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Dear Ms. Hanna and Mr. Schell,

EDF thanks the New Jersey Department of Environmental Protection (DEP) for its consideration of these brief comments. These comments amplify the comments submitted on October 8, 2020 and the joint comments submitted to you by the Natural Resources Defense Council on January 15, 2021. State leadership on these issues is critical – especially in the absence of protective national standards. These programs are needed to protect public health and the environment, help mitigate climate change, and stimulate the economy. With the incoming Biden Administration, there is also an opportunity for federal standards that help secure substantial emission reductions.

I. *The Transition to Zero-Emission Vehicles Must Reflect the Urgency of the Health Crisis Caused by Transportation Pollution*

Transitioning to medium- and heavy-duty vehicles (MHDVs) to zero-emissions alternatives is a critical component of a just transition to a low-emissions future. In addition to their sizable greenhouse gas (GHG) impact, these vehicles are responsible for an outsized portion of harmful, localized pollution from transportation – contributing a disproportionate amount of nitrogen oxide (NO_x) and sulfur oxide (SO_x) emissions relative to the size of the vehicle population (approximately 5% of vehicles on the road).¹

As discussed in previous comments, this localized pollution disproportionately impacts certain communities across the state – typically low- and moderate-income and environmental justice communities – that are more likely to reside near freight corridors, ports, bus depots, and Newark Airport. Of course, this contributes to heightened levels of respiratory and cardiovascular disease, comorbidities that may exacerbate the severity of COVID-19 for those individuals.²

To put a finer point on it, allowing transportation and freight to continue with the status quo will have a detrimental and significant impact on health in communities, particularly those that live in close proximity to highways and other major sources of transportation pollution. Indeed, a new study estimates

¹ Gabel Associates, Inc., *Full Market Vehicle Electrification in New Jersey: The Opportunities, Impacts and Net Benefits for Light-, Medium-, and Heavy-Duty Electric Vehicles* (prepared for ChargeEVC) (Oct. 7, 2020) at 64, available at <http://www.chargevc.org/wp-content/uploads/2020/10/ChargeEVC-Full-Market-Electrification-Study-FINAL-Oct-7-2020.pdf>.

² Andrea Pozzer, *et al.*, *Regional and global contributions of air pollution to risk of death from COVID-19*, 116 *Cardiovascular Research* 2247 (Dec. 1, 2020).
<https://academic.oup.com/circvasres/article/116/14/2247/5940460>.

that more than 20,000 people die prematurely every year as a result of the health burden from the motor vehicle pollution on our roads and highways.³ Similarly, up to 18,000 deaths are likely in 2025 (and even more today) across the nation from fine particulate matter and ozone (the latter of which is largely a result of NO_x emissions). In New Jersey itself, hundreds of premature deaths are attributed to fine particulate matter from transportation,⁴ demonstrating the severity of this sector on human health. As such, New Jersey must take action in order to start mitigating the impact of these vehicles – and ensure that environmental justice communities are prioritized, so that they are able to benefit from these policies and are well equipped to take part in infrastructure and vehicle deployment programs.

II. *New Jersey needs a more ambitious long-term target to meet state climate commitments and adequately address the public health risk posed by diesel medium- and heavy-duty vehicles.*

Under the current NESCAUM Memorandum of Understanding, New Jersey has committed to have 100% of new truck and bus sales be zero-emission by 2050. Simply put, that lacks the ambition needed in order to meet state statutory goals – for example, not addressing the emission impact of medium- and heavy-duty vehicles may result in an inability of New Jersey to meet the targets set forth in the Global Warming Response Act - and fails to recognize the severity of their impact on climate change and on health. As well, New Jersey must establish goals for medium- and heavy-duty vehicle deployment under the Plug-in Vehicle Act, and therefore enable the scale of transition that is so desperately needed. As such, New Jersey must show appropriate ambition, in combination with a comprehensive set of policies, in making the transition to zero-emission trucks and buses to deliver invaluable health benefits and set the course for achieving the state's climate and clean air commitments.

