Before the:

U.S. Environmental Protection Agency
Docket No. EPA-HQ-OAR-2022-0985

Comments of the:
AMERICAN TRUCKING ASSOCIATIONS

On the:

Greenhouse Gas Emission Standards for Heavy-Duty Vehicles; Phase 3 Proposed Rule
(*Federal Register*, April 27, 2023, Pg. 25926)

June 16, 2023

Introduction

The American Trucking Associations (ATA) appreciates the opportunity to comment on the U.S. Environmental Protection Agency's (EPA) Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles-Phase 3 "Phase 3" Proposed Regulation that was published in the Federal Register on April 27, 2023. ATA advocates for technology that supports the trucking industry's efforts to achieve better fuel efficiency, deliver operational savings and reduce the industry's carbon emissions.

ATA is a 90-year-old federation and the largest national trade organization representing the 7.65 million men and women working in trucking-related jobs. ATA membership includes motor carriers, state trucking associations, and national trucking conferences created to promote and protect the interest of the trucking industry. ATA's direct membership includes approximately 1,800 trucking companies ranging from less-than-truckload (LTL) to truckload (TL), refrigerated transport, intermodal trucking, auto haulage, and household goods movement and industry suppliers of equipment and services; and in conjunction with its 50 state affiliated trucking organizations, it represents 30,000 motor carriers. Our members range from the nation's largest motor carriers to small one-truck operations.

The trucking industry is diverse due to different sizes of operations, business structures, vehicle duty-cycles, vehicle applications, and investment cycles. To support the diversity of operations in the industry, a variety of vehicle applications, ranging from Class 3 to 8 with their own specific performance requirements, are used to support goods movement throughout the country. EPA has recognized this diversity and followed long lead times for emissions regulations, further engaging in stakeholder technical data-sharing to prove emissions reduction technologies work.

Unfortunately, EPA's proposed rule is working on an expedited regulatory timeline with a mandate to finalize a regulation by the end of the year.[1] Given a rule of this economic impact and technology forcing adoption on the proposed timelines, ATA and the American Truck Dealers submitted a request for a modest 45-day extension on May 26, 2023.[2] EPA's 50 days for comment did not allow enough time to read this complex rule and supporting materials, schedule technical conversations with fleets, and complete impact studies.

As the national representative of the trucking industry, ATA regularly comments on matters affecting the trucking industry and impacts on its operations. In the past, ATA has collaborated and provided technical guidance to EPA's Heavy-Duty Greenhouse Gas Phase 1 and 2 rules. This rulemaking is no different in that ATA has surveyed its members to understand their experiences and learnings from their operation of zero-emission vehicles (ZEVs), their strategies and concerns with ZEVs, and the opportunities and limitations they experience. While the stringency requirements proposed in Phase 3 are not specifically directed at trucking fleets,

[1] U.S. Office of Management and Budget, Office of Information and Regulatory Affairs, *Unified Agenda, Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles-Phase 3*, Spring 2023.
[2] Goffman, Joseph, *Denial of 45-day extension of comment period for EPA-HQ-OAR-2022-0985*, June 7, 2023.

purchasing new trucks will be the key driver of this rule's expected emissions reductions. The success of the proposed regulation depends on ZEVs meeting fleets' need for reliable performance through a vehicle's useful life with a reasonable return-on-investment (ROI).

The consistent message that ATA hears from fleets on ZEVs is that they are in the early stages of learning the technology. Today's ZEVs require significant pre-planning before operations can begin, the expected operational savings are not currently being realized, and the technology in certain applications is further off for cost parity with diesel and other drop-in fuels. Fleets remain optimistic about the promise of these technologies. Still, they are facing hurdles with infrastructure delays, high upfront costs, and proof of performance, depending on the operation and duty cycle.

ATA supports nationwide standards that are achievable and technology neutral. EPA's proposed Phase 3 regulation leaves fleets with the choice of battery electric or hydrogen fuel cell and ignores other readily available low-carbon fuel options using more cost-effective assets. While ATA supports reducing the industry's carbon footprint, we encourage the agency to consider the ripeness of ZEV technologies, costs of implementation, performance and include technology that can be adopted today to bridge towards a zero-emission future as it finalizes the Phase 3 regulation. ATA's comments will cover members' concerns on the following topics:

1. Opposed to Reopening GHG Phase 2
2. EPA's Phase 3 Rule Should Continue to Follow Three-year Stability
3. ZEV Technology for Many Fleets is Unproven
    a. Product availability
    b. Performance
4. The Upfront Costs of ZEVs are High and Fleets are Looking for Proof Prices Will Come Down
    a. Payback period concerns
    b. Stranded assets
    c. Higher cost for transportation
5. Infrastructure Will Be a Key Driver Towards the Adoption of ZEV Technology
    a. Grid availability
    b. Lead times are long
    c. Onsite charging is preferred
    d. Public charging will serve as a redundant power supply for fleets
    e. Hydrogen refueling
6. Workforce and Maintenance Training Needs to be Established
    a. Driver experience and learnings
    b. Technicians' new skills to service
7. ATA Recommendations

COMMENTS

1. Opposed to Reopening GHG Phase 2

ATA opposes reopening the EPA Greenhouse Gas Phase 2 rule for model years 2027 to 2030. ATA and our members opposed EPA's original proposal in the agency's proposed Heavy-Duty Low NOx regulation.[3] Reopening any final rule representing years' worth of stakeholder discussions, input, data sharing, and negotiation reverses EPA's long held position of providing lead-time and stability for the industry on new heavy-duty GHG emissions standards. Setting new emissions standards for 2027-2030 could lead to market disruptions and limited product availability. EPA's preamble under GHG Phase 2 recognized the need for long lead times to introduce new technologies into the market. ATA continues to agree with this rationale:

> "Providing additional lead time can often enable manufacturers to resolve technological challenges or to find lower cost means of meeting new regulatory standards, effectively making them more feasible in either case. See generally NRDC v. EPA, 655 F. 2d 318, 329 (D.C. Cir. 1981). On the other hand, manufacturers and/or operators may incur additional costs if regulations require them to make changes to their products with less lead time than manufacturers would normally have when bringing a new technology to the market or expanding the application of existing technologies. After developing a new technology, manufacturers typically conduct extensive field tests to ensure its durability and reliability in actual use. Standards that accelerate technology deployment can lead to manufacturers incurring additional costs to accelerate this development work or can lead to manufacturers beginning production before such testing can be completed. Some industry stakeholders have informed EPA that when manufacturers introduced new emission control technologies (primarily diesel particulate filters) in response to the 2007 heavy-duty engine standards they did not perform sufficient product development validation, which led to additional costs for operators when the technologies required repairs or resulted in other operational issues in use. Thus, the issues of costs, lead time, and reliability are intertwined for the agencies' determination of whether standards are reasonable and maximum feasible, respectively."[4]

ATA and other industry stakeholders worked with EPA in good faith to arrive at a final regulation that was stringent but achievable and defended the final rule from external political pressures. Changing GHG Phase 2 mid-stream will upend the lead-time, planning and resources necessary for manufacturers to design and validate emissions reduction technologies and that remains our concern with reopening the rule today.

Besides the policy implications, the Clean Air Act (CAA) Section 202(a)(3)(C) requires four-year lead time and three-year stability periods for new or revised heavy-duty truck emissions.

[3] U.S. Environmental Protection Agency, *Proposed Rule and Related Materials for Control Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards*, EPA-HQ-OAR-2019-0985, March 2022.
[4]U.S. Environmental Protection Agency, *Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium-Heavy-Duty Engines and Vehicles-Phase 2*, EPA-HQ-OAR-2014-0827, October 2016 at 73,493.

EPA's proposed reopening of MY 2027 GHG Phase 2 standard fails to follow the CAA four-year lead time requirement.

2. EPA's Phase 3 Rule Should Continue to Follow Three-year Stability

EPA's Phase 3 regulation sets new ZEV market adoption rates for model years 2027, 2028, 2029, 2030, 2031 and 2032, setting new heavy-duty emissions standards. By requiring new emissions standards each year, EPA does not follow Section 202(a)(3)(C) under the CAA that requires three-year stability for each new and revised heavy-duty truck emission standard. EPA's previous GHG Phase 1 and 2 regulations adhered to the CAA following four-year lead time and three-year stability for model years 2014, 2017, 2021, 2024 and 2027. Beyond these requirements, new ZEV technologies that are being mandated for compliance will not be given time for evaluation and adjustment prior to increasing adoption levels.

President Biden's August 2021 Executive Order requires the agency to complete its Phase 3 rule by the summer of 2024[5]. This schedule allows EPA to continue working with stakeholders to thoroughly assess the range of associated issues, including charging infrastructure, that will play an important role in further tightening heavy-duty GHG standards in 2030 and beyond. The trucking industry continues to support the pursuit of one nationwide emissions reduction plan that is the most reasonable, technology neutral, logical, affordable, and least disruptive to the nation's supply chains.

3. ZEV Technology for Many Fleets is Unproven

Under the proposed Phase 3 regulation, EPA relies on technology that is at early-stage and lacks the real-world demonstrated maturity compared to proven internal combustion engine vehicle (ICEV) technologies. EPA's analysis assumes reductions in battery and vehicle costs, performance, energy generation and transmission, and charging and refueling infrastructure. Each of EPA's technical assumptions will need to align and come to fruition to hit the cost parity targets that EPA believes will follow their projected adoption curves. Market dynamics affect the availability of ZEV products, costs and performance capabilities. In some cases, the unproven nature of ZEV technologies in the heavy-duty segment will slow their adoption rate as fleets look to validate against their current total cost of ownership (TCO) schedule. Many fleets have lower profit margins, especially small, undercapitalized, or independently owned and operated ones. They are generally disinclined from experimental investments in new technologies that have yet to demonstrate TCO or ROI for their fleet size, operation, or duty cycle. EPA has acknowledged these challenges in the past, and in Phase 2 accommodated for them by giving the industry enough lead time to test and validate equipment, explaining in the preamble:

> "Another important consideration was the possibility of disrupting the market, which would be a risk if compliance required application of new technologies too suddenly.

[5] Biden, Joseph, Strengthening *American Leadership in Clean Cars and Trucks*, Executive Order 14037, August 10, 2021.

> Several of the heavy-duty vehicle manufacturers, fleets, and commercial truck dealerships informed the agencies that for fleet purchases that are planned more than a year in advance, expectations of reduced reliability, increased operating costs, reduced residual value, or of large increases in purchase prices can lead the fleets to pull-ahead by several months planned future vehicle purchases by pre-buying vehicles without the newer technology. In the context of the Class 8 tractor market, where a relatively small number of large fleets typically purchase very large volumes of tractors, such actions by a small number of firms can result in large swings in sales volumes. Such market impacts would be followed by some period of reduced purchases that can lead to temporary layoffs at the factories producing the engines and vehicles, as well as at supplier factories, and disruptions at dealerships. Such market impacts also can reduce the overall environmental and fuel consumption benefits of the standards by delaying the rate at which the fleet turns over. See International Harvester v. EPA, 478 F. 2d 615, 634 (D.C. Cir. 1973)."[6]

EPA's adoption rate table includes levels of stringency that require fleets to adopt increasing ZEV percentages in the vocational, short, and long-haul segments.

TABLE 1. EPA's Preferred ZEV Market Sales for GHG Compliance

	MY 2027	MY 2028	MY 2029	MY 2030	MY 2031	MY 2032
Vocational	20%	25%	30%	35%	40%	50%
Short-Haul Tractors	10%	12%	15%	20%	30%	35%
Long-Haul Tractors	0%	0%	0%	10%	20%	25%

TABLE 2. EPA's Alternative ZEV Market Sales for GHG Compliance

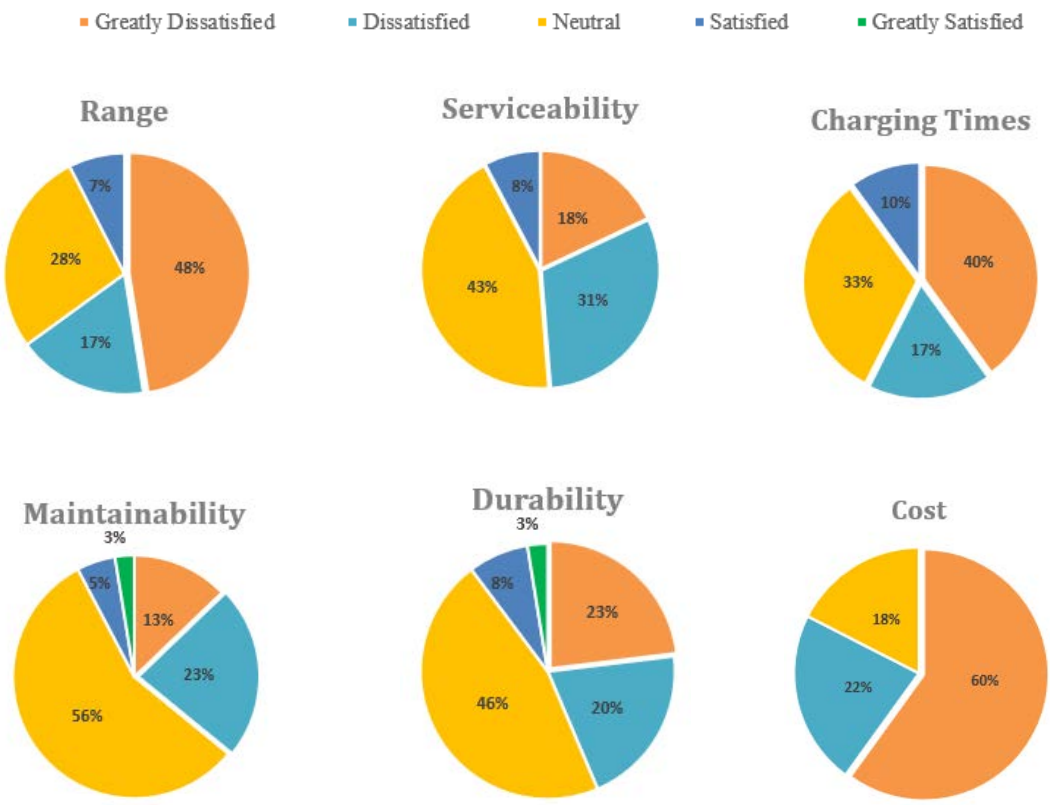
	MY 2027	MY 2028	MY 2029	MY 2030	MY 2031	MY 2032
Vocational	14%	20%	25%	30%	35%	40%
Short-Haul Tractors	5%	8%	10%	15%	20%	25%
Long-Haul Tractors	0%	0%	0%	10%	15%	20%

While ATA appreciates EPA's addition of three broad market segmentations and 101 different vehicle types in the EPA HD TRUCS model, we note that the operational diversity and complexity of the trucking industry are still too broad to be entirely inclusive of all three vehicle categories. The vehicle weight distributions relative to the battery cell and axle weight impact real-world payload, charge time, and maintainability in each vehicle configuration and category. Each category and configuration require separate treatment as these factors—important variables in the fleet purchase decision—affect the TCO calculation.

