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HEARING "BUILDING A 100 PERCENT CLEAN ECONOMY: SOLUTIONS FOR PLANES, TRAINS AND EVERYTHING BEYOND AUTOMOBILES" BEFORE THE SUBCOMMITTEE ON ENVIRONMENT AND CLIMATE CHANGE, ENERGY AND COMMERCE COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

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Thank you, Mr. Chairman and members of the Committee for the opportunity to testify today. My name is Adrian Martinez, and I am a staff attorney for Earthjustice. Earthjustice is a nonprofit environmental law organization. We wield the power of the law and the strength of partnership to protect people's health; to preserve magnificent places and wildlife; to advance clean energy; and to combat climate change. I work out of Earthjustice's Los Angeles office on the Right to Zero campaign. The Right to Zero campaign seeks to transform the way we use energy and transport goods, services, and ourselves across California. From our power grid to ports to buses to garbage trucks, the Right to Zero program works with our partners to the shift California to zero-emissions.

I have spent the last fifteen years working on smog pollution issues in Los Angeles. And while being a smog lawyer and advocate in Los Angeles may provide incredible job security, it has been a frustrating experience knowing that each year thousands of people die prematurely from air pollution and thousands of children, elderly, and adults get sick simply from the simple act of breathing. It has also been frustrating as climate change has made it harder to meet federal and state clean air standards in the region. This journey working on the intractable issue of air pollution in the nation's smoggiest area has led me to one conclusion: A rapid and robust shift to zero-emissions is necessary if we finally want to close the chapter of dirty air in the

nation's smog capital. In fact, moving away from combustion in the parts of the transportation sector discussed today is critical to the success of beating air pollution in many communities throughout the country. Prior incremental approaches of implementing policies of simply cleaner combustion will not solve the air pollution problems in places like Los Angeles, and we should spend significant efforts forging a path towards a zero-emissions future.

While a shift to zero-emissions in the transportation sector is a significant change, we can accomplish this big vision just as the United States has tackled other major challenges. Importantly, this transformation will take a lot of people working hard to achieve a retreat from burning large quantities of fossil fuels in vehicles. From the electric truck manufacturing facility of the nation's largest truck maker outside of Portland, Oregon, to the worker installing charging infrastructure for electric refuse trucks in Ada County, Idaho, to the driver of an electric bus at Alabama A & M University, we have the opportunity to address climate pollution, reduce air pollution, and put people to work in the clean energy economy all across the nation.

I. Emissions from the Transportation Sector Remain a Critical Issue That Must Be Addressed.

Transportation is the largest source of greenhouse gas emissions in the United States.[1] And while light duty vehicles (i.e. cars) represent the largest source of greenhouse gas emissions within the transportation sector at 59%, other types of vehicles represent a large portion of transportation emissions with medium- and heavy-duty trucks representing 23% of transportation-related greenhouse gas emissions, aircraft representing 9%, rail representing

[1] EPA, *Fast Facts on Transportation Greenhouse Gas Emissions*, *available at* https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions.

2%, and ships and boats representing 3%.[2] As such, reducing transportation greenhouse gas emissions requires moving to zero-emissions in vehicles beyond just cars.

In addition to greenhouse gas emissions, the transportation sector imposes significant traditional air pollutants (i.e. ozone, fine particulates, etc.) on communities throughout the United States. EPA estimates that the transportation sector is responsible for approximately 55% of the Nitrogen Oxides (NOx) – a precursor pollutant that leads to ozone formation – nationally.[3] Heavy-duty trucks alone are projected to be responsible for one-third of the transportation NOx emissions nationally despite being a small percentage of vehicles overall.[4]

In the South Coast Air Basin, which is home to the worst ozone pollution in the nation, large vehicles currently comprise a significant portion of the NOx emissions.