Rather than 2050, New Jersey should commit to a 2040 timeframe for all new truck and bus sales to be zero-emission; further, the state should set pre-2040 targets for specific vehicle types and duty cycles where feasible. While a 2040 timeframe may be appropriate for certain vehicles (e.g., Class 8 regional- and long-haul tractors), there are vehicle classes that can and should be transitioned to zero-emission alternatives more quickly – well before 2040. This includes urban delivery trucks as well as school and transit buses.

A more ambitious timeframe is both achievable and affordable. Two commonly held arguments against this ambition are that vehicles of all classes won't be available on this timeframe, and that upfront cost will still be too prohibitive to make a transition to zero-emission vehicles attractive. Both can be dispelled.

First, zero-emission trucks and buses are quickly becoming available across every size and duty cycle. In the North American market, more than 100 zero-emissions truck and bus models are either already available or coming to market by 2022, ranging from shuttle buses and cargo vans to school buses and tractor-trailers (Figure 1 and Figure 2).⁵ Rapid technological progress is unlocking electrification of even the most demanding duty cycles. Daimler, Paccar, and Volvo, who collectively account for nearly 90% of the class 7-8 truck market, are all actively testing zero-emissions class 8 tractors and have announced

³ Environmental Defense Fund, *Accelerating to 100% Clean: Zero Emitting Vehicles Saves Lives, Advance Justice, Create Jobs* (Aug. 27, 2020) at 2, <https://www.edf.org/sites/default/files/documents/TransportationWhitePaper.pdf>.

⁴ State of New Jersey Department of Environmental Protection, Bureau of Mobile Sources, <https://www.nj.gov/dep/stopthesoot/>.

⁵ Ben Sharpe, et al., *Race to Zero - How manufacturers are positioned for zero emission commercial trucks and buses in North America*, International Council on Clean Transportation and Environmental Defense Fund (Oct. 2020), Appendix E, https://www.edf.org/sites/default/files/documents/Race%20to%20Zero-ICCT_EDF_PQ-FINAL.pdf.

plans to bring them to series production over the next 1-2 years.⁶ In addition, several other legacy and zero-emission vehicle manufacturers are currently developing prototypes and first-generation commercial products, including hydrogen fuel cell vehicles for long-haul operations.

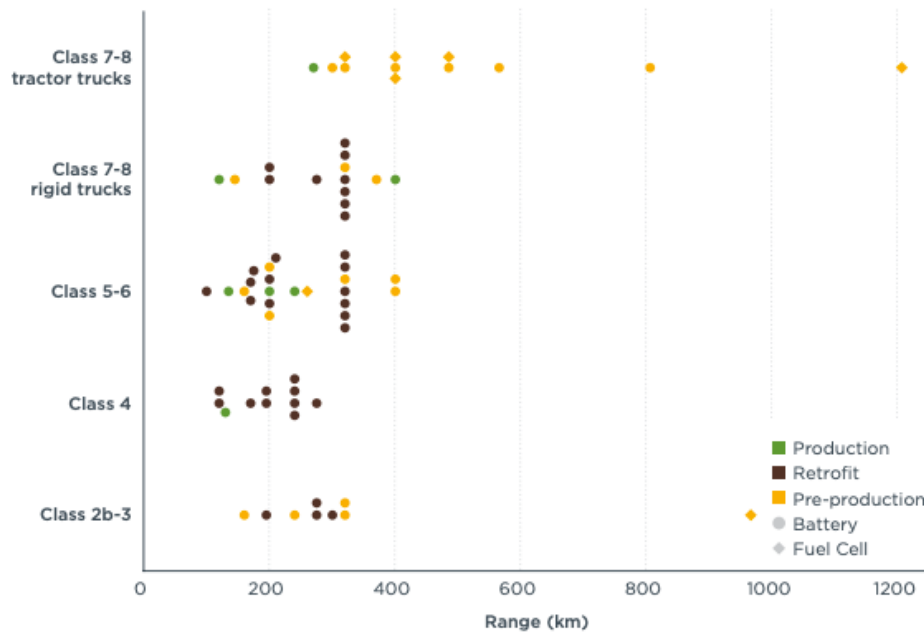


Figure 1. Available and Announced Zero Emissions Truck Models in the U.S. and Canada⁷