[6] Ibid, pg. 73,494.

For example, under the vocational category, 35 percent of concrete mixers would need to be electrified by 2032 [7]. Requiring an electrified powertrain to mix and place concrete risks catastrophic internal component failure when interruptions to the power unit occur. ATA's TMC Fleet Survey respondents see promise in ZEV technology but most rate serious dissatisfaction as it exists today. Eighty-three percent are dissatisfied with cost, 65 percent with range, and 58 percent with charge times. Seven to ten percent of respondents were satisfied or greatly satisfied in five of the six categories presented (range, serviceability, charging times, maintainability, and durability)[8]. No respondents were satisfied or greatly satisfied with the cost. In qualitative feedback provided to ATA through the survey and interviews, fleets said they need validation to ensure that ZEVs will deliver the cost and operational efficiencies they see with current ICEVs. The negative experiences of product delays, challenges related to local electric utility under-capacity and distribution, and the under-specification of BEV products to meet current operational capacity and payload requirements strongly deter potential early adopters from placing ZEV purchase orders.

FIGURE 1. Satisfaction with ZEV Technology Today with Key TCO Elements[9]



[7] U.S. Environmental and Protection Agency, *Greenhouse Gas Emissions Standards for Medium-Heavy Duty Vehicles-Phase 3, Draft Impact Regulatory Analysis*, pg. 242, April 27, 2023.
[8] Refer to appendix 1 *Technology and Maintenance Council Greenhouse Gas Phase 3 Member Survey (2023)*, June 16, 2023.
[9] Ibid, 2023.

During our conversations with fleets, a few brought up their strategy not to be early ZEV adopters due to past experiences with early-stage selective catalytic reduction (SCR) and exhaust gas recirculation (EGR) technologies. Early adoption of generations one and two of SCR and EGR technology left lasting financial scars and impressions carried forward today as fleets evaluate the reliability of any new technologies and the difficulty of maintaining uptime. Their experiences of unvalidated technologies being rushed to the market to meet regulatory requirements left lasting impressions that real-world mileage is more valuable than in-lab testing.

Product availability

EPA's proposed and alternative adoption cases, Tables 1 and 2, assume OEM-announced product availability will be a major driver of the ZEV transition. However, product availability alone is insufficient to enable heavy-duty ZEVs at scale. In 2021, over 150 HD BEV models were available; but they accounted for less than 0.1 percent of Class 7 & 8 sales, which does not suggest an adoption rate that can accommodate the industry's needs from MY 2027 to 2032.[10] ZEVs must meet a highly customized set of performance requirements and product specifications to scale. Said one fleet, "allow more time for unproven technologies to be real-world tested," which in the fleet context means—verify that ZEVs meet the current operational duty cycle vehicles are assigned to perform. One truck leasing and rental company we spoke with noted that some light-duty commercial products are available for operations needing only 100 miles of range, but significantly fewer in heavier weight class applications requiring 200 miles or more. OEMs are currently developing and testing medium- and heavy-duty vehicles under varying specifications; however, options remain limited. For example, the introduction of electric power take-off systems is a recently available technology that utilizes an electric motor to power auxiliary equipment.

A significant point of frustration is the need for more specification options available for battery electric truck chassis. There is no such thing as a generic truck in the U.S. Heavy-duty vehicles produced for the U.S. market are highly customized to meet fleets' unique duty cycles and maximize ROI. Customizations can include nearly every critical vehicle component, such as its body, suspension, engine, transmission, and axles. ZEVs present unique economic and engineering challenges when integrated into an existing fleet. Because the ZEV market is nascent, customization options will not be available at scale under EPA's proposed adoption timelines. Specifications and customizations will continue to be important as fleets incorporate ZEVs into their operations.

While most battery electric vocational and short-haul vehicles follow a similar configuration and design, there are trade-offs on battery capacity, range, and wheelbase size, which can still greatly impact operations. One company invested in a startup partner to acquire a large number of highly customized electric delivery vans to meet its last-mile delivery needs, which are scheduled to be

[10] U.S. Environmental Protection Agency, *Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles: Phase 3: Draft Regulatory Impact Analysis*, pgs. 45-49, EPA-HQ-OAR-2022-0985, April 27, 2023.

fully delivered in 2030. This level of customization is generally not available to all fleets purchasing vehicles, even in vocational and short-haul segments. Another company initially focused on electrifying last-mile vehicles but pursued another technological solution instead of ZEV because of the limited options.

Some fleets are skeptical about viable use cases that meet their specific needs, especially given the lag between product announcements and production schedules. One significant factor is the impact of production constraints and order backlogs. Manufacturer production rates have been affected by challenges such as semiconductor shortages and sourcing difficulties, creating long order backlogs that cannot be promptly fulfilled or tendered to truck dealers. Relatively minor delays in the supply chains or any part of the intricate truck build process can have cascading effects on product availability. This becomes especially apparent as the U.S. begins to source and scale lithium-ion and battery cell component production. Sourcing scarcity and product delays are a big concern in the long-haul segment, where product choices are comparably limited.

Drawing upon past experiences, fleets are concerned that manufacturers will limit diesel product availability to ensure they can comply with their GHG 3 target, which requires a certain percentage of ZEVs to be sold as part of the OEM's fleet mix. Under the GHG 2 regulation, fleets were obligated to purchase aero packages, specific tire configurations, and start-stop technology to ensure compliance with the EPA's technology package. This resulted in a restricted range of options when fleets placed vehicle orders. EPA's elimination of the Advanced Technology Credit for MY 2027, which provides a steeper incline for manufacturers to hit their new GHG 2027 proposed targets with ZEVs, will likely limit fleet technology choices.

EPA requests comments on adopting a national GHG 3 standard that follows California's Advance Clean Trucks Rule adoption timeline, followed by other opt-in states.[11, 12]

TABLE 3. EPA's CARB Market ZEV Sales for GHG Compliance

	MY 2027	MY 2028	MY 2029	MY 2030	MY 2031	MY 2032
Vocational	20%	30%	40%	50%	55%	60%
Tractor	15%	20%	25%	30%	35%	40%

ATA does not support EPA adopting California's Advanced Clean Truck percentages as national Phase 3 stringency requirements. The percentages proposed in Table 3 will lead to market disruptions and economic distortions. Fleets are experiencing product availability issues today in California. The state's Advanced Clean Trucks rule, which requires manufacturers to sell an increasing percentage of electric trucks, and its Omnibus NOx regulation have created uncertainty in the heavy-duty market. The regulatory impact of these requirements is reflected in purchase volumes and expected price increases. Fleets will find alternative solutions to

[11] California Air Resources Board, *Advanced Clean Truck Rule*, March 15, 2021.
[12] www.electrictrucksnow.com/states

purchasing a truck that can provide service, such as holding trucks longer, purchasing from the used truck market, limiting their California operations, or reconfiguring their business. ATA expects that California will need to amend their sales percentages during the life of the regulation to recognize lack of available products and infrastructure capacity. EPA has limited regulatory capability to revise emissions standards in response to California amending their ZEV sales mandates.

Performance
Performance is key to whether heavy-duty ZEVs meet a given duty cycle's range, performance, and battery capacity requirements. Drivers regularly run short and long-haul routes, often including regional and interstate journeys. For example, a carrier transporting perishable agricultural products to and from a West Coast port runs routes to inland destinations like Colorado, St. Louis, Reno, and California's Central Valley. This operation's range and battery performance needs differ significantly from shorter hauls primarily within ten miles of a point of origination. Battery weight is a crucial factor. A bulk agricultural hauler moving mixed commodities to and from a facility can easily come up against weight limits with added batteries.

In addition to range and battery capacity, other performance factors also play a role in heavy-duty ZEVs. Power output, acceleration, and overall vehicle performance are crucial to ensuring vehicles can meet the demands of their duty cycles, regardless of climate or topographical conditions. ZEVs must be capable of the same payload while climbing steep inclines, maintaining high speeds on highways, and handling challenging extreme temperatures in a way that compares favorably with ICEVs.

4. The Upfront Costs of ZEVs are High and Fleets are Looking for Proof Prices Will Come Down

ZEVs' upfront acquisition costs are generally much higher than ICEVs, making it difficult for fleets to embrace electrification until they see meaningful year-over-year upfront purchase price declines. Before incentives, costs can be two to three times higher for BEVs and up to seven times higher for hydrogen fuel cell Class 8 trucks.[13] Across the industry, acquisition costs are often greater than or equal to three-fifths of the TCO.[14] For many fleets, calculating the TCO is a complex math problem that cannot be easily confirmed without significant expense and trial and error. Case studies alone are insufficient to validate assumptions due to each fleet's unique operating characteristics, including configuration, duty cycle, and cost.[15]

[13] Class 4-6 battery electric delivery vehicles can range from $100,000 to $200,000, while Class 8 over-the-road vehicles can cost $400,000 or more before incentives. Diesel MDV is around $75,000 and HDV is $165,000.
[14] See, e.g., Volvo Trucks North America, Press Releases, "Volvo Trucks' New Electromobility Total Cost of Ownership Tool Demonstrates Financial, Environmental Benefits of Volvo VNR Electric," October 23, 2022; and Dana, Inc., Total Cost of Ownership Tool, n.d.
[15] These variable inputs can be non-linear, colinear, and frequently interconnected, further complicating the TCO calculation process.

In calculating TCO, fleets generally think about capital and non-capital expenses. Capital expenses can be depreciated to offset some, though not all, of the significantly higher MSRP on a ZEV. Capital expenses are also expected to retain some residual value at the end of their useful lives, but there is little data to estimate these values for heavy-duty ZEVs. The fleet survey conducted by ATA confirms that most fleet respondents were uncertain about ZEVs' residual value. Reducing MSRP would be an impactful way to offset the uncertainty around TCO and encourage adoption. However, many fleets worry about the uncertainties of EPA's BEV price and cost assumptions because the technology is a new product category. They worry capacity improvements in batteries or efficiency gains in the cost-per-unit capacity will not necessarily translate into direct price reductions in the near to medium term, as projected under the proposed rule. Notably, battery and component costs have remained comparatively stable in the light-duty market for BEVs. Similarly, a midsize fleet manager running a mixed truckload and less-than-truckload operation shared they have seen prices increase year-over-year due to component pricing.

Given the uncertainty around factors such as energy prices, uptime, and residual value, the MSRP must be significantly reduced to make the TCO comparable to existing equipment. Fleets understand this new technology will cost more in the near term and want to see a clear trend of incremental technology improvements translating into incremental reductions in MSRP to make a TCO investment that pays off. If fleets do not see the expected TCO benefit, they will likely hold onto their existing equipment longer resulting in an older fleet with higher emissions profile. Robust and stable federal and state incentives above currently funded levels could be one way to do this. Unfortunately, generous state incentives and the federal commercial clean vehicle credit are only starting points.

Fleet maintenance of a ZEV needs to be better understood than it is currently. As a non-capital expense, estimating any expected savings over its lifespan is especially difficult. The previously mentioned fleet manager said their fleet relies on the OEM to repair their ZEVs but anticipates transitioning to in-house maintenance after the warranty expires. This fleet manager was not alone in his approach. All the fleets that we surveyed that had ZEVs in their fleets are currently contracting out the maintenance for the vehicles. Fleet operators need to gain knowledge on accurately calculating and assessing repair turnaround times, workforce training requirements, and occupational risks of maintaining and servicing high-voltage batteries (ranging from 600 to 800 volts) but see a benefit to doing the work in-house rather than sending the vehicle away. The same fleet manager highlighted that for the TCO to be justifiable, the acquisition costs of their box trucks would need to decrease by $100,000. Maintenance costs are unknown once battery warranties expire. Fleets told us these costs can have outsized impacts on their TCO. For example, a large national carrier cautioned that one outside-of-warranty battery repair or replacement job of $30,000 to $100,000 could be detrimental to an entire TCO structure. The calculation on BEV maintenance costs, they say, should only be assumed at a certain percentage if real-world average savings over the life of a vehicle can be proven.