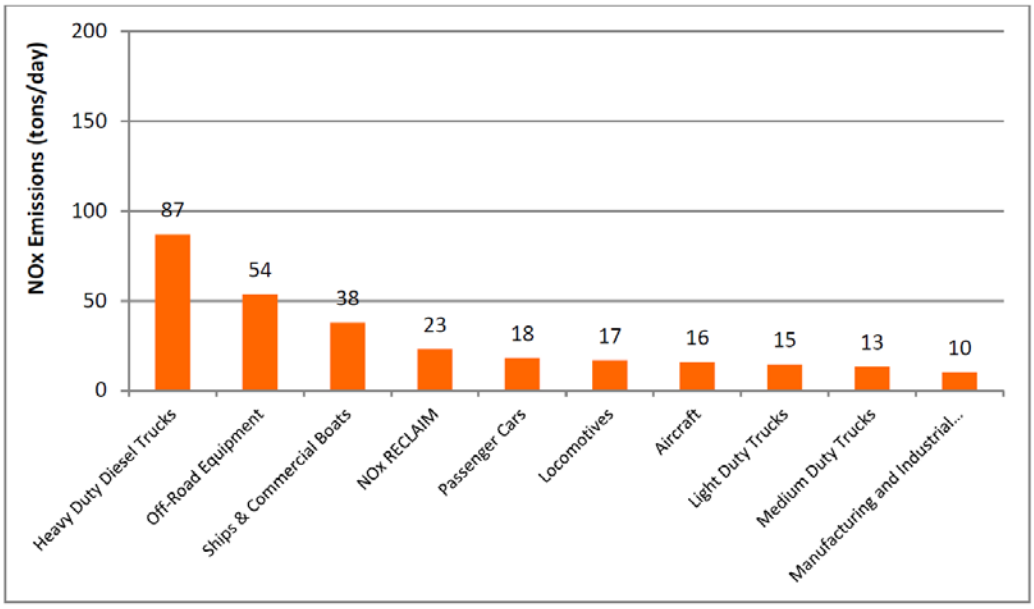

FIGURE 3-14

TOP TEN EMITTER CATEGORIES FOR NOX IN 2019 (SUMMER PLANNING)

[2] Id.

[3] EPA, *Smog, Soot, and Other Air Pollution: Transportation*, *available at* https://www.epa.gov/transportation-air-pollution-and-climate-change/smog-soot-and-local-air-pollution.

[4] EPA, *News Release*, (Nov. 13, 2018) *available at* https://www.epa.gov/newsreleases/epa-acting-administrator-wheeler-launches-cleaner-trucks-initiative.

*** South Coast Air Quality Management District, *2016 Final Air Quality Management Plan*, at p. 3-33, *available at* http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

Finally, many of the larger vehicles being discussed today also impose additional localized health threats from emitting vast amounts of diesel exhaust. In 2012, the International Agency for Research on Cancer, a division of the World Health Organization, listed the exhaust emanating from diesel engines as "carcinogenic to humans."[5] In addition, California labeled diesel exhaust a toxic air contaminant in 1998.[6] Many facilities that have a large concentration of diesel vehicles such as ports and railyards impose serious health threats to adjacent communities.

II. A Zero Emissions Future Is Coming, And Government Can Facilitate This Transition.

This last spring in Long Beach, California, at the ACT-Expo, a leading conference and showcase of clean technology in the transportation sector, the President and CEO of Daimler, North America, the largest truck seller in North America, shocked the freight and logistics world with a speech about Daimler's future. In a blog post after the fact about the experience he posited the following: "This is the beginning of the post-internal combustion engine era for commercial vehicles."[7] This is just one of many statements signaling the move away from combustion to a zero-emission future for vehicles like trucks and buses. In addition, we have seen many companies, including some incumbent manufacturers and even newcomers, enter

[5] IARC, Press Release: Diesel Engine Exhaust is Carcinogenic, (June 12, 2012), available at https://www.iarc.fr/wp-content/uploads/2018/07/pr213_E.pdf.
[6] See generally, Title 17 California Code of Regulations § 93000.
[7] Roger Nielson, *The Future is Electric*, (April 24, 2019) *available at* https://daimler-trucksnorthamerica.com/company/blog/the-future-is-electric/.

into the markets for selling zero-emission vehicles. One of the key hurdles to deployment of these vehicles is infrastructure. We need vast quantities of charging and other fueling infrastructure if we want to achieve the necessary zero-emissions future.