⁶ Daimler, *Freightliner eCascadia*, https://freightliner.com/trucks/ecascadia/?gclid=Cj0KCQiAk53-BRD0ARIsAJuNhpvaY5r5sdujZrtV0MVKcZW1b7S45zOAePmr-OXhBQpd8evPgZOW5MkaArDzEALw_wcB; Paccar, *Kenworth T680E and Peterbilt 579EV*, <https://www.kenworth.com/news/news-releases/2020/october/t680e/> and <https://www.peterbilt.com/electric-vehicles>, Volvo, *Volvo VNR Electric Truck to Hit the Market Dec.3*, <https://www.truckinginfo.com/10129692/volvo-vnr-electric-truck-to-hit-the-market-dec-3>.

⁷ Ben Sharpe, et al., *Race to Zero - How manufacturers are positioned for zero emission commercial trucks and buses in North America*, International Council on Clean Transportation and Environmental Defense Fund (Oct. 2020), Figure 7, https://www.edf.org/sites/default/files/documents/Race%20to%20Zero-ICCT_EDF_PQ-FINAL.pdf.

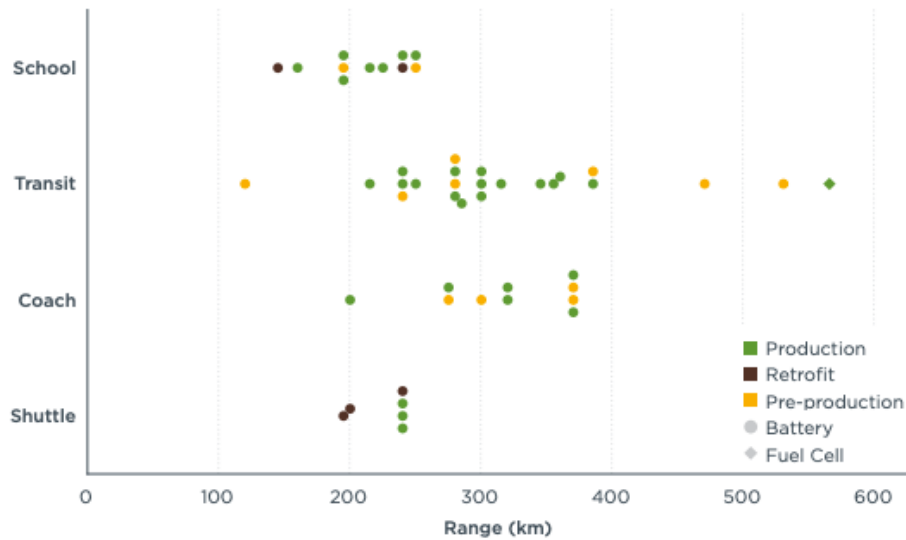


Figure 2. Available and Announced Zero Emissions Bus Models in the U.S. and Canada⁸

Second, while upfront cost of zero emission trucks and buses still exceeds that of their diesel counterparts and requires mitigation, cost parity over the total cost of ownership will be achieved well before the currently proposed 2050 timeframe. Medium-duty trucks (Class 3-6) are already cost competitive over the total cost of ownership (TCO) and heavy-duty short-haul vehicles (Class 7-8) are expected to achieve TCO parity with diesel powered vehicles by 2025, even without incentives.⁹ Heavy-duty long-haul vehicles (likely powered by hydrogen fuel cells) are expected to demonstrate TCO parity without incentives by around 2030.¹⁰ As component costs continue to decline, the business case for zero-emissions vehicles will only strengthen leading up to 2040.

