with the ACT requirements for tractors. ARB has established an ACT tractor ZEV sales requirement by 2032 of 40%. This sales mandate exceeds the ZEV adoption rate that would be required to meet the EPA proposed standards of 48.2 grams CO_2/ton-mile (g CO_2/ton-mile) to 68.2 g/ton-mile CO_2 for class 7 and 8 low, mid, and high roof tractors in 2032.

EPA's proposed stringencies for MY 2032 tractors assume a 25% zero emission vehicle penetration rate as shown in Table IX-6 of the NPRM. The table provides ZEV technology adoption rates for short-haul and long-haul tractors in the technology packages considered for the proposed standards. The assumed ZEV adoption rates for tractors are significantly lower than the 40% tractor ZEV requirement in the ACT regulation.

ZEV tractor introduction could advance more quickly than EPA estimates in its NPRM. EPA states in the NPRM that technology adoption rates were selected based on the payback period calculated for tractors.[27] Battery sizing is an important factor in overall battery electric vehicle BEV cost, and, according to EPA, "battery sizes we used in our assessment are conservative because they could meet 100 percent of the daily operating requirement using the 90th percentile VMT at the battery end of life."[28] EPA's analysis assumes tractor batteries would be sized to meet an entire day's travel with no opportunity charging.[29] As a result, EPA estimates a battery

[26] 81 Fed. Reg. 73478 (October 25, 2016).
[27] 88 Fed. Reg. 25926 (April 27, 2023), p. 25974.
[28] *Ibid.*, p. 25977.
[29] U.S. EPA, "Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3 Draft Regulatory Impact Analysis," April 27, 2023, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10178RN.pdf.

size of 1.5 megawatt-hours (MWh) or greater is needed for some tractors, a significantly larger battery than would be needed if these tractors are charged during the day. EPA requested comment on this approach.

We note that a recent ICCT study found that with opportunity charging, a battery size of 1 MWh or smaller would be sufficient to support the duty cycles of long-haul tractors.[30] We believe the substantial investments states, utilities, and industry are making to develop MHD ZEV charging infrastructure will provide opportunity charging for tractors. Opportunity charging can extend the daily range of tractor trailers, in turn facilitating deployment of heavy-duty zero emission vehicles with smaller batteries and thus lower overall upfront costs than those assumed by EPA in its modeling for the NPRM.

We request that EPA evaluate recent analyses such as the ICCT study as well as state, utility, county, and municipality efforts to establish infrastructure and adjust assumptions about tractor battery sizing, costs, and ZEV penetration rates in the final rule.

Establish More Stringent Standards for a Subset of Vocational Vehicles

EPA requested comment on a standards structure for Phase 3 that would establish unique, mandatory, application-specific standards for some subset of heavy-duty vehicle applications. We encourage EPA to finalize more stringent application-specific g CO_2/ton-mile emission standards for urban buses, school buses, refuse haulers, and cement mixers.

- State, county, transit authority, and municipality actions are speeding the transition to electric urban buses in the U.S. Most of the largest transit fleets in the country have committed to transition to zero emission buses. New York's Metropolitan Transportation Authority (MTA) will require all new urban bus purchases to be ZEVs by 2029, with a commitment to replace its entire fleet of 5,800 buses with zero-emissions buses by 2040.[31] Five additional New York transit agencies have the goal to transition their fleets of 1,300 buses to 100% zero-emissions buses by 2035, with an interim goal of 25% zero-emission buses by 2025.[32] New Jersey requires that all new urban bus purchases be ZEVs by 2032, and Maryland requires that all new urban bus purchases be ZEV by 2023. California, Washington, Colorado, Connecticut, and Massachusetts also have requirements that urban bus fleets transition to 100% ZEVs by a specific calendar year. The District of Columbia and Chicago's transit bus fleets are transitioning to zero emissions. These jurisdictions taken together have 9 of the top 10 transit agencies by bus fleet size in the nation.[33] Additional states will likely put in place requirements for zero-