The following sections outline some additional details on specific types of equipment where the federal government should be facilitating the movement to zero-emissions.[8]

A. Heavy-Duty Vehicles

Heavy-duty vehicles are prime for electrification. The large fuel used for trucks, buses and other equipment make them a prime place to pursue greenhouse gas and traditional air pollution reductions through zero-emissions technologies.

i. Transit Buses

A key market segment to propel cleaning up the transportation sector in the near-term is the transit bus fleet. We have seen remarkable progress in deployments of zero-emission transit buses over the last five years. Currently, there are either zero-emission buses (electric or fuel cell) in all but five states.[9] In fact, CALSTART, a vehicle think tank found "[z]ero-emission buses nationally have grown to over 2000 buses on the road or on order, an increase of 36 percent over the last calendar year."[10] As the number of electric and fuel cell buses increase on the road, we will learn very important information about operating fleets of large vehicles.

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[8] This is not an exhaustive list of the vehicles Earthjustice is working to advance zero-emissions, but rather this testimony highlights some of the best opportunities for advancing zero-emissions in the near term.

[9] Fred Silver, John Jackson, and Bryan Lee, *Zeroing on ZEBs*, at pp. 5-6 (October 17, 2019), *available at* https://calstart.org/wp-content/uploads/2019/10/Zeroing_In_on_ZEBs_Final_10182018-10.21.19.pdf.

[10] Id. at p. 3.

This committee and the federal government at large could help with the electrification of the bus fleet in several important ways. First, the federal government should continue support for zero-emission buses. Programs to support transit agencies are vital to encourage replenishing bus fleets with the cleanest technologies. Second, the federal government can provide support for transit agencies related to scaling up fueling for zero-emission buses. Fleets are figuring out how to deploy 1 to 5 of these vehicles with somewhat ease. But, as we see fleets of hundreds of electric vehicles needing to charge at a depot, there is significant planning that needs to take place, which could be supported by energy agencies and other agencies at the federal level.

B. School Buses

Significant interest has been expressed in electrifying school buses throughout the nation. This makes sense because the vehicles that transport our children to school should be as clean as possible. One of the most robust zero-emission school bus programs is not too far from here. Dominion Energy announced a major electric school bus program where they will partner with Virginia schools to deploy 50 electric school buses this year and 200 a year for the next five years.[11] Con Edison is also partnering with the school district in White Planes to deploy electric school buses.[12]

[11] Dominion Energy, *Electric School Buses*, *available at* https://www.dominionenergy.com/ourpromise/innovation/electric-school-buses.

[12] Con Edison, *Electricity from School Bus Batteries Will Support Con Edison Grid Reliability*, (June 19, 2018), *available at* https://www.coned.com/en/about-us/media-center/news/20180619/electricity-from-school-bus-batteries-will-support-con-edison-grid-reliability.

A particularly important place where the federal government can help in the transition to zero-emission school buses is through support for planning by states and utilities on how to increase deployments of electric school buses. In addition to transporting kids to school, electric school buses can be an immensely valuable asset for utilities as a grid resource as we've seen identified in New York and Virginia. As vehicle to grid integration gets better, these school buses can provide a really flexible power supply at times when utilities need additional electrical capacity. Entities like the Department of Energy should identify ways to further support and catalyze this approach. Robust deployments of electric school buses is a win-win for school districts and utilities.

C. Locomotives

In addition to the dire need for EPA to set cleaner locomotive standards beyond Tier IV for locomotives, the railroad industry needs to advance zero-emissions. We have already seen some positive signs in the pursuit of an electric locomotive by Burlington Northern Santa Fe railroad.[13] The federal government should support and encourage the deployment of zero-emission locomotives with a