

**STATE OF NEW JERSEY  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

<b>Advanced Clean Trucks Program and</b>	<b>)</b>	<b>53 N.J.R. 588(a)</b>
<b>Fleet Reporting Requirements; Proposed</b>	<b>)</b>	<b>Notice of Rule Proposal</b>
<b>Amendments: N.J.A.C. 7-27A-3.10;</b>	<b>)</b>	<b>Publication Date: April 19, 2021</b>
<b>Proposed New Rules: N.J.A.C. 7:27-31</b>	<b>)</b>	<b>Public Hearing Date: May 20, 2021</b>
<b>and 33.</b>	<b>)</b>	

**COMMENTS OF THE  
TRUCK AND ENGINE MANUFACTURERS ASSOCIATION**

June 18, 2021

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**Introduction**

The Truck and Engine Manufacturers Association (EMA) submits these comments in opposition to the proposal of the New Jersey Department of Environmental Protection (DEP), published in the New Jersey Register on April 19, 2021 (53 N.J.R. 588(a)), to adopt and opt-in to California's Advanced Clean Trucks (ACT) Program and Fleet Reporting Requirements. As DEP staff know, California's ACT rule is part of a suite of additional rules that the California Air Resources Board (CARB) has adopted or plans to adopt regulating the emissions from medium-duty (MD) and heavy-duty (HD) on-highway vehicles and engines. Those rules collectively raise a number of concerns regarding the technological feasibility, cost, and practical implementability of California's future MD and HD regulatory program. That is significant, since we believe that New Jersey is obligated to opt-in to the entirety of California's MD and HD program, not just the ACT Rule in isolation. The DEP cannot simply pick and choose which particular regulatory elements to adopt. Finally, and most important, the Biden Administration has indicated that it intends to proceed with a national MD and HD regulatory program which, we believe, will obviate the need for New Jersey, or any State, to opt-in to California's MD/HD program – a program specifically adopted to address California's truly unique air quality issues.

Because EPA is almost certain to act before New Jersey could fully implement the California MD and HD program, and as explained in greater detail below, we urge the DEP to defer taking any action to adopt the ACT program now. Instead, the DEP should wait to see if the Biden Administration and EPA fulfill their promises to move toward a zero-emission vehicle (ZEV) future. Moreover, and at the very least, the DEP should defer taking action on the ACT Rule until the DEP can make a full assessment of the wide-ranging impacts that will result from the DEP's having to adopt all of CARB's other MD/HD rules.

EMA is the trade association that represents, among other entities, the world's leading manufacturers of MD and HD on-highway vehicles and engines – the types of trucks and truck engines that would be subject to the ACT Program that the DEP has proposed to adopt and implement in New Jersey. EMA regularly represents the interests of its members in helping to develop federal and state programs to regulate the emissions from HD and MD vehicles and engines. Accordingly, the DEP's pending proposal to opt-in to the ACT Program, which was

adopted by CARB and finalized as of March 15, 2021, is directly germane to EMA and its members.

EMA member companies design and manufacture highly-customized vehicles to perform a wide variety of commercial functions, including interstate trucking, regional freight shipping, local parcel pickup and delivery, refuse hauling, and construction – to name a few. EMA member companies are investing billions of dollars to develop MD and HD ZEVs and fully support expanding the market in New Jersey for those ZEV trucks. However, the ACT Program is not a reasonable or cost-effective path to accelerate the deployment of MD and HD ZEVs in New Jersey.

EMA's comments explain why the DEP should not approve or implement the ACT Proposal in New Jersey, especially at this juncture. In brief, the ACT Program should not be adopted because:

- (i) there are better alternative paths for accelerating the deployment of MD and HD ZEVs in New Jersey;
- (ii) the ACT Proposal is not a reasonable regulatory program for accelerating the deployment of MD and HD ZEVs in New Jersey, and is more likely to deter the deployment of ZEV trucks;
- (iii) the ACT Program, as the DEP proposes to implement it in New Jersey, would not be “identical” to CARB’s ACT Program, and so cannot meet the opt-in criteria under section 177 of the federal Clean Air Act (CAA);
- (iv) the DEP has failed to assess the benefits or costs of the ACT Program in a reasonable manner as required under the New Jersey Administrative Procedure Act (APA);
- (v) the DEP is not relying on the ACT Program to achieve or demonstrate compliance with the national ambient air quality standards (NAAQS) for ozone in New Jersey, so an opt-in to the ACT Program is not authorized under the section 177 of the CAA – the “opt-in” provision of the CAA; and
- (vi) the DEP has additional time to consider these important issues before opting-in to the ACT Program with a model year 2025 effective date, which additional time will allow for the development of a more holistic and integrated program that also considers the measures that EPA will be putting into place.

These comments address each of those issues in turn.

i) **New Jersey would be better served by advocating for next-tier nationwide HDOH standards as a “bridge” to ZEVs**

EMA and its members fully recognize that ZEVs are integral to the future of the commercial trucking industry. Accordingly, as noted, EMA member companies are investing billions of dollars to develop and bring to market MD and HD ZEVs. Those efforts alone, however, will not achieve success. A broad-based transition of the trucking industry to ZEVs will

take a determined and concerted effort by federal and state policymakers, manufacturers, trucking fleets, utilities, and other key stakeholders. During that period of transition, new cost-effective interim NO<sub>x</sub> and GHG standards for conventionally-fueled trucks will be necessary to achieve additional emission reductions during the bridge-period toward the longer-term development and deployment of commercial ZEVs.

More specifically, next-tier nationwide emission-reduction regulations for conventionally-fueled trucks will be key to establishing a cost-effective bridge to heavy-duty and medium-duty ZEVs. To that end, the DEP along with the other “MOU States” should work with EMA and other stakeholders to advocate for next-tier EPA regulations for HD and MD vehicles and engines that include the following elements:

- Meaningful reductions in the tailpipe NO<sub>x</sub> standard.
- New test procedures focused on reducing emissions under lightly-loaded operating conditions typical of urban centers.
- Additional NO<sub>x</sub> control under extended idle conditions.
- Next generation “in-use” compliance-assurance protocols to control emissions over a broader range of real-world operating conditions.
- Program elements to ensure compliance over a longer period of time than currently required.
- Continued reduction of GHG standards and emissions based on an increasing percentage penetration of ZEVs in the MD/HD truck market.
- Flexible emissions credits to incentivize ZEVs.

EMA encourages the DEP to join in EMA’s collaborative work with EPA to assess all of the above program elements as part of a next-tier commercial vehicle rulemaking in 2021 and 2022, with potential nationwide implementation dates starting in 2027.

While several of CARB’s program elements for MD and HD trucks are directionally consistent with those that EMA envisions for EPA’s next-tier nationwide rule, CARB will be implementing those elements with unreasonably short timelines, questionable technical feasibility, unsustainable cost-benefit metrics, and material adverse impacts on new vehicle prices and sales volumes. The overall impacts of CARB’s new regulations are likely to yield extremely negative consequences. In that regard, commercial fleets have not reacted positively in the past to the deployment of major new emissions-control technologies on an accelerated timeline, and, as a result, we fully expect that the very significant “pre-buy/no-buy” scenarios that occurred in 2007 with respect to commercial vehicles will be experienced again in California, as well as in any opt-in States.

A far more effective bridge to widespread commercial MD and HD ZEV sales and deployment is through a cost-effective nationwide EPA-implemented lower-NO<sub>x</sub> program. Future

federally-certified lower-NO<sub>x</sub> HD/MD engines and vehicles will ensure that businesses and municipalities in each state have access to the full range of powertrain and vehicle solutions they are accustomed to purchasing today. They will not be forced to pay premium prices for potentially less reliable products, to purchase outside their brand preference, or to seek purchase opportunities in neighboring states. And, they can remain profitable without resorting to purchasing used higher-emitting vehicles, or having to maintain their existing fleets longer, both of which adverse outcomes would negate the environmental benefits that result from the purchase and deployment of new vehicles.

The significant nationwide NO<sub>x</sub> reductions from an EPA lower-NO<sub>x</sub> program for commercial vehicles and engines would be much more effective than State-specific programs at achieving nearer-term air quality goals, because nationwide standards will cover all of the out-of-state trucks that travel in and through New Jersey. To the extent that there might be other local needs to reduce emissions from NO<sub>x</sub> “hotspots” within the State (*e.g.*, ports), those local needs could be best addressed through more specific approaches, such as targeted accelerated fleet turnover requirements, alternative fuel specifications, zero-emission vehicle and equipment programs at specific facilities, and other targeted incentive programs, rather than through the adverse statewide economic and environmental impacts that would result from the adoption of CARB’s unilateral ZEV mandates. Accordingly, New Jersey (as well as the other MOU States) should work for the implementation of EPA’s next-tier HD/MD regulations as the best option for achieving their respective air quality goals during the bridge years before significant ZEV-truck market penetration takes hold.

Transitioning the commercial trucking industry to ZEVs demands a strategic and concerted effort by state and federal policymakers, manufacturers, trucking fleets, utilities, and others. More specifically, successfully bridging to a MD and HD ZEV future will require the following steps:

Undertake technical and economic research to:

- Determine the level of incentives needed to overcome the financial barriers to purchasing ZEVs and converting commercial fleets to zero emissions.
- Identify the funding and other potential impediments to building-out the necessary electric charging/hydrogen fueling infrastructure.
- Assess the optimal commercial vehicle market segments most suitable for the near-term deployment of ZEVs; properly prioritize and allocate resources for early deployment in those market segments; and establish reasonable pathways to the broader adoption of commercial ZEVs.
- Determine the optimal long-term ZEV power source for each commercial vehicle market segment and the corresponding infrastructure needs (*i.e.*, electricity and/or hydrogen), including generation and storage.

Establish practical, implementable, and effective policies to:

- Incentivize trucking fleet transitions to ZEVs.
- Accelerate the turnover/retirement of older, high-emitting commercial vehicles.

- Target the commercial vehicle applications and markets most suitable for near-term transition to ZEVs.
- Fund construction of the unique charging/fueling infrastructure needed for MD and HD ZEVs, including electricity grid modernization and decarbonization.
- Implement new nearer-term EPA lower-emission standards for conventionally-fueled trucks on a nationwide basis to allow for broad-based additional NO<sub>x</sub> and GHG reductions and to help manage the longer-term transition (the bridge) to commercial ZEVs.
- Utilize carbon neutral liquid and gaseous fuels for interim GHG reductions.

The DEP should join with other stakeholders, including EMA, to advocate for a national program consistent with the foregoing principles and recommendations. That is the better path to the accelerated successful deployment of MD and HD ZEVs. CARB's ACT Program will not lead to that desired outcome. It should not be adopted.

ii) **CARB's ACT Rule is not a reasonable means to achieve the accelerated deployment of MD and HD ZEVs in New Jersey**

The DEP's proposal to "opt-in" to CARB's ACT Program is more likely to hinder, rather than promote, the emerging market for zero-emission commercial vehicles. In brief, the ACT Rule amounts to a naked sales mandate that requires manufacturers to sell a prescribed increasing number of zero-emission MD and HD vehicles, without any corresponding ZEV-purchase requirements. Consequently, instead of buying ZEV trucks, fleet customers in New Jersey may simply choose to purchase other less expensive conventionally-fueled trucks, or to continue maintaining their existing trucks.

In that regard, MD and HD ZEVs have higher initial purchase costs (2 to 3 times higher), higher current overall life-cycle costs and lower utility (i.e., it takes more ZEVs to do the work) than conventionally-fueled vehicles, and the ACT Rule fails to consider the significant financial incentives needed to make MD and HD ZEVs a viable investment for a trucking business. Further, the ACT Rule does not address or provide for the comprehensive and robust charging and refueling infrastructure that will be needed at fleet facilities to operate the mandated ZEVs, the build-out of which will be expensive, complicated, and time-consuming.

As noted above, the core components of an effective MD/HD ZEV program include significant public investments in ZEV infrastructure build-out and in ZEV-purchase incentives. The ACT Rule that the DEP proposes to adopt does not include those necessary program elements, and so will not result in an effective ZEV program for MD and HD ZEVs. To the contrary, the DEP's proposal likely will have the unintended consequence of slowing the turnover of the MD and HD truck fleet in New Jersey, as fleets shift to purchasing low-mileage used trucks as one potential alternative. The likely results from that accelerated fleet turn-over will be corresponding negative impacts on air quality.

New Jersey's commercial vehicle market includes many distinct segments that each require unique vehicle configurations, and each application has a different level of suitability for HD and

MD ZEVs. We estimate that there are at least 70 different market segments for Class 4 through 8 trucks in New Jersey, with some applications (*e.g.*, residential parcel delivery) representing reasonable targets for electrification, while others (*e.g.*, cement-mixing and plowing snow) are much less suitable. Any analysis of the opportunities for deploying MD and HD ZEVs in New Jersey must consider the diverse market segments and include a robust evaluation of each one. Those segments identified as highly suitable may be considered “beachhead” markets, where zero-emission trucks can be deployed first before expanding to other market segments.

As the DEP staff is well aware, commercial trucks are not just big cars. Unlike the passenger car market where purchasers select from a limited number of vehicle options, commercial fleets provide truck manufacturers with extensive and detailed vehicle specifications so their trucks will meet the particular demands of the fleets’ unique operations in the most efficient and cost-effective manner. When a trucking company purchases a commercial vehicle, it is making a significant capital investment in business equipment that it expects to utilize in a manner that will return a profit. Trucks are amortized over longer time periods than cars, and they are assessed, not with regard to subjective criteria such as style and comfort, but solely on the objective basis of work-performance and cost-efficiency. Thus, truck purchasers’ decisions turn on detailed up-front assessments of the customized truck’s utility for the job at hand, and its purchase price, reliability, durability, operating costs, and resale value. In short, a trucking company will only invest in a new commercial vehicle when it will improve the bottom line of the business.

In light of the foregoing, the zero-emission MD and HD vehicle market in New Jersey will require significant incentive funding until zero-emission trucks are profitable for trucking businesses. Incentives must be sufficient to offset all of the ZEV truck life-cycle costs that will exceed current commercial vehicle costs, including: (i) higher purchase prices, and increased sales taxes; (ii) operational inefficiencies (*i.e.*, it takes more ZEV trucks to perform the work of conventionally-fueled trucks); (iii) lower residual values; (iv) required investments in new maintenance facilities, training, and parts inventories; and (v) significant investments to install and maintain the necessary charging and refueling infrastructure. Additionally, incentives must be available for an extended period of time so fleets can rely on them in implementing their long-term business plans. CARB’s ACT mandates — and the DEP’s proposed opt-in to them — do not include any of those requisite incentives.

As noted, an effective ZEV-truck program also must address the challenges of developing and installing the requisite charging infrastructure to support zero-emission MD and HD battery-electric trucks — something else that the proposed ACT Program completely fails to do. Charging stations must be located at fleet terminals and other depots where trucks are typically parked, and developing that infrastructure will be a complicated, expensive and multi-year undertaking. Moreover, fleets will need to expand the charging infrastructure over time if they plan to deploy additional battery-electric trucks. Since it may take 24 to 48 months from concept to having a fully functional charging station in place, a viable MD/HD ZEV initiative needs to have a primary near-term objective of incentivizing and assisting in the development of an appropriate charging infrastructure to enable the deployment of battery-electric commercial vehicles. Additionally, for fleet applications where fuel-cell electric vehicles may be the better option, hydrogen fueling stations will be needed. Again, the ACT Program does not account for that at all.

A reasonable ZEV-truck program needs to include significant incentive funding to offset the higher purchase-related costs and the very significant costs of the ZEV-recharging and refueling infrastructure build-out. The ACT Rule, which does not include such incentives, is inherently unreasonable (and unstable) and cannot stand. As a result, the ACT Rule, with its unilateral ZEV sales mandates and nothing more, is not the regulatory platform on which New Jersey should build its program to accelerate the deployment of MD and HD ZEVs.<sup>1</sup>

iii) **The DEP’s proposed ACT Program is not “identical” to CARB’s ACT Program and does not meet the opt-in requirements under CAA section 177**

There is another reason why the DEP’s proposed opt-in to CARB’s ACT Program should not proceed – the proposed opt-in is not authorized under CAA section 177. The ACT Program as the DEP would adopt and implement it in New Jersey would not be “identical” to the ACT Program that CARB is implementing in California. The DEP admits as much, noting in its proposal that it intends to implement “a **nearly identical** program in New Jersey.” (Proposal, p.11.) That does not pass muster under the CAA.

CAA section 177 establishes a number of criteria that a State must meet in order to be authorized to adopt and enforce California mobile source standards. See 42 U.S.C. §7507. One of those criteria, discussed more fully below, is that the State must need to include the California standards in its SIP to meet the State’s NAAQS-attainment obligations. New Jersey cannot meet that criterion. Another criterion is that the State’s adoption and opt-in process must result in the State having standards that “are **identical to the California standards** for which a [preemption] waiver has been granted.” 42 U.S.C. §7505(1). (Emphasis added.) The DEP’s proposal does not satisfy the CAA’s identity requirement.

The ACT Rule, as adopted in California, requires the manufacturers of MD and HD vehicles to sell an increasing percentage of ZEV trucks starting in 2024, with the mandated ZEV-sales percentages varying for the different weight classes of MD and HD vehicles. The following table summarizes the ZEV sales mandates at issue:

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<sup>1</sup> EMA previously filed extensive comments with CARB detailing why its ACT Rule is inherently unreasonable. Copies of those comments are attached hereto and incorporated herein.



Table A-1. ZEV Sales Percentage Schedule

Model Year	Class 2b-3 Group	Class 4-8 Group	Class 7-8 Tractors Group
2024	5%	9%	5%
2025	7%	11%	7%
2026	10%	13%	10%
2027	15%	20%	15%
2028	20%	30%	20%
2029	25%	40%	25%
2030	30%	50%	30%
2031	35%	55%	35%
2032	40%	60%	40%
2033	45%	65%	40%
2034	50%	70%	40%
2035 and beyond	55%	75%	40%

The ACT Rule, as originally adopted in California, applies the foregoing percentage-based sales mandates to the total number of MD and HD vehicles that a manufacturer sells in California to calculate the specific number and types of ZEV trucks, as sorted into the 3 weight-class groups, that a manufacturer needs to sell in a given year. Basically, a manufacturer generates a “deficit” for each conventionally-fueled vehicle it sells in any of the three listed weight-class groups of vehicles. The manufacturer then needs to generate a “credit” to offset that deficit by selling a ZEV truck of the same type, by selling a near-ZEV truck of the same type (which will earn partial credit), or by buying credits from another manufacturer. The credits that a manufacturer earns are weighted (using differing multipliers) based on the vehicle class of the ZEV-truck that the manufacturer sells, with larger heavier trucks earning higher credit-multipliers than smaller lighter trucks. The following table lists the specific credit-multipliers that are applied under the ACT Rule:

Table A-2. Weight Class Modifiers

	Vehicles in the Class 2b-3	Class 4-5 Vehicles in the Class 4-8 Group	Class 6-7 Vehicles in the Class 4-8 Group	Class 8 Vehicles in the Class 4-8 Group	Vehicles in the Class 7 and 8 Tractor Group
Weight Class Modifier	0.8	1	1.5	2	2.5

The ACT Rule's prescribed ZEV-sales percentages, in essence, are used to calculate the number of deficits that need to be retired each year through a manufacturer's sale of ZEV trucks and generation of corresponding credits. Those required ZEV-sales numbers are directly tied to the numbers and types of MD and HD vehicles that a manufacturer sells into the California market each year.

Significantly, the DEP is not proposing to utilize the California-sales-based calculations to determine the number of ZEV trucks that would need to be sold in New Jersey under the proposed opt-in to CARB's ACT Rule. Instead, the DEP intends to apply the above-listed ZEV-percentage sales mandates and weighting factors to the number and types of conventionally-fueled MD and HD vehicles that a manufacturer sells in New Jersey. One very important outcome from substituting New Jersey sales-based data for the California sales-based data is that New Jersey's ACT Program will not be "identical" to California's. The number and mix of MD and HD vehicles sold into New Jersey is fundamentally different from the number and mix of MD and HD vehicles sold in California. The result to MD and HD vehicle manufacturers is that the ACT Program as implemented in California, on the one hand, and in New Jersey, on the other, will not be identical.

Consider the following example: In 2028, Manufacturer A sells in California 400 Class 2b-3 Group trucks, 200 Class 4-8 Group trucks, and 400 Class 7-8 tractors. Under the ACT Program's percentage-based ZEV-sales mandates in 2028, that Manufacturer will need to sell 80 Class 2b-3 ZEV trucks, 60 Class 4-8 ZEV trucks, and 80 Class 7-8 ZEV tractor-trucks. To that Manufacturer, the breakdown for its overall production of MD and HD ZEVs in 2028 for California will need to be 36.5% Class 2b-3 trucks, 27% Class 4-8 trucks, and 36.5% Class 7-8 tractor-trucks (to total 100% of the Manufacturer's ZEV-truck production). However, if that same Manufacturer A sells in New Jersey that same year (2028) 300 Class 2b-3 Group trucks, 150 Class 4-8 Group trucks, and 50 Class 7-8 tractors, it will need to sell 60 Class 2b-3 ZEV trucks, 45 Class 4-8 ZEV trucks, and 10 Class 7-8 ZEV tractors. Under that scenario, the practical result to that same Manufacturer is that the manufacturing profile for its overall production of ZEV trucks for New Jersey (as distinguished from California) will need to be 52% Class 2b-3 trucks, 39% Class 4-8 trucks, and 9% Class 7-8 tractor-trucks. Thus, to that Manufacturer, and in practice to any manufacturer, the ZEV-truck production mandates under the ACT Program are **not identical** for California and New Jersey.