[30] Hussein B. *et al*., The International Council on Clean Transportation, "Total Cost of Ownership of Alternative Powertrain Technologies For Class 8 Long-Haul Trucks In The United States," April 2023.
[31] MTA, "Transitioning to a zero-emissions bus fleet," updated July 25, 2022, https://new.mta.info/project/zero-emission-bus-fleet.
[32] NYSERDA, Governor Cuomo Announces Initiatives to Electrify Transit Buses, Boosting Access to Clean Transportation and Building Healthier Communities, December 29, 2020, https://www.nyserda.ny.gov/About/Newsroom/2020-Announcements/2020-12-29-Governor-Cuomo-Announces-Initiatives-to-Electrify-Transit-Buses-Boosting-Access-to-Clean-Transportation-and-Building-Healthier-Communities.
[33] Federal Transit Administration, U.S. Department of Transportation, "Transit Profiles: 2020 Top 50 Reporters," September 2021, https://www.transit.dot.gov/sites/fta.dot.gov/files/2021-11/2020%20Top%2050%20Profiles%20Report_0.pdf.

emitting urban buses. Given the high percentage of the nation's urban buses that are already required to transition to zero emissions, we believe more stringent g CO_2/ton-mile standards for urban buses should be finalized. We encourage EPA to evaluate the state of the urban bus market in more detail and finalize more stringent CO_2 g/ton-mile standards for this category. For many years, urban buses were held to more stringent emission standards than other heavy-duty vehicles given they are operated in densely populated urban areas and in communities overburdened by pollution.

- Likewise, New York, California, and Michigan all have adopted mandates, and/or funding programs to convert school bus fleets to zero emissions.[34] Massachusetts, Illinois, Washington, and Hawaii all have proposed electric school bus legislation. In New York, no later than July 1, 2027, school districts and school bus contractors shall operate and maintain only zero-emissions school buses.[35] New York State's Environmental Bond Act (2022) includes $500 million for school bus electrification to help reduce zero emission school bus purchase and charger costs.[36] New Jersey in 2022 established a $45 million grant program for electric school buses to be administered by the New Jersey Department of Environmental Protection. Other states also have incentives to aid in the transition to zero emission school buses. Furthermore, EPA's Clean School Bus Program will provide $5 billion in funding between 2022 and 2026 for school buses.
- Other vehicles currently in the custom chassis category, such as refuse haulers and concrete mixers, should be required to meet significantly more stringent CO_2 standards, based on the projections for ZEV penetration for these categories of vehicles. As noted by EPA on page 240 of its RIA, ZEV sales of refuse truck and concrete mixers will reach 35% by 2032.

The Phase 2 GHG program includes optional custom chassis standards for eight specific vehicle types. Those vehicle types may either meet the primary vocational vehicle program standards or, at the vehicle manufacturer's option, they may comply with these optional standards. The existing custom chassis standards are numerically less stringent than the primary GHG Phase 2 vocational vehicle standards. Manufacturers should not have the option to certify urban buses, school buses, refuse hauling trucks, and concrete mixers to optional custom chassis standards that are weaker than the vocational category.

The Administration's Inflation Reduction Act (IRA)[37] and the bipartisan Infrastructure Investment and Jobs Act (IIJA)[38] will further accelerate the transition to a zero-emission future by supporting zero emission vehicles and charging infrastructure. Recent analysis of electric vehicle sales trends coupled with the anticipated impact of the IRA indicate the 2030 U.S.

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[34] CALSTART, "Zeroing in on Zero Emission School Buses," ZIO-ESBs-final-with-May-cover-4.28.23.pdf (calstart.org).
[35] NYS (Chapter 56 of the Laws of 2022).
[36] The New York State Senate, Section 3638, "Zero Emission School Buses," https://www.nysenate.gov/legislation/laws/EDN/3638.
[37] Public Law 117-169 "Inflation Reduction Act of 2022," August 16, 2022, https://www.congress.gov/bill/117th-congress/housebill/5376/all-info.
[38] Public Law 117-58 "Infrastructure Investment and Jobs Act," November 15, 2021, https://www.govinfo.gov/content/pkg/PLAW117publ58/pdf/PLAW-117publ58.pdf.