Payback periods concerns
EPA discusses the potential for pre-buys or low buys, which may occur in response to buyers' concerns about higher upfront costs, a higher operational cost, or reduced reliability.[16] EPA concludes, "We expect pre-buy and low buy to be very small if they occur at all."[17] EPA does not evaluate the potential for an "alternative buy" strategy, however. The prospect of fleets purchasing lower cost conventional vehicles and utilizing lower carbon fueling options, such as renewable diesel or renewable natural gas, is not addressed in the proposed regulation.

In 2016, EPA adopted, and ATA supported, Phase 2 GHG standards for medium- and heavy-duty trucks. Although regulations that increase the upfront cost of a vehicle are always a concern, fleets' ability to recoup these investments over a reasonable payback period helps mitigate these concerns. As shown in Table 4, EPA's Phase 2 rule projected a reasonable payback period of two to four years for tractors and vocational vehicles, respectively.

The additional cost of meeting the 2027 Phase 2 GHG standards was projected to add at least $10,240 to the price of a day cab and as much as $13,750 to the price of a sleeper cab tractor. Vocational trucks were projected to experience cost increases ranging from $1,490 to $5,670. These projected costs will be introduced into the marketplace beginning in 2027.

TABLE 4. Incremental Costs and Payback Periods

	Vocational Vehicles	**Tractors**
	2027 Phase 2	
Incremental Per-Vehicle Cost	$1,490 - $5,670	$10,240 - $13,750
Payback Period (Years)	4	2
	2027 Phase 3	
Incremental Upfront Per-ZEV Cost	$8,828 - $14,711	$61,803
Assumed IRA Tax Credit Per-ZEV	$3,483 - $9,026	$40,000
Payback Period (Years)	3	8
	2032 Phase 3	
Incremental Upfront Per-ZEV Cost	$944 -$11,405	$14,712 - $17,335
Assumed IRA Tax Credit Per-ZEV	$93 - $16,674	$25,782 - $40,000
Payback Period (Years)	1 - 3	3 - 7

[16] U.S. Environmental Protection Agency, *Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles: Phase 3: Draft Regulatory Impact Analysis*, EPA-420-D-23-001, pg. 449, April 2023.
[17] Ibid, pg. 456

Under the proposed Phase 3 program, EPA adds to the upcoming Phase 2 costs, extending the payback period for new vehicles. For example, EPA estimates the upfront per-vehicle cost of a ZEV daycab will be an additional $61,803 more than a comparable Phase 2 daycab tractor. Similarly, the upfront cost of ZEV vocational vehicles is estimated to be $8,828 to $14,711 mainly due to the cost of ZEV infrastructure. It is important to note that these costs have been reduced by the federal vehicle tax credits contained in the Inflation Reduction Act (IRA). As shown, these credits significantly impact the financial feasibility of ZEVs. For example, in 2027, a ZEV daycab tractor is expected to have an 8-year payback period when accounting for the IRA vehicle tax credits, which sunset in 2032. Absent these credits, the payback period would be 14 years.

Fleets are evaluating and implementing cost-effective options to reduce emissions. Biodiesel is a traditional plug-in fuel that yields lower carbon emissions. More recently, renewable diesel has emerged as a desirable carbon reduction option, producing near-zero tailpipe emissions when combined with the newest engine technologies. Fleets are also operating renewable natural gas and propane-powered vehicles in locations where fueling infrastructure is established. These fuel-based options present more cost-effective solutions and should be encouraged under the proposed regulation. A crediting system that prorates the annual expansion of lower carbon fuel use across new conventional vehicle sales is needed to capture existing carbon reduction efforts. This system would help account for fleet efforts to purchase conventional or alternative fueled vehicles rather than only ZEVs.

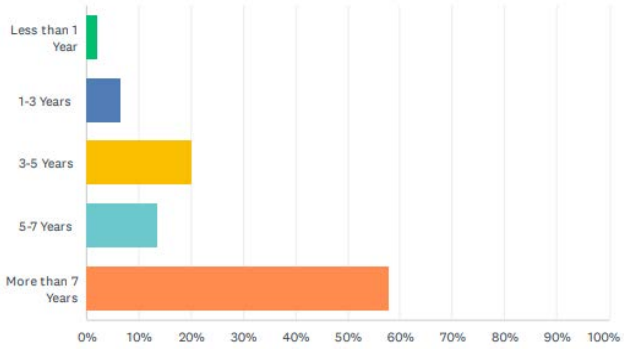
The learning process in transitioning to electric trucks highlights the direct and indirect costs for fleet owners. Direct costs must be accurately factored into expenses when calculating ROI. Still, BEV drayage fleets report increased costs they would never have previously accounted for, like the administrative work related to obtaining city permits. Electric vehicle supply equipment (EVSE) may need more physical space, but real estate is limited near ports, and land prices continue to rise in many parts of the country.

Stranded assets

The fear of making mistakes or committing too early is a common concern when fleets evaluate ZEVs. To many, uncertainty makes fleet electrification seem like a roll of the dice. Of the fleet owners that have been early adopters, they are still determining whether the investment will yield successful results within a payback period that aligns with their expected ROI. In ATA's fleet survey, respondents were asked what the expected payback period is for their current conventionally powered fleet and any electric or hydrogen fuel cell vehicles. Most respondents (73 percent) indicated an expected payback period of 1 to 5 years for conventionally powered vehicles, and 58 percent indicated an expected payback period of more than seven years for electric or hydrogen fuel cell vehicles. Caution about the technology stems from a handful of concerns, including the limited availability of certain technologies at scale, the affordability and accessibility of power to sustain the required duty cycle, and the inadequate investments in capacity by electric utilities. In effect, these factors make it challenging to accurately calculate

near- and medium-term returns and present a risk of stranded assets if fleets invest in one brand, configuration, or technology only to discover later another is more suitable for their operation.

FIGURE 2. Expected Payback Periods for ZEV Technology



Higher cost for transportation

As noted above, the IRA provides a commercial clean vehicle tax credit of up to $40,000 per vehicle through 2032 to offset the higher incremental cost of commercial ZEVs. In addition, an alternative fuel refueling property tax credit of up to $100,000 is available for projects located in low-income or rural census tracts. While the availability of these tax credits helps offset a portion of the vehicle and infrastructure expense, ensuring the credits are structured for fleet use will help incentivize higher utilization rates. Currently, the IRA credit covers less than the $48,000 in federal excise tax when fleets purchase a $400,000 BEV day cab. Also, the Alternative Fuel Refueling Infrastructure Tax Credit has limiting factors where fleets will be unable to qualify due to their depot locations or tax liability. These additional costs must be passed on to consumers for businesses to stay profitable.

Another way to view these cost increases is their relationship to vehicle purchase prices. EPA estimated the Phase 2 2027 costs would increase the price of tractors by 12 percent and vocational vehicles by 3 percent.[18] Using EPA's minimum vehicle price estimate of $100,000 for tractors and vocational vehicles, this equates to a 2027 ZEV price increase of 9 to 15 percent for vocational vehicles and 61 percent for tractors. For perspective, even with the IRA vehicle tax credits in place, these increases will be on par and surpass the U.S. consumer price increases of 9 percent in 2022, reaching its highest level in more than 40 years. The projected price increases associated with the proposed rule is a significant concern and requires further analysis of how purchasers will respond.

[18] U.S. Environmental Protection Agency and Department of Transportation, *Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles-Phase 2: Final Rule*, Federal Register Vol, 81. No. 206. pg. 73482, October 25, 2016.

5. Infrastructure Will Be a Key Driver Towards the Adoption of ZEV Technology

EPA recognizes that infrastructure availability will be a key enabler to adopting ZEVs. The agency's proposed GHG 3 regulation includes BEV and FCEV vehicles, each with different infrastructure requirements and investment costs. While EPA estimates the additional cost of providing electrical infrastructure to charge BEVs, this does not ensure that infrastructure is available or suitable for most heavy-duty applications. Without adequate infrastructure, increasing percentages of ZEV sales, both BEVs and FCEVs, will be unachievable, and the industry will not hit the annual milestone targets in EPA's ZEV adoption table.

EPA cites the Department of Energy's Alternative Fuels Data Center Station Locator for providing the number of chargers available for publicly and privately held locations to justify the expansion of battery electric vehicles throughout the United States. The agency acknowledges that the station counts of over 53,000 are not broken out by light- or heavy-duty capable charging capacities or site configurations. In our discussions with fleets, ATA is aware that a small number of heavy-duty accessible public charging stations are available nationwide. EPA cites the federal funds available to states to support the construction of charging networks under the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA), but the programs included in the legislation do not robustly support commercial vehicle electrification.

The National Electric Vehicle Infrastructure (NEVI) grant program, included in IIJA, provides federal funds to states to begin to build a nationwide charging network to support transportation electrification in all highway segments. The authorizing legislation qualified medium duty commercial charging as eligible projects, but initial guidance from the Federal Highway Administration (FHWA) in February 2022 discouraged states from providing truck charging capacity and did not require specific design requirements that would co-locate medium- and heavy-duty charging infrastructure support. ATA commented on the NEVI program and pushed FHWA to provide funds to immediately support commercial-scale electrification projects.[19] We were pleased to see the agency issue new guidance clarifying the eligibility of medium- and heavy-duty charging infrastructure, but unfortunately, ATA is unaware of any state directing their NEVI state block grant funds toward it. California, Oregon, and Washington provided a competitive grant submission to fund a portion of their joint I-5 charging network, which would include heavy-duty charging stations and are awaiting an award announcement.

Grid Availability

Charging sites for depots or large public charging stations for commercial vehicles will require significant energy. The American Transportation Research Institute (ATRI) estimates full commercial vehicle electrification would require a 14 percent increase in energy generation from today's standards.[20] In many cases, remote or densely populated areas do not have available power to direct toward commercial vehicle charging sites. The International Council on Clean

[19] American Trucking Associations, *Comments on the National Electric Vehicle Infrastructure Formula Program*, FHWA-2022-0008-0339, August 23, 2022

[20] American Transportation Research Institute, *Charging Infrastructure Challenges for the U.S. Electric Vehicle Fleet*, pg. 17, December 2022.

Transportation (ICCT) recognizes that the electrification of commercial vehicles will significantly burden the current electrical grid and challenge the centralization of where and how charging accommodates trucks in operation today. [21]

> "We find that near-term energy needs will be concentrated in industrial areas in the largest metropolitan areas in the country, including Los Angeles, Phoenix, Houston, Chicago, and Dallas. 1% of U.S. counties will account for 15% of nationwide MHDV charging energy needs in 2030, constituting high-priority areas in which to concentrate near-term deployment of charging and refueling infrastructure of MHDVs."

Early adopting fleets are being forced to quickly learn electricity demands and generation requirements as an important external factor that impacts their operations and TCO calculation. One fleet interviewed provided an example of their desire to electrify forklifts. In their mind, it would serve as an early use case to understand electric technology as they explored BEVs for their operations. However, in their discussions with the local utility, they were only allowed to electrify a small percentage of the originally desired forklifts due to limited onsite power. ATA asked fleets about their experiences with local utilities. More than two-thirds of respondents said they had not begun conversations with them.

The multi-state patchwork of energy generation and transmission regulatory bodies has made investment and modernization of the U.S grid even more challenging. Fleets are left with the reality of wading through local utility politics to receive approval for a permit to install minimal chargers on their site today. Addressing these site-specific challenges to build out charging infrastructure is essential to achieving the proposed rule's adoption rates and should begin immediately to accommodate large-scale transportation electrification. Yet, most states have not begun this process. With 168 investor-owned utilities, 1,958 publicly owned utilities and 812 cooperatives providing electricity to customers in the U.S., the scale of this undertaking will be significant and time consuming.[22] The planning and oversight associated with hydrogen infrastructure is especially so. EPA should not propose a ZEV-dependent rule prior to ensuring the needed electric and hydrogen infrastructure will be available, including initiating state-wide planning and deployment assessments prior to establishing proposed ZEV adoption rates and timelines.

For example, recently the California Public Utilities Commission (CPUC) developed a "Draft Staff Proposal: Zero-Emissions Freight Infrastructure Planning" that addresses the need for proactive planning of long lead time utility-side electric infrastructure (*i.e.*, distribution and transmission) needed to support the acceleration of transportation electrification.[23]

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[21] The International Council on Clean Transportation, *Near Term Infrastructure Deployment to Support Zero-Emission Medium-and Heavy-Duty Vehicles in the United States*, May 2023.
[22] Energy Information Administration, *Investor-owned utilities served 72% of U.S. electricity customers in 2017*, August 15, 2019, available at http://www.eia.gov/todayinenergy/detail.php?id=40913.
[23] California Public Utilities Commission, *Freight Infrastructure Planning*, May 22, 2023, available at: http://www.cpucc.ca.gov/industries-and-topics/electricial-energy/infrastructure/transportation-electrification/freight-infrastructure-planning.

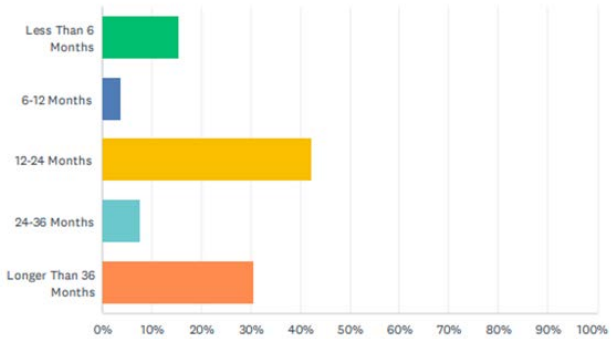
CPUC identified several challenges through this process, including:

- Approximately three years of required time to sequence statewide planning efforts and complete infrastructure authorizations. This does not include the time for cost recovery approval.
- Significant market and technology uncertainty affects the state's ability to proactively authorize infrastructure solutions.
- Risks and uncertainties regarding electricity grid load that are dependent on large-scale infrastructure buildout. These have not been adequately quantified within the state's existing planning and forecasting processes.
- The lack of an existing source of information on future fleet charger locations, and the need for long-term grid infrastructure planning to account for fleets' current flexible and economical routes.
- The lack of a coherent planning framework to optimize fleet business needs with electricity sector goals and requirements (*i.e.*, how to cost-effectively upgrade the distribution and transmission system).
- The lack of a process for identifying long-term substation land acquisition needs.