Significantly, the disparate and non-identical impacts on manufacturers from imposing the prescribed ZEV-sales mandates on differing mixes of truck sales in the two States will be exacerbated even more – multiplied, in fact – once the ACT Rule's various ZEV-credit multipliers (weighted differently for the three different weight-class groupings) are applied to manufacturers' differing mixes of trucks sold each year in the two States. That multiplying effect of the very real differences between the implementation of the ZEV mandates makes it even more apparent that the ACT Program would not apply identically to manufacturers selling trucks in New Jersey and California. The net result is that the DEP is not authorized to adopt the ACT Program under CAA Section 177.

The ACT Program as the DEP has proposed to adopt it is non-identical to California's in another important aspect as well. More specifically, under CARB's ACT Rule, MD and HD manufacturers can generate and "bank" early credits by selling ZEV trucks starting this year, in

2021, which gives manufacturers a three-year window to generate ZEV credits before they start to accrue deficits in 2024 for their sales of conventionally-fueled vehicles in California.

The DEP is not adopting that provision of CARB's ACT Rule. In that regard, the DEP states in its proposal that "[t]hough California's ACT regulation allows credits to be banked as early as 2021, [the DEP's proposal] provides that early credits may not be banked sooner than the 2024 model year." (Proposal, pp. 17-18.) "New Jersey will not allow manufacturers to generate credits prior to model year 2024." (Proposal, p. 19.) Thus, the DEP would provide only a one-year window to generate early ZEV credits, not a three-year window, which means that the DEP's ACT program will not only be non-identical to CARB's, but more stringent as well. That is another reason why the DEP's opt-in proposal is not authorized under the CAA.<sup>2</sup>

iv) **The DEP has failed to assess the likely costs and benefits of the ACT Program in New Jersey as required under the New Jersey APA**

New Jersey law requires that any regulatory proposal like the one at issue must include "a description of the expected socio-economic impacts of the rule, a regulatory flexibility analysis, ...and a job impact statement which shall include an assessment of the number of jobs to be generated or lost if the proposed rule takes effect." NJ Rev. Stat. §52:15B-4(a)(2). The required regulatory flexibility analysis needs to include an assessment of the initial capital costs and annual costs that will result from the proposed rule, along with an analysis of how the proposed rule has been designed to minimize any adverse economic impacts. NJ Rev. Stat. §52:14B-19. The DEP has failed to undertake and complete the mandated socio-economic analyses relating to the proposed adoption of the ACT Rule in New Jersey.

Instead of doing any analysis of its own regarding any of the potential socio-economic impacts from the implementation of the ACT Rule in New Jersey, the DEP has relied wholly and exclusively on the Standardized Regulatory Impact Analysis (SRIA) that CARB prepared for the ACT Program as adopted in California. In that regard, the DEP also has relied on all of the California-specific assumptions that went into CARB's SRIA. This is confirmed by the following multiple statements set forth in the DEP's proposal:

The Department relied on the methodology provided by CARB to estimate the emission reductions of the rule based on increased sales of medium-duty and heavy-duty ZEVs in New Jersey. These estimates were scaled to fit New Jersey's demographics and vehicle usage. (Proposal, p. 46.)

\* \* \*

CARB quantified the health risk from exposure to particulate matter (see CARB, Standardized Regulatory Impact Assessment) (CARB SRIA)) . . . and ascribed monetary values associated with each avoided premature death and health

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<sup>2</sup> CARB's ACT Rule relies, in part, on an earlier-adopted CARB rule that establishes certification requirements for ZEV powertrains. If the DEP does not also adopt that rule, the ACT Programs in California and New Jersey will be non-identical on that basis as well.

incident . . . The Department used CARB’s standard values to monetize the expected health outcomes [in New Jersey]. (Proposal, p. 48.)

\* \* \*

The costs [of the ACT Proposal] can be roughly estimated by adjusting the cost estimates developed by CARB in its Advanced Clean Trucks analysis. See CARB SRIA. CARB’s values were scaled to reflect VMT [vehicle miles traveled] in New Jersey. (Proposal, p. 50.)

\* \* \*

Based on its cost analysis, CARB found “developing ZEVs will decrease costs to the California economy primarily due to lower fuel costs.” CARB SRIA, p. 48. The Department assumes similar savings in New Jersey, even in the absence of California’s Low Carbon Fuel Standard program, which enables vehicle manufacturers to earn credit from producing low carbon vehicles (Proposal, p. 51.)

\* \* \*

The Department estimated the projected emission reductions of greenhouse gases, NO<sub>x</sub> and PM<sub>2.5</sub> from the implementation of the ACT regulation in New Jersey by scaling the benefits calculated by CARB in its rulemaking. Specifically, the Department relied upon the emission benefits described in CARB’s analysis for the ACT, and then scaled the results by multiplying the ratio of New Jersey’s medium-duty and heavy-duty vehicle miles traveled (VMT) by California’s medium- and heavy-duty VMT (Proposal, p. 54.)

\* \* \*

In order to estimate the benefits of implementing the ACT Program in New Jersey through 2040, the Department scaled California’s benefits to New Jersey’s VMT. The scaling factor of New Jersey medium- and heavy-duty VMT divided by California medium- and heavy-duty VMT is 0.150. (Proposal, p.55.)

\* \* \*

As part of its economic analysis, CARB estimated the impact of the ACT Regulation on total employment in California across all industries. [The Department scaled that analysis] adjusting

for the size of New Jersey's employment as of October 2020.  
(Proposal, p. 61.)

The foregoing quotes from the DEP's proposal make it clear that the DEP has conducted no independent analysis whatsoever of the socio-economic impacts or employment impacts of implementing the ACT Program in New Jersey. Instead, the sum and substance of the DEP's analysis was simply to apply a linear VMT-based scaling factor to all of the relevant cost-benefit calculations contained in the SRIA that CARB prepared for its California-tailored ACT regulation. That really amounts to no actual analysis at all. The DEP has simply assumed – without undertaking any critical review or independent verification efforts whatsoever – that the methods and conclusions set forth in CARB's SRIA are 100% correct and directly transferable to New Jersey. That type of unquestioning wholesale reliance on and deference to the regulatory analysis that another State prepared for its own purposes is inherently deficient as the basis for a valid rulemaking.<sup>3</sup>

One of the principal shortcomings of the DEP's short-cut methodology is the underlying assumption that the impact of the ACT Rule in California – the fifth largest economy in the world – can be scaled in a direct and linear fashion to the potential impacts of a similar rule in New Jersey, based solely on relative VMT. That is a manifestly unreasonable assumption, as detailed below.

Among the key differences between California and New Jersey that need to be factored-in when assessing the relative cost-benefit impacts of an ACT Program – differences that are not accounted for through a simple scaling of relative VMTs from MD and HD vehicles – are the following:

- (a) the population and mix, by weight and class, of MD and HD vehicles in California is markedly different than in New Jersey;
- (b) the driving and traffic patterns of MD and HD vehicles, along with the time-weighted utilization of different vehicle types (as well as the average speeds and loads of those differing vehicles) are not linearly related between California and New Jersey;
- (c) the rate at which MD and HD vehicles are replaced is not the same in California and New Jersey (for example, on a percentage basis, twice as many Class 7 trucks are sold in New Jersey than in California; see IHS Markit Data);
- (d) CARB has adopted a separate "Truck and Bus Regulation," which requires the accelerated turnover of pre-2010 MD and HD vehicles in California; New Jersey has no such regulation, which means that the underlying dynamics for new MD and HD vehicle sales in the two States are fundamentally different;

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<sup>3</sup> There is compelling evidence that CARB's SRIA is not 100% correct. More specifically, the California Natural Gas Vehicle Coalition (CNGVC) has sued CARB to overturn the ACT Rule on the ground that CARB's SRIA failed to account for the emissions and other environmental impacts that will result from the construction and development of the comprehensive recharging infrastructure that will be required to implement the ACT Rule's MD/HD ZEV mandates. See CNGVC v. CARB, Case No. 20CEG02250 (Ca, Sup. Ct., Fresno County).

- (e) the amount of VMT generated by out-of-state vehicles is not the same in California and New Jersey;
- (f) the emission rates from the HD and MD vehicle fleets are not the same in California and New Jersey, since, among other things, the age and usage rates of the vehicles, by weight class, in the respective fleets are not the same;
- (g) due to the many differences at issue, California uses a mobile source emissions model – EMFAC2021 – that is entirely different from the emission model approved for use in New Jersey – MOVES3;
- (h) the composition, capacity and types of electrical generating units (EGUs) that power the electrical grid in California are different than in New Jersey, which means that switching an increasing percentage of HD and MD vehicles to being powered by the electrical grid will yield different net environmental outcomes – and different risks and impacts from power grid interruptions – in the two States;
- (i) it is unreasonable to assume that the per-vehicle marginal costs of the ACT Program will be the same in New Jersey as in California, if New Jersey’s market for MD and HD vehicles is less than one-fifth of the size of California’s;
- (j) given the relative size of the California and New Jersey economies, it is not reasonable to assume that New Jersey’s economy can absorb and cover the ZEV infrastructure development costs at issue in the same manner and to the same extent as in California;
- (k) given the disparity of financial resources that California and New Jersey can apply to a MD/HD ZEV truck initiative, it can be anticipated that the scope and extent of potentially relevant ZEV incentive programs will differ substantially between the two States;
- (l) there is no assurance that the prices for diesel fuel and electricity, as well as the spread between those prices, will remain the same in New Jersey and California out through 2040;
- (m) there is no assurance that the mix of battery-electric ZEV trucks and hydrogen fuel-cell ZEV trucks will be the same in California and New Jersey, which will cause substantially different economic impacts; and
- (n) given the different levels of ambient air pollutants and the vastly different meteorology, there is no basis for assuming that vehicle emission reductions in California will yield precisely the same air quality benefits, just scaled for VMT, as in New Jersey.

Experts from Ramboll Consulting (Ramboll) have evaluated whether the relevant differences between New Jersey and California – differences relating to, among other things, the MD/HD trucking fleet mix and age, truck utilization rates, traffic patterns, vehicle operating conditions, emission profiles, emission inventories, vehicle turnover rates, out-of-state vehicle impacts, and electrical grid emissions, to name a few — preclude any reasonable assessment of the potential benefits and costs from adopting a ZEV-truck sales mandate in New Jersey, based

solely on applying a VMT-based scaling factor to the calculated benefits and costs from adopting a ZEV-truck sales mandate in California. Ramboll's analysis shows that such a VMT-based scaling methodology cannot yield a reasonable cost-benefit assessment. A copy of Ramboll's report is attached.

There are a number of key reasons supporting Ramboll's assessment. First and foremost, the GHG emission rates from electric generating units (EGUs) in New Jersey will remain higher than in California out to 2040, which encompasses the full phase-in period of the ACT Rule. Thus, switching HD/MD vehicles to being powered by EGUs will result in approximately 30% less GHG reductions in New Jersey than the DEP is assuming based on its rudimentary VMT-scaling approach. Second, New Jersey's trucking fleet mix (and VMT mix) is comprised, on a percentage basis, of many more short-haul vehicles than are operating in California. Since those vehicles emit less GHGs than the larger long-haul trucks, the presumed GHG benefits in New Jersey will be less for this reason as well. In addition, since short-haul trucks will have less residual value when replaced with ZEV-trucks, the incremental capital costs of the ACT Program will be higher in New Jersey. Third, trucks in California idle (when assessed on an hours basis) two-times more than trucks in New Jersey, meaning that New Jersey will see only one-half of the GHG reductions attributable to the elimination of idle emissions from ZEV trucks.

The DEP's rudimentary VMT-based scaling analysis fails to account for any of the foregoing relevant factors and differences, and so is fundamentally deficient. As a result, that simplistic analysis cannot and does not satisfy the requirements of New Jersey's Administrative Procedures Act. Indeed, since the DEP conducted no independent analysis of the actual amount of air pollution reductions (in tons-per-day) that will result from implementing the ACT Program in New Jersey, or of any of the actual associated costs in New Jersey, there is no prospect that the DEP's rulemaking record in this case could withstand judicial scrutiny. VMT-based scaling of CARB's SRIA, without more, cannot amount to a sufficient rulemaking record for implementing the ACT Program in New Jersey.

While the DEP's VMT-scaling methodology is fundamentally deficient (since it involves no actual assessment of any actual costs or potential benefits in New Jersey, as opposed to California), it does highlight the fact that the DEP's unilateral go-it-alone approach to reducing GHG emissions through the adoption of a ZEV-truck sales mandate just for New Jersey will not and cannot be effective. More specifically, in its proposal, the DEP notes that in order to meet the State's goals, "New Jersey must reduce its annual GHG emissions by roughly 73 MMT [million metric tons] CO<sub>2e</sub> [CO-equivalent] by 2050." (Proposal, p. 6.) The DEP then goes on to acknowledge that, at best, if all goes according to plan, opting-in to the ACT Rule will result in an annual CO<sub>2e</sub> reduction (by 2040) of just "0.44MMT/year CO<sub>2e</sub>." (Proposal, at p.55.)

By the DEP's own estimates and scaling methodology, all of the costs and market disruptions that will result from a unilateral opt-in to the ACT Rule will generate **less than one percent (0.6%)** of the required annual reductions in CO<sub>2e</sub>. And even that minuscule amount is probably overstated given Ramboll's findings, as highlighted above. Either way, no matter how one might slice the DEP's expected results, it is clear that the DEP's proposed opt-in to the ACT Rule is neither reasonable nor cost-effective.

It is also worth noting that the DEP’s proposal includes no analysis at all of whether the ACT Program can actually be implemented in New Jersey. In that regard, the DEP has made no showing that sufficient numbers and types of MD and HD ZEV trucks will be available for sale in New Jersey to comply with the proposed ZEV-sales mandate, especially in the absence of any corresponding ZEV-purchase mandates, or any incentives to promote ZEV purchases and the necessary build-out of a robust charging infrastructure. On that basis as well, the DEP’s analysis is inadequate and unreasonable.

In addition, it can be anticipated that once CARB’s mandates take effect in New Jersey, truck dealerships in the State may see their businesses suffer, long-haul fleet operators may choose to move out-of-state, and trucking-related job losses will occur. All of those adverse consequences should be, but have not been, accounted for in the DEP’s analysis of the impacts of the proposal at issue.

In sum, the DEP has utterly failed to support the proposed adoption of the ACT Program with the types of detailed New-Jersey-centric analyses required under the applicable New Jersey statutes. Consequently, the proposed rulemaking — which will have de minimus impact on GHG emissions in any event — should not be approved.

v) **The DEP likely will not have a basis to adopt and “opt-in” to the ACT Program under section 177 of the Clean Air Act**

a. **The scope of CAA Section 177**

New Jersey is in attainment with the 2008 national ambient air quality standards (NAAQS) for ozone (75 ppb), and will have demonstrated full attainment with the current 70 ppb ozone NAAQS by August of 2024. As the DEP confirmed in its State Implementation Plan (SIP) revision in December of 2017 (at page xiii), “all monitors in the New Jersey portion of the Northern NJ-NY-CT Nonattainment Area are below the 75 ppb standard, and have been since 2014. Therefore, we believe that New Jersey has met its obligations for attainment of the 75 ppb ozone NAAQS.”

Section 177 applies only in those instances where a State that is in nonattainment with a NAAQS (*i.e.*, for ozone) needs to include more stringent California standards as SIP measures to demonstrate NAAQS-attainment.

The specific terms of CAA section 177 (42 U.S.C. §7507) are as follows:

**New motor vehicle emission standards in *nonattainment* areas**

Notwithstanding section 7543(a) of this title [the CAA section relating to the preemption of state standards] **any State with plan provisions approved under this part** [“Part D - Plan Requirements for Nonattainment Areas”] may adopt and enforce for any model year standards relating to the control of emissions from new motor vehicles or new motor vehicle engines and take such other actions as are referred to in section 7543(a) of this title respecting such vehicles if —



- (1) Such standards are identical to the California standards for which a [preemption] waiver has been granted for such model year; and
- (2) California and such State adopt such standards at least two years before commencement of such model year (as determined by regulations of the Administrator). (Emphasis added.)

The statutory language makes it clear that the option for States to utilize section 177 is limited to those States that have EPA-approved SIPs and that need to include more stringent California standards as SIP provisions in order to bring the States' nonattainment areas into attainment with the applicable NAAQS, including for ozone. The heading to section 177 – “New motor vehicle emission standards in **nonattainment** areas” – reinforces that conclusion. In that regard, CAA section 171(2) (42 U.S.C. § 7501(2)) defines a nonattainment area to mean “for any air pollutant, an area which is designated ‘nonattainment’ with respect to that pollutant.” Given that definition, a State that is demonstrating compliance with the NAAQS through an EPA-approved “maintenance plan” would not be eligible for an opt-in under Section 177, since the submission of a maintenance plan applies to a State “which *has attained* the national primary ambient air quality standard for that pollutant.” (42 U.S.C. § 7505a.)

The Second Circuit Court of Appeals has reinforced that conclusion, noting that “[i]t was in an effort **to assist those states struggling to meet federal pollution standards** that Congress directed in 1977 that other states could promulgate regulations requiring vehicles sold in their state to be in compliance with California’s emission standards.” Motor Vehicle Manufacturers Ass’n v. New York State of Dept. of Environ. Conservation, 17 F.3<sup>rd</sup> 521 (2<sup>nd</sup> Cir. 1994). (Emphasis Added.) “Section 177 was inserted into the Act in 1977 **so that states attempting to combat their own pollution problems could adopt California’s more stringent emission controls.**” *Id.*

The relevant legislative history of section 177 also makes it clear that opt-ins to California’s mobile source standards are only available to States that need to utilize California standards to address persistent NAAQS-nonattainment issues. More specifically, as explained in the 1977 House (Report No. 95-294), CAA section 177 was initially referred to as “Section 221” in the proposed 1977 amendments to the CAA. In its explanation of Section 221 (now, Section 177), the House Committee stated that “a State which is subject to the [new] vehicle inspection and maintenance requirements [I/M] of [proposed] section 208 of the [1977 CAA amendments] is authorized to adopt and enforce new motor vehicle emission standards which are identical to California standards for which a waiver is given under section 209(b) of the act.” (H.R. 95-294, p. 431.) Significantly, the application of proposed section 208, which mandated that States adopt I/M programs, was expressly limited to the “29 air quality regions **predicted to exceed the national primary ambient air quality standards** for carbon monoxide (CO) or for photochemical oxidants.” In other words, the House understood and intended that the option to adopt California standards was limited to those States that would be in nonattainment but for their inclusion of California’s more stringent standards in their SIPs. (*Id.* at 224.) The House Committee Report went on to note as follows:

[T]he Committee is concerned that preemption [of state standards] (section 209(a) of the Act) now interferes with legitimate police powers of the States, prevents effective protection of public health, and limits

economic growth and employment opportunities **in non-attainment areas for automotive pollutants.**

Id. at 244 (emphasis added).

The accompanying Senate Report (S.R. 95-127) for the relevant amendments to the CAA in 1977 contained similar statements regarding the scope and availability of CAA section 177. Of particular note in that regard is the statement of Senator Anderson:

One issue of particular concern to me is the limitation in section 209 of the waiver from the State preemption provision for automobile emission standards only for the State of California . . . . I believe, **communities and States with substantial cleanup problems** should be allowed the option of protecting the public in their jurisdiction **by requiring accelerated cleanup [through California standards]**. (S.R. 98-127, p.93.) (Emphasis added.)

Thus, the relevant House and Senate Reports demonstrate that the potential opt-ins envisioned under what would become CAA section 177 were intended to be available only to those States that were still predicted to be in nonattainment with the NAAQS, and so were compelled to adopt more stringent California mobile sources standards as components of their accelerated NAAQS-attainment efforts, specifically as plan provisions in their SIPs. In that regard, the underlying premise for California's ability to seek a waiver of federal preemption under section 209(b) of the CAA is that the State faces "compelling and extraordinary" air quality challenges. (42 U.S.C. §7543(b)(1)(B).) That same underlying premise necessarily carries over under section 177 for potential opt-in States as well.

It is clear from all of the foregoing that a State's opt-in to California regulations under Section 177 is authorized only when the California regulations at issue are necessary components of the State's NAAQS attainment demonstration.

#### **b. New Jersey's attainment status**

New Jersey's 2017 State Implementation Plan (SIP) for ozone confirms that New Jersey "has met its obligations for attainment of the 84 ppb and 75 ppb ozone NAAQS." (2017 SIP, p. x.) Indeed, New Jersey's attainment date for those earlier ozone NAAQS was July 20, 2018. Thus, since "all of New Jersey's monitors are measuring below the 2008 75 ppb ozone standard" (id.), nonattainment with that standard likely cannot be a justification for attempting to opt-in to CARB's ACT and Omnibus Low-NO<sub>x</sub> Rules.

With respect to the current 70 ppb ozone NAAQS, New Jersey's need to achieve attainment with that lower standard also cannot justify opting-in to CARB's Regulations. As detailed in New Jersey's 2018 Air Quality Report (AQR), on a three-year average basis (2015-2018), half of New Jersey's monitoring sites (8 out of 16) already meet the 70 ppb ozone NAAQS. (See AQR, Table 4-2 and Figure 4-8.) Of the eight sites that do not yet meet the 70 ppb ozone standard, the three-year ozone averages at those sites range from 71 ppb to 75 ppb, and so were already very close to compliance as of 2018. Ozone levels have only gone down since then. In that regard, New Jersey experienced only 5 ozone exceedance days in 2020. (See 2020 Ozone Season Update.)