National Blueprint for Transportation Decarbonization[39] targets will be exceeded in 2030 without any additional regulatory actions by EPA.[40]

In summary, based on the ongoing collective state efforts, the rapid advance of electric vehicle technologies, falling costs, and significant federal funding for ZEVs and infrastructure, we believe tractor and vocational vehicle GHG standards can be and should be more ambitious. Furthermore, urban buses, school buses, refuse trucks, and concrete mixers should be required to meet more stringent, application-specific emission standards. NESCAUM and OTC are ready upon request to provide additional information to EPA on state requirements and incentives.

Interim Provisions outlined in Sections 1036.150 and 1037.150

We encourage EPA to establish sunset dates for the proposed "interim provisions" outlined in Sections 1036.150 and 1037.150. As written, the proposal does not appear to propose a sunset date for these provisions. EPA in future rulemakings should continue to establish sunset dates for interim provisions. Alternatively, if EPA finds an interim provision does not require a sunset date the agency should not consider that provision "interim" and define it accordingly within its regulations.

Missing Appendices

We support moving the requirements of 40 CFR 1037.550 for new engines to 40 CFR 1036.545 for existing and new engines. Appendix A and Appendix D, however, continue to be referenced in the new location as being part of the new section, but the appendices were not moved. We request references to the values that existed in Part 1037 or, alternatively, we request that EPA move the existing Appendices A and D from Part 1037 to Part 1036.

Hydrogen Internal Combustion Engines

Hydrogen internal combustion engines are listed as a potential technology for compliance with the GHG standards. We request that EPA further evaluate the disbenefits associated with using hydrogen-fueled ICEs. NOx emissions related to hydrogen combustion should be more fully evaluated prior to finalizing the rule. We note that with the persistent ground-level ozone problems in the Northeast Corridor and other urban areas across the country where on-road transportation emissions dominate the NOx emissions inventory, NOx emissions from hydrogen combustion in ICEs can delay progress towards achieving ozone air quality standards. In addition, hydrogen-fueled ICE vehicles will use considerably more hydrogen than FCEVs and have greater leakage potential of hydrogen within the fueling infrastructure. Because of this, there can be significant issues with hydrogen ICEs related to use of scarce resources of low carbon hydrogen and greater upstream emissions associated with the production and transport of

[39] Office of Energy Efficiency & Renewable Energy (EERE), "U.S. National Blueprint for Transportation Decarbonization: A Joint Strategy to Transform Transportation," January 2023, https://www.energy.gov/eere/us-national-blueprint-transportation-decarbonization-joint-strategy-transform-transportation.
[40] Slowik, P., *et al.*, Analyzing the Impact of the Inflation Reduction Act on Electric Vehicle Uptake in the United States, White Paper, International Council on Clean Transportation, January 31, 2023, https://theicct.org/publication/ira-impact-evs-us-jan23/.

hydrogen. We request EPA evaluate these issues prior to finalizing the rule and institute production caps for hydrogen-fueled ICEs if the issues cannot be fully evaluated.

Battery warranty

EPA's proposal includes battery durability monitoring requirements applicable to heavy-duty battery electric vehicles. The proposal, however, appears to lack similar provisions applicable to heavy-duty FCEVs. We encourage EPA to establish warranty provisions for heavy-duty FCEVs.

Advanced Technology Multipliers

We agree with EPA's proposal to remove the BEV advanced technology multiplier in MY 2026. The multiplier, if left in place, could result in significant production of credits and a dilution of the stringency of the GHG standards. We encourage EPA to remove the FCEV multiplier in 2026 as well.

Averaging Banking and Trading (ABT)

EPA requests comment on the consideration of the use of credits across averaging sets and specifically requests comment on consideration of a program similar to ARB's ACT credit program. EPA proposed to allow the transfer of CO_2 credits between class 4-6 vocational vehicles and class 7 and 8 tractors. In the ACT regulation, tractor ZEV sales cannot be offset by sales of class 4-6 vehicles. In the final rule, we encourage EPA to disallow the transfer of credits across classes 4-6 to class 7 and 8 tractors. We encourage EPA to only allow ZEV tractor sales credits to be used to offset tractor sales deficits. As stated earlier, tractor emissions make up the lion's share of heavy-duty vehicle emissions and fuel consumption. Allowing the use of credits across averaging sets could reduce the effectiveness of the regulation.