Lead times are long

Onsite power availability limits the number of BEVs a site can charge. Regardless of location, all fleets surveyed had similar feedback regarding conversations with utilities. Usually, these conversations can begin years before an order is placed for a BEV. Among surveyed fleets, 40 percent indicated a lead time of 12 to 14 months, and 30 percent received quotes of over 36 months for additional electricity. As a fleet looks to acquire one electric vehicle, they begin to assess the available power capacity available from the utility and on their physical site. Site-level analysis, land use configuration, and long-term power usage planning and facility modifications are all outside the typical competencies of most fleets, require learning by doing, and invariably increase the amount of time it takes to adopt ZEV technologies.

FIGURE 3. Currently Quoted Lead Times for Onsite Charging



Onsite charging is preferred
As fleets examine battery electric and hydrogen fuel cell trucks, they prefer to charge and refuel onsite. Today, most fleets have diesel refueling onsite for beginning trips, and line-haul fleets manage their refueling and break time for drivers to overlap. As ATA's Vice Chairman Andrew Boyle testified at the Senate Environment and Public Works Committee, today's diesel technology allows a fleet to travel 1,200 miles and refuel in 15 minutes for an additional 1,200 miles. Based on the range for Class 8 battery-electric trucks today, that same truck can travel roughly 250 miles before the need to charge with downtime of up to 3-8 hours, depending on the charging equipment available.[24]

EPA assumes that battery electric trucks can accommodate eight hours of charging downtime. While this could work for certain truck applications that return to base each night, constantly moving regional and line-haul trucks will require more energy for shorter charge times. The agency's assumption is based on electricity pricing, where overnight charging would be more cost-effective than daytime charging. While this is true for electricity costs, truck operators have already found the most optimal time for them to operate. For example, line-haul fleets prefer to run at night due to less congestion on the road. In addition, many line-haul fleets "slip seat" their drivers to meet federal hours-of-service regulations and ensure that their investment, the truck, operates 24 hours a day. Many regional fleets begin their days in the pre-dawn hours to stage before sites open to begin their routes for the day's pickup and delivery routes.

The uncertainty of the costs associated with opportunity public charging and the availability of mega charging sites requires fleets to invest in onsite charging. Investment in charging onsite has become a barrier as well. On average, a 180-kW charger with dual ports costs fleets $100,000 each. In consultation with utilities, available power and expected power usage dictate the number of chargers on site. In many cases, the high cost of installation and planning also limits fleets from electrifying a greater number of ZEVs or narrows their electrification plans to just forklifts or yard trucks.

Public charging will serve as a redundant power supply for fleets
Onsite "behind the fence" depot charging is preferred by early adopters. While public charging could allow for defrayed investment costs for fleets, the unpredictability of electricity prices and uncertain build out of public charging locations are forcing these fleets to invest capital in on-site charging. Today, there is one truck parking space for every 11 drivers in the industry, equating to 313,000 available spaces nationwide. Very few of those spaces have the infrastructure or capacity to charge heavy-duty ZEVs.[25] Fleets see public charging stations needing to meet specific requirements to support electrification in the commercial vehicle industry. Public charging stations and sites should be:

[24] Boyle, Andrew, *Testimony at Hearing: Cleaner Vehicles: Good for Consumers and Public Health*, Senate Environment and Public Works Committee, April 18, 2023.
[25] U.S. Department of Transportation, *Jason's Law Commercial Motor Vehicle Parking Survey and Comparative Assessment*, December 1, 2022.

- Closely located to where trucks fill up today. Freight corridors are already built out for optimal movement and charging stations will need to be located at or near sites where trucks spend downtime.
- Able to charge trucks at the same rate or faster than the time it takes to refuel a diesel truck today. Even one or two hours of charging downtime requires fleets to reconfigure and reoptimize routes, hours-of-service, scheduled downtime, and delivery schedules.
- Be designed for pull-in-charging to allow for a truck with a trailer to fit properly.

Hydrogen refueling
EPA assumes that hydrogen fuel technology will become the predominant technology of choice for line-haul fleets by 2030 when long-haul tractor percentage sales requirements begin. EPA's cost analysis relies on the availability of hydrogen fuel stations and low-cost green hydrogen. Today, there are 57 hydrogen refueling stations in the United States, almost all of them in California. To support hydrogen-fuel adoption in line-haul tractors, stations must be built on interstate freight corridors.

ICCT's analysis of hydrogen pricing and refueling indicates a lack of cost competitiveness before 2035, while EPA's preferred proposal would require 10 percent of the line-haul market to be ZEV in 2030 with hydrogen-fuel cell winning out.[26]

> "Our renewable hydrogen price projections of $8/kg-$10/kg in 2040 means there will be very few cases of lower cost of ownership for hydrogen long-haul trucks over their battery-electric counterparts. Hydrogen trucks could become cost-competitive in the late 2030s, if hydrogen became significantly lower than our central estimate. However even with median hydrogen prices as low as $3, we find no significant business case for hydrogen trucks before 2035 due to lower technology maturity."

6. Workforce and Maintenance Training Needs to be Established

The deployment of ZEVs must support the trucking industry's workforce initiatives. The safety of drivers and maintenance technicians is the primary focus of these efforts. Ensuring adequate compensation to attract and maintain this workforce is a critical component. In 2022, the truck driver shortage remained near its historical high at nearly 78,000 drivers.[27] Qualified technicians, especially ones with advanced electrical training, are in short supply.[28] To achieve the proposed emission standards, training, education, and facility upgrades will be needed to ensure each driver and technician can safely and efficiently perform their job duties while operating or maintaining zero-emission trucks.

Driver experience and learnings

[26] The International Council on Clean Transportation, *Near-Term Infrastructure Deployment to Support Zero-Emission Medium-and Heavy-Duty Vehicles in the United States*, pgs. 16-17 May 2023.
[27] American Trucking Associations, Inc., *Driver Shortage Update 2022* (October 25, 2022).
[28] Techforce, *2022 Transportation Technician Supply & Demand Report* (November 1, 2022).

Education and training are needed to efficiently operate ZEVs. Training drivers on efficiently using regenerative braking or operating tractors safely are clear examples. Like EPA's discussion of first responders, drivers need to know how to locate and apply high voltage disconnects. Drivers must also know industry best practices and the policies and procedures to follow should crashes occur, such as avoiding high-voltage power sources and responding to runaway thermal events. Fleets will need time to develop and incorporate those practices into their safety handbooks. At a higher level, standards-setting bodies will need time to develop and standardize processes on the safe operation of ZEVs across a wide range of safety issues.

Ensuring drivers can maintain or improve efficiency is also a consideration that is tied to compensation. In conversations with fleets, several have indicated BEVs are not able to perform the same function as their conventional trucks due to range limitations and charging times and indicate that two trucks are needed to do the same amount of work as one. These factors can potentially worsen the driver shortage and congestion issues by necessitating more trucks and drivers handle the same workload. Compensation may also be affected if limited range and extended charging times reduce available driving time. To tackle these challenges, ATA encourages EPA to broaden its analyses and quantify the impacts of regulations on driver operational and occupational efficiency.

Technicians' new skills to service
As EPA has noted, performing standard maintenance on BEVs leads to new or increased risk compared to ICE vehicles and requires corresponding safety training due to the following:[29]

- the presence of high voltage components and cabling capable of delivering a fatal electric shock;
- the storage of electrical energy with the potential to cause explosion or fire;
- components that may retain a dangerous voltage even when a vehicle is switched off;
- electric motors or the vehicle itself that may move unexpectedly due to magnetic forces within the motors;
- manual handling risks associated with battery replacement;
- the potential for the release of explosive gases and harmful liquids if batteries are damaged or incorrectly modified;
- the possibility of people being unaware of vehicles being in motion because when they are electrically driven, they are silent in operation; and the potential for the electrical systems on the vehicle to affect medical devices such as pacemakers.

EPA further notes that hydrogen-related fuel cell vehicles carry additional risks that can be mitigated through:[30]

[29] U.S. Environmental Protection Agency, *Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles: Phase 3: Draft Regulatory Impact Analysis*, pgs. 38-39, EPA-HQ-OAR-2022-0985, April 27, 2023.
[30] Ibid, pg. 76

- proper no/low leak designs for infrastructure, hydrogen fill equipment, vehicle connectors, and vehicle storage and supply;
- ambient hydrogen concentration monitoring and alarm;
- hydrogen pressure monitoring in the vehicle and infrastructure to indicate leaks;
- proper ventilation in and around hydrogen fueling equipment and fuel cell vehicles;
- vehicle controls to ensure the vehicle cannot be driven while fueling equipment is attached; and
- vehicle controls that isolate hydrogen storage in the case of an accident.

Fleets will need to expand existing technician safety training and education to manage these potential risks. Maintenance facilities upgrades will also be needed to accommodate BEV and FCEV vehicles. For example, because hydrogen is lighter than air, shop ventilation and monitoring will be needed for fleets servicing FCEVs. For BEVs, isolating high-voltage service bays has been mentioned as a potential maintenance strategy. Fleets are in the initial stages of understanding how to adapt existing maintenance shops to accommodate BEVs and/or FCEVs. As many fleets conduct in-house maintenance on their vehicles, EPA should further investigate the proposed rule's impact on maintenance practices and facilities.

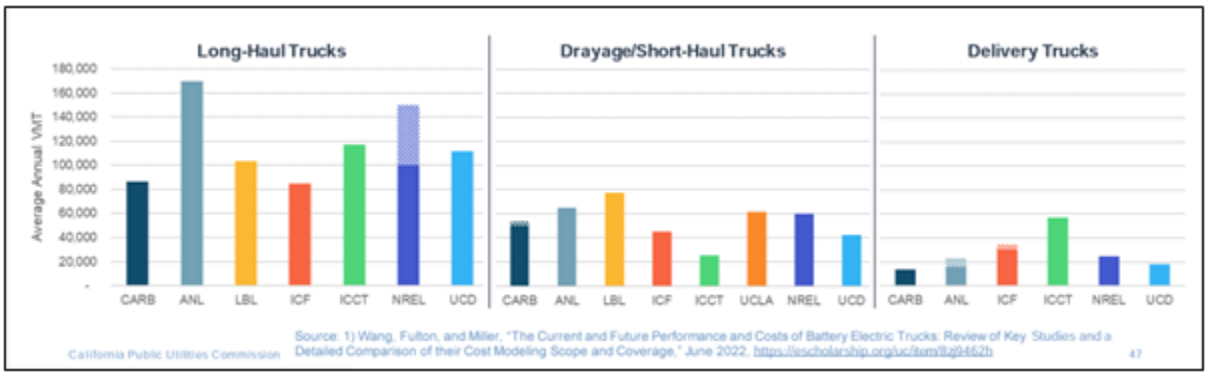
7. ATA Recommendations

Trucking companies are in the early stages of testing ZEVs, primarily BEVs. For instance, Volvo was one of the first companies to introduce a Class 8 BEV day cab as part of its $91 million Volvo Lights project in December 2020, less than 3 years ago. While the 23 heavy-duty BEV trucks deployed as part of this project have provided valuable information on the operation of these vehicles, more deployment-scale demonstrations are needed.

Data compiled by the CPUC helps illustrate the uncertainty associated with vehicle operations.[31] A study by researchers at the University of California-Davis examined 10 recent studies on the heavy-duty BEV TCO. The findings revealed that variations in TCO are directly linked to differences in assumptions, parameters, and other factors across the studies. For instance, the average distance traveled by truck varied by a factor of two to four times, as depicted in Figure 4.

[31] California Public Utilities Commission, *Freight Infrastructure Planning* (5/22/2023). Available at: https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/transportation-electrification/freight-infrastructure-planning.

FIGURE 4. Input Values Vary Widely Between Sources



Like the average VMT estimates, other BEV-related TCO components, such as vehicle, battery and maintenance costs, battery sizing and efficiency, etc., tended to have similar levels of variability. As the authors note, "Overall, TCO estimates across the studies, for a given truck type, can vary dramatically, though often several studies cluster together." This level of uncertainty across several research organizations raises concerns over the EPA and others' understanding of the performance and cost of ZEV technology.

Given the uncertainties outlined in these comments, ATA makes the following recommendations:

- More research and testing of ZEVs are needed to prove that the technology can scale to meet the trucking industry's various duty cycles and operating environments. EPA should conduct a supplemental analysis incorporating these factors.
- EPA should not reopen GHG Phase 2 2027 standards.
- GHG Phase 3 stringency targets should not begin until model year 2030 at the earliest to allow EPA time to evaluate the technology, fleets and OEMs to gather more real-world data, and accelerate charging and refueling infrastructure build out.
- EPA should work with the Department of Energy (DOE) and Department of Transportation (DOE) to determine metrics and regulatory authority to require the robust buildout of heavy-duty charging infrastructure.
- EPA and DOE jointly determine policy initiatives to streamline the patchwork regulatory system for energy transmission.
- Adopt a fuel and technology-neutral approach that incorporates established low-emission fuels alongside ZEVs. Including more mature and available fuels like renewable diesel, biofuels, compressed natural gas, and clean diesel can effectively reduce emissions today and align with the operational profile of our industry. Fuel diversity is a critical component to achieve a zero-emission future.