Importantly, New Jersey will need to demonstrate attainment with the 70 ppb ozone NAAQS several years before any opt-in to California’s ACT mandates could take effect. The DEP’s proposed opt-in to the ACT Rule will not take effect until the 2025 model year. Significantly, that timing is **after** the dates by which New Jersey must demonstrate attainment.

Generally speaking, EPA has designated the northern half of New Jersey as being in “moderate” nonattainment with the 70 ppb standard, while the southern half of the State is in “marginal” nonattainment. For marginal areas, the EPA-mandated attainment date for the 70 ppb standard is August of 2021, just two months from now. For moderate areas, attainment demonstrations through SIP submissions to EPA are required by August of 2022, and the date for attainment of the 70 ppb ozone standard is August of 2024. That date is **before** the proposed opt-ins would take effect, and **after** New Jersey will have reached full attainment with the 70 ppb ozone NAAQS.

Accordingly, New Jersey cannot rely on the proposed opt-in to demonstrate attainment with the current ozone NAAQS, and in fact, is obligated to reach attainment before the contemplated opt-in would even take effect, let alone result in significant reductions in ozone-precursor emissions. The net result is that since New Jersey does not need and cannot use CARB’s ACT Rule as a SIP provision to demonstrate ozone attainment, New Jersey is not authorized to opt-in to the ACT Rule under CAA section 177.

vi) **The DEP has an additional year to consider better options to accelerate the deployment of MD and HD ZEVs**

Since New Jersey is not planning to implement the ACT Rule until the 2025 model year, the two-year lead-time requirement contained in the federal opt-in statute CAA section 177) can still be met if the DEP defers action until some time in 2022. This conclusion stems from the fact that, as it relates to a potential opt-in to the ACT Rule, the term “model year” *equates* with calendar year. As a result, States such as New Jersey that defer acting on an opt-in initiative until next year, would still have two full “model years” (i.e., calendar years) in advance of an effective date in 2025, and so would still be in compliance with the opt-in lead-time provision of the CAA.

The most relevant definition of “model year” is found in the ACT Rule itself. Specifically, the ACT Rule (see CCR Title 13 section 1963 (c)(15)) references a provision of CARB’s “Phase 2” greenhouse gas (GHG) regulations as providing the applicable definition of “model year.” That provision (CCR Title 17 section 95662(a)(16)) defines model year, as follows:

“Model year” means one of the following for compliance with this subarticle. Note that manufacturers may have other model year designations for the same vehicle for compliance with other requirements or purposes:

(A) For tractors and vocational vehicles with a date of manufacture on or after January 1, 2021, **the vehicle’s model year is the calendar year corresponding to the date of manufacture;** (emphasis added).

This directly applicable definition makes it clear that even though the term “model year” may have different applications for compliance with other requirements or purposes, as it relates to the ACT Rule, the term “model year” *equates* with calendar year. Accordingly, if a potential opt-in State is looking to implement the ACT Rule starting in the 2025 “model year,” that implementation will, by definition, apply to vehicles manufactured in the 2025 *calendar* year. Given that, so long as any potential opt-in States, including New Jersey, adopt the ACT Rule before the end of the 2022 calendar year, those States will provide the requisite two-years leadtime before the start of the 2025 calendar year.

The applicable and controlling federal definition of “model year” leads to the same conclusion. The relevant EPA definition of “model year” is found in EPA’s Phase 2 greenhouse gas (GHG) regulations. Under the Agency’s Phase 2 regulations, “model year” means:

- (i) For tractors and vocational vehicles with a date of manufacture on or after January 1, 2021, **the vehicle’s model year is the calendar year** corresponding to the date of manufacture (40 C.F.R. §1037.801(i); emphasis added).

This federal regulation matches the directly applicable CARB ACT regulation, and again makes it clear that model years and calendar years are the same for these purposes.

This conclusion is further reinforced by the manner in which the ACT Rule phases-in. Under the ACT Rule, a HD vehicle manufacturer’s obligation to produce and sell a certain percentage of zero-emission vehicles (ZEV trucks) in a given model/calendar year is based on the number of conventionally-fueled trucks that a manufacturer sells in that same calendar year. In that regard, sections 1963.1(a) and 1963.1(a) of the ACT Rule provide that:

[A] manufacturer shall annually incur deficits **based on the manufacturer’s annual sales volumes of on-road vehicles** produced and delivered for sale in California. Deficits are incurred when the on-road vehicle is sold to the ultimate purchaser in California...

[A] manufacturer must retire a number of ZEV or NZEV credits that equals or exceeds **their total annual deficits** each model year ... (emphasis added).

Under these operative provisions of the ACT Rule, and by way of example, vehicles manufactured before the 2025 model year would not factor-in to the calculation of the ACT Rule’s ZEV-truck percentage-sales requirements for the 2025 model year, since those requirements would be based on manufactures’ annual vehicle sales in 2025, not before. In fact, that percentage-sales requirement could not be fully calculated until the end of the 2025 calendar year (again, not before) when a manufacturer’s total annual sales of conventionally-fueled trucks could be calculated.

Thus, it is clear from the operative definitions, and from the manner in which the ACT Rule phases-in, that model year and calendar year are synonymous as it relates to the implementation of the ACT Rule. Consequently, it is equally clear that the DEP can wait until the

2022 calendar year and still provide the two full years of lead-time that the CAA requires before implementing the ACT Rule in the 2025 “model year.”

**vii) Conclusion**

There is no doubt that ZEVs are the future of the commercial trucking industry, and there is a viable roadmap on an accelerated timeline to develop and bring to market medium- and heavy-duty ZEVs. Policymakers and other stakeholders should collaborate on those targeted and holistic strategies to successfully establish the commercial ZEV market. In the meantime, a complementary nationwide EPA bridge program can serve to reduce NO<sub>x</sub> and GHG emissions from conventionally-fueled commercial vehicles. EMA and its members have already begun aggressively moving down the road toward a ZEV future. We look forward to working with the DEP and other stakeholders to put in place the necessary elements to ensure we reach that shared goal.

That said, and as detailed above, CARB’s ACT Program – which amounts solely to a naked sales mandate – is not a pathway to success, and is not a rule that the DEP is authorized to opt-in to under the CAA. Accordingly, the DEP should not adopt CARB’s ACT Program, but instead should work toward effective holistic national programs. At the very least, the DEP should defer acting on the pending proposal for one year to allow for a more thorough assessment of the multiple issues and concerns relating to CARB’s ACT Program, and to allow for the development of more coordinated multi-pronged ZEV-truck programs, including through the anticipated national initiatives.

Respectfully submitted,

TRUCK & ENGINE  
MANUFACTURERS ASSOCIATION

**STATE OF CALIFORNIA  
AIR RESOURCES BOARD**

<b>Proposed Advanced Clean Truck</b>	<b>)</b>	<b>Hearing Date:</b>
<b>Regulation; Initial Statement of Reasons</b>	<b>)</b>	<b>December 12, 2019</b>

**COMMENTS OF THE  
TRUCK AND ENGINE MANUFACTURERS ASSOCIATION**

December 9, 2019

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**STATE OF CALIFORNIA  
AIR RESOURCES BOARD**

**Proposed Advanced Clean Truck                    )                   Hearing Date:**  
**Regulation; Initial Statement of Reasons    )                   December 12, 2019**

**Introduction**

The Truck and Engine Manufacturers Association (“EMA”) hereby submits its comments in opposition to the Proposed Advanced Clean Trucks (ACT) Regulation, which the California Air Resources Board (CARB) released for public review, along with CARB Staff’s Initial Statement of Reasons (ISOR), on October 22, 2019.

EMA is the trade association that, among other things, represents the interests of the world’s leading manufacturers of heavy-duty and medium-duty on-highway vehicles and engines. Those vehicles are the subject of the pending ACT Regulation. Accordingly, EMA has a direct and substantial interest in this rulemaking.

EMA’s members are investing billions of dollars to develop zero-emission technologies for the heavy-duty market and support expanding the market. But, as detailed below, the Proposed ACT Regulation is not ready for adoption. In essence, CARB’s pending ACT proposal would put the cart before the horse by mandating that manufacturers sell an increasing percentage of zero-emission heavy-duty and medium-duty vehicles (ZEVs), without first ensuring that the requisite ZEV recharging infrastructure and ZEV-purchasing requirements will be in place. Until those two critical legs of what should be a three-legged rulemaking are established, the Proposed ACT Regulation is likely to collapse. Simply stated, commercial vehicle manufacturers will not be able to sell, on an economically viable basis, an increasing number of ZEVs unless a robust ZEV infrastructure is assured and in place, and unless a sufficient number of commercial vehicle fleets in California are required to purchase ZEVs on a similarly increasing-percentage basis. Without those two prongs of what needs to be a three-pronged regulatory paradigm for widespread ZEV deployment, vehicle manufacturers will be faced with unacceptable costs and market risks, and may be compelled to reduce their sales into the California market, or abandon that market altogether. That adverse result becomes even more likely when the costs, burdens and market disruptions of CARB’s anticipated and contemporaneous Omnibus Heavy-Duty On-Highway (HDOH) Low-NO<sub>x</sub> Regulations are factored in.

In light of the fundamental shortcomings of the Proposed ACT Rulemaking, the Board should not adopt the current proposal. Instead the Board should direct CARB Staff to develop a more strategically focused rule that: (i) couples fleet-and-application-specific ZEV sales mandates with fleet-and-application-specific ZEV purchase mandates; (ii) includes provisions and financial incentives to cover the increased marginal cost of ZEV trucks and to ensure the timely development and installation of the requisite ZEV infrastructure; and (iii) better coordinates, and takes into consideration, the parallel and compounding adverse impacts of both a HDOH ZEV sales mandate and a contemporaneous “omnibus” HDOH ultra-low NO<sub>x</sub> rule.

### **The Fundamental Challenges at Issue**

In evaluating the merits of the Proposed ACT Regulation, it is important to note, as an initial matter, that commercial trucks and the commercial truck market are not analogous to the passenger car market. The size of the respective markets, the nature of the respective motor vehicle products, and the needs of the respective motor vehicle purchasers are fundamentally different.

The passenger car market in California covers more than 30 million vehicles, with annual sales volumes approaching one million. In sharp contrast, the data presented in the ISOR show that annual sales of heavy-duty trucks (Classes 4-8) in California total less than 20,000 units. (ISOR, p. IX-4.) Thus, when the aggregate costs of transforming the medium-duty and heavy-duty truck market into a ZEV-based market are considered, the relatively small size of the relevant commercial vehicle market cannot be overlooked. Unlike the passenger car market, there is a very limited number of trucks to which the very substantial costs of a market-wide ZEV-sales initiative could be allocated. And, compounding that fundamental problem in this instance, those substantial market-wide costs will need to be absorbed and recouped in the same time frame that manufacturers will be forced to absorb and recoup the substantial market-wide costs associated with CARB's anticipated Omnibus Low-NO<sub>x</sub> Rule. Thus, the prospects for truck manufacturers to generate any profits on the mandated sale of medium-duty and heavy-duty ZEVs are, at best, remote, especially in the absence of corresponding ZEV-purchase mandates.

Similarly, the nature and utilization of commercial trucks are markedly different from passenger cars. Commercial trucks are built to highly detailed specifications for a very broad range of unique applications, including, to name a few, contractor pickup trucks, parcel delivery vans, pickup and delivery trucks, concrete mixers, dump trucks, bucket trucks, garbage trucks, fire trucks, ambulances, regional freight tractors, and line-haul tractors. Commercial vehicle manufacturers need to be able to meet all of those varying customer needs and produce all of those highly specialized vehicles, while still generating a profit. The product planning, manufacturing process, array of vehicle platforms, production schedules, and product distribution and services functions, again, are nothing like the passenger car industry where the volumes are orders-of-magnitude higher and the range of customer needs and vehicle applications is far narrower. Consequently, while the passenger car market potentially can spread vehicle development costs over literally millions of cars, thereby more readily preserving per-product profit margins, the commercial truck market presents no opportunity to do so. The low product volumes and the high number of different commercial vehicle applications make a unilateral, broad-based and naked ZEV sales mandate inherently impractical.

The needs of commercial vehicle purchasers also are fundamentally different from car-buyers. Commercial trucks are capital assets acquired for specific commercial purposes to help derive profits from specific commercial enterprises. They are amortized over longer time periods than cars, and they are assessed, not with regard to the subjective criteria of style and comfort, but solely on the objective basis of performance capability and cost-efficiency. Thus, truck purchasers' decisions turn on detailed up-front assessments of a truck's utility for the job at hand, and its purchase price, durability, operating costs, and resale value. To the extent that new vehicle technologies or regulatory controls impact those criteria — as in the case of a broad-based regulatory mandate for the sale of ZEV trucks — truck purchasers will alter their purchase patterns and choices, especially in the absence of substantial incentives to cover the increases in the



purchase price and operating costs of ZEV trucks.

Putting all of this together, it becomes clear that the pending ACT Proposal, with its market-wide unilateral mandate for the sale of ZEV trucks, will create very significant adverse market disruptions, unless the Proposal is modified in substantial ways. Without those necessary changes to the Proposal, truck manufacturers will be forced to incur very significant per-vehicle costs to design, test, and manufacture a broad array of ZEV trucks, with no assurance that truck-buyers would elect to assume those significantly increased costs through ZEV purchases, and with insufficient volumes to recoup any meaningful return on their overall investments in the development of ZEV technologies.

The fundamental challenges associated with the Proposed ACT Regulation are compounded even further by CARB's other anticipated and contemporaneous rulemaking for commercial trucks — CARB's Omnibus Low-NO<sub>x</sub> Rulemaking. That rulemaking will apply to manufacturers of traditionally-fueled commercial vehicles, and will entail new low-NO<sub>x</sub> tailpipe standards, new low-load and in-use testing requirements, extended useful life and warranty provisions, and enhanced vehicle-recall liability. As it stands, commercial vehicle manufacturers would be forced to face the significant technical challenges and costs of that "omnibus" rulemaking (which will take effect in the 2024 model year (MY)) at the exact same time as the ZEV sales mandates would kick in.

The sales volumes and market demands applicable to commercial trucks in California likely cannot accommodate one sweeping regulatory program, much less two at the same time. Consequently, to the extent that CARB continues down its current two-track regulatory path for medium-duty and heavy-duty vehicles, there is a very real chance that manufacturers will be forced out of the California market, not by choice, but by the compounding mandates of CARB.

There is a better path. First, the pending ACT Regulation and the Omnibus Low-NO<sub>x</sub> Rule should be coordinated to better assess the combined aggregate costs and feasibility issues. Second, with due regard to the production volumes that inherently constrain what can be done, specific commercial-truck fleet types and applications should be identified and prioritized for a more focused and optimized introduction of ZEV trucks. Third, the sales mandates directed at those prioritized fleet applications ("beachhead" markets) should be coupled with corresponding ZEV purchase mandates applicable to the operators of the target fleets of commercial trucks. Fourth, significant incentive funds should be identified and deployed to construct the necessary ZEV infrastructure for the covered fleets and to reimburse fleet operators for the increased marginal costs of purchasing and operating ZEV trucks. And fifth, given what will be the shrinking size of the remaining market for diesel-fueled trucks, the Omnibus Low-NO<sub>x</sub> Rule should be scaled back substantially to allow for a cost-effective and growing transition to medium-duty and heavy-duty ZEV technologies.

### **Summary of the Proposed ACT Rule**

The Proposed ACT Rule is centered around a mandate that medium-duty and heavy-duty vehicle manufacturers — manufacturers of vehicles with a gross vehicle weight rating (GVWR) greater than 8,500 pounds — produce and sell into California an increasing percentage of ZEVs, calculated on the basis of the manufacturers' overall sales of medium-duty and heavy-duty vehicles

in California. In essence, “affected manufacturers would incur deficits for each vehicle sold into California starting with the 2024 MY that must be met with credits generated from producing and selling ZEVs or NZEVs into California starting in the 2021 MY.” (ISOR, p. III-8.) The ZEV sales mandates would increase annually until the 2030 MY, as follows:

**Table III-1: ZEV Sales Percentage Schedule**

<b>Model Year (MY)</b>	<b>Class 2b-3 Group*</b>	<b>Class 4-8 Group**</b>	<b>Class 7-8 Tractor Group</b>
2024	3%	7%	3%
2025	5%	9%	5%
2026	7%	11%	7%
2027	9%	13%	9%
2028	11%	24%	11%
2029	13%	37%	13%
2030 and beyond	15%	50%	15%

\*Excludes pickups until 2027 MY

\*\*Excludes Class 7-8 Tractors, Includes Yard Tractors

The ZEV credit values that would be used to offset non-ZEV sales would be scaled based on vehicle weight classes to account for the higher emissions associated with larger vehicles, and “to keep credits and deficits approximately equitable from an emissions standpoint.” (ISOR, p. III-9.) The specific proposed weight-class credit modifiers are, as follows:

**Table III-2: Weight Class Modifiers**

<b>Weight Class</b>	<b>Class 2b-3</b>	<b>Class 4-5</b>	<b>Class 6–7*</b>	<b>Class 7 Tractors and All Class 8</b>
Weight Class Modifier	0.6	1	1.5	2

\*Excludes Class 7 tractors

Limitations would be placed on the use of ZEV credits. In particular, only Class 7 and 8 tractor credits could be used to satisfy the Class 7 and 8 tractor deficits, and all ZEV credits would have a limited lifetime before they would expire. Credits could be generated, banked and traded starting in the 2021 MY, but the means for generating such early credits appear to be largely illusory.

### **The Proposed ACT Regulation Is Not Supported by Data or Well-Reasoned Analysis**

Beyond its fundamental challenges, as noted above, the Proposed ACT Regulation appears, in part, to be an exercise in wishful thinking, and threatens to re-create the decades-long difficulties and market disruptions that CARB encountered through its passenger car ZEV sales mandates.

All stakeholders recognize that there are three core elements to a viable ZEV program for commercial trucks: (i) a well-funded, widespread and assured infrastructure for the prompt and efficient recharging and service of heavy-duty and medium-duty ZEVs; (ii) fleet-and-application-specific purchase mandates (which could and should be incentivized) to ensure that a sufficiently

large market exists for ZEV trucks (which will have significantly higher purchase prices, and so might not be acquired by fleet operators in the absence of mandates); and (iii) correspondingly-scaled production mandates to ensure that commercial vehicle manufacturers have ZEVs available in sufficient varieties and numbers to meet the specific market segments and applications covered by the ZEV purchase mandates.

The Proposed ACT Regulation includes only one of those three core elements, and so amounts to an inherently flawed proposal. Any assembly that requires three integrated pieces cannot be built with just one piece. In this instance, vehicle manufacturers will find it difficult if not impossible to incur the very significant costs of developing, testing and manufacturing commercial ZEVs in the absence of an assured ZEV infrastructure and an assured ZEV market. Again, a three-legged stool with only one leg is difficult to sit on. Consequently, until CARB Staff is prepared to propose a thoroughly vetted (and sufficiently funded) three-element ZEV rulemaking for commercial vehicles, the pending rulemaking, which pertains to only one element, should not be adopted.

Beyond its elemental shortcomings and challenges, the Proposed ACT Rule lacks a sufficient basis in data or robust market analysis and projections. Rather, the ISOR includes multiple aspirational statements, with citations to various Executive Orders and legislative targets for addressing climate change. That compendium of good intentions does not amount to a sufficient rulemaking record.

Representative examples of CARB Staff's hopeful but unsubstantiated assertions in support of the Proposed ACT Regulation are as follows:

- Over time, projected price reductions and continued zero-emission technology improvements will allow the ZEV market to expand broadly throughout the trucking sector. (ISOR, p. I-1.)
- Longer range ZEVs are expected to become available as technology continues to improve. (ISOR, p. I-10.)
- The Proposed ACT Regulation would provide certainty for manufacturers to make investments today to produce increasing numbers of ZEVs, . . . and also would foster a self-sustaining zero-emission truck market through increasing sales of zero-emission trucks and buses in California. (ISOR pp. II-7 and II-8.)
- The Proposed ACT Regulation will increase the number of ZEVs deployed, which will in turn increase the amount of electricity supplied by utility providers. (ISOR, p. V-2.)

There are no actual objective data or studies in support of any of the forgoing claims. To the contrary, CARB's history of imposing aggressive ZEV sales mandates on the passenger car industry, without adopting companion purchase mandates or ZEV infrastructure requirements, demonstrates that unilateral sales mandates for medium-duty and heavy-duty commercial ZEVs in all likelihood will not succeed on the timeline that CARB has assumed.

CARB correctly identified that it is essential for a commercial vehicle buyer to accurately calculate the total cost of ownership (TCO) and predict a return on the capital investment before they will purchase a new vehicle. However, the assumptions that CARB uses to assess TCO of

battery-electric medium- and heavy-duty vehicles fail to fully recognize the importance of battery capacity for work trucks and overestimate the benefits of available government incentives. Regarding incentives, a fleet that is considering converting all its trucks to ZEVs over time will need to be able to predict the TCO of ZEVs over many years, likely more than a decade. To ensure a return on the purchase price investment, the fleet must consider (i) up-front purchase price, (ii) operational and maintenance costs, (iii) infrastructure costs, (iv) electricity costs, and (v) resale value. Before considering incentives in that calculation, a fleet would need adequate assurances from the government that the incentives will be available over the time it takes to convert the entire fleet to ZEVs. Without that assurance, a fleet likely will not be able to factor in incentives when calculating whether it makes financial sense to begin converting its fleet to ZEVs.