Definition of U.S.-Directed Production Volume

EPA asks for comment on its proposal to change the definition of the U.S.-Directed Production Volume in 40 CFR 1037.801 such that it represents the total nationwide production volumes, including vehicles certified to state emission standards that are different than the emission standards of 40 CFR part 1037. We request that EPA retain the definition of U.S.-Directed Production Volume as it currently is defined in 40 CFR 1037.801 so that Phase 3 GHG standards achieve benefits beyond what the standards in California and the Section 177 states achieve.

The current definition excludes vehicles certified to a state emission standard that is different from U.S. EPA's, in this case, vehicles certified to California and Section 177 state standards. The change in definition would allow inclusion of the Section 177 states' and California's MHD ZEV production volumes in the national average. Information in EPA's Draft RIA shows the agency expects nationwide vocational ZEV sales to increase from 1.1 percent in 2024 to 2.4 percent in 2026, and nationwide tractor ZEV sales to increase from 0.3 percent in 2024 to 1.0 percent in 2026. Assuming these vehicles are sold as BEVs eligible for a 4.5 advanced technology credit multiplier, these ZEV sales would provide manufacturers with a credit bank sufficient to offset a nationwide 25 percent ZEV sales requirement for vocational vehicles and nationwide 9 percent ZEV sales requirement for tractors. Given the 2027 standards for

vocational vehicles and tractors are 20 percent and 10 percent respectively, these banked credits would almost completely offset the entire 2027 MY requirements under the proposed rule. As stated previously, EPA's reference case does not include the impacts of Vermont, Colorado, or future states adopting the ACT regulation, the ACF regulation, or potential early action by manufacturers. Because of this, the amount of banked ZEV credits will likely be greater than assumed in the reference case. This sizable bank will reduce the number of ZEVs other states receive. Thus, continuing to exclude vehicles certified to a state's emission standard different from EPA's in the definition of the U.S.-Directed Production Volume is critical to avoid these negative effects.

Revision to Preemption Regulation for Locomotives

We agree with EPA that the prohibition of state locomotive regulation contained in 40 C.F.R. § 1074.12(b) exceeds the scope of preemption in CAA Section 209(e)(1)(B), and that the factual underpinnings of EPA's 1998 final rule establishing Emissions Standards for Locomotives and Locomotive Engines no longer apply. As discussed in the NPRM, locomotive emission controls have advanced significantly since 1998 and can be employed for existing locomotives without affecting the design and manufacture of new locomotives and engines. The NPRM identifies two potential examples: retrofitting an auxiliary power unit to support engine shutdown for idle reduction; and installing a load control calibration strategy to better manage load on the main engine while the locomotive is in line haul service. Moreover, given the rapid pace of technological development, it is not necessary or possible for EPA to prejudge all potential forms of state control of existing locomotives with no possibility of authorization under CAA Section 209(e)(2). Similarly, as discussed in the NPRM, there is sufficient reason to question EPA's 1998 conclusion that all the forms of state control listed in the current text in 40 C.F.R. § 1074.12(b) would necessarily affect how manufacturers and remanufacturers design new locomotives and locomotive engines.

EPA's proposal, if finalized, would provide California with greater flexibility to explore and develop a specific program to reduce emissions from locomotives, and allow EPA to evaluate a request for authorization from the state on its merits with the benefit of an administrative record. If so authorized, states would gain an important tool to help achieve and maintain the NAAQS. As such, we strongly support EPA's proposal to delete 40 C.F.R. § 1074.12(b) in its entirety and make the other procedural and housekeeping revisions discussed in the NPRM.

Updating Equations and Sample Calculations

We wish to express the importance of EPA communicating technical information clearly and effectively. As such, we suggest EPA review its existing and proposed equations and regulations to ensure that they describe technical aspects in clear and fully descriptive language and are accessible to all readers. This includes adding units to substituted values within sample calculations, checking variable names and descriptions in equations for typos, numbering non-numbered equations, and reformatting equations for legibility and scale uniformity. Making these changes will ensure the regulations will be easier to understand for all readers.

We appreciate the opportunity to provide these comments and look forward to working with EPA in the rule development process.

Sincerely,

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Paul E. Farrell
Chair, OTC Mobile Sources Committee
Acting Bureau Chief, CT DEEP

cc: NESCAUM and OTC Directors
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