Consistent with the operational complexity of the trucking industry, ATA views the transition to ZEVs as a sequence based on technological maturity and readiness. Some fleets will figure out

how to electrify portions of their operation, given predictable routes, limited geographical range, and operationally compatible dwell times for charging. Others have discovered that ZEVs are not working in their operations because of the high purchase price, unavailability of infrastructure, or payload and performance concerns. Some fleets running certain battery-electric vocational trucks can appropriately scale the infrastructure required for their operation and duty cycle. Most long-haul operators, however, tell us that the challenges are too significant to do so affordably and at scale. EPA should sequence its focus on the infrastructure to support ZEVs and segments of the industry that prove the technology works for the duty cycle.

Conclusion

Trucking moves America. Today, 80 percent of the United States is serviced only by trucks. "If you got it, a truck brought it," is a common saying in the industry. Our national experience with COVID shows that small disruptions to the supply chain somewhere can have cascading effects everywhere. As EPA evaluates comments submitted to the Phase 3 proposed rule and examines where the technology is today, ATA again requests that it is done in a manner that will be cost-effective to fleets. That means understanding how existing assets are used in real-world operations.

ATA members have made significant environmental progress in adopting emissions technology that have reduced criteria pollutants by 99 percent and cut oil consumption. Industry has supported past EPA regulations because they were achievable and benefited fleets with reasonable payback periods for emission reducing technologies. Under the Phase 3 proposal, the EPA will require industry to adopt yet to be proven technology, without sufficient charging or refueling infrastructure to support proposed adoption rates and abandon the collaborative trust by reopening GHG Phase 2 standards.

ATA stands ready to assist in this significant rulemaking to ensure a final regulation can be implemented and lead to success. If you have any questions concerning these comments, please contact me at 703-838-1879 or jgelb@trucking.org.

Respectfully submitted,

Jacqueline Gelb
Vice President, Energy and Environment
American Trucking Associations

Appendix 1.

OFFICIAL SURVEY

Technology & Maintenance Council

Turning Experience Into Practice

Issued:
June 16, 2023

Greenhouse Gas (GHG) Phase 3 Member Survey (2023)

Developed by the Technology & Maintenance Council (TMC)

ABSTRACT

Sixty-five individual TMC Fleet Executive level members responded to TMC's "Greenhouse Gas (GHG) Phase 3 Member Survey," which was administered in May and June 2023. The purpose of the study was to gather intelligence required for American Trucking Associations, Inc. (ATA) to offer a comprehensive response to the U.S. Environmental Protection Agency's (EPA) GHG Phase 3 proposal. The survey consisted of 25 questions, covering fleet demographics, experience with battery electric and hydrogen fuel cell vehicles, as well as any future plans the responding fleets may have regarding these technologies and the infrastructure that supports them. The majority of those responding indicated little or no experience with either BEVs or hydrogen fuel cell vehicles. Of those that did report experience, a majority reported being either greatly dissatisfied or dissatisfied with respect to range, charging times and cost.

While most respondents did not have current experience with BEVs or hydrogen fuel cell vehicles, 50 percent reported they expect to have to include them in their fleets, mainly to comply with anticipated future regulations. Respondents are generally negative regarding the anticipated payback period for the new technologies as compared to their existing fleet inventory, and many expressed concern over long lead times for charging station installations and infrastructure challenges. In order to compensate for these perceived challenges, many reported needing weight exemptions, financial and tax incentives and extended rollout timetables for regulatory compliance if BEVs and hydrogen fuel cell vehicles are to be successfully integrated into their fleet operations. ❑

COUNCIL OF ATA

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INTRODUCTION

Sixty-five individual TMC Fleet Executive level members responded to TMC's "Greenhouse Gas (GHG) Phase 3 Member Survey," which was administered in May and June 2023. The purpose of the study was to gather intelligence required for American Trucking Associations,Inc. (ATA) to offer a comprehensive response to the U.S Environmental Protection Agency's (EPA) GHG Phase 3 proposal. The survey consisted of 25 questions, covering fleet demographics, experience with battery electric and hydrogen fuel cell vehicles, as well as any future plans the responding fleets may have regarding these technologies and supporting infrastructure.

METHODOLOGY

Survey alerts were sent via email to more than 500 TMC Fleet Executive Level Members at various times starting in May 2023 and closing in June 2023. **Figure 1** illustrates how the survey notice email appeared to recipients.

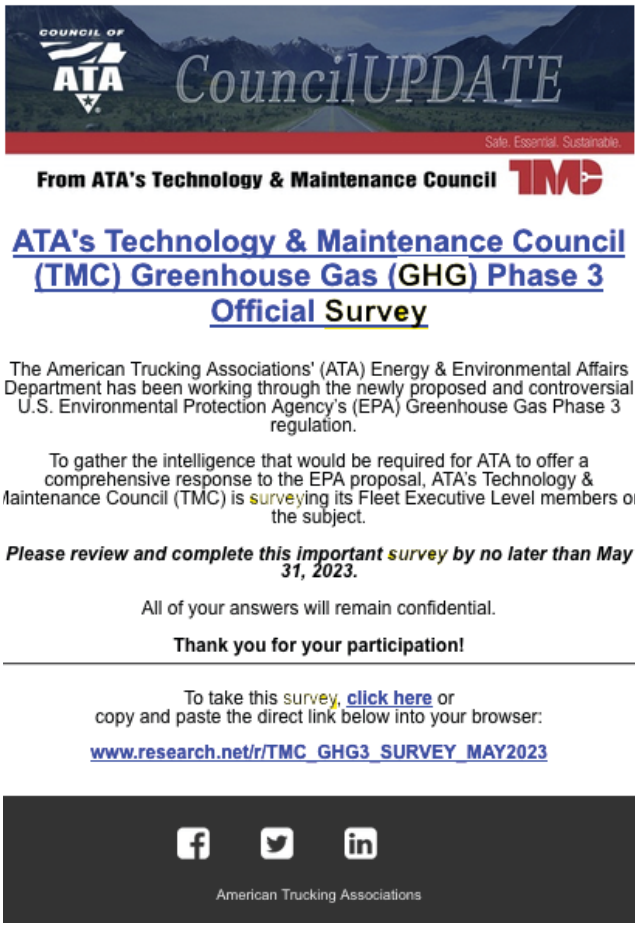

Figure 1

The survey was conducted using SurveyMonkey. Eblast alerts were generated using the Adestra email management system. Sixty-five individuals attempted to complete at least a portion of the survey. The survey was activated on May 18, 2023. The survey was closed June 1, 2023.

The survey was initiated at the request of the American Trucking Associations' Energy & Environmental Affairs Department, and administered by Council staff members Robert Braswell, TMC Executive Director, and Cori Hicks, TMC Administrative Coordinator.

RESULTS

The total number of responding TMC member fleets was 65. The response rate was about 13 percent. Survey respondents were asked a series of demographic questions to determine their company's geographic area of operation, vocation and fleet size (if applicable).

Q1: Which of the following best describes your company's operation (check all that apply)?

Vocation	Number
Motor Carrier	46
Private carrier	8
Vocational	2
Longhaul	25
Regional	25
Shorthaul	23
Intermodal	6
Leasing (full service)	3
Truckload	15
Less-than-Truckload	15
Pickup & Delivery	13
Other (household movers)	3

See **Figure 2.**

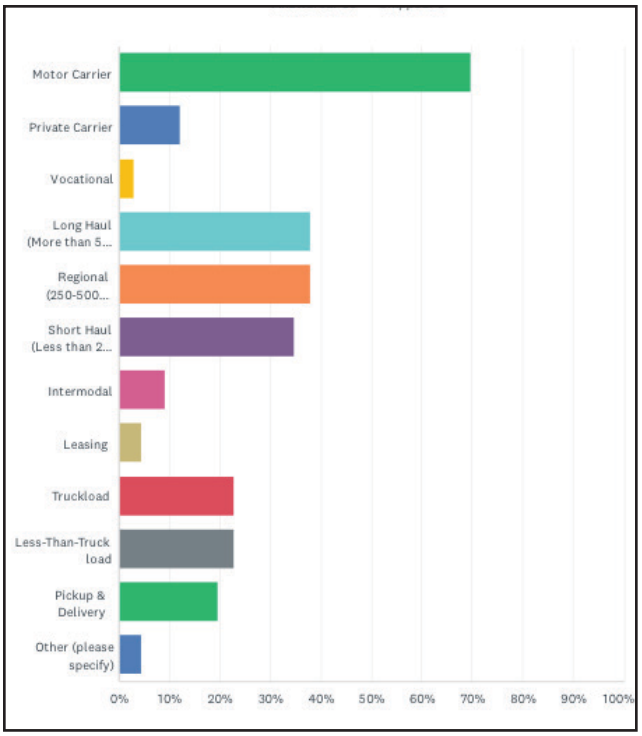

Figure 2: Vocation

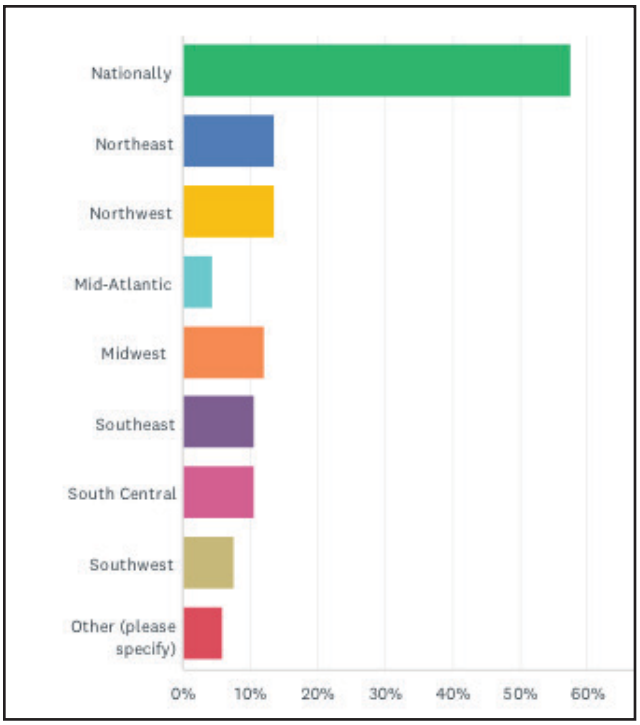

Figure 3: Region

Q2: In what area(s) does your fleet principally operate (check all that apply)?

Region	Number
Nationally	38
Northeast	9
Northwest	9
Mid-Atlantic	3
Midwest	8
Southeast	7
South Central	7
Southwest (including Hawaii)	5
Other (includes Alaska, Canada)	4

See **Figure 3**.

Q3: How many diesel-powered pieces of equipment does your fleet operate?

Individuals reported operating the following types of equipment in their operations. Sixty of 65 reported using Class 7 & 8 equipment.

Class 7 & 8 Tractors/Trucks	60
Class 5 & 6 Trucks	34
Class 3 & 4 Trucks	35

The total number of Class 7/8 tractors and trucks reported was 38,452. The total number of Class 5/6 trucks reported was 11,827. The total number of Class 3/4 trucks reported was 11,398.

Q4: How many battery electric vehicles (BEVs) have you purchased or leased for your fleet?

About 76.7 percent of respondents said their fleet has never purchased or leased battery electric vehicles (BEVs). Only 3.28 percent had reported purchasing or leasing 1-9 units. No one reported purchasing or leasing more than 99 BEVs.

The distribution of responses follows below:

Answer	Number
None	46
1-9	8
10-49	2
50-99	2
100-249	1
250-999	1
1000 or more	0

Q5: How many hydrogen fuel cell vehicles have you purchased or leased for your fleet?

About 93.4 percent of respondents said their fleet has never purchased or leased hydrogen fuel cell vehicles. Only 3.28 percent had reported purchasing or leasing 1-9 units. No one reported purchasing or leasing more than 99 such vehicles. The distribution of responses follows below:

Answer	Number
None	57
1-9	2
10-49	1
50-99	1
100-249	0
250-999	0
1000 or more	0

Q6: If you answered "None" above, are you exploring integrating electric vehicles into your existing operations?

Of those who reported purchase or lease of no BEVs, the majority (55 percent) said they were not exploring integrating electric vehicles into existing operations. The remaining 45 percent answered "yes."

Q7: Please rank your experience with the new technology? Examples: Range, serviceability, durability, charging times.

Respondents were asked to rate range, serviceability, charging times, maintainability, durability and cost associated with BEVs. Those who said they had experience with this new technology said the following:

Range	Percent
Greatly Dissatisfied	47.5%
Dissatisfied	17.5%
Neutral	27.5%
Satisfied	7.5%
Greatly Satisfied	0%

Serviceability	Percent
Greatly Dissatisfied	17.9%
Dissatisfied	30.8%
Neutral	43.6%
Satisfied	7.7%
Greatly Satisfied	0%

Charging Times	Percent
Greatly Dissatisfied	40.0%
Dissatisfied	17.5%
Neutral	32.5%
Satisfied	10.0%
Greatly Satisfied	0%

Maintainability	Percent
Greatly Dissatisfied	12.8%
Dissatisfied	23.1%
Neutral	56.4%
Satisfied	5.1%
Greatly Satisfied	2.6%

Durability	Percent
Greatly Dissatisfied	23.1%
Dissatisfied	20.5%
Neutral	46.1%
Satisfied	7.7%
Greatly Satisfied	2.6%

Cost	Percent
Greatly Dissatisfied	60.0%
Dissatisfied	22.5%
Neutral	17.5%
Satisfied	0%
Greatly Satisfied	0%

Q8: What is your payback period for your current conventionally powered fleet?