With respect to battery capacity, the TCO analysis for Class 7-8 ZEVs assumes a configuration that has a daily range of only 140 miles. To meet that range the ZEV utilizes a 400 kWh battery pack and would cost \$64,312 more than a conventional vehicle. However, in tractor applications, which the ACT rule would specially mandate, even a regional tractor will typically operate more than 300 miles per day. To achieve a 300-mile range, the ZEV would need a 740 kWh battery pack. Assuming \$200/kWh cost for the battery pack and 2.1 kWh/mile for the added range, the incremental cost to the buy a ZEV tractor would more than double to over \$131,000 above the cost of a conventional tractor. That staggering up-front purchase price increase for a ZEV, to perform the same work as the tractor it replaces, still does not take into account the charging infrastructure costs, electricity costs, battery replacement costs, or loss of residual value.

Even with the overly-optimistic assumptions in CARB's TCO calculator, a conventional Class 2B-3 pickup trucks still is less expensive to operate than a ZEV pickup in the 2024 through 2030 timeframe. When CARB's assumptions are corrected to maintain the towing and hauling capacity that are deciding factors in the purchase of a Class 2B-3 pickup truck, the battery size increases 2.5 times. Using the TCO calculator default assumptions with the increased battery size, a Class 3 pickup truck would cost \$32,000 more than a conventional truck (a 66% increase).

A deep source of real-world insight into what it takes to deploy zero-emission commercial vehicles exists in programs such as the extensive Low Carbon Transport Heavy-Duty Pilot and Demonstration Projects and the Zero- and Near Zero-Emissions Freight Facilities Project. CARB has invested hundreds of millions of dollars in those projects to test zero-emission commercial vehicles in select market applications, and the data from the projects hold the solutions to the challenges of the development of self-sustaining beachhead ZEV markets. However, but for a few passing comments in the ISOR, CARB Staff choose to ignore the real-world data from those projects and how that rich dataset could be used to create a well-reasoned rule.

Tellingly, the only actual data that CARB staff point to in their ISOR is a zero-emission truck market assessment that EMA prepared. (See ISOR, Appendix E.) But the results and conclusion from that assessment do not support a market-wide sales mandate for ZEV trucks. Rather, the conclusion from that assessment is that there are a limited number (approximately seven) of specific prioritized commercial truck-fleet applications that should be targeted for near-term ZEV deployment through a comprehensive program of purchase and sales mandates, and substantial investments in ZEV infrastructure. Thus, the "updated" market assessment that CARB has appended to the ISOR does not, in fact, make the case for the pending ACT proposal.

Significantly, CARB knew as much when it first considered the adoption of mandates for medium-duty and heavy-duty ZEVs. In CARB's 2016 "Mobile Source Strategy" and its related State Implementation Plan (SIP), CARB targeted "last-mile delivery" fleets as best suited for an initial ZEV truck regulatory program. (See ISOR, p. I-1.) That type of targeted fleet-application program, which EMA has recommended, could be made to work. In contrast, CARB's subsequent expansion of its ZEV truck program to encompass the entire medium-duty and heavy-duty market through unilateral sales mandates will not work, and may well undermine the developing market for ZEVs due to its significant overreach. To avoid that likely negative outcome, CARB should return to the application and fleet-specific approach that it first envisioned for a commercial vehicle ZEV program.

EMA and its members have over the past two years consistently and constructively pointed out to CARB the flaws in a unilateral ZEV sales mandate for the commercial vehicle sector. In addition to the concerns we have shared, we have read and endorse the recommendations in an August 2019 paper titled *Issues Concerning the ARB ZEV Truck Mandate Proposal*, by independent researchers Miller, M. & Burke, A., at the University of California, Davis. (The paper was provided to CARB and copies are available from the authors upon request.) The paper makes detailed findings on issues with CARB's proposal, including (i) increased ZEV purchase prices and maintenance costs, (ii) significant charging infrastructure investments needed, (iii) uncertainty of Low Carbon Fuel Standard credits over time, (iv) ZEV operational issues for fleets, (v) lack of ZEV availability across the broad vehicle categories included in the mandate, and (vi) strategies fleets will use to avoid purchasing unprofitable ZEVs.

### **Multiple Obstacles Are Likely to Prevent the Effective Implementation of the Proposed ACT Regulation**

To their credit, CARB staff do mention in their ISOR the very real issues that are significant obstacles to the successful implementation of the Proposed ACT Rule. Among those issues are the following:

- Large manufacturers have been absent from the ZEV market until recently, and have refrained from investing significant amounts of capital in ZEV trucks because of the uncertainties relating to the longer-term market and due to the substantially estimated higher costs. (ISOR, pp. I-7, I-8 and IX-29.)
- ZEV trucks are not suitable for towing heavy loads, and ZEV technologies have inherent characteristics that may be detrimental to certain commercial vehicle applications. (ISOR, pp. I-9 and I-16.)
- ZEV trucks have a higher curb weight (e.g., battery packs can weigh 8,000 pounds), less cargo space, and higher near-term cost than conventional commercial vehicles. (ISOR, pp. I-11.) Although this, in and of itself is detrimental to the market, it also incurs other problems. For example, many vehicles are built to GVWRs that don't exceed 26,000 pounds so the drivers do not require a Commercial Driver's License, that as a ZEV may need to exceed that GVWR threshold to perform the same work, and thus would require licensed drivers – increasing fleets' operating costs. Similarly, many vehicles are built with a GVWR that does not exceed 33,000 pounds so they are not subject to the 12 percent

Federal Excise Tax that as a ZEV may exceed that threshold – increasing fleets’ acquisition costs.

- The ACT Proposal would require extensive development and installation of high-powered charging and hydrogen-refueling stations. That in turn will require site assessments, extensive and time-consuming local and state permitting processes, agreements with utilities, construction of additional electrical infrastructure, and related planning and build-outs, all at very significant expense. (ISOR, pp. I-14 and I-15.)
- Currently, differing types of charging stations are being deployed and utilized, and there is no common SAE charging standard, which could lead to stranded infrastructure investments. (ISOR, p. I-17.)
- Manufacturers would bear the considerable risks associated with the incremental costs related to the design, production and sale of ZEVs, especially when compared to compliance strategies that depend on modest improvements in conventional truck technologies. Manufacturing ZEV trucks requires large upfront costs that go into research and development, prototyping, assembly-line upgrades and tooling, and other cost categories, including increased component costs. (ISOR, pp. IX-2, IX-29 and IX-31.)
- The absence of a ZEV purchase mandate means that manufacturers bear the risk of having to sell ZEVs below cost to meet the requirements of the Proposed ACT Rule. (ISOR, p. IX-31.)
- Staff estimates that the batteries of a ZEV would need to be replaced every 300,000 miles and compares that to an 850,00-mile useful life for a heavy-duty diesel engine. (ISOR, IX-23). Using those estimates, a fleet would have to completely replace the batteries of ZEV twice before it would need to rebuild the diesel engine of a conventional truck. Such a comparison highlights that a diesel engine will initially last much longer, and by performing a relatively inexpensive rebuild the fleet can further extend the return on its investment in a diesel engine.
- While not identified in the ISOR, ZEV purchase incentive funding that exists today may not be available tomorrow. For example, funds for the fiscal year 2019-2020 Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), that provides the primary source of purchase incentives for ZEV trucks, already are exhausted and future purchase incentives have been put on hold pending identification of a new funding source.
- Additionally, not mentioned in the ISOR is the prevalence of wildfires in California, and the attendant extensive Public Safety Power Shutoff (PSPS) events that further enhance the multiple uncertainties that impede the development of a robust ZEV market and infrastructure for commercial vehicles. The utilities proposed long-term solutions to avoid PSPS events is to harden the infrastructure, clear vegetation around hundreds of thousands of miles of transmission and distribution lines, increase inspection frequency, increase energy storage, and deploy microgrids. The costs of those solutions must be passed on to ratepayers, creating further uncertainties for fleets attempting to calculate the life-cycle costs of operating ZEVs.

There is no evidence in the record relating to this rulemaking that any of the foregoing obstacles and challenges will be overcome in a manner sufficient to allow for any type of cost-effective implementation of the pending ACT proposal. Consequently, and as already noted, the Board should direct staff to make substantial revisions to the proposal to narrow its scope, provide for corresponding purchase mandates and incentives, include adequate assurances of a robust and widespread ZEV infrastructure, and incorporate a more modest low-NO<sub>x</sub> program for conventionally-fueled vehicles.

**The ACT Proposal Will Not be an Effective  
Means to Address Nearer-Term Ozone NAAQS Attainment Issues**

One asserted justification for the Proposed ACT Regulation is that it will help to achieve California's criteria pollutant requirements, including the national ambient air quality standard (NAAQS) for ozone. (ISOR, pp. ES-I, ES-5 and Section VI.) That is unlikely.

As stated in the ISOR, the NO<sub>x</sub> reductions from the Proposed ACT Regulation are projected to be 5 tons per-day (tpd) on a statewide basis as of 2031. (ISOR, p. VI-1.) However, in order to reach attainment with the 2024 ozone NAAQS (of 80 ppb) in the South Coast Air Basin (SoCAB), additional NO<sub>x</sub> reductions of 108 tpd will be required by 2023. Even greater NO<sub>x</sub> reductions (on a tpd basis) will be required to achieve the 2031 ozone NAAQS (of 75 ppb) in the SoCAB. The 5 tpd NO<sub>x</sub> reductions potentially resulting from the ACT Regulations as of 2031 — statewide reductions that likely scale to only 2 tpd of NO<sub>x</sub> in the SoCAB — do not address either the non-attainment issues facing the SoCAB in 2023 or thereafter. To the contrary, as stated in the SCAQMD's recent Draft Final Contingency Measure Plan, “without considerable emission reductions from sources under federal control, the South Coast Air Basin will not be able to reach attainment in 2023 or the subsequent attainment dates for other air quality standards.” (Id. at p. 38.) Accordingly, the Proposed ACT Regulation is not a relevant control measure for achieving attainment with the ozone NAAQS in the SoCAB on the applicable timeline, and so cannot be justified on that basis.

Moreover, adoption of the proposed ACT Regulation is just as likely to worsen NAAQS-attainment concerns as it is to ameliorate them. As the ISOR notes, “it is possible that manufacturers may shift sales for new California-bound trucks out of state to avoid the requirements of the Proposed ACT Regulation, which would consequently reduce overall projected emission reductions.” (ISOR, p. IX-32.) That possibility becomes much more of a likelihood when CARB's anticipated “Heavy-Duty Low-NO<sub>x</sub> Omnibus Regulation” is considered. As noted, the “multi-pronged” requirements under that regulation — including lower tailpipe NO<sub>x</sub> standards, a new low-load test cycle, longer emission durability and warranty requirements, new in-use standards, and other measures — “will go into effect at the same time the Proposed ACT Regulation will begin to require ZEV sales.” (ISOR, pp. 1-12 and III-14.)

Thus, one likely possibility from the adoption of the Proposed ACT Rule, when coupled with the significant burdens and costs that manufacturers will face under the contemporaneous Low-NO<sub>x</sub> Omnibus Regulations, is that some number of medium-duty and heavy-duty engine and vehicle manufacturers may choose to exit the California market in advance of the 2024 MY. Irrespective of that reasonably foreseeable outcome, customers likely will pre-buy current technology vehicles and engines, and fleet operators will retain their older trucks for longer time

periods than currently anticipated. The net result would be an increase in NO<sub>x</sub> emissions from the assumed baseline, not a decrease. The Board should give due consideration to this important adverse consequence of the proposed regulations.

### **The Proposed ACT Regulation Fails to Provide Sufficient Leadtime**

The Proposed ACT Regulation is scheduled to become a fully-adopted and final rule in late 2020, perhaps even later than that depending on when California's Office of Administrative Law approves the rulemaking. Thus, the Proposed ACT Regulation, which will take effect in the 2024 MY, will provide less than four-years of leadtime before its implementation.

In order to implement the Proposed ACT Regulation, which would establish new emission standards for new motor vehicles, CARB must seek and obtain from U.S. EPA a waiver of federal preemption under the Clean Air Act. (See 42 U.S.C. § 7543(b).) One of the necessary prerequisites to EPA's granting a preemption waiver is that the California standards at issue must be consistent with section 202(a) (42 U.S.C. § 7521(a)) of the Clean Air Act. That referenced section, among other things, requires a minimum of four full years of leadtime before new heavy-duty vehicle emission standards can take effect. Accordingly, since the Proposed ACT Regulation does not satisfy that necessary leadtime prerequisite under the Clean Air Act, it would be invalid under federal law.

### **Specific Comments on the Provisions of the Proposed ACT Regulation**

As noted, EMA urges the Board to withdraw and reconsider the Proposed ACT Regulation in a manner than is consistent with the foregoing comments and concerns. However, should the Board elect to approve the Proposed Regulation, EMA has the following specific comments regarding the draft regulatory language:

1. **Off Ramps.** CARB should add regulatory language that would suspend the manufacturer sales mandates in advance of their 2024 implementation if the commercial vehicle marketplace in California is not ready to effectuate those sales. Stated differently, CARB should add "off-ramps" that would suspend the ZEV sales mandate if adequate fleet-rule purchase mandates and ZEV infrastructure installations are not in place by 2024 (*i.e.*, the other two legs of the three-legged stool). The adequacy of the off-ramps for the sales requirements must take into consideration the volume of ZEVs required by the anticipated future fleet-purchase mandates and any off-ramps in that corresponding purchase-mandate rule. Additionally, the sales requirement off-ramps should be further refined to provide unique provisions for each weight class category (*i.e.*, Class 2B-3, Class 4-5, Class 6-7, Class 8, and Class 7-8 tractors).

EMA recommends including the following specific off-ramps in proposed § 1963.1:

- A. **Purchase Mandate by 2022.** Fleet rules must be in place by 2022 that require ZEV purchases in 2024 in quantities that exceed the number of ZEVs that traditional vehicle manufacturers are mandated to sell plus ZEVs sold by new market entrants and low-volume manufacturers.



- B. **Infrastructure by 2023.** Robust charging infrastructure elements for commercial vehicles must be in place by 2023, or scheduled for completion by 2024, to support the number of ZEVs that traditional vehicle manufacturers are mandated to sell, plus ZEVs sold in 2024 by new market entrants and low-volume manufacturers, plus ZEVs already in service. The chargers must be “Level 2 or 3” and located at fleet terminals, and with expansion plans so they can meet the needs of more ZEVs.
2. **Tractor Deficits.** CARB should remove the restriction in § 1963.3(e) and allow a manufacturer to use *truck* credits to make up *tractor* deficits.
  3. **Deficit Make-Up.** CARB should extend the requirement in § 1963.3(b) so a manufacturer must make up a deficit within three model years, like the GHG rule at 40 C.F.R. § 1037.745(e).
  4. **Credit Life.** CARB should extend the credit lifetime in § 1963.2(g)(2) to allow ZEV credits to be used for five model years after the year in which they are generated, like the GHG rule at 40 C.F.R. § 1036.740(d).
  5. **Credit Retirement Order.** CARB should modify § 1963.3(c) to allow manufacturers more flexibility in using credits before they retire.
  6. **Sales Reporting.** CARB should modify § 1963.4(a) to clarify that manufacturers must report by March 31 following the end of each model year.
  7. **All-Electric Range Determination.** CARB should modify § 1963.2(b)(1) by adding language to clarify that manufacturers may determine “all-electric range” in the same manner as GHG certification, including the test procedure.
  8. **Deficit Calculation.** CARB should modify § 1963.1(a)(1)(B) to clarify how deficits are calculated, specifically whether they are calculated per vehicle or across all sales.
  9. **NZEV Credits.** CARB should remove the restriction in § 1963.2(b) that eliminated the generation of NZEV credits after 2030.

### **Conclusion**

Medium-duty and heavy-duty commercial trucks are not simply big cars. They are capital investments used by business entities to help generate profits from specific business operations. Thus, detailed calculations of upfront purchase costs and ongoing operating and fueling costs, including any fuel-infrastructure costs (and the certainty and predictability of those costs), will dictate whether a given commercial vehicle is purchased or not. Commercial vehicle and fleet operators need highly-specified trucks to perform the specific work at issue, and require predictable costs and long-term reliability assurances before converting to a new vehicle technology platform.

In addition, commercial trucks, unlike passenger cars, are highly varied and customized to perform myriad functions in myriad applications, all in an efficient, durable and cost-effective manner. Those multi-various trucks will operate over different types and lengths of routes, under

different conditions, carrying different payloads, towing different cargo, and engaging in different patterns of stop-and-go behavior. While some of those highly variable vehicle applications could allow for the targeted introduction of ZEVs (assuming suitable corresponding purchase mandates, infrastructure assurances, and incentives), many applications would not. In some cases, fleets would need to purchase more than one ZEV to replace a single traditionally-fueled truck, due to limited range that a ZEV can operate between charges, the dwell time needed to recharge, and/or lower freight carrying capacity due to the additional weight of the batteries.

The net result is that commercial vehicle fleet operators and small business owners are unlikely to acquire ZEVs in any appreciable numbers until they are proven to be profitable over their useful lives in the particular application(s) of concern to the fleet operator. That includes providing fleet operators with sufficient up-front assurances of ZEVs' suitability, reliability, durability and cost-effectiveness, as well as the certainty of a readily available and affordable ZEV recharging/refueling infrastructure. Unilateral across-the-board ZEV sales mandates imposed broadly on commercial vehicle manufacturers will not provide the requisite assurances of profitability to vehicle fleet operators, and will not drive a viable ZEV market for commercial trucks.

At the same time, across-the-board ZEV sales mandates, especially when coupled with the additional burdens of CARB's Omnibus Low-NO<sub>x</sub> Regulations, could compel some number of commercial vehicle and engine manufacturers to exit the California market. Under the current ACT Proposal, manufacturers would be forced to incur the massive costs of designing, testing and producing some relatively small number of ZEV trucks for a wide range of potential applications without any assurance whatsoever that their ZEV vehicles would be purchased in sufficient numbers to generate any profit, and without any assurance whatsoever that the requisite widespread ZEV infrastructure would be in place. Some manufacturers may elect not assume those costs and risks.

Given the foregoing, one potential outcome of the Proposed ACT Regulations is that commercial vehicle and engine manufacturers may be forced to abandon the California market, and fleet operators will "pre-buy" larger numbers of current-technology, while they retain their older vehicles longer than they otherwise would have. The ultimate impact of that reasonably foreseeable scenario in California is that vehicle emissions will increase, not decrease, compared against the relevant baseline.

To avoid those unintended adverse outcomes, the Board should direct CARB staff to refashion the ACT Rule so that it includes the three necessary components (the three legs) of a viable ZEV program. Those components are: (i) identification of a reasonable number of targeted commercial fleet applications that are best suited to the profitable operation of ZEV trucks; (ii) corresponding sales and purchase mandates for the ZEV trucks used in those targeted commercial fleet applications; and (iii) sufficiently robust regulations and incentives that can assure the development and installation of the ZEV infrastructure needed to support the targeted fleet applications. In addition, the Board should direct CARB staff to coordinate the development of its Omnibus Low-NO<sub>x</sub> Rule with the ACT Regulation, and to scale-back that Omnibus Rule to account for the compounding burdens facing commercial vehicle manufacturers in California, and in recognition of the shrinking size of the remaining market for diesel-fueled trucks as the

prospects for a successful transition to ZEV technologies take root. That type of refashioned and holistic commercial-fleet ZEV program could work, and would be supported by EMA.

Respectfully submitted,

TRUCK & ENGINE  
MANUFACTURERS ASSOCIATION

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**STATE OF CALIFORNIA  
AIR RESOURCES BOARD**

<b>Proposed Amendments to the Proposed</b>	<b>)</b>	<b>Hearing Date:</b>
<b>Advanced Clean Trucks Regulations</b>	<b>)</b>	<b>June 25, 2020</b>

**COMMENTS OF THE  
TRUCK AND ENGINE MANUFACTURERS ASSOCIATION**

May 28, 2020

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**STATE OF CALIFORNIA  
AIR RESOURCES BOARD**

<b>Proposed Amendments to the Proposed Advanced Clean Trucks Regulation</b>	) )	<b>Hearing Date: December 12, 2019</b>
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**Introduction**

The Truck and Engine Manufacturers Association (EMA) hereby submits its comments in opposition to the Proposed Amendments to the Proposed Advanced Clean Trucks (ACT) Regulation that the California Air Resources Board (CARB) released on April 28, 2020, and subsequently revised on May 1, 2020.

EMA represents the world's leading manufacturers of medium- and heavy-duty on-highway trucks and engines. EMA member companies design and manufacture highly-customized vehicles to perform a wide variety of commercial functions including interstate trucking, regional freight shipping, local parcel pickup and delivery, refuse hauling, and construction – to name a few. The vehicles that EMA members produce are the subject of the pending ACT regulation, and accordingly EMA has a direct and significant interest in this rulemaking.