III. *New Jersey Should Continue with Adoption of the Advanced Clean Truck Rule and the Heavy-Duty Vehicle and Engine Omnibus Rule*

EDF reiterates the points raised in the joint letter submitted by the Natural Resources Defense Council, and incorporates by reference the comments submitted by EDF to the NJ DEP¹¹ on the Advanced Clean Truck (ACT) regulation and the Heavy-Duty Low NO_x Omnibus regulation (hereinafter, low-NO_x rule) on October 8, 2020. In addition, EDF raises three additional points.

The low-NO_x rule does not present overly burdensome technological changes and will result in significant health benefits

First, it should be noted that the timeline set out by the current iteration of the low NO_x rule does not present undue constraints. The low NO_x standards that immediately precede the California Air Resources Board's (CARB) recent low NO_x rule, which largely mirrored the EPA standards, were some of the most

⁸ *Id.* at Figure 8.

⁹ North American Council for Freight Efficiency, *Electric Trucks: Where They Make Sense* (May 2019) at 13-14, <https://nacfe.org/emerging-technology/electric-trucks/>.

¹⁰ ICF, *Comparison of Medium- and Heavy-Duty Technologies in California – Executive Summary* (Dec. 2019) at 4, https://www.caletc.com/assets/files/ICF-Truck-Report_Final_December-2019.pdf.

¹¹ Environmental Defense Fund,

Comments on proposed adoption by New Jersey of the California Advanced Clean Truck Regulation and the California Heavy-Duty Engine and Vehicle Omnibus Regulation (Oct. 8, 2020).

technology-forcing emissions standards ever adopted – requiring development of a completely new catalyst, new particulate filters, and a system that had to track the amount of NO_x in the tailpipe, an amount that varies greatly under different driving conditions and integration of an advanced and complex engine exhaust gas recirculation system. Further, those new technological elements all had to work in concert without significantly impacting fuel consumption. Despite these challenges, manufacturers were readily able to meet these standards in a timely manner. In contrast, “meeting the envisioned CARB 2024 targets would require very modest increases in technology complexity and costs.”¹² Thus, compliance can reasonably be achieved on the timeline set forth by CARB.

Further, this rule would result in significant health benefits. As stated above, the emissions from MHDVs are significant and can result in severe health impacts, missed workdays and hospital visits. Given that the low NO_x rule can greatly alleviate those impacts, the commensurate monetized health benefits in California, estimated by CARB, are \$36.8 billion dollars¹³ – the significance of which should not be given short shrift in the context of an analogous New Jersey rule.

Implementation of the low-NO_x rule is eminently feasible.

EDF fully supports CARB’s proposed model year 2024 NO_x and PM standards and the 2027 NO_x standard on existing regulatory cycles. CARB staff has demonstrated the technical feasibility of both the 2024 and 2027 proposed NO_x standards through several years of extensive development and testing in partnership with the Southwest Research Institute (SwRI).¹⁴ The development and testing, together with related work by manufacturers, show that the proposed 2024 standards can be met using a combination of improved engine calibration, the newest configuration of after-treatment devices and urea injection. And, the 0.02 g/bhp-hr NO_x standard proposed for model year 2027 and subsequent years can be achieved by adding cylinder deactivation - a technology widely used in passenger vehicles.¹⁵

The proposed standards will have no adverse impact on carbon dioxide (CO₂) emissions or fuel consumption.¹⁶ Past heavy-duty diesel NO_x standards resulted in an increase in fuel consumption. SwRI has shown that this tradeoff can be prevented. SwRI evaluated several engine modifications that could prevent an increase in fuel consumption while simultaneously reducing NO_x. SwRI down-selected cylinder deactivation is the most practical technology that helps improve engine efficiency and reduces CO₂. Cylinder deactivation also increases exhaust temperature, which reduces CO₂ by improving NO_x catalyst efficiency, especially at low speed and low load conditions where current after-treatment systems have been less effective due to low exhaust temperature. Thus, cylinder deactivation helps achieve a 90 percent reduction in NO_x emissions under most driving conditions with no increase in CO₂ emissions or fuel consumption.