Respondents reported the following regarding payback periods for their conventionally powered fleets:

Answer	Percent
Less than one year	8.33%
1-3 Years	33.3%
3-5 Years	39.6%
5-7 Years	12.5%
More than 7 Years	6.25%

Q9: What do you expect as the payback period for any electric or hydrogen fuel cell vehicle?

Respondents reported the following as their expected payback periods for any electric or hydrogen fuel cell vehicles:

Answer	Percent
Less than one year	8.33%
1-3 Years	33.3%
3-5 Years	39.6%
5-7 Years	12.5%
More than 7 Years	6.25%

Q10: Have you experienced any difficulty insuring battery electric or hydrogen fuel cell vehicles?

The majority of respondents (74.2 percent) said they did not experience any difficulty insuring BEV or hydrogen fuel cell vehicles. The remaining 25.8 percent answered "yes."

Q11: What do you expect the residual value of these vehicles to be? (Please specify in US Dollars)

There was no single, common response to this question. Responses ranged from specific dollar figures ranging from $0 to $150,000. Others responded they did not know what the residual value might be, while others responded they expected there to be a negative residual value. Some representative comments included:

- *Negative Value. Batteries are not expected to last beyond 5 years without significant reduction in range. Battery replacement every 5-7 years alone will be more expensive than purchasing a conventionally powered truck.*
- *The early EVs will lose a lot of value because the technology is changing so fast that they will soon be obsolete.*
- *No clue, I don't think anyone knows or cares that small and midsize carriers do not have the time or money to deal with the pace this is coming at us!*
- *Unknown. Early vehicles mean technology that is outdated a year later.*

Q12: Have you had to retrain your maintenance technicians to service battery electric or hydrogen fuel cell vehicles?

The majority of respondents (76.3 percent) answered "no," and the remaining 23.7 percent answered "yes." This is consistent with earlier responses that indicated most fleets said they had little or no experience with these types of vehicles.

Q13: If the answer above was "yes," what is the required skill set and timeline to ensure technicians are knowledgeable to work on these electric and/or hydrogen fuel cell trucks?

Twelve individuals responded to this question. The following responses are representative of those received:

- *TBD—most of these new vehicles are too new for even the OE service techs to be familiar with, so our techs are just trained enough to know how to be safe around them and how to perform basic maintenance tasks (tires, brakes, etc).*
- *We do not have any "yet" we are just confused what to do and when?*
- *Training on new battery electric vehicles. Training occurs within a few months of deploying BEVs.*
- *Forced outsourcing at premium prices. With this, there is a void of qualified personnel. In addition to current skills, technicians will now have to be trained in high voltage electricity.*
- *We are trying to be allowed to work on the high voltage side of the units but have not been allowed to. We have taken all online training available and are willing to purchase tooling and commit to this. We do everything on our diesel and CNG trucks.*
- *None currently in the fleet but absolutely will need to retrain/ further train as these vehicles enter the fleet.*

Q14: Does your operation plan to install charging on site or anticipate utilizing public charging when it becomes available for commercial vehicles? Please explain.

Thirty-six individuals responded to this question, of whom 19 said they planned to install charging onsite or anticipated using public charging when available. Several others said their decision would depend on cost, routes and site availability. Eleven said definitively they would not.

Q15: What experience have you had with your utility to integrate charging on site?

Twenty-three of 33 respondents reported little or no experience in this area. The remaining fleets reported frustration with long lead times for installation and availability. The following responses are representative of those received:

- *We attempted to install battery electric fork lifts at one of our facilities a decade ago and the cost to get the power to the building and redo the electric infrastructure was cost prohibitive.*
- *So far, it has been difficult for even small to medium size projects, and very expensive. Working-level utility folks are great to deal with, but the regulations they are bound by make the job very difficult.*
- *Not much. However, we did receive a rebate to integrate two level 2 chargers for light duty electric vehicles that we have already incorporated.*
- *Slow for the utility to respond.*
- *At this point, utility can't even install adequate power to larger new buildings. Some construction projects on three-year wait to connect. Expanding to include major commercial transportation may take 10 years.*
- *18-24 month lead time. 12 markets we are looking at electrifying with 10 different utilities.*
- *Only one California location today. Once installed the site was maxed out on supply.*

Q16: If you do not have onsite charging, have you begun having conversations with your utility?

Forty individuals responded to this question. Of these, 32.5 percent reported "no," and 67.5 percent reported "yes."

Q17: What is the lead time being quoted for onsite charging installation? (Please select the best range that applies.)

Twenty-six individuals responded to this question. The distribution of answers follows:

Answer	Percent
Less than six months	15.4%
6-12 months	3.8%
12-24 months	42.3%
24-36 months	7.7%
Longer than 36 months	30.8%

See **Figure 4**.

Q18: Is your company investing capital to own charging on site?

Thirty-five individuals responded to this question. Of these, 62.7 percent reported "no," and 37.1 percent reported "yes."

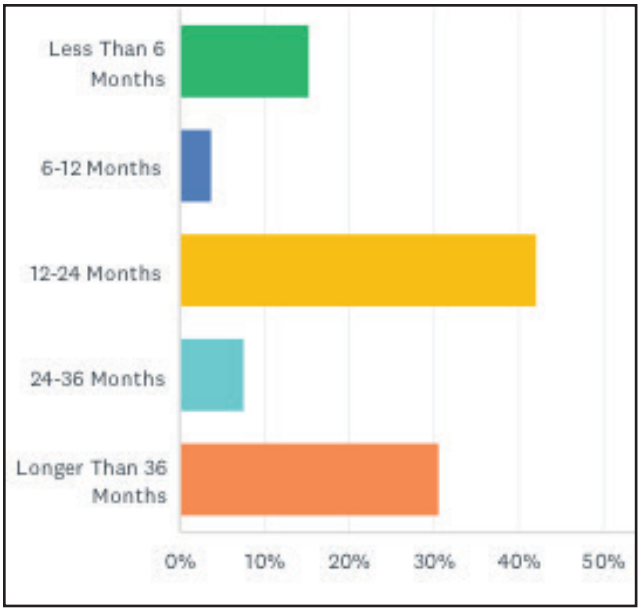

Figure 4: Station Installation Lead Time

Q19: How would you rate the promise of electric vehicle and hydrogen fuel cell technology on a scale of 1-10? (10 being the best and 1 being the worst.)

Thirty-eight individuals responded to this question. The average rating received was 3.54 out of 10.

Q20: Why did you rate the Promise of EV and Hydrogen Fuel Cell technology as you did in the question above? Please explain.

Thirty-five individuals responded to this question. The following responses are representative of those received:

- *Weight and distance concerns*
- *Will have limited use*
- *No proven technology in harsh climates. Hydrogen is very inefficient and costly.*
- *I think electric it not feasible for our operation at all. Hydrogen has some promise from a length of haul and time on the street, but is still less efficient than diesel and takes more energy to make hydrogen than it produces.*
- *The ROI, political impacts of the necessary rare earth minerals, and environmental impacts of battery proliferation are far worse than current clean diesel alternatives.*
- *Huge unknown with technology and infrastructure to support.*
- *Because it only changes the problem. It doesn't solve it*
- *Reliability for both is below our economic threshold. Availability is questionable for trucks and grid capacity.*
- *I am not opposed to hydrogen-powered equipment. There is not enough power to the existing grid to support current technology, not sure how we can buy equipment that can not meet the needs of our contracts.*
- *Too many initial challenges upfront with know known solutions to overcome complete cost and range issues.*
- *Because seeing is believing. Also I feel the government has an agenda here which may not necessarily be in our best interest.*
- *The promise is excellent. These vehicles can be envisioned as total replacements for our existing fleets, but the reality is that a lot of assumptions will have to come true to make that happen.*
- *No long testing results available.*
- *Too early to give any value to EV or HFC before using it*
- *It is coming at us too fast! We have no clue what to do first or even if we should do anything at all? What about our current fleet? What happens to that equipment? We cant get trucks now, and they think there will be enough EV or Hydrogen trucks available?*
- *This question should have been separate for each technology. Battery electric is in production with many OEM's but still has limitations for range, cost and weight. Hydrogen fuel cell is still in development.*
- *First hand experience as well as limited infrastructure. These technologies are in their infancy and do not appear ready for large scale deployment. Using battery versus LP gas forklifts as a reference for life cycle cost savings since it is an established technology, it appears projected cost savings from the government for battery powered trucks are very optimistic..*
- *After attending the ACT expo a few weeks ago and doing further research, there are still more questions than answers. The charging infrastructure is nowhere near where it needs to be. The grid can not handle the necessary power needed to put infrastructure in. The trucks are cost prohibitive from an initial investment standpoint. I am having a difficult time getting an actual quote or an order for a Class 6 BEV box truck. The dealers do not have people knowledgeable with selling those trucks in my market.*

- *There are too many holes or discrepancies in the plans we hear. No one is talking about the lack of power to charge these trucks. The lack of range has improved but I don't hear much progress. Everyone is ignoring the fact that EV's have a much larger carbon foot print than current diesel trucks.*
- *I think the move to HFC is the future for long haul and there is not enough R and D for that type of fuel.*
- *Our electricity grid will not be able to handle the demand of EV vehicles. They are too expensive and we don't think we can afford to insure them. Batteries for them are too expensive.*
- *Long term we feel that alternate power technology will be able to be utilized in specific parts of the industry successfully, but likely will not be able to provide a solution for all use cases.*
- *I'm optimistic due to how fast technology is evolving. Concerned over the utilities on the electric side and cost structure of hydrogen. It will only make sense if it comes down significantly in cost (infrastructure will take at least a decade) or diesel will have to climb in cost to catch up to it.*

Q21: Are you expecting to expand your electric vehicle or hydrogen fuel cell portfolio in the next 3 years?

Forty individuals responded to this question. Of these, 50 percent reported "no," and 50 percent reported "yes."

Q22: Are electric or fuel cell vehicles part of your company's sustainability goals?

Thirty-seven individuals responded to this question. Of these, 59.5 percent reported "no," and 40.5 percent reported "yes."

Q23: If you answered "yes" in the previous question, please describe the anticipated extent and timing of deployment.

Fourteen individuals responded to this question. The following responses are representative of those received:

- *Will have to follow the mandate.*
- *Looking at yard trucks first and on site charging stations. Port trucks etc. In the next 3-5 years.*
- *Depends on our utility provider, they are waiting until we have electric trucks to start building and we are waiting until they have the electricity available to purchase trucks.*
- *We will follow California's ACF and EPA's GHG Phase 3 timing for our deployments, and anything beyond that will be opportunistic if costs align. Customer requests will also increase our transition pace beyond the regulatory requirements.*
- *Fleet conversion is expected to include deployment of electric vehicles over the next decade to support sustainability goals.*
- *Contingent upon regulations. Range on current products is greatly lacking.*
- *I currently have two light-duty electric vehicles that we use for visiting job sites. I plan to incorporate one 26' class 6 BEV truck either in Q4 2023 or Q1 2024 depending on when we can actually get an order placed.*
- *5 to 10 years.*
- *Within 5 years, but may be forced to implement sooner.*
- *Not sure, watching the market and will decide as technology matures.*
- *Applied for funding. Will find out this summer if we received it. It is extremely expensive right now to do this outside of California or New York state. And not sure if the OEMs will be able to support the volume of what is needed to comply with regulations coming.*
- *We any at this point. Cannot answer some questions.*
- *Testing in 3 to 5 years*

Q24: Is there any additional information that ATA should include in our comments to EPA to supplement the transition to electrification? For example: incentives, other alternative fuels, federal excise tax (FET) repeal, weight exemptions, etc.

Twenty-five individuals responded with comments to this question. The following responses are representative of those received:

- *Alternative fuels, incentives.*
- *Weight exemptions and alternative fuels. Specifically, locally produced renewable diesel and dairy digester gas (negative emissions!).*
- *The broad-brush approach to these policies is not the right model.*
- *Focus on renewable diesel. It's far cleaner than even BEV vehicles when you take into account the full life cycle of the vehicle and electrical generation. It runs in the current fleet of trucks and requires no new distribution infrastructure.*
- *Lack of incentives other than in California. FET a huge penalty for current equipment as well as ZEVs. Need practical solutions, not hypothetical.*
- *The final cost to the average consumer will be horrific if we continue down this path.*
- *Lessen the regulations and make them more affordable so small businesses like ours should be able to survive. These emissions regulations are literally putting us out of business.*
- *Incentives are not sufficient. The $40,000 tax rebate is nice, but it doesn't touch the business case for a current zero-emission, Class 8 truck that now costs over $400,000 and can't do a typical diesel truck's work in a day. EPA should also be looking at overall infrastructure timing for both electricity and hydrogen. The amount of each 'fuel' required is staggering for Class 8 trucks alone, and even the GHG Phase 3 timing is optimistic to support the volumes of vehicles that will be required for compliance. Weight exemptions must be treated very carefully, as we could damage our already fragile roadways by going too far for the sake of accommodating overweight technology.*
- *No one has a clue how time consuming and confusing this is for the small and mid size carriers. We are currently fighting so many battles and now another one coming at us! How many are just going to give up? This could be devastating to the supply chain!*
- *Incentives for BEVs are important and weight exemptions should be considered.*
- *Allow more time for these unproven technologies to be real world tested before mandating their use. In addition, have one rule instead of state by state provisions.*
- *We need incentives, credits, and grants in other markets besides California. To my knowledge, Arizona does not have much to offer currently. We will also need a weight exemption as a BEV 26' box truck will weigh about 21,000 lbs empty. This only gives a legal Class 6 payload of 5,000 lbs. That will be a deal breaker for many movers and truckers that run medium duty.*
- *EPA ignores the fact there is not enough power available to meet their EV goals. EPA ignores the fact that EVs have a much larger carbon foot print, cradle to grave, than diesel trucks.*
- *This is another example of the government lacking common sense. In order to meet the demand for electricity power companies will cause more environmental damage than using diesel power will over next 25 years. The economic burden alone will kill thousands of truckers. Sick and tired of government interference.*
- *Not sure, customers are not going to understand weight reduction requirements do to regulation changes.*
- *Timing is everything. Radical changes to our industry will result in significant disruptions and cost increases.*

- *I believe that the electric infrastructure is not ready and won't be ready to meet government dreams.*
- *We are under the CAACF regulation and will be looking at 10% in 2027. Needs to be GVW weight accommodation for batteries. FET repeal is good as a stand alone. Need for Government/Industry collaboration with fuel/utility industry to drive infrastructure forward. Need to start messaging that moving forward will not be without cost for consumers (they need to accept that they will pay for it, period). TMC needs to continue leadership in standardizing industry components and operating procedures.*

CONCLUSION

The majority of those responding indicated little or no experience with either BEVs or hydrogen fuel cell vehicles. Of those that did report experience, a majority reported being either greatly dissatisfied or dissatisfied with respect to range, charging times and cost. A near majority reported similar dissatisfaction with respect to serviceability. A more favorable response was given to maintainability and durability, with half or nearly half of respondents rating this factor as "neutral." In all five categories, less than 12 percent rated them as either greatly satisfied or satisfied.

While most respondents did not have current experience with BEVs or hydrogen fuel cell vehicles, 50 percent reported they expect to have to include them in their fleets, mainly to comply with anticipated future regulations. Respondents are generally negative regarding the anticipated payback period for the new technologies as compared to their existing fleet inventory, and many expressed concern over long lead times for charging station installations and infrastructure challenges.

In order to compensate for these perceived challenges, many reported needing weight exemptions, financial and tax incentives and extended rollout timetables for regulatory compliance if BEVs and hydrogen fuel cell vehicles are to be successfully integrated into their fleet operations. ❑

NOTES

FUTURE TMC MEETINGS

CLEVELAND, OHIO
September 17-21, 2023
2023 Fall Meeting
& National Technician Skills Competitions
Huntington Convention Center
To Register: *http:/tmcfall.trucking.org*

NEW ORLEANS, LA.
March 4-7, 2024
2024 Annual Meeting
& Transportation Technology Exhibition
Ernest N. Morial Convention Center

Technology & Maintenance Council
A Technical Council of
American Trucking Associations

80 M Street, SE, Suite 800 • Washington, DC 20003 • (703) 838-1763 • http://tmc.trucking.org

Appendix 2.

Statement of

Andrew Boyle
First Vice Chair of the American Trucking Associations
and
Co-President, Boyle Transportation

Before the

United States Senate
Committee on Environment and Public Works
Subcommittee on Clean Air, Climate, and Nuclear Safety

Hearing on

"Cleaner Vehicles: Good for Consumers and Public Health"

April 18, 2023

Introduction

Chairman Markey, Ranking Member Ricketts, and Members of the Subcommittee, I appreciate the opportunity to testify before you today on behalf of the American Trucking Associations (ATA) and my company, Boyle Transportation. In addition to my duties as Co-President of Boyle Transportation, I also serve as 1st Vice Chairman on the Board of Directors for the ATA, as a member of the American Transportation Research Institute's (ATRI's) Board of Directors, and as a member of the business advisory committee for the Northwestern University Transportation Center.

ATA is a 90-year-old federation and the largest national trade organization representing the 7.65 million men and women working in trucking-related jobs. ATA is a fifty-state federation that encompasses 34,000 motor carriers and their suppliers, working in all sectors of the industry, from less-than-truckload (LTL) to truckload, refrigerated transport for food and beverage and life sciences, intermodal trucking, auto haulage, and household goods movement. Our members range from the nation's largest motor carriers to mom-and-pop one-truck operations.

Boyle Transportation is a 51-year-old motor carrier providing transportation services to select clients in the bio-pharmaceutical and government/defense sectors. We employ 200 people, including 160 of the nation's finest professional truck drivers, and were recognized as having the #1 work environment among smaller fleets in all of the US and Canada in 2020 and 2021. We have the honor of doing important work – transporting critical materiel to support national defense and delivering life-saving medicine. In December 2020, the first batches of the Pfizer COVID vaccine were shipped on Boyle Transportation trucks.[1] Boyle is a subsidiary of Andlauer Healthcare Group, a highly regarded logistics provider to the Canadian healthcare industry.

Our company has made enormous investments in environmental sustainability. We are the only trucking company in North America to achieve certification for the International Standards Organization's rigorous 14001 Environmental Management System. Boyle has been an Environmental Protection Agency (EPA) SmartWay Partner since 2008, including the last 5 consecutive years as a SmartWay "High Performer." We are a recipient of EPA's Region 1 Environmental Merit Award. Thanks to continual investment in equipment and adoption of best practices, in the last 6 years we have reduced fuel consumption per truck by 20%, reduced CO2 emissions by 14%, and Particulate Matter emissions by more than 50%. Our headquarters is solar powered.

I welcome the opportunity to discuss how the trucking industry has made progress in reducing emissions by deploying cleaner heavy-duty trucks on our nation's highways, as well as the challenges that we face in meeting ambitious goals for achieving further environmental benefits. Boyle Transportation, and the trucking industry as a whole, recognizes the importance of reducing our emissions footprint. I hope that my testimony today will assist the Committee in evaluating the path forward on achievable regulations to improve sustainability in the transportation industry.

The Facts on Trucking's Environmental Progress

The trucking industry has a positive story to tell about our progress in reducing emissions over the past few decades. A new truck today emits 99% fewer particulate matter emissions than one in 1985, and 99% fewer nitrogen oxide (NOx) emissions than one in 1975. 60 trucks today emit what one truck

[1] Smith, J. (2020, December 14). Vaccine Transport Leans on Tight Network of Refrigerated-Truck Operators. *Wall Street Journal*. https://www.wsj.com/articles/vaccine-transport-leans-on-tight-network-of-refrigerated-truck-operators-11607987480?reflink=desktopwebshare_permalink

emitted in 1988. Those cleaner trucks are meeting American's demands to move more freight than ever before. More than 80% of U.S. communities rely *exclusively* on trucking to meet their freight transportation needs, and trucking currently moves more than 70% of the nation's annual freight tonnage.[2] Over the next decade, trucks will be tasked with moving 2.4 billion more tons of freight than they do today, and trucks will continue to deliver the vast majority of goods to American communities.[3] As we meet the needs of our domestic supply chains, we look forward to working with Congress, agencies and stakeholders to continue improving our environmental sustainability.

Boyle Transportation proudly participates in the voluntary EPA SmartWay program, which works with transportation service providers to track, document, and share information about reducing fuel use and freight emissions across supply chains. For the last five years, as a SmartWay "High Performer," we reduced our emissions output to a level 59% lower than that of the average tractor trailer fleet, and we look forward to continuing to achieve emissions reductions through this program.

Since 2004, EPA SmartWay partners in trucking have saved billions of dollars in fuel costs, reduced oil consumption, and eliminated millions of tons of air pollutants. EPA estimates that the program has helped its partners save 357 million barrels of oil since 2004.[4] If one barrel of oil produces 11 to 12 gallons of diesel fuel,[5] that means trucking companies participating in the SmartWay program have saved more than 4 billion gallons of fuel—over $19 billion at current prices—in the last eighteen years. Critically, those fuel savings resulted in massive emissions reductions of 2.7 million short tons of nitrogen oxide (NOx); 112,000 short tons of particulate matter, and 143 million metric tons of CO2.

Trucking began phasing out harmful sulfur from diesel fuel in 2006, practically eliminating sulfur oxide emissions. ATA also championed two separate EPA and National Highway Traffic Safety Administration (NHTSA) regulations in 2011 and 2016, establishing the first-ever truck engine and vehicle greenhouse gas (GHG) emission and fuel consumption standards—known as Phase 1 and 2, respectively. In total, between 2014 and 2027, the combined Phase 1 and 2 GHG standards stand to cut CO2 emissions by 1.37 billion metric tons, saving vehicle owners and operators $220 billion in fuel costs, and reducing oil consumption by up to 2.5 billion barrels of oil over the lifetime of the vehicles sold under the program. As EPA prepares to begin its Phase 3 GHG rulemaking, trucking looks forward to working with the agency to set ambitious, but also achievable, standards.

Compliance Challenges for Interstate Trucking

Aggressive emissions reduction goals are important and necessary. However, our industry's path forward on zero-emission vehicle development requires time for infrastructure to be built out, increased production of clean energy and alternative fuels, and the maturation of a market for next generation vehicles that are affordable for trucking companies of all sizes. Trucking is keenly aware of the costs of new requirements and their impacts on energy supplies and supply chains. Forcing unnecessary demands on the trucking industry such those formulated by the California Air Resources Board (CARB) that recently received EPA waivers for implementation under the Clean Air Act, will harm our supply chains without meaningfully accelerating the deployment of new, clean trucks nationwide.

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[2] *U.S. Census Bureau Commodity Flow Survey.* U.S. Census Bureau, 2017.
[3] *Freight Transportation Forecast 2020 to 2031*. American Trucking Associations, 2020.
[4] *SmartWay Program Successes*, U.S. EPA, Available online at: https://www.epa.gov/smartway/smartway-program-successes.
[5] *Frequently Asked Questions*, U.S. EIA, Available online at: https://www.eia.gov/tools/faqs/faq.php?id=327&t=10

While these challenges will be overcome in time, the large-scale substitution of battery electric vehicles will require unprecedented advancements in battery range and capacity, as well as a significant buildout of the national power grid. The path forward for trucking decarbonization requires acknowledgement of market realities that both keep supply chains moving and enable fleets like mine to affordably acquire and install infrastructure. If I want to electrify a battery or hydrogen fuel cell electric fleet, I need infrastructure that is affordable, available, and compatible with the grid, in a way that is timely, reliable, and makes sense for my operation. Unfortunately, that is not the case today.

To the point of needed investments in our power grid to support battery electric vehicles, and specifically heavy-duty trucks, the statistics on the amount of energy that will be consumed following that transition are astounding. A recent ATRI study found that electrification of the entire U.S. vehicle fleet would consume 40.3% of the current electricity demand, yet our aging grid can hardly sustain its current needs.[6] In California, where rolling blackouts and brownouts are not uncommon, utilities would need to generate an additional 57% beyond their current output to support an electric vehicle fleet.[7] Beyond the sheer volume of energy production required, installation of charging facilities that fit the demands on commercial trucking is equally vital. Many ATA members who try to install even modest charging infrastructure today are told by electric utilities that it will take years to extend the required service to their facilities, if at all possible.

Whereas the purchase of a car is often driven by personal preference and emotion, buying a truck is an entirely different exercise. A truck is a utilitarian device. Beyond safety, the purchasing decision is predicated on reliability (which we call "uptime"), productivity, and total cost of ownership.

In 15 minutes, a truck driver today can fill his or her truck with enough diesel to travel over 1,200 miles. For battery-electric trucks, a two-hour charge can get you 200 miles, depending on the conditions (range can degrade significantly with cold or hill conditions, or when using HVAC systems). With the advancement of DC fast chargers, this charging time could be cut in half. The next generation of chargers is expensive – roughly $100,000 each. Even with their installation, it would still require over five hours to achieve the same range you get in 15 minutes today, assuming a truck could even carry that quantity of batteries.

Long-haul trucks require significantly heavier batteries (anywhere from 6,000 to 17,000 lbs.), which leads to reduced payload capacity. When trucks are less productive due to decreased payload capacity, limited mileage range, and downtime for charging, the consequence is that *more trucks and drivers are needed to move the same amount of freight*. Some of our large members running limited-scope BEV operations report the need for a 3:2 and sometimes even 2:1 ratio of battery-powered trucks relative to what their diesel trucks produce. Couple the need for more trucks with the fact that each BEV truck costs 2-3x that of today's clean diesel truck (a roughly $300,000 upcharge per unit) and it's easy to see that the negative economics of BEVs would be felt severely by the trucking industry and in turn shared by shippers and consumers.

While diesel fueling stations allow for throughput of 4-5 trucks per hour, charging stations would service 2-3 trucks *per day*. Every truck parking (not fueling) spot would need a charging station, and we are woefully short of truck parking spots today.

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[6] *Charging Infrastructure Challenges for the U.S. Electric Vehicle Fleet*, American Transportation Research Institute, December 2022. Available online at: https://truckingresearch.org/2022/12/06/charging-infrastructure-challenges-for-the-u-s-electric-vehicle-fleet/

[7] *Ibid.*

Ongoing fuel price volatility, and state-based regulations increasing prices at the pump, continue to cost the industry tens of billions of dollars and make it harder to upgrade equipment to new, cleaner trucks. In 2019, U.S. trucks consumed 45.6 billion gallons of fuel—of which 36.5 billion gallons were diesel.[8] The trucking industry's fuel bill in 2019 was $112 billion when prices were $3.00/gallon. However, diesel prices rose throughout 2022, reaching a high of $5.81/gallon—90% higher than 2019 average prices. This increase resulted in an annual diesel fuel bill exceeding $200 billion for the American trucking industry, a nearly $100 billion yearly increase.[9]

I urge the Subcommittee to be aware of the challenges facing the small- and medium-sized trucking fleets that are the heart of our supply chains in obtaining new, clean trucks. According to statistics from the U.S. Department of Transportation (USDOT), 95.7% of private and for-hire motor carriers operate 10 or fewer trucks and 99.7% operate fewer than 100 trucks.[10] According to a 2022 ATRI survey of the industry, fuel costs (22%), equipment and lease payments (15%), and repair and maintenance costs (9%) account for 46%, or nearly half of the overall operating costs for trucking companies nationwide.[11] Surging fuel and truck prices, as well as the deployment of new technologies that are difficult for fleets to maintain, create enormous headwinds that stymie efforts to incentivize fleets to invest in newer, cleaner equipment.

While larger fleets can take advantage of economies of scale as they invest in new equipment, thousands of smaller fleets lack that flexibility. Expensive new engine technologies, historically high diesel prices and interest rates, and the lack of infrastructure to support alternatives such as battery-electric or hydrogen fuel cell vehicles must be considered in evaluating realistic timelines for reducing emissions in freight transportation. Trucking companies support cleaner transportation technologies and fuels that protect the environment, but we are only the consumers who purchase those goods and not the manufacturers. New California requirements that mandate the purchase of specific equipment should take into account whether those trucks are available at the necessary scale to achieve regulatory goals.

Disadvantages of Patchwork State Regulations

Trucking companies traverse state lines multiple times a day, and a strong *national* emissions framework ensures the continuity of our nation's freight networks. ATA strongly advocates for federal emissions regulations to ensure that interstate commerce continues to move. State-based regulations that impact fuel costs or mandate the deployment of particular equipment make it harder for our industry to meet the needs of their customers—your constituents. Federal standards for emissions reduction are necessary to ensure companies transporting freight interstate are not forced to become creative with how, where, and when they purchase and dispatch new equipment to remain compliant.

For this reason, ATA has opposed state-based regulations such as those promulgated by CARB and other jurisdictions while working with federal regulators at the EPA and other agencies to craft harmonized federal alternatives. The recent decision by the EPA to grant California's Clean Air Act waivers to enforce policies that are unworkable for the trucking industry – policies that wholly

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[8] *ATA Economics and Industry Data*. American Trucking Associations, 2022. Available online at: https://www.trucking.org/economics-and-industry-data

[9] ATA Analysis based on EIA fuel pricing data. Available online at: https://www.eia.gov/

[10] *ATA Economics and Industry Data*. American Trucking Associations, 2022. Available online at: https://www.trucking.org/economics-and-industry-data

[11] *An Analysis of the Operational Costs of Trucking: 2022 Update.* American Transportation Research Institute, August 2022.

discounted and marginalized trucking industry participation – will result in unworkable regulations and undermine long-term cooperative efforts to reduce emissions.

California has a unique set of clean air issues due to their particular topography and atmospheric conditions, and for this reason the state should not become the *de facto* template for the next national emissions standards, pollutant criteria, and zero-emissions vehicles sales and purchase requirements. Establishing standards that are not technologically sound or that set unrealistic timelines for the deployment and purchase of new zero-emission trucks will set the industry and country up for failure. Federal standards for these areas need to be technologically and economically achievable, without impeding supply chain operations or business planning for the trucking industry and those who rely on us to deliver their freight.

The Biden Administration's multiagency *U.S. National Blueprint for Transportation Decarbonization* identifies battery electric technology as a "limited long-term opportunity" in the long-haul segment and points out better-positioned opportunities for hydrogen and sustainable liquid fuels.[12] These alternatives offer advantages in energy density, comparable refueling times with diesel fuel and, in the case of biodiesel and renewable diesel, compatibility with many current internal combustion engine configurations. Despite the aggressive timelines set out by the state of California to mandate battery electric vehicle manufacture and fleet sales, the Administration's blueprint notes longer, more manageable timelines extending out to 2050.[13]

Allowing California to impose punitive, unachievable mandates that are guaranteed to fail will not help to accelerate deployment of technologies nationwide. State-based standards distort the market for vehicle manufacturers and complicate decisions for purchasers of new heavy-duty trucks. Earlier this year, manufacturers informed California they will not be making certain engines available in the state from 2024 to 2026 due to the state's ill-conceived emissions standards.[14] EPA should not approve standards that are unachievable or promote their spread to other states. In addition, banning the in-use operation of engines certified to federal standards by requiring California-only emission standards will significantly impact the ability of interstate fleets to manage their national operations.[15]

Similarly, aggressive state mandates where compliance relies more on fleets obtaining exemptions than their ability to deploy zero-emission trucks do little to advance this technology. A realistic compliance timeline is needed given the limitations surrounding the capability of zero-emission vehicles combined with the dearth of charging and fueling infrastructure. The business case for a zero-emission truck mandated in California is further impacted if a company needs to operate that vehicle in colder climates or on mountain roads where it will have significantly less range and payload.

Allowing California to proceed under a Clean Air Act waiver will also have a major impact on container cargo moving to and from ports in that state, risking further disruption in facilities that are just now recovering from historic backlogs and challenges with cargo distribution. In December of 2022, 99.87% of visits to the Port of New York/New Jersey were by diesel-powered trucks.[16] At the Port of Los

[12] *The U.S. National Blueprint for Transportation Decarbonization*, page 50, U.S. Department of Transportation, January 2023.
[13] *Ibid.*
[14] California Air Resources Board, Public Meeting to Consider Proposed Delegation of Authority to the Executive Officer to Consider Proposed Amendments to Mobile Source Regulations, Board Item #23-3-3 Summary (March 23, 2023).
[15] California Air Resources Board, Proposed 15-day Changes to the Proposed Regulation Order Advanced Clean Fleets Regulation High Priority and Federal Fleets Requirements, Section 2015 (r) ICE Vehicle Additions (March 23, 2023).
[16] *PortTruckPass Comprehensive Report*. Port Authority of New York and New Jersey, December 2022.

Angeles, 93% of container moves and 95% of trucks are powered by diesel fuel with virtually all remaining movements powered by natural gas. At the beginning of this year, California prohibited the use of truck engines manufactured prior to 2010, which accounted for 13% of all container moves at the Port of Los Angeles in December.[17] (The figure for New York/New Jersey is even higher at 30.48%.[18])

As CARB seeks to phase out older trucks and mandate only zero-emission trucks at ports by 2035, those drayage trucking companies will have to replace their entire fleets. This mandate is unworkable for an ecosystem of carriers that tend to be small companies operating at low margins, and whose productivity is often victim to unpredictable cargo availability and other commercial complications that reduce their efficient movements to and from ports and inland facilities. These state mandates are unworkable and will drive enormous costs on the trucking industry, risking further supply chain disruption. It's worth noting that despite its intensive regulatory environment, California has one of the oldest truck fleets in the country, with 52% of its trucks not meeting the EPA 2010 emission standard[19].

Federal Solutions for Interstate Emissions Reductions

Allowing states to impose unworkable mandates will not move the needle on large-scale substitution of electric, hydrogen, or alternative fuel models for diesel trucks, or on reducing emissions in the freight transportation sector. Developing achievable federal standards, making new heavy-duty trucks more affordable by repealing the federal excise tax on those vehicles, addressing the unique needs of heavy-duty trucks in the rollout of Infrastructure Investment and Jobs Act (IIJA) and Inflation Reduction Act (IRA) programs and incentives, and allocating IIJA funding toward reducing congestion will all have tangible benefits for environmental sustainability.

Reducing the cost of new, cleaner, or alternative fuel vehicles is the first step to increasing their usage nationwide. While the IRA included purchase incentives for heavy-duty vehicles, those incentives are offset by a century-old tax established to fund our participation in World War I. The antiquated Federal Excise Tax (FET) on heavy-duty trucks and equipment adds an additional 12 percent to the cost of every new truck. To ensure the maximum impact of IRA incentives for clean vehicle purchases, and to encourage the reduction of emissions from trucking and the supply chain, the first important step is removing this onerous tax to immediately make new, clean equipment more affordable. Senators Ben Cardin and Todd Young recently introduced the Modern, Clean, and Safe Trucks Act (S. 694) to repeal this burdensome tax, and we urge the members of this Subcommittee to consider the strong merits of that legislation in the context of broader sustainability goals.

Eliminating the FET will reduce the cost of new technologies by tens of thousands of dollars and is a technology-neutral solution that allows companies to invest in not only battery-electric, but alternative fuel vehicles as well depending on the availability of infrastructure to support the specific technologies. Proposals for hydrogen infrastructure for trucks must ensure that the infrastructure is in place where that technology best fits in supply chains. Where lifecycle emissions can be reduced by deploying renewable diesel and renewable natural gas, those fuel stocks need to be available for trucking.

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[17] *Clean Truck Program (CTP) – Gate Move Analysis*. Port of Los Angeles, December 2022. Available online at: https://kentico.portoflosangeles.org/getmedia/452bad8c-4e16-490f-bab6-155b061866bb/POLA-Monthly-Gate-Move-Analysis (accessed January 19, 2023).

[18] *PortTruckPass Comprehensive Report*. Port Authority of New York and New Jersey, December 2022.

[19] Diesel Technology Forum, dieselforum.org

ATA supports technology-neutral efforts to incentivize the deployment of new, clean trucks. Where Congress has chosen to provide targeted incentives in this area, such as the 45W tax credit for Qualified Commercial Clean Vehicles and the 30C Alternative Fuel Vehicle Refueling Property credit, ATA will work with federal agencies to formulate guidance that will enable industry to maximize the effect of the incentives on emissions reductions.

In the case of initial guidance proposed by the Internal Revenue Service (IRS) on Qualified Commercial Clean Vehicles, ATA recommended changes to extend the credit to vehicles reaping the benefit of maturing technologies that charge vehicles through regenerative braking or solar sources. We hope that the agency will take stakeholder feedback into account as it implements provisions of the IRA. Additionally, because various tax credits and infrastructure improvements affect the underlying economics of trucking and the supply chain, we urge Congress to give the market time to adjust before considering or pursuing additional measures that may drive up the operational costs of trucking.

The availability and price-competitiveness of low-carbon and renewable fuels is also an important area where additional Congressional action could help reduce emissions from trucking. While the IRA increased the tax credit for Sustainable Aviation Fuel (SAF) up to $1.75 per gallon, the credits for renewable diesel remain at $1.00 per gallon. As a result, feedstocks for this valuable emissions-reduction tool for trucking are likely to be cannibalized for aviation. Restoring parity for tax credits for renewable diesel – and increasing the tax credit for renewable natural gas, which is used by some trucking companies and is currently eligible for a $0.50 per gallon tax credit – can have immediate and sustainable environmental benefits.

As technologies for clean vehicles mature and the infrastructure buildout continues for electric and alternative fueled passenger and commercial vehicles, the greatest near-term reduction in emissions must come from dedicating infrastructure funding towards congestion mitigation. Reducing idling hours and time wasted in stop-and-go traffic on our nation's highway bottlenecks will make more efficient use of every gallon of fuel burned, as well as benefit our nation's truck drivers and highway safety. Congress should ensure that highway funding is directed to new[20] construction that targets those chokepoints.

Highway congestion adds nearly $75 billion to the cost of freight transportation each year.[21] In 2016, truck drivers sat in traffic for nearly 1.2 billion hours, equivalent to more than 425,000 drivers sitting idle for a year.[22] This caused the trucking industry to consume an additional 6.87 billion gallons of fuel in 2016, representing approximately 13% of the industry's total fuel consumption, and resulting in 67.3 million metric tons of excess carbon dioxide (CO2) emissions.[23]

Congestion serves as a brake on economic growth and job creation nationwide. A first-world economy cannot survive a developing-world infrastructure system. As such, the federal government has an obligation to ensure that necessary resources are available to address this self-imposed and completely solvable situation. ATA encourages USDOT to prioritize the discretionary program resources made

[20] "After Capito, Graves Pledge to Formally Challenge Federal Highways Memo, FHWA Issues Substantially Revised Replacement," U.S. Senate Committee on Environment & Public Works, Press Release, 24 February 2023, Available online at: https://www.epw.senate.gov/public/index.cfm/2023/2/after-capito-pledge-to-formally-challenge-federal-highways-memo-fhwa-issues-substantially-revised-replacement.
[21] *Cost of Congestion to the Trucking Industry: 2018 Update*. American Transportation Research Institute, Oct. 2018.
[22] *Ibid.*
[23] *Fixing the 12% Case Study: Atlanta, GA.* American Transportation Research Institute, Feb. 2019.

available by the IIJA to address major freight bottlenecks. Furthermore, given the importance of the National Highway System—and especially the Interstate System—to the supply chain, a greater share of federal investment should be directed toward the maintenance and improvement of these highways, which serve as key freight corridors.

Finally, I encourage the U.S. Government to use its purchasing power to encourage fleets that move freight for government agencies to purchase the ultra-low emission vehicles currently on the market and embrace EPA SmartWay's best practices. 47% of Class 8 trucks currently operating nationwide are model year 2010 or older and send far more emissions into the air than today's clean vehicles. The path to long-haul heavy truck electrification depends on technology and infrastructure advancements that will take years to develop. Meanwhile, we can make significant progress in reducing emissions offering a market-oriented "carrot" for implementing best practices for sustainability and deployment of new, clean trucks.

In Conclusion

Thank you for the opportunity to testify before you today on the progress being made by the trucking industry to reduce emissions in recent decades. I am grateful for the opportunity to share my company's unique sustainability success story and welcome the chance to discuss workable solutions to the environmental challenges we face.

On behalf of the American Trucking Associations and the 7.65 million people in trucking-related jobs who power our nation's supply chains and keep the wheels of the economy turning, we look forward to working with the Subcommittee and Congressional leaders to support legislation that will help us meet ambitious energy and emissions goals. Thank you.