EMA member companies are developing and promoting zero-emission (ZE) commercial vehicles and therefore strongly support efforts to expand the ZE truck market in California. However, we oppose the proposed amendments to the proposed ACT regulation because they double-down on a flawed regulatory approach. As we pointed out in our comments submitted last year on the initial ACT rule proposal, the structure of the proposed regulation would require manufacturers to sell an increasing percentage of ZE trucks even though the businesses who purchase their products would not be required to buy them. In the interest of advancing their commercial enterprises, those businesses may instead choose to simply purchase other truck technologies or extend their vehicle replacement cycles. In addition to failing to mandate that trucking fleets purchase the ZE trucks that the rule would require manufacturers to sell, the proposed rule does not address establishing the essential charging infrastructure. The proposed amendments do not address those critical shortcomings of the original proposal. Instead, the amendments would simply increase and extend the naked sales mandate on truck manufacturers, and therefore the proposed ACT rule remains a fundamentally flawed regulatory approach.

The proposed ACT rule ignores the fact that for many years ZE trucks will cost more for trucking fleets to purchase and operate than traditional vehicles, and that to operate ZE trucks a fleet must also invest in a charging infrastructure at their facilities to power them. Those incremental costs of ZE commercial vehicles must be offset by government-funded incentives until such time that the overall life-cycle costs of ZE trucks, including the costs associated with the establishing a charging infrastructure, are lower than comparable costs associated with traditional vehicles. Those government incentives must be predictable, sufficient, and sustained so the businesses that operate trucks can calculate a financial benefit from converting to ZE technologies.

The coronavirus pandemic has created turmoil in all sectors of our economy and, considering the California government's looming budget crises, it is hard to see how those necessary incentives may be adequately funded. Without those incentives, the substantial ZE truck deployments envisioned by the proposed ACT rule remain merely aspirational and without any rational basis.

The increased ZE truck sales percentages mandated by the proposed amendments to the ACT rule also will significantly increase manufacturers' burden in meeting CARB's anticipated Omnibus Low-NO<sub>x</sub> regulations. With ZE sales mandated to increase to 75 percent, the ACT rule would leave very few diesel truck sales in California available to recoup the high costs of developing the emissions-reduction technologies needed to meet the anticipated low-NO<sub>x</sub> requirements. The compounding and overlapping nature of the ACT and Low-NO<sub>x</sub> rules are likely to create unacceptable market risks for traditional truck manufacturers that may force them to reduce their sales into the California market, or abandon the market altogether.

The proposed amendments to the ACT regulation simply increase and extend the percentages in the naked ZE truck sales mandate and completely fail to address the fundamental structural deficiencies of the rule's regulatory approach, and therefore the Board should not adopt them. Instead, the Board should direct staff to develop a more holistic rule that addresses all three critical aspects of the California ZE truck marketplace: (i) available ZE truck products; (ii) fleet purchase, operational, and maintenance needs of ZE trucks; and (iii) development of a robust charging infrastructure at trucking terminals and other fleet facilities. Additionally, the Board should not adopt the ACT rule until sufficient and sustainable government incentives are established so that ZE trucks will not negatively impact the bottom lines of small and large trucking fleets in California. To proceed with the ACT rule as proposed would be an exercise in wishing that the complex challenge of establishing a self-sustaining ZE truck market in California were a simple problem that could be addressed by a simple sales mandate on traditional vehicle manufacturers. Instead of achieving its intended result, the proposed myopic regulatory mandate is likely to compel manufacturers to abandon the California market and, by doing so, harm the small and large trucking businesses in the state that rely on their products and services.

**The Proposed Amendments Maintain a  
Fundamentally Flawed Regulatory Structure and  
Ignore Important Input Provided by the Board**

The proposed amendments retain the flawed framework of the proposed ACT rule and simply mandate that traditional truck manufacturers convert still greater percentages of their California sales to ZE trucks. Like the earlier proposal, the amended proposal fails to address the complex issues of ensuring that trucking fleets will actually purchase and deploy ZE trucks (*i.e.*, which they will only do if ZE trucks will have lower life-cycle costs than other available options) or ensuring that there will be a sufficient infrastructure to charge the ZE trucks. The proposed amendments simply, but substantially, increase and extend the manufacturer sales requirements as shown in the following chart:

Model Year	Class 2b-3 Group*	Class 4-8 Group	Class 7-8 Tractors Group
2024	<del>3%</del> <u>5%</u>	<del>7%</del> <u>9%</u>	<del>3%</del> <u>5%</u>
2025	<del>5%</del> <u>7%</u>	<del>9%</del> <u>11%</u>	<del>5%</del> <u>7%</u>
2026	<del>7%</del> <u>10%</u>	<del>11%</del> <u>13%</u>	<del>7%</del> <u>10%</u>
2027	<del>9%</del> <u>15%</u>	<del>13%</del> <u>20%</u>	<del>9%</del> <u>15%</u>
2028	<del>11%</del> <u>20%</u>	<del>24%</del> <u>30%</u>	<del>11%</del> <u>20%</u>
2029	<del>13%</del> <u>25%</u>	<del>37%</del> <u>40%</u>	<del>13%</del> <u>25%</u>
2030 and beyond	<del>15%</del> <u>30%</u>	50%	<del>15%</del> <u>30%</u>
2031	<u>35%</u>	<u>55%</u>	<u>35%</u>
2032	<u>40%</u>	<u>60%</u>	<u>40%</u>
2033	<u>45%</u>	<u>65%</u>	<u>40%</u>
2034	<u>50%</u>	<u>70%</u>	<u>40%</u>
2035 and beyond	<u>55%</u>	<u>75%</u>	<u>40%</u>

\*Excluding pickup trucks until the 2027 model year

At the December 12, 2019, public hearing, the Board considered staff's initial proposal for the ACT regulation. During the hearing, the Board received nearly six hours of oral testimony on the proposed rule, in addition to over 120 written submissions. During the hearing EMA proposed an implementable approach for the ACT rule that could successfully achieve greater numbers of ZE trucks deployed than the rule proposed, starting earlier than the proposed rule, and focused in environmental justice communities. We proposed that instead of a naked sales mandate, the ACT rule should holistically establish "beachhead" commercial vehicle markets in the segments that are most suitable for electrification. By first addressing the most suitable market segments, CARB could ensure that (i) manufacturers focus their development resources on products for those specific market segments, (ii) fleets operating in those segments begin converting to ZE trucks, and (iii) infrastructure investments can be channeled to those limited fleet facilities that will be deploying increasing numbers of ZE trucks. Once beachheads are established in initial targeted commercial vehicle market segments, the rule could expand to additional segments.

EMA first proposed to CARB staff that the ACT should target the most suitable commercial vehicle market segments for electrification during a meeting on July 24, 2018. Soon after that, we provided staff an analysis tool for weighing the relative suitability of the different market segments and the number of trucks in each segment that could be converted to ZE. Following that initial proposal in the summer of 2018 and through release of the initial ACT rule proposal in October 2019, we attempted to work with staff on the approach to holistically focus on the most suitable market segments. However, the initial ACT rule proposal included only a manufacturer sales mandate that broadly covers all vehicle classes from Class 2b through 8. During the December 12, 2019, Broad hearing we reiterated our position that a targeted approach for the ACT rule could more successfully grow the ZE truck market in California.

During the December 12, 2019, hearing, Board Members provided direction to staff on how to revise and restructure the proposed ACT rule. The Board Members' input included direction to align the sales and purchasing mandates, to consider the beachhead strategy, and to

assess the need to develop a charging infrastructure for ZE commercial vehicles. Following are excerpts from some of the Board Members' direction to staff on those topics:

On aligning the sales and purchase requirements:

- “I think aligning those better really does also help create the market. It sends those signals that this is where we’re heading and people begin to put in place things. But you don’t want to leave the manufacturers hanging with a requirement that they produce things that does not align with the requirement that people have to buy them, because then again, it’s not as likely to achieve the outcomes that we want, which is cleaner air, lower greenhouse gas emissions. But it also places an undue burden on one side of the market.” - Board Member Fletcher
- “I think it’s urgent that we do the fleet man... – the purchase mandates much sooner than what we’re talking – much sooner – having them done much sooner than 2022. I mean, here we are telling these companies to sell all these trucks. Are they’re coming at it and they’re saying, well, are people going to buy them? They’re going to be more expensive. And then we’re not sure there’s going to be incentives. And, you know, we’re uncertain about the charging infrastructure.” – Board Member Sperling
- “And so I worry that as we start these fleet rules that our hearing room is going to be overflowing with people that are legitimately concerned, but we’re not talking about that yet.” – Vice Chair Berg

On the beachhead strategy:

- And that is, we heard a number of people talking about the beachhead concept. And I really think we should be giving some more thought to that, because there are many of these fleets where it does make a lot of sense.” – Board Member Sperling
- “Mr. Mandel [EMA President], I guess we’re going to work with you a lot, because we want to take you up on some of your offer of how to move this around and get some early action items.” – Board Member Riordan
- “I also agree with multiple Board Members about this – being enthusiastic about the sectorial approach, where we can get, as industry says, Mr. Mandel suggested, we could go further in some areas than where the staff is proposing, but maybe be more careful with regard to the heavy-duty tractors that we all want.” ... “But I like the sectorial approach, because I think we can help those communities if we’re careful about working with industry to get cleaner trucks in certain sectors faster.” Board Member Balmes
- “I agree with Jed Mandel and the Truck and Engine Manufacturers Association’s position that we could look at this in segments. And there are certain segments along this spectrum of trucks that are probably more ready than others. And we can prioritize – prioritize some of those segments and the investments in those



segments, so that we experience early success. I think that's important." – Board Member Mitchell

On the charging infrastructure:

- "So as we move things around, and we accelerate then, there has to be the infrastructure to make it all happen. And it can be costly, and it can be very difficult." Board Member Riordan
- "And I fear that's [insufficient passenger car charging stations] going to be even more of a problem as Ms. Riordan said for commercial fleets. I mean, maybe we're making good progress with infrastructure for commercial fleets. But if it's anywhere near like we were with passenger vehicles, I think – I'm not so sure. So I want to be convinced that we have the infrastructure there." Board Member Balmes
- "I think we've been entirely too casual about infrastructure. We have substantive funding for vehicle light-duty infrastructure. Our success has been frankly disappointing. And I think as we look to infrastructure, we need to evaluate the barriers that have occurred with regard to our current push for vehicular charging stations which I think have largely accrued or partially accrued to zoning kinds of restrictions. We need to be prepared and have a plan to reach out to those entities in order to enable heavy-duty charging infrastructure." – Board Member Eisenhut
- "The other part ... is the infrastructure. And this is huge. I mean, we can look at the experience we had with light-duty infrastructure and multiply that about ten times, because heavy-duty infrastructure is going to require a lot of involvement with our utilities. It's going to involve changes to the whole grid operation. It's going to be expensive." Board Member Mitchell
- "And so one of the things that I should – that I think should be happening, as we do this, I think it would be good to form some kind of working group." ... "And I suggest that we get that going as soon as possible and that we work – that we start this working group to be working with our staff over the next several months, so that when you come back to us with the rule, we have some good decision makers at this working group that help inform our decisions and the final regulations." Board Member Mitchell

Unfortunately, none of that direction is reflected in the proposed amendments to the ACT rule. The amendments do not align the sales and purchase mandates, they do not adopt any aspect of the beachhead strategy, and they do not address establishing a charging infrastructure at fleet facilities. Instead, the amendments simply increase and extend the percentages originally proposed for the naked manufacturer sales mandate.

The Notice of Public Availability of Modified Text acknowledges that "the Board directed staff to ... give consideration to the Truck and Engine Manufacturers Association proposal." However, the proposed amendments go in the opposite direction. They maintain the manufacturer

sales mandate and ignore the issues that must be addressed for fleets to purchase and deploy ZE trucks, the investments that must be made in a charging infrastructure at fleet facilities, and the opportunity to establish beachheads in suitable market segments and environmental justice communities. Contrary to considering the EMA proposal, the amendments would simply increase and extend the flawed unilateral sales mandate.

Not only do the proposed amendments reject the beachhead strategy, they pick two of the commercial vehicle applications that are least suitable for electrification and mandate that manufacturers sell even more ZE trucks into those market segments. The rule advances and increases the requirement that manufacturers sell ZE heavy-duty pickup trucks, even though those trucks are purchased almost exclusively for their hauling and towing capacity – performance aspects that will be very challenging to meet with a battery-electric powertrain. Additionally, the proposed amendments more than double the percentages for sales of Class 7 and 8 tractors that are designed to tow loaded semitrailers over long distances – an extremely challenging vehicle configuration and duty cycle for a battery-electric powertrain. Instead of following the Board's direction and holistically considering the most suitable market segments, or even simply increasing the mandated sales percentages equally in all vehicle weight classes, the proposed rule singles out two of the least suitable segments for the greatest increases.

By ignoring a targeted market segment approach, the proposed amendments to the proposed ACT rule are counter to CARB's existing strategy for establishing ZE beachheads in other commercial vehicle segments. CARB is deploying a beachhead approach with the Innovative Clean Transit regulation that requires municipalities to begin converting to ZE buses beginning in 2023. Additionally, CARB recently finalized the Zero-Emission Airport Shuttle Regulation that requires fleets to begin converting airport shuttles to ZE buses beginning in 2027. In 2022, CARB plans to establish a regulation to mandate converting port drayage tractors to ZE. With each of those rules, CARB is focusing on a beachhead segment for the deployment of ZE commercial vehicles. However, the proposed ACT rule ignores that precedent – and the Board's direction – to mandate the sale of ZE trucks across entire vehicle weight classes.

### **The Proposed ACT Rule is Based on Inaccurate Projections of the Costs Associated with Deploying Zero-Emission Trucks**

During the ACT rulemaking CARB correctly identified that to establish a self-sustaining market in California for ZE commercial vehicles, it will be essential for buyers to be able to accurately compare the total cost of ownership (TCO) of a ZE truck to a traditional vehicle. A commercial vehicle represents a capital investment by a business, and it must return a profit. To ensure that purchasing a new truck is a wise investment, a trucking business must consider (i) up-front purchase price, (ii) operational and maintenance costs, (iii) charging infrastructure costs, (iv) electricity costs, and (v) residual value. The business will only purchase a ZE truck if it can calculate that those life-cycle costs will improve its bottom line. The fleet business may also consider government incentives in that calculation, so long as those incentives will be available over the time it takes to convert the entire fleet of trucks to ZE. Without that assurance, a fleet likely will not be able to factor in incentives when calculating whether it make financial sense to begin converting to ZE trucks.

To support the ACT rule, CARB conducted a TCO analysis that concluded ZE trucks will have favorable life-cycles costs to diesel-fueled trucks by 2024. Unfortunately, that TCO analysis includes many overly-optimistic assumptions and its conclusions have not been validated. In developing the TCO analysis, CARB chose to ignore an immense amount of data on the real-world operation of hundreds of ZE trucks in the Low Carbon Transport Heavy-Duty Pilot and Demonstration Projects that CARB is funding with hundreds of millions of dollars. Additionally, CARB did not substantiate the TCO analysis by having it reviewed by any fleets that have purchased ZE trucks. Instead, CARB subjectively made many inaccurate assumptions that resulted in a TCO analysis that heavily favors battery-electric trucks. Following are several of those inaccurate assumptions:

- Assumes very long operating life, when many fleets replace trucks after a short period of ownership.
- Assumes low purchase prices that ignore amortization of the costs of product design, development, validation, warranty, and aftermarket support.
- Assumes low battery prices based on battery-electric passenger cars, when truck operating conditions and duty cycles will demand different technologies.
- Underestimates the negative impacts of low battery-electric truck residual values, when residual value is critical to a fleet's purchasing decision.
- Predicts very long battery replacement cycles, even no replacements over an assumed 26-year life of Class 2b-3 vehicles, when truck operation and charging characteristics will accelerate battery degradation.
- Includes battery-electric truck mileage ranges that will be unacceptable to truck customers – ranges that will be shortened further by the heavy loads and harsh operating conditions associated with commercial vehicles.
- Assumes that battery-electric powertrains will become significantly more efficient over a short period of time.
- Assumes very low fuel efficiency for traditional diesel-fueled vehicles, artificially making battery-electric vehicles compare better,
- Ignores the costs and complications of installing, maintaining, and expanding a charging infrastructure at fleet facilities, which the fleet may rent.
- Assumes significant Low Carbon Fuel Standard (LCFS) benefits to nearly all truck users, when it is completely unproven that operators will receive LCFS credits.

#### Incorrect TCO Analysis Assumptions for Class 2b-3 Vehicles

For Class 2b-3 vehicles, the original TCO calculator showed that even with assumptions that do not align with industry's and academia's technical understanding, gasoline and diesel

pickup trucks were cheaper to own and operate than their electrified counterparts. The recently revised state-wide cost/benefit calculator has made even more unrealistic assumptions in order to show a positive business case for battery-electric vehicles. The already parsimonious assumptions on battery and electric motor size have been further reduced. Vehicle lifetime or ownership period has been eliminated, which ignores the fact that the original purchaser will bear the burden of higher purchase costs without realizing the longer-term fuel savings. Similarly, the assumed fuel economy of gasoline powered pickup trucks has been decreased by almost 50 percent, which grossly overstates the fuel savings of a battery-electric pickup truck relative to those vehicles.

While the TCO analysis correctly acknowledges that electric vehicles will need battery replacements, Class 2b-3 are the only vehicles for which no battery replacement is assumed throughout a 26-year lifespan. Despite the lower projected lifetime mileage for Class 2b-3 vehicles, a major component of battery degradation is age related, making it likely that one or more midlife battery replacements would be required. Also, given the uniquely varied and diverse use cases for vehicles in this segment, the assumed annual mileage is both inexplicably lower and has an unusually rapid drop-off in mileage as the vehicle ages.

The TCO analysis incorrectly assumes that only 30 percent of Class 2b-3 vehicles will be sold to individuals. In fact, approximately 80 percent of Class 2b-3 vehicles are sold to individuals and small businesses. Those individuals and small businesses will rely on non-centralized charging stations and therefore would have absolutely no opportunity to benefit from LCFS credits.

Ongoing changes to the TCO analysis may add up to a favorable cost-benefit analysis for increased numbers of Class 2b-3 battery-electric vehicles, but the underlying assumptions used to get there result in vehicles, especially pickup trucks, that are not commercially viable. A “standard range” battery providing 65 miles of range is unlikely to be suitable for any customers. Similarly, the “long range” battery with a 97-mile range would not be suitable for most customers in this segment. Both individual and commercial users of pickup trucks have variable daily mileage requirements that will not be satisfied with these short ranges. Additionally, with the small battery and motor sizes assumed in the analysis, battery-electric vehicles would be wholly unsuited for towing, which is one of the primary reasons customers purchase class 2b and 3 pickup trucks.

CARB has cited a number of product announcements to support the increase in ZE pickup truck requirements in the proposed amendments to the ACT rule, speculating that at least some of them would be in the Class 2b range. However, even the most capable of those announced pickups only offer payload and towing capability barely equivalent to smallest Class 2b pickup, and would not serve as a substitute for diesel-powered heavy-duty pickup trucks. Customers buy heavy-duty pickup trucks for their capability and will not purchase trucks that do not meet their needs.

**CARB Lacks Statutory Authority to Mandate the Certification  
Warranty, Defect Reporting and Recall Requirements in the  
Zero-Emission Powertrains Certification Requirements**

The proposed ACT rule still includes the following provision to require that ZE trucks meet CARB’s zero-emission powertrain (ZEP) certification provisions:

*Zero-Emission Powertrain Certification for ZEVs.* Beginning with the 2024 model year, on-road ZEVs over 14,000 pounds GVWR and incomplete medium-duty ZEVs from 8,501 through 14,000 pounds GVWR produced and delivered for sale in California must meet the requirements of 13 CCR section 1956.8 and 17 CCR section 95663 as amended by the Zero-Emission Powertrain Certification regulation to receive ZEV credit. (See, proposed § 1963.2(h).)

By requiring ZEP certification to meet the requirements of the ACT rule, the rule would mandate certification, warranty, defect reporting and recall requirements for ZEPs. However, as EMA explained previously, CARB does not have the statutory authority to adopt mandatory ZEP certification requirements, which, as explained below, renders that proposed requirement invalid as a matter of law.

The specific provisions of the proposed ZEP certification requirements would include all of the following regulatory elements:

- (i) Certified heavy-duty families of ZEVs would be required to use a ZEP that is certified in accordance with the “ZEP Cert powertrain requirements,” and would be required to submit a detailed “application package” for certification;
- (ii) Manufacturers would be required to attest that the vehicle integration components are designed and developed to accommodate the expected output of the ZEP to be used;
- (iii) Covered heavy-duty ZEV manufacturers would be required to include a ZEP Cert “compliance statement” on their Phase 2 GHG labels;
- (iv) Covered heavy-duty ZEV manufacturers would be required to provide vehicle purchasers with a “prescribed guidance statement identifying considerations that would be made when choosing a [heavy-duty electric vehicle],” including range, top speed, maximum grade, and impacts on performance, and also would be required to provide a detailed description of the manufacturer’s diagnosis and repair process;
- (v) Covered heavy-duty ZEV manufacturers would be required to make available their diagnostic and repair manuals, as well as any necessary service tools;
- (vi) Covered heavy-duty ZEV manufacturers would be required to display or make available various vehicle-related information, including kilowatts used per trip and remaining usable battery-capacity;
- (vii) Covered heavy-duty ZEV manufacturers would need to utilize a standardized battery-capacity test (the constant current battery depletion test) to “provide a useful reference point by which different battery-based powertrains could be compared;”
- (viii) Covered heavy-duty ZEV manufacturers would be required to describe the monitoring, diagnostics and software strategies that they use;

- (ix) Covered heavy-duty ZEV manufacturers would be required to provide ZEP warranties covering all powertrain components against workmanship and component defects for, at a minimum, 3-years or 50,000 miles of operation;
- (x) Covered heavy-duty ZEV manufacturers would be required to submit periodic “screened” and unscreened” warranty information reports, and to initiate ZEV recalls when the number of screened failures of warranted ZEP components exceeds 4 percent or 25 failures, whichever is greater; and
- (xi) Covered heavy-duty ZEV manufacturers would be required to affix a label on each certified ZEP providing, among other things, the manufacturer’s name and a “compliance statement” confirming that the ZEP has been certified to CARB’s requirements.

Significantly, none of the foregoing multiple regulatory requirements relate to engine or vehicle emissions standards or to engine vehicle emissions performance in-use. Rather, all of the foregoing requirements relate to consumer awareness or protection, all aimed at spurring consumers’ purchases of and satisfaction with ZE trucks. Those types of consumer-protection and market-promotion regulations, however, are beyond the scope of CARB’s certification authority under the relevant California statutes.

Health and Safety Code (“HSC”) section 39018 defines “certification” to mean “a finding by the state board that *a motor vehicle, motor vehicle engine, or motor vehicle pollution control device* has satisfied the criteria adopted by the state board *for the control of specified air contaminants from vehicular sources.*” (Emphasis added.) HSC section 39040 defines “motor vehicle pollution control device” to mean “equipment designed for installation on a motor vehicle *for the purpose of reducing the air contaminants emitted* from the vehicle.” HSC sections 43013(a) and 43101(a) provide that “the state board shall adopt motor vehicle emission standards . . . *for the control of air contaminants and sources of air pollution,*” and shall “adopt and implement emission standards *for new motor vehicles for the control of emissions from new motor vehicles.*” (Emphasis added.) In that regard, HSC section 39027 defines “emission standards” to mean “specified limitations on the discharge of air contaminants into the atmosphere.” Finally, HSC section 43102(a) states that,

No new motor vehicle or new motor vehicle engine shall be certified by the state board, *unless the vehicle or engine, as the case may be, meets the emission standards adopted by the state board* pursuant to Section 43101 . . . . (Emphasis added.)

From all of the foregoing, it is evident that CARB’s certification authority under the applicable statutes is limited to issuing findings that a new motor vehicle, new motor vehicle engine, or new motor vehicle pollution control device has satisfied CARB’s prescribed limitations on the discharge of specified air contaminants into the atmosphere. As a result, it is equally clear that CARB does not have the authority to certify specific powertrain components that have no capability to discharge any air contaminants into the atmosphere. CARB’s certification authority is inherently tied to the assessment and verification that new motor vehicles and engines — not

specific zero-emission powertrain components — are compliant with specified limitations on the discharge of air contaminants. Mandating that manufacturers provide “consistent and reliable information about zero-emission technology” simply does not fit within the scope of CARB’s delegated certification authority as delineated by the relevant HSC statutes. Where a system for vehicle tractive effort is comprised of powertrain components that cannot and do not produce any emissions, those components, by definition and by law, are outside the ambit of CARB’s certification authority for the control of specified air contaminants from motor vehicles and engines.

All of the foregoing statutory provisions support the conclusion that CARB does not have the authority to certify specific heavy-duty powertrains and powertrain components that have no capability to generate or discharge emissions of any air contaminants. Consequently, CARB’s proposal to adopt detailed ZEP-related certification requirements pertaining to battery capacity, labeling, purchasing guidance, on-board information, diagnostics and repairs, are simply beyond the scope of CARB’s legislatively delegated authority, and so are invalid.

The same holds true for CARB’s specific warranty and recall requirements relating to ZEP components. Again, the plain reading of the relevant provisions of the HSC bears this out.

Those relevant statutory provisions are as follows:

**HSC §43205.5. Manufacturer’s warranty on vehicles or engines**

Commencing with the 1990 model-year, the manufacturer of each motor vehicle and motor vehicle engine . . . shall warrant to the ultimate purchaser and each subsequent purchaser *that the motor vehicle or motor vehicle engine* meets all of the following requirements:

- (a) Is designed, built, and equipped *so as to conform with the applicable emission standards* specified in this part for a period of use determined by the state board.
- (b) Is free from defects in materials and workmanship which cause *the motor vehicle or motor vehicle engine* to fail to conform with the applicable requirements specified in this part.

(Emphasis added.)

\* \* \*

**HSC §43105. Manufacturer’s violation and failure to correct; recall**

No *new motor vehicle, new motor vehicle engine*, or motor vehicle with a new motor vehicle engine required pursuant to this part to meet *the emission standards established pursuant to Section 43101* shall be sold to the ultimate purchaser . . . or registered in this state *if the manufacturer has violated emission standards and test procedures*

and has failed to take corrective action, which may include recall of vehicles or engines . . .  
(Emphasis added.)

The foregoing statutes make it clear that CARB's warranty authority under the HSC is limited to ensuring that manufacturers comply with the tailpipe emission standards and other emissions-related requirements that apply to motor vehicles and motor vehicle engines. CARB's statutorily-limited warranty authority does not extend to enhancing the "market transparency, consistency and stability" for the various components of ZEPs, or to promoting the "broad market adoption of zero-emission technology in the heavy-duty sector." The relevant provisions of HSC section 43205.5 do not by any stretch authorize regulations geared to provide "policy support to accelerate" the maturation of the heavy-duty ZEV/ZEP market. Nor do they cover powertrain components at all. Rather, the governing statutory provisions constrain and restrict CARB's warranty authority to regulations that help to ensure that new motor vehicles and new motor vehicle engines remain in compliance with quantitative emissions standards and related requirements for the period of use that the state board determines. CARB's proposal for ZEP warranties — which again is aimed at enhancing customers' acceptance of and satisfaction with the componentry of heavy-duty ZEPs, not at ensuring robust tailpipe emissions compliance — exceeds the bounds of CARB's statutory authority.

Similarly, CARB's proposal to establish defect reporting and recall requirements centered around the number of failures of ZEP components also is beyond the scope of CARB's delegated regulatory authority. Under HSC section 43105, CARB-mandated corrective actions, including recalls, are limited to circumstances where it can be demonstrated, through reported failure rates or otherwise, that a manufacturer's motor vehicles or motor vehicle engines are in violation of "emission standards" or related "test procedures." Accordingly, the corrective actions, along with the monitoring that might lead to corrective actions, that are permitted under HSC section 43103 do not encompass actions intended to promote the market for "zero-emission" powertrain component parts, such as generators, on-board chargers or battery management systems. Those types of non-emissions-related consumer-satisfaction issues are simply outside the boundaries of CARB's emissions-related mission and legislative grants of authority, especially as it pertains to warranties, defect reporting, and recall requirements.

CARB's response to EMA's detailed explanation why CARB lacks the statutory authority to adopt certification, warranty, defect reporting and recall requirements for zero-emission powertrain (ZEP) components is really no response at all. CARB simply claims that it has broad authority to adopt emission standards and "ancillary requirements" for new motor vehicles and engines. (See Response to Comments, p. 26.) EMA does not dispute that. Rather, what EMA has demonstrated is that CARB has no authority to establish performance and reliability criteria or other ancillary requirements — including warranty, reporting, and recall requirements — for the specific components of zero-emission powertrains, such as batteries, generators, and electrical systems, that have no capacity whatsoever to generate any air contaminants in any amount from any new vehicle or engine. CARB's response does nothing to rebut that clear-cut conclusion.

CARB also concedes in its response that it is, in fact, venturing well beyond its jurisdiction over air contaminants into the realm of consumer protection, a regulatory area that the Legislature has never delegated to CARB. CARB acknowledges that the real object of its attempted ZEP



performance criteria is to “encourage higher utilization of battery-electric and full-cell vehicles,” and to “raise consumer awareness of ZEP technologies.” (Response to Comments, pp. 26-27.) Nothing in the Health and Safety code authorizes CARB to vest itself with such an expansive mandate to act as a consumer advocate for the development of the ZEV/ZEP market.

Consequently, CARB’s ultra vires ZEP regulation remains invalid and unlawful.

### **CARB Should Restructure the ACT Rule to Maximize the Chances of Success**

The proposed ACT rule can and should be restructured into a workable and implementable program that is more likely to establish a self-sustaining market for ZE commercial vehicles in California. To maximize the chances of success, the Board should direct staff to modify the rule to address the following:

- **Prioritize the most suitable market segments.** ZE trucks are more suitable for certain commercial vehicle market segments than others and therefore the beachhead approach presents a much greater chance of success.
- **Link any sales mandates to purchase requirements.** To be effective, the two policies must be issued simultaneously, be balanced, and apply to same segment populations in the same time frame.
- **Focus on what fleets need to successfully convert to ZE trucks.** Before fleets will purchase ZE trucks, they must also be ready to incorporate into their operations the maintenance and operational needs of the new technologies.
- **Recognize the critical charging infrastructure needs.** Commercial trucking fleets must first invest in and build out adequate charging infrastructure at their facilities to be able to operate ZE trucks. Developing the charging infrastructure is the longest leadtime aspect of converting to ZE trucks, and fleets must have it in place before purchasing ZE trucks.

Additionally, the ZE commercial vehicle market will require significant incentives until ZE trucks provide a positive return on a fleet’s investment. Incentives must be sufficient to address all ZE truck life-cycle costs that exceed traditional vehicles, including (i) higher purchase prices, (ii) operational inefficiencies, (iii) lower residual values, (iv) new maintenance facility and equipment investments, and (v) significant new infrastructure investments. Additionally, incentives must be available for an extended period of time so fleets can rely on them in their long-term business plans to convert to ZE trucks. Without sufficient certainty that adequate incentives will be available years in the future, fleets will not begin the long and complicated process of converting to ZE trucks due to the associated business risks.

To make the ACT rule successful and establish a self-sustaining a ZE commercial vehicle market, CARB must address the four issues listed above and ensure that the California government will provide sufficient and sustain incentive funding. The incentives must adequately ensure that the small and large businesses that operate commercial vehicles in the state will not be harmed by the rule.

## **CARB Must Address Several Specific Issues with the Proposed Amendments**

Should CARB keep the ACT rule structured as only a naked sales mandate, at a minimum, the Board should direct staff to address the following specific issues with the proposal:

### **Recognize the Need for a Fleet Rule**

At a February 12, 2020, public workshop, CARB staff outlined a plan to bring fleet rules to the Board in 2021 or 2022. Staff predicted that the fleet rules would be effective in 2024 and drive the purchase of more ZE trucks than the sales mandate would require manufacturers to sell. At that workshop staff proposed seven unique concepts from which they would pick the most promising and then begin developing a regulation. While that ambitious approach for the fleet rules may sound promising, it is inherently misaligned with the current sales mandate proposal because they are not addressing the same truck populations in the same time frame. Since robust and effective fleet rules will be critical to establishing a ZE truck market in California, the Board should direct staff to, at the very least, incorporate their intent to establish future fleet rules into the proposed ACT rule. Staff should add to the regulation an exemption for manufacturers from the sales requirements in the event that the fleet rules are not established in time or are not sufficient to mandate the purchase of more ZE trucks than the sales requirements.

### **Recognize the Need for a Charging Infrastructure**

The proposed ACT rule assumes that fleets and utilities will establish the requisite charging stations needed to support the ZE trucks deployed. However, the charging stations for ZE commercial vehicles must be located at fleet terminals and other depots where trucks are typically parked, and developing that charging infrastructure will be complicated, expensive, and time-consuming. Moreover, the charging infrastructure development must consider expanding the number of charging stations in anticipation of the fleet deploying more ZE trucks over time. Additionally, since 80 percent of the Class 2b-3 vehicles are sold to individuals or small businesses, the chargers for those vehicles must be broadly available to retail consumers. Considering that 24 to 48 months may be needed between concept and a fully functional charging station, the ACT rule should include an exemption for manufacturers from the sales requirements in the event that a sufficient charging infrastructure is not in place.

### **Provide Additional Compliance Provisions for Other States**

Section 177 of Clean Air Act allows other states to adopt CARB's standards. (See, 42 U.S.C. § 7507.) To enhance the chances of the ACT rule to be successful outside of California, the rule should provide truck manufacturers additional compliance flexibilities for those Section 177 states. For example, the Advanced Clean Cars (ACC) rule initially provided a credit travel provision that was later extended through the 2017 model year. The travel provision allowed all zero-emission vehicle (ZEV) types, except transitional ZEVs (TZEVs), that were sold in other states to be counted toward compliance with CARB's ACC requirements, as if they were sold in California. Similarly, a vehicle sold in California would count toward compliance in a Section 177 state. Under the travel provision, the number of ZEVs that a vehicle manufacturer must sell nationwide will not exceed the number of ZEVs required by CARB's regulation alone, regardless of how many states adopt CARB's rule. A travel provision would enhance the chances that other

states could successfully adopt CARB's ACT rule, and therefore should be included in the rule.

Additionally, the ACC rule currently provides an optional compliance path whereby vehicle manufacturers may elect to pool credits within two large regions outside of California. Unlike the credit travel provision, credit pooling would not alter either the total number of ZE trucks sold inside or outside of California. However, credit pooling would allow more efficient allocation of ZE trucks in states that adopt CARB's ACT rule and therefore should be included in the rule.

Both the credit travel and pooling provisions are important considerations for the success of the ACT rule in Section 177 states because those states will trail California in the development and implementation of supporting heavy-duty ZE truck policies such as purchase incentives, the development of the charging infrastructure, and the implementation of fleet purchase rules.

### Modify the Description of Vehicles Sold in California

The proposed amendments would modify the regulatory language for the population of vehicles from which a manufacturer's sales mandate percentage is applied to include any vehicle that ends up being put into service in California. However, the proposed amendment would be impossible to implement considering the nature of the multi-stage manufacturing that occurs with all single-unit commercial trucks (*i.e.*, everything but tractors). A single-unit truck is built as an incomplete vehicle by the truck manufacturer (*e.g.*, a chassis-cab), and then another entity installs a body on the truck chassis and completes the vehicle manufacturing. The original truck manufacturer may not even know which of its chassis-cabs will end up in California, and the vehicle may not be put into service until many months after the chassis-cab was built. It would be impracticable for a truck manufacturer to track all of its chassis-cabs through their subsequent sales and manufacturing operations to identify those that may eventually be sold to a user in California. Following is one example of where the language proposed new is used:

*Deficit Generation.* Starting with the 2024 model year, a manufacturer shall annually incur deficits based on the manufacturer's annual sales volume of on-road vehicles produced and delivered for sales in California. ***Deficits are incurred when the on-road vehicle is sold to the ultimate purchaser in California.*** (See, proposed § 1963.1(a). Emphasis added.)

To resolve the impracticability of the proposed description of vehicles sold into California, CARB could do one of two things. CARB could clarify that they plan to regulate the bodybuilders who sell completed commercial vehicles to California customers, thus ensuring that the original truck manufacturer may not later be held liable for those vehicles. Alternatively, CARB could remove the second part of the description that reads: "Deficits are incurred when the on-road vehicle is sold to the ultimate purchaser in California." Doing so would leave the definition the same as what is in the Advanced Clean Cars and Greenhouse Gas Standards for Medium- and Heavy-Duty Engine and Vehicles (Heavy-Duty GHG) regulations. That simple change would align the ACT rule with other rules and would capture nearly all of a truck manufacturer's vehicle that are put into service in California. To achieve that end in an implementable manner, CARB should eliminate the impracticable second part of the description and keep the first part. To be

clear, the § 1963.1(a) language should be as follows:

*Deficit Generation.* Starting with the 2024 model year, a manufacturer shall annually incur deficits based on the manufacturer's annual sales volume of on-road vehicles produced and delivered for sale in California.

#### Modify Near Zero Emission Vehicle Requirements

The proposed amendments include the following new requirement for the minimum all-electric range (AER) of a near-zero-emission vehicle (NZEV):

*Minimum All-Electric Range.* To earn credit, NZEVs must have an all-electric range that equals or exceeds the criteria specified in 17 CCR section 95663(d) until the end of the 2029 model year and ***an all-electric range that equals or exceeds 75 miles or greater starting with the 2030 model year.*** (See, proposed § 1963.2(b)(2). Emphasis added.)

The proposed 75-mile or greater AER for an NZEV after 2029 is unnecessary. A NZEV couples an electric drivetrain with an internal combustion engine that may be used to generate power to recharge the batteries or propel the vehicle to avoid completely draining the power from the batteries and stranding the vehicle. NZEVs are particularly useful for commercial customers who have occasional uses of a vehicle that may exceed range of its battery capacity. It would be unnecessary to require a 75-mile AER for an NZEV that typically operates over much shorter distances because the customer would be required to pay for and carry extra battery capacity.

Instead of establishing a 75-mile AER, CARB reduce the credits that a manufacturer may generate with an NZEV after 2029. That is, in lieu of requiring a 75-mile AER, CARB should modify § 1963.2(b)(1) to replace the 0.75 not-to exceed value with 0.65 beginning with model year 2030. The 0.65 not-to-exceed factor would reduce the NZEV credits by thirteen percent and thus make them much less valuable. Specifically, § 1963.2(b)(2) should be eliminated and § 1963.2(b)(1) should be revised to read as follows:

*NZEV Factor Value.* The NZEV factor used to calculate NZEV credits shall be calculated as 0.01 multiplied by the all-electric range, and is not to exceed 0.75 until the end of the 2029 model year and 0.65 starting with the 2030 model year.

Should CARB increase the AER requirement for NZEVs built after 2029, the range should be significantly reduced to allow manufacturers the flexibility to design a product that best suits their customers' needs. In that case, a 45-mile AER would be more appropriate. Additionally, CARB should clarify the requirements for measuring AER in 17 CCR § 95663(d). We know of no instance where a manufacturer has utilized those complex requirements, and in the interest of regulatory certainty CARB must provide detailed guidance on how to apply them.

CARB has stated that one of the purposes of the ACT rule is to reduce emissions from criteria pollutants and greenhouse gases from on-road medium- and heavy-duty vehicles. Given

their potential to achieve significant near- and long-term emission reductions, EMA recommends that the rule include NZEV credits for vehicles with engines certified to the optional low-NO<sub>x</sub> standard of 0.02g/hp-hr and that use renewable fuel. Such vehicles not only already achieve near-zero NO<sub>x</sub> emissions but can also be carbon neutral/negative depending on the fuel source. The definition of NZEV in the proposed rule focuses on certain technologies instead of actual emissions performance or capability. EMA recommends modifying the NZEV definition to include additional technologies that can achieve the optional certification to 0.02g/hp-hr NO<sub>x</sub> standard and use renewable fuel. CARB should also clarify that the new definition of NZEV used in the ACT rule does not affect the definition of “near-zero” as it is used in other CARB regulations or funding programs.

#### Modify the Requirement to Make Up a Deficit

The proposed amendments would modify the time period within which manufacturers may make up a deficit as follows:

*Requirement to Make Up a Deficit.* A manufacturer that retires fewer ZEV or NZEV credits than required to meet its credit obligation in a given model year must make up the deficit ***by the end of the next model year*** by submitting a commensurate number of ZEV credits to satisfy the deficiency. Deficits carried over to the following model year cannot be made up with NZEV credits. (See, proposed § 1963.3(b). Emphasis added.)

The proposed requirement for a manufacturer to make up a deficit by the end of the next model year is unreasonable restrictive. Because commercial vehicles are highly customized to complete unique functions and are sold to entities whose cash flow will vary greatly with changing economic and business conditions, a truck manufacturer’s sales volumes and product mix will vary greatly year-over-year. Accordingly, it may be unreasonably challenging for a manufacturer to make up a deficit in one year. That issue was recognized in the Heavy-Duty GHG regulations that provide three model years to remedy a deficit. (See, 40 C.F.R. § 1037.745(e).) To provide manufacturers the flexibility needed in the commercial vehicle marketplace, CARB should modify the requirement to require a manufacturer to make up a deficit within three model years, in alignment with the Heavy-Duty GHG rule.

#### Modify the Low Tractor Volume Flexibility

The proposed amendments would establish a very limited availability for a manufacturer to use truck credits to make up for a deficit in the tractor category. We understand that CARB is restricting the use of truck credits to make up for tractor deficits to force manufacturers to sell ZE tractors, regardless of what types of vehicles customers are willing to purchase. Such forcing of sales into a particularly unsuitable market is further evidence, on top of our discussion above about the proposed higher tractor sales percentages, that the amendments to the ACT rule represent the antithesis of a beachhead strategy that CARB previously followed and that the Board has recommended. Following is the provision in the proposed amendments that limits a manufacturers ability to transfer credits into the tractor category:

*Low Tractor Volume Flexibility.* A manufacturer who generates 25 or fewer Class 7-8 tractor deficits in a model year and has tractor deficits remaining after retiring credits per the credit retirement order in sections 1963.3(c)(1) and 1963.3(c)(2) ***can use a maximum of 25 Class 2b-3 or Class 4-8 group ZEV credits***, starting with the earliest expiring credits, to satisfy their Class 7-8 tractor group deficits. (See, proposed § 1963.3(c)(3). Emphasis added.)

Allowing only 25 truck credits to be used to make up tractor deficits is unreasonably restrictive, particularly since the Weight Class Modifiers in § 1963.1(b) would require a manufacturer to sell more than one ZE truck to make up for the lack of a ZE tractor. The restriction would be especially harmful to a manufacturer who sells a limited number of tractors in California, and likely could not justify the investment in developing a ZE tractor model. To address those concerns, and to provide all manufacturers the ability to balance credits more effectively in response to shifting marketplace conditions, CARB should revise the provision to be as follows:

*Low Tractor Volume Flexibility.* A manufacturer who has tractor deficits remaining after retiring credits per the credit retirement order in sections 1963.3(c)(1) and 1963.3(c)(2) can use Class 2b-3 or Class 4-8 group ZEV credits, starting with the earliest expiring credits, to satisfy up to 50 of their Class 7-8 tractor group deficits.

### **Conclusion**

EMA member companies are investing heavily in ZE truck technologies and fully support expanding the California market for ZE trucks. However, the proposed ACT rule is built on a flawed regulatory structure and thus it risks poisoning the market. As proposed, the rule would require that manufacturers sell a product that may not further their customers' business and thus they will not buy. Instead, those trucking fleets may simply purchase other technologies or maintain their existing trucks longer. Hoping that staff will complete fleet rules in record time and successfully implement them with very little leadtime does not justify finalizing a fundamentally flawed rule now. Additionally, hoping that the electricity providers will install an adequate charging infrastructure in time at the fleet facilities where it will be needed does not make up for ignoring that critical aspect in the ACT rulemaking. Avoiding those urgently important aspects of establishing a ZE commercial vehicle marketplace will doom the ACT rule to failure. To avoid that outcome and increase the chances that the ACT will achieve its intended results, the Board must reject the proposed amendments and again direct staff to amend the proposal so that it addresses all three necessary components of a viable ZE truck program: (i) ZE truck products, (ii) robust fleet rules, and (iii) the requisite charging infrastructure.

Following soon after the ACT rule, CARB is anticipated to finalize the Omnibus Low-NO<sub>x</sub> rule, and the two rules will have significant and overlapping impacts on commercial vehicles sold in California. The rules simultaneously apply to the same group of truck and engine manufacturers, affect the same commercial vehicle products in California, and will significantly impact all those who use trucks and who benefit from them. The enormous technology development costs of the Omnibus Low-NO<sub>x</sub> rule must be spread over the limited number of medium- and heavy-duty trucks sold in California. At the same time, the ACT rule will impose

enormous research and development costs and require manufacturers to convert up to 75 percent of those trucks to ZE. Thus, among other things, the requirements of the ACT rule will reduce the number of traditional diesel products for which manufacturers can spread, and recoup, the costs of the Omnibus Low-NO<sub>x</sub> rule. The concurrent nature of the two rules will require manufacturers to complete two major product development programs for the California market in the same time frame and under the unprecedented constraints imposed by the coronavirus pandemic. Those costs ultimately will be borne by commercial truck buyers and will significantly impact the cost of goods movement in California. Further, as a practical matter, the coronavirus crisis also will reduce the leadtime manufactures need to comply with the rules. The crisis will reduce the needed capital and financial assistance commercial truck customers need to fund the higher truck purchase prices and operational costs associated with the ACT rule. Additionally, the crisis will reduce the time and capital available to develop the necessary charging infrastructure, and considering California's budget situation it will be much harder for the state to fund incentive programs needed to offset the higher purchase and operational costs of ZE trucks.

The enormous economic cost and hardships caused by the coronavirus pandemic, and the diminished ability of truck and engine manufacturers to devote resources needed for future product development, significantly reduces manufacturers' ability to meet the stringent demands of the Omnibus Low-NO<sub>x</sub> and ACT rules in the time frames contemplated. Indeed, the crisis even makes it impractical to participate in and to provide data in response to the rulemakings.

It should come as no surprise that truck and engine manufacturers may decide to simply exit the California market due to the costs and feasibility of producing a commercially-viable product under the Omnibus Low-NO<sub>x</sub> rule. In fact, we have heard from CARB staff that at least one major heavy-duty manufacturer has so informed them. Of course, if one or more manufacturers are compelled to exit the California marketplace, the ACT rule's ZEV mandate will have no effect on them. Since the sales mandate is calculated as a percentage of diesel sales, their mandate will be X percent of zero.

We look forward to continuing to work with the Board, staff, and other stakeholders to reduce the unintended negative consequences of the proposed ACT rule and develop a program that will successfully expand the ZE commercial vehicle market in California. If you have any questions, or if there is any additional information we could provide, please do not hesitate to contact Timothy Blubaugh at (312) 929-1972 or [tblubaugh@emamail.org](mailto:tblubaugh@emamail.org).

Respectfully submitted,

TRUCK & ENGINE MANUFACTURERS  
ASSOCIATION

**STATE OF CALIFORNIA  
AIR RESOURCES BOARD**

**Second Notice of Public Availability of    )  
Additional Documents and Information;    )  
Advanced Clean Trucks Regulation        )**

**Hearing Date:  
June 25, 2020**

**COMMENTS OF THE  
TRUCK AND ENGINE MANUFACTURERS ASSOCIATION**

October 20, 2020

Timothy A. Blubaugh  
Truck & Engine Manufacturers Association  
333 West Wacker Drive, Suite 810  
Chicago, IL 60606



**STATE OF CALIFORNIA  
AIR RESOURCES BOARD**

**Second Notice of Public Availability of     )  
Additional Documents and Information;     )  
Advanced Clean Trucks Regulation         )**

**Hearing Date:  
June 25, 2020**

The Truck and Engine Manufacturers Association (EMA) hereby submits comments on the *Second Notice of Public Availability of Additional Documents and Information for the Advanced Clean Trucks (ACT) Regulation* that the California Air Resources Board (CARB) released on October 5, 2020.

EMA represents the world's leading manufacturers of medium- and heavy-duty on-highway trucks and engines. EMA member companies design and manufacture highly-customized low-volume commercial vehicles that perform a wide variety of functions, including long-haul interstate trucking, regional freight shipping, intracity pickup and delivery, parcel delivery, refuse hauling, and construction. EMA member companies are investing billions of dollars to develop and promote medium- and heavy-duty zero-emission vehicles (ZEVs) for those diverse trucking applications and therefore strongly support efforts to expand the California commercial ZEV market.

EMA appreciates CARB providing the additional material for the ACT rulemaking record. However, we are concerned that some of the new documents appear to follow the flawed regulatory structure of the ACT regulation. The *Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding* and the Governor's Executive Order N-79-20 both appear to promote establishing a commercial ZEV market simply by mandating that manufacturers sell the vehicles. Like the ACT rule, they ignore the fundamental barriers that must be overcome before trucking companies will convert to ZEVs. Trucking fleets must earn a profit on the investment they make to purchase a truck, and if a new truck technology is not cost effective they will choose a different technology or decide to maintain their existing trucks longer. The ACT rule does not address the higher life-cycle costs and lower utility of zero-emission trucks, nor does it require development of the unique electric charging or hydrogen fueling infrastructure needed to operate commercial ZEVs. By failing to confront those crucial market challenges, the sales mandate in the ACT rule will not alone be successful in achieving sustainable medium- and heavy-duty ZEV deployments.

During both hearings on the ACT regulation the Board members repeatedly recognized that the ACT rule was incomplete, and that expanding the commercial ZEV market in California would require addressing the fundamental fleet and infrastructure issues. CARB's anticipated Advanced Clean Fleets (ACF) regulation is intended to address the missing purchase part of the purchase=sale equation that must be solved to make the ACT rule successful. Unfortunately, the ACF regulation has a long way to go before becoming reality. CARB currently is evaluating multiple disparate regulatory concepts for the rule, and each involves significant challenges that

CARB must overcome to finalize an effective regulation. At the same time, the ACT rule becomes effective in 2024, anticipates deploying approximately 100,000 ZEVs in California by 2030, and targets 300,000 by 2035. The ACF regulation must ensure that fleets are motivated to purchase all those ZEVs, plus unregulated ZEV sales. Those unregulated sales may come from ZEV manufacturers that do not also produce traditional vehicles and thus are not mandated by the ACT rule to sell anything, and low volume manufacturers that are exempt from the rule. CARB plans to choose a regulatory path for the ACF rule, complete a proposed regulation and achieve Board approval, in time to make the rule effective in 2023. We hope CARB is successful meeting that ambitious rulemaking timeline, and we note that failure to promulgate an effective and implementable ACF regulation will cripple the chances that the ACT rule will be successful.

When approving the ACT rule the Board members also recognized the importance of developing an electric charging and/or hydrogen fueling infrastructure for the commercial ZEVs to be deployed under the rule. The infrastructure must be appropriately sized for medium- and heavy-duty ZEVs, and chargers must be located at fleet terminals where trucks are parked. Since it can take between 24 and 48 months from concept to a fully-functional charging station, and even longer for a hydrogen fueling station, development should begin immediately on the infrastructure for ZEVs sold in 2024, the first year of the ACT rule sales mandate. Similarly, the charging/fueling infrastructure for ZEVs sold in 2025 should be underway next year – and so on for the increasing volumes every subsequent year. Unfortunately, the ACT does not include any requirements for establishing a charging/fueling infrastructure or directly address that crucial market element. Without the infrastructure in place, or at least under construction, it would be financially reckless for a fleet to begin purchasing ZEVs.

Perhaps the greatest challenge in developing the medium- and heavy-duty ZEV market in California will be identifying the funding needed to incentivize fleets to purchase ZEVs and to build out the infrastructure to keep the vehicles in operation. Since a trucking company may only replace ten percent of its fleet with new vehicles in any given year, it could take ten years for the fleet to fully convert to ZEVs. Before undertaking such a long-term technology changeover, a trucking company must be assured of incentive funding throughout that time period that is sufficient to cover the higher life-cycle costs and lower utility of ZEVs. Additionally, the fleet must not only install the first charging stations at its terminals before purchasing ZEVs, it must plan to expand those stations over time and far in advance of receiving each new set of ZEV purchases. Trucking businesses already operate on razor thin profit margins and cannot absorb the financial burden associated with ZEVs, and therefore CARB must provide significant funding for the commercial ZEV market for the foreseeable future. Such government expenditures will be particularly challenging at a time when State revenue is declining precipitously due to the coronavirus pandemic and the resulting economic crisis. The California Budget Act of 2020 predicts declining revenue in each of the next four years, with revenue in 2023-24 is expected to be twenty percent less than in 2019-20. Without adequate and sustained funding, developing the California medium- and heavy-duty ZEV market as envisioned in the ACT is not sustainable.

The ACT manufacturer sales mandate is on the books, but now CARB must begin some truly hard work. The medium- and heavy-duty ZEV fleet and infrastructure issues must be addressed with appropriate regulatory measures and timely, sufficient, and sustained funding. Otherwise, the lack of follow through will doom the ACT rule to failure.

We look forward to continuing to work with CARB and other stakeholders to ensure that the ACT rule can constructively contribute to developing the medium- and heavy-duty ZEV market in California. If you have any questions, or if there is any additional information we could provide, please do not hesitate to contact Timothy Blubaugh at (312) 929-1972, or [tblubaugh@emamail.org](mailto:tblubaugh@emamail.org).

Respectfully submitted,

TRUCK & ENGINE MANUFACTURERS  
ASSOCIATION

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**MEMORANDUM**

Date: **June 11, 2021**

To: **Timothy French; Truck and Engine Manufacturers Association (EMA)**

From: **John Grant, Uarporn Nopmongcol, Lit Chan**

Subject: **Factors that Could Result in Different Impacts with Advanced Clean Truck Rule Adoption in New Jersey Compared to California**

The New Jersey Department of Environmental Protection (NJDEP) has released the Notice of Rule Proposal and State Implementation Plan Revision: Advanced Clean Trucks Program and Fleet Reporting Requirements<sup>1</sup>. If adopted, New Jersey would opt-into the California Air Resources Board (CARB) Advanced Clean Trucks (ACT) rulemaking which requires zero emission vehicle (ZEV) adoption for heavy-duty (HD) and medium-duty (MD) vehicles.

For the rulemaking technical analysis, NJDEP has assumed that criteria air pollutant and greenhouse gas (GHG) emission reductions impacts/costs/benefits of the rule scale with CARB ACT rule estimates, proportional to vehicles miles traveled (VMT) (i.e. CARB ACT rule impacts/costs/benefits scale by the 0.15 ratio of New Jersey (NJ) state-wide to California (CA) state-wide MD and HD vehicle VMT). This simple scaling methodology does not account for potentially substantial differences in NJ and CA heavy duty truck fleets that could result in substantially different impact estimates.

At the request of EMA, Ramboll has reviewed the topics below for which New Jersey specific emissions and/or cost analysis are not well represented by scaling CARB impacts by the 0.15 ratio noted in the Notice of Rule Proposal and State Implementation Plan Revision: Advanced Clean Trucks Program and Fleet Reporting Requirements. Topics and a summary of findings are listed below.

- **Energy Portfolio / Electric Vehicle Charging:** In 2019, New Jersey's electricity mix resulted in GHG emission rates (lb/MWh) from the electric sector that were 41% higher compared to California according to the US Environmental Protection Agency (EPA) Emissions & Generation Resource Integrated Database (eGRID; EPA, 2021). GHG emission rates in New Jersey would potentially be higher than in California at least through 2035; therefore, emissions from electricity used to charge vehicles would be higher. Based on future forecasts of electricity generation and associated GHG emissions for New Jersey (GWRA 80x50 report; NJDEP, 2020) and California (E3, 2019; high electrification scenario), electricity GHG emission rates (lb/MWh) in New Jersey are estimated to be approximately 20% higher in 2030 and 30% higher in 2040.
- **Extended Idle:** Truck electrification is expected to reduce all tailpipe emissions, including idle emissions. Lower per vehicle extended idle activity estimates for combination unit long-haul trucks in New Jersey could result in lower per vehicle NOx emission reductions in New Jersey compared to California.
- **Vehicle mix:** Costs and economic impacts associated with electrification of New Jersey's fleet could be higher compared to California's based on the higher fraction of short-haul trucks which tend to be older and have less resale value, as well as annual VMT, than long-haul trucks.

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<sup>1</sup> <https://www.nj.gov/dep/rules/notices/20210419a.html>

- **Trip Frequency:** A lower number of trips per day could lead to less opportunity between trips for vehicle charging, making implementation of electric trucks more challenging in New Jersey compared to California.

## 1. **Energy Portfolio Analysis**

Below we provide a summary of New Jersey's current and forecast energy portfolio.

According to EPA's eGRID, calendar year 2019 electricity emission rates in New Jersey (545 pounds per megawatt hour [lb/MWh] CO<sub>2</sub>e) were 41% higher than calendar year 2019 electricity emission rates in California (387 lb/MWh CO<sub>2</sub>e).

New Jersey's energy master plan provides an energy forecast to meet increasing electricity demand due to electrification while reaching its goal of 100% clean energy by 2050. We provide insights on how this plan compares to California's renewables portfolio standard program to meet Greenhouse Gas (GHG) targets over the same time horizon. Given that these are future targets that do not guarantee implementation, the comparison made in this memorandum should be viewed from a qualitative perspective only.

As electric vehicles (EVs) shift tailpipe emissions to power plant emissions, their impacts are determined by the electricity mix. In 2019, total U.S. electricity generation of 4.13 trillion kilo-watt-hours (kWh) from all energy sources resulted in 1.90 billion tons of carbon dioxide (CO<sub>2</sub>). This equaled about 0.92 pounds (lb) of CO<sub>2</sub> emissions per kWh. Coal combustion is more carbon intensive than burning natural gas for electricity<sup>2</sup>. Electricity generation from biomass, hydro, solar, and wind is considered carbon neutral. Net CO<sub>2</sub> emissions from generation, therefore, vary by region because of heterogeneity in electricity mix.

Assessing the state's energy plans can provide insights on GHG impacts due to increasing electrification (vehicles, engines, buildings). Climate policies are designed to reduce carbon emissions through various initiatives including carbon taxes, energy efficiencies, renewable portfolio standards, and other traditional policies leveraged by national and state governments. These policies evaluate analyses of multiple energy scenarios, including transportation, building, and renewable energy strategies to determine if GHG reduction targets are achievable. Each state sets its GHG targets and periodically reassesses and adjusts its roadmap (e.g., energy plan) to assure that the targets can be met. States that increase reliance on clean energy will likely see overall benefit from electrification. Nonetheless, such energy plans cannot foresee future developments and therefore should not be viewed as rigid establishments of future energy portfolios.

### 1.1 **New Jersey Energy Portfolio**

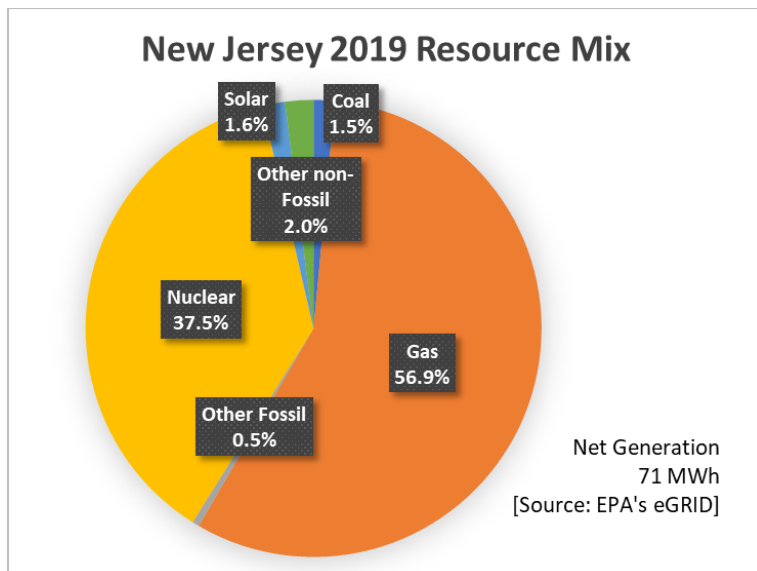
#### *Current Year*

Natural gas and nuclear power together accounted for 94% of New Jersey's net generation in 2019 (Figure 1). Natural gas-fired generation increased steadily from 2005 to 2015, when it exceeded nuclear power generation for the first time. The low-cost natural gas nearly eliminated older coal-fired generation which accounts for 1.5%, down from about 10% in 2010. New Jersey subsidizes three nuclear power reactors to prevent nuclear plant closures that might result from competition with less expensive natural gas-fired generation. New Jersey is part of the PJM Interconnection, the regional transmission organization that coordinates movement of power supplies on the electricity grid in all or parts of 13 states and the District of Columbia. New Jersey consumes more electricity than it

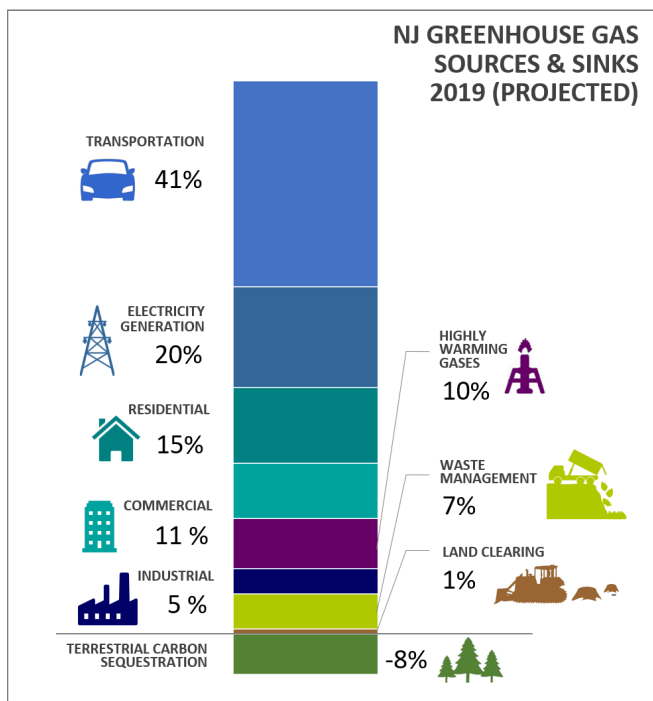
<sup>2</sup> CO<sub>2</sub> emission factors in 2019 for coal and natural gas are 2.21 b/kWh and 0.91 b/kWh, respectively.

generates, and in 2018, New Jersey obtained about 8% of its power from generators in other states through PJM<sup>3</sup>. New Jersey's imported electricity typically has had a higher emissions profile.

Electric generation accounts for 20% of GHG emissions in 2019, led by transportation (41%) and followed by residential (15%) and commercial (11%) fossil fuel use (Figure 2).



**Figure 1. New Jersey net electricity generation by source in 2019**



Source: NJ.gov

**Figure 2. New Jersey GHG sources in 2019**

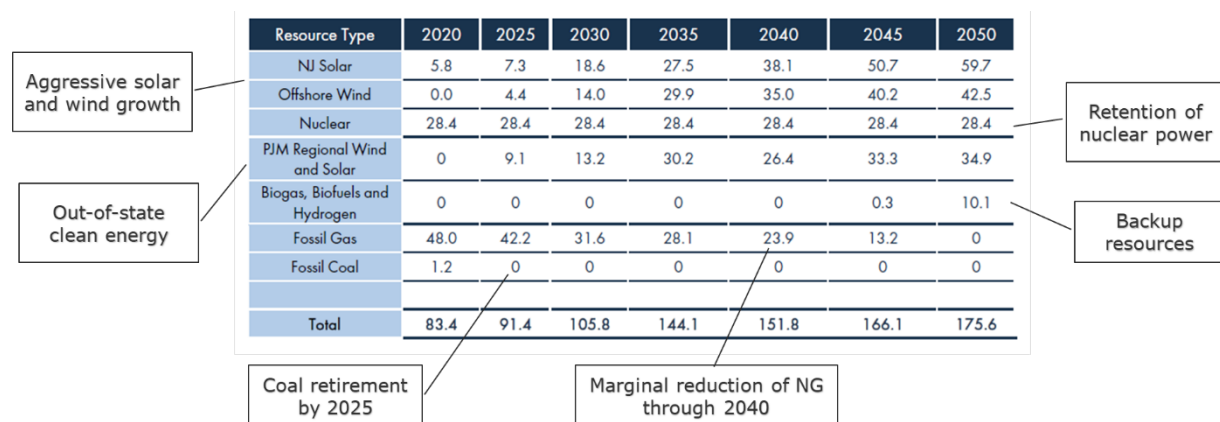
<sup>3</sup> U.S. EIA, New Jersey Electricity Profile 2018, Table 10, Supply and disposition of electricity, 1990 through 2018.

### *Energy Outlook: New Jersey Climate Change Goals*

New Jersey released its Energy Master Plan (EMP) in 2019: Pathway to 2050, which targets 100% clean energy by 2050 (EMP report; NJDEP, 2019). In 2020, in response to the mandate in the Global Warming Response Act (GWRA), to reduce the state's GHG emissions by 80% from their 2006 levels (approximately 24.1 MMTCO<sub>2</sub>e) by 2050, a follow-on report (GWRA 80x50 report; NJDEP, 2020) was released. Both plans call for carbon-neutral electricity generation, electrification of transportation, increased energy efficiency, improvements in the grid, and building sector improvements that include expanding net zero carbon homes incentive programs.

The 2019 EMP's least cost scenario projected that demand for electricity will more than double to approximately 165 terawatt-hours (TWh) in 2050. In this scenario, 88% of new light-duty vehicle sales are to be electrified by 2030, rising to 100% by 2035, and 90% of buildings must be electrified by 2050.

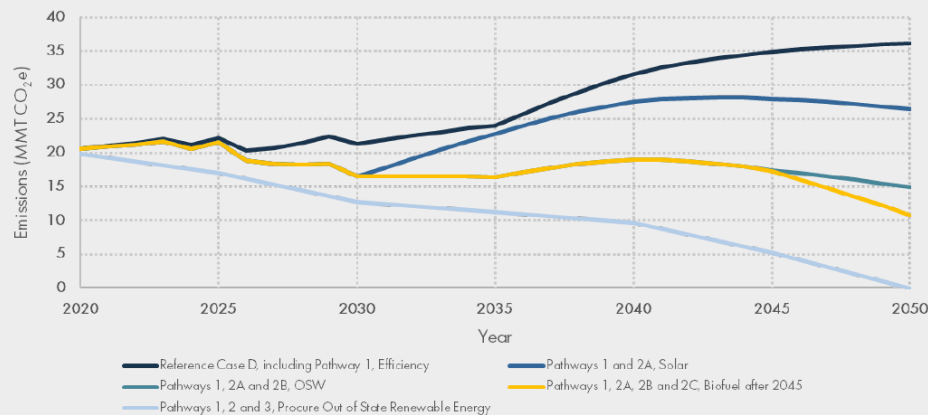
As natural gas power plants are progressively retired (e.g., generation contribution of 30% in 2030; 16% in 2040, 0% in 2050) and existing nuclear is retained, the entirety of the remaining electricity demand is assumed to be satisfied by renewable power. Particularly, the 2019 EMP assumes a sharp growth in solar capacity, a steady rise in offshore wind generation, and substantial import on wind-generation elsewhere in the PJM. In-state generation includes a dispatchable fleet that shifts over time from natural gas to alternatives such as renewable biogas and hydrogen. Figure 3 presents annual generation goals for the period 2020-2050 in the second most aggressive pathway presented in the GWRA 80x50 report (e.g., Pathway 1,2A,2B,2C, biofuel after 2045). As successive waves of technological change and more reliance on renewables come into effect emissions are expected to drop through 2050 (Figure 4; yellow line). Out-of-state renewables or additional in-state resources close the gap and bring emissions to zero by 2050 (Figure 4; bottom line labeled Pathway 1,2, and 3, Procure out-of-state renewable).



Source: Adapted from GWRA 80x50, Table 3.4  
Pathway 1,2A,2B,2C, biofuel after 2045

**Figure 3. New Jersey annual generation goals by year (TWh)**

**Figure 3.12. Estimated emissions due to renewable energy and energy efficiency in the Electric Generation Sector (MMT CO<sub>2</sub>e).**  
 Addition of solar PV, offshore wind, and biofuel-powered combustion offset emissions growth as electrification proceeds. Out-of-state renewables or additional in-state resources close the gap and bring emissions to zero by 2050.



Source: GWRA 80x50, Figure 3.12

**Figure 4. Estimated emissions in New Jersey electric sector (MMT CO<sub>2</sub>e)**

## 1.2

### California Energy Portfolio

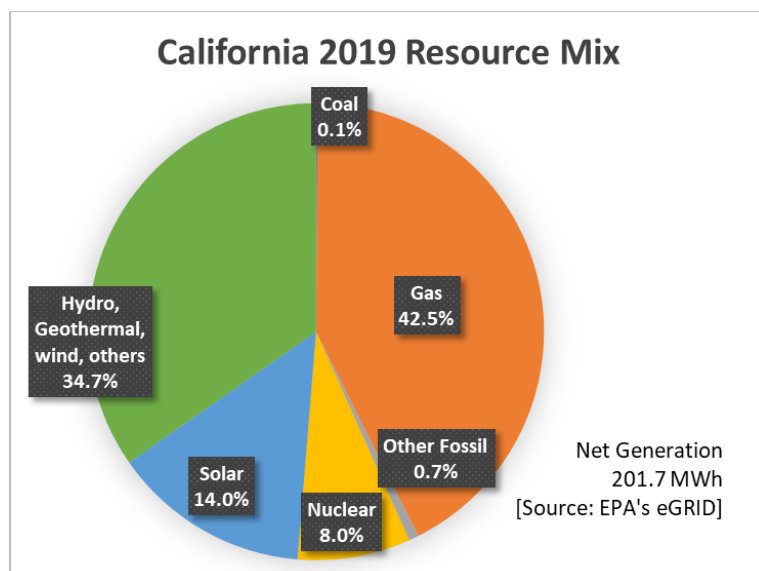
#### Current Year

In 2019, California was the nation's top producer of electricity from solar, geothermal, and biomass energy, and the state was second in the nation in conventional hydroelectric power generation (Figure 5). Wind supplied 7% of California's in-state electricity net generation in 2019. Natural gas-fired power plants provided 42%. Nuclear power provided 8% from only one operating nuclear plant, down from nearly 20% in 2011 when two nuclear plants were operating. Only 0.1% of California's net generation was fueled by coal, and it is all from industrial cogeneration units. California consumes more electricity than it generates, and in 2018, California obtained about 28% of its power from generators outside of California including imports from Mexico<sup>4</sup>. California's imported electricity typically have a higher emissions profile.

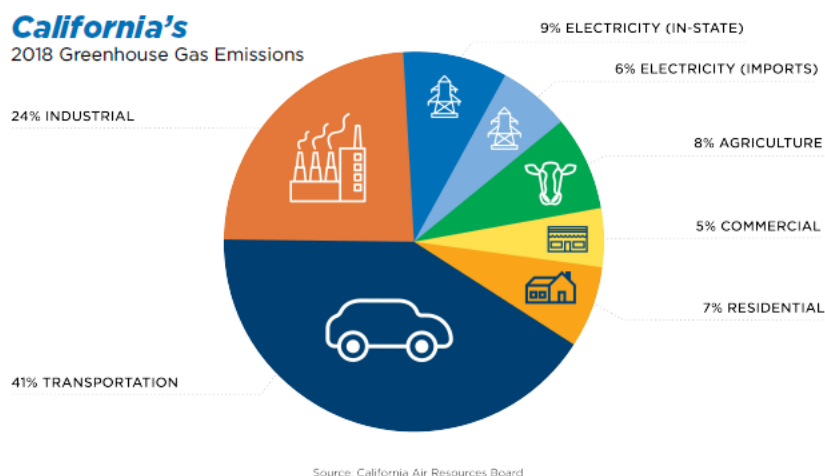
Electric generation accounts for 15% (9% in-state, 6% imports) of GHG emissions in 2018, led by transportation (41%) and followed by industrial (24%) and agriculture (8%) (Figure 6).

<sup>4</sup> U.S. EIA, State Energy Data System, Table F20, Electricity Consumption Estimates, 2019.





**Figure 5. California net electricity generation by source in 2019**



Source: California Air Resources Board

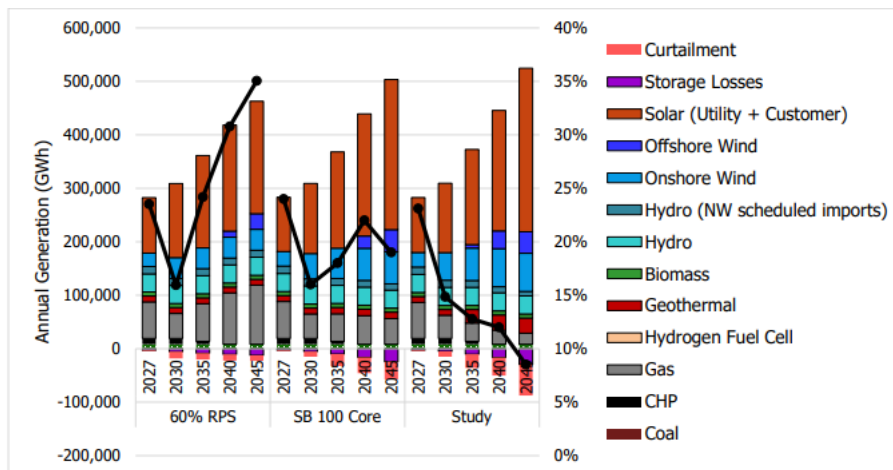
**Figure 6. California GHG sources in 2018**

#### *Energy Outlook: California Climate Change Goals*

California's renewable portfolio standard (RPS) was enacted in 2002 and has been revised several times since then. The 2021 Senate Bill No.100 (SB 100), which is the latest RPS, requires that 33% of electricity retail sales in California come from eligible renewable resources by 2020, 60% by 2030, and 100% by 2045 (CEC, 2021). SB 100 addresses only retail sales and state agency procurement of electricity; wholesale or nonretail sales and losses from storage and transmission and distribution lines are not subject to the law.

The SB 100 report assesses various pathways to achieve the 2045 target. California is moving toward having 100 percent of new cars and passenger trucks sold in the state be zero-emission by 2035. California will need to roughly triple its current electricity power capacity by 2045 driven by the

conversion to clean energy resources and growing electricity demand. By 2025, out-of-state coal generation is projected to be eliminated from the state's resource mix altogether. As shown in Figure 7, the annual generation in each of the scenarios increases significantly over the modeled years, (e.g., SB 100 core scenario). While gas generation decreases between 2027 and 2045, gas capacity is retained through 2045 to ensure uninterrupted power supply during the transition to 100% clean energy for reliability needs. Generation of renewable and zero-carbon resources must be at least equal to retail sales by 2045, however natural gas generation can serve non-retail load or system losses.



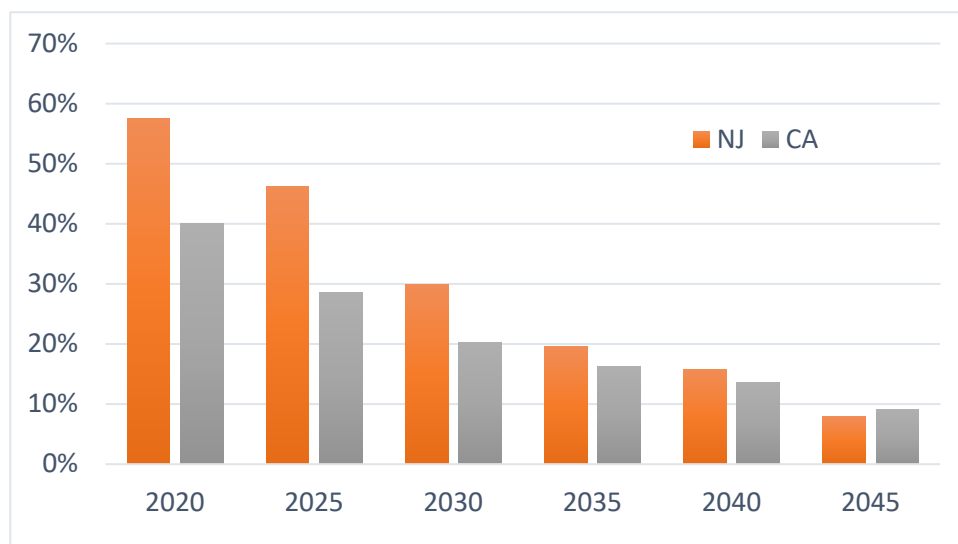
Scenario description: 60% RPS = 60% RPS through 2045 (counterfactual); SB 100 Core = 100% RPS by 2045, high electrification demand; Study = 100% RPS by 2045 including storage and transmission losses. Source: SB 100 Report, Figure 29

**Figure 7. California annual generation goals by year (TWh)**

### 1.3

## Conclusions

While California has led the nation in clean energy, New Jersey projects swift adoption of clean energy going forward. New Jersey assumed aggressive wind and solar growth, while California will rely more on solar as wind generation has ecological and environmental land constraints. Coal reaches retirement by 2025 in both states. Gas generation will continue to play a role in ensuring grid reliability, thus will determine GHG emissions from electric sector. Because of ambitious targets of clean energy in both states, gas generation contribution (%) will progressively decline reaching about 20% in 2035 and less than 10% in 2045 (Figure 8). Similar gas generation mix in the two states by 2035 would result in comparable GHG emission rates (lb/MWh) past 2035 (Table 1).



Note: California values were 'roughly' estimated from Figure 8 and included transmission and storage losses. Do not quote.

**Figure 8. Forecast of gas generation in the electricity mix (%) for New Jersey and California**

**Table 1. Electricity GHG emission rate (CO<sub>2</sub>e lb/MWh) for New Jersey and California**

State	New Jersey*		California**
	with Biofuel after 2045	Out-of-state renewable	High Electrification
2020	529	529	448
2025	531	410	335***
2030	344	260	223
2035	252	168	166***
2040	269	145	109
2045	219	66	75***
2050	136	0	42

Note: these emission rates were roughly estimated for illustration purpose only. Do not quote.

\* GWRA 80x50 report: Generation (MWh) for the biofuel scenario from Table 3.4

(assumed no change in out-of-state scenario), CO<sub>2</sub>e emissions approximated from Figure 3.12

\*\*E3 (2019): Generation and CO<sub>2</sub>e emissions from Table 7, High Electrification Scenario which was also assumed in SB 100 Core

\*\*\*Interpolated between available decadal values

Key takeaways from comparing energy portfolios are as follows:

- Currently, GHG contributions in New Jersey and California from transportation (about 40%) and electric (15-20%) sectors are comparable.
- GHG impacts are driven by gas generation in the electricity mix as states retire coal and shift to cleaner energy.
- GHG emission rates in New Jersey likely will be higher than in California at least through 2035; therefore, emissions from electricity used to charge vehicles would be higher. Post-

2035, the GHG emission rates could be more comparable through the adoption of out-of-state renewables.

- In 2019, New Jersey's electricity mix resulted in GHG emission rates (lb/MWh) from the electric sector that were 41% higher compared to California according to EPA's eGRID.
- Based on future forecasts of electricity generation and associated GHG emissions for New Jersey (GWRA 80x50 report) and California (E3, 2019; high electrification scenario), electricity GHG emission rates (lb/MWh) in New Jersey are estimated to be approximately 20% higher in 2030 and 30% higher in 2040.

## 2. **Extended Idle Emissions**

Extended idle emissions occur when a vehicle engine is turned-on, but the vehicle is not moving. California's Emission FACTor (EMFAC) model defines extended idle as any idle period greater than five minutes, including, for example, idle at rest stops when power is needed for in-cabin accessories or idle during cargo loading/unloading. EPA's MOVES model defines extended idling as only related to hoteling stops of long-haul vehicles when power is needed for in-cabin accessories and does not include other idle activities such as idle during cargo loading/unloading. During periods of extended idle operations, power is provided by the main engine or auxiliary power unit. In cases where power is provided by the main engine, extended idle operations can result in substantial NOx emissions as a result of operation when the engine is not sufficiently warm to induce effective catalyst operation.

In the 2016v1 Modeling Platform<sup>5</sup> MOVES calendar year 2028 emission inventory, New Jersey extended idle hours for combination unit long-haul trucks were estimated to be 1.3 hours/day-vehicle<sup>6</sup>. In California's EMFAC2017 model, those trucks which most closely correspond to combination unit long-haul trucks (i.e., T7 and T6 California International Registration Plan [CAIRP], Neighboring Out-of-state [NOOS], Out-of-state [OOS], and Tractors) have an average extended idle hours per vehicle of 2.4 hours/day-vehicle based on a calendar year 2028 EMFAC2017 emission inventory. The California estimate is 1.1 hours/day-vehicle longer than the New Jersey estimates. Some of this additional idle time could be a result of the different extended idle definitions in MOVES and EMFAC.

Truck electrification is expected to reduce all tailpipe emissions, including idle emissions. Lower per vehicle extended idle activity estimates for combination unit long-haul trucks in New Jersey could result in lower per vehicle NOx emission reductions in New Jersey compared to California.

## 3. **Vehicle Mix**

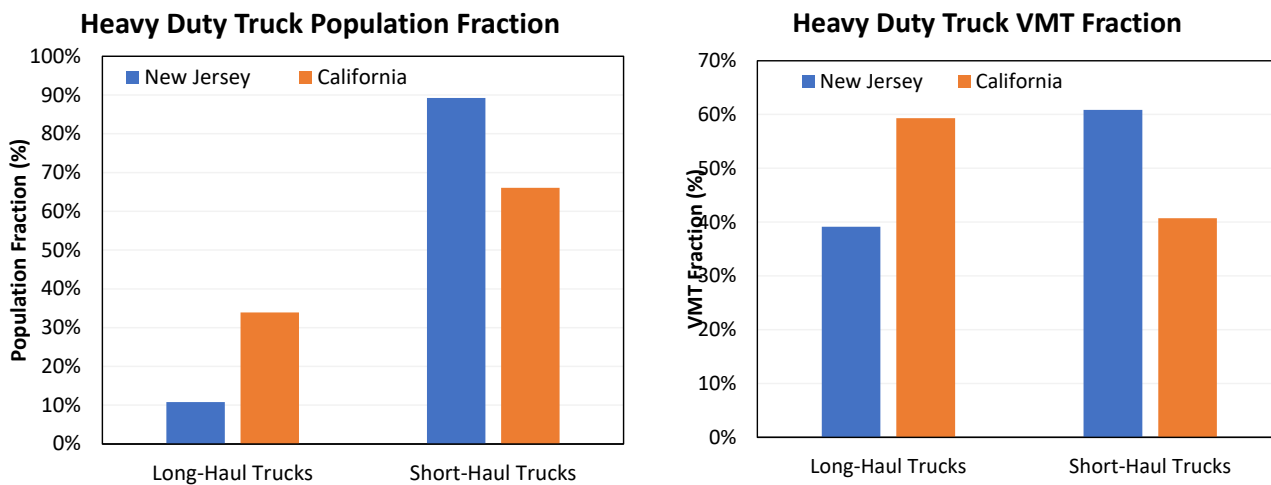
New Jersey's truck fleet includes more activity for short-haul and less activity for long-haul vehicles compared to California (see Figure 9). A recent MOVES technical support document noted that "[combination unit] short-haul trucks are often purchased in secondary markets, such as for drayage applications, after being used primarily for long-haul trips."<sup>7</sup> Replacement of short-haul trucks with zero emission models could incur higher incremental capital costs compared to long-haul vehicles because the short-haul vehicles are expected

<sup>5</sup> <https://www.epa.gov/air-emissions-modeling/2016v1-platform>

<sup>6</sup> Including idling activities in which power is supplied by the main engine or auxiliary power unit.

<sup>7</sup> "Population and Activity of Onroad Vehicles in MOVES3", April 2021, EPA-420-R-21-012, <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1011TF8.pdf>

to have less resale value and annual VMT. Therefore, costs and economic impacts associated with electrification of New Jersey's fleet could be higher compare to California's.



**Figure 9.** Population (left) and vehicle miles traveled (VMT; right) contributions from long- and short-haul trucks in New Jersey and California<sup>8</sup>.

#### 4. Trip Frequency

Vehicle trips are defined by the number of key-off and key-on events per day. California's EMFAC2017 model estimates substantially higher trips per day compared to estimates for New Jersey from the recent 2016v1 Modeling Platform<sup>5</sup>. For heavy duty trucks >14,000lb gross vehicle weight rating, EMFAC2017 estimates an aggregate value of approximately 11 trips/day. The 2016v1 Modeling Platform estimate was approximately 4.0 trips/day for similar vehicles types (combination and single unit short- and long-haul trucks). A lower number of trips per day could indicate longer trips which could lead to a decreased number of charging event opportunities per day and potentially higher and more costly energy storage per vehicle requirements.

#### 5. References

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<sup>8</sup> EMFAC vehicle classes converted to long- and short-haul based on the following cross-reference file: [ftp://newftp.epa.gov/air/nei/2014/doc/2014v2\\_supportingdata/onroad/2014v1\\_EICtoEPA\\_SCCmapping.xlsx](ftp://newftp.epa.gov/air/nei/2014/doc/2014v2_supportingdata/onroad/2014v1_EICtoEPA_SCCmapping.xlsx)

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