¹² International Council on Clean Transportation, *Estimated cost of diesel emissions-control technology to meet the future California low NO_x standards in 2024 and 2027* (May 20, 2020), <https://theicct.org/publications/cost-emissions-control-ca-standards>.

¹³ California Air Resources Board, Public Hearing to Consider the Proposed Heavy-duty Engine and Vehicle Omnibus Regulation and Association Amendments, Staff Report: Initial Statement of Reasons (2020), at V-11.

¹⁴ *Id.* at ES-12.

¹⁵ *Id.* at III-12 to III-27.

¹⁶ *Id.* at V-5.

The low-NOx rule will not result in pre-buying to avoid more stringent regulations.

Analysis performed by EDF clearly shows that there are significant benefits inherent in more stringent emissions standards.¹⁷ Indeed, when reviewing market growth in response to 2007 and 2010 federal engine standards, there was smooth growth in vehicle demand prior to, and during implementation of the 2014 Phase 1 fuel efficiency standards. Indeed, the purchase of model year 2014 vehicles was *higher* than any year since 2005.¹⁸ This suggests that lower freight costs, facilitated by fuel savings from more efficient vehicles, drive higher demand for freight transport and this demand, in turn, drives demand for new vehicles. Adoption of efficiency standards can shield fleets from fuel price shocks and insulates the level of demand from being beholden to those fuel fluctuations. Moreover, fuel efficiency standards are associated with declining impacts of fuel price shocks on employment and wages heavy-duty vehicle manufacturing.

It should also be noted that “the pre-buy in response to 2007 criteria pollutant standards [was found] to be approximately symmetric, short-lived, and small in volume relative to previous estimates”¹⁹ – indicating that fears of mass purchase of more polluting vehicles before implementation of a standard may not come to fruition. The bottom line is that, rather than seeing fleets buy dirtier, ostensibly cheaper vehicles in a panic, there is clear evidence that there is no meaningful adjustment in market purchasing as a result of these standards – fleets recognize the cost savings over time of cleaner vehicles and do not seem inclined to ignore those benefits to reap the marginally lower purchase price of more polluting vehicles while they still can.

¹⁷ Katherine Rittenhouse and Matthew Zaragoza-Watkins, *Strategic Response to Environmental Regulation: Evidence from U.S. Heavy-Duty Vehicle Air Pollution Regulations*, MIT CEEPR Working Paper, (2016).

¹⁸ Heavy Duty Trucking *Healthy Demand Overall for Trucks in September*, Heavy Duty Trucking (Oct. 3, 2014), <http://www.truckinginfo.com/channel/fleet-management/news/story/2014/10/healthy-demand-overall-for-trucks-in-september.aspx?ref=rel-recommended>.

¹⁹ Katherine Rittenhouse and Matthew Zaragoza-Watkins, *Strategic Response to Environmental Regulation: Evidence from U.S. Heavy-Duty Vehicle Air Pollution Regulations* at 33, MIT CEEPR Working Paper, (2016).

IV. *Conclusion*

EDF thanks the DEP for its consideration of these comments and urges New Jersey to move forward with adoption of these important standards.

Sincerely,

A handwritten signature in cursive script that reads "Mary Barber".

Mary Barber
Director, Regulatory and Legislative Affairs
Environmental Defense Fund

A handwritten signature in cursive script that reads "Larissa Koehler".

Larissa Koehler
Senior Attorney
Environmental Defense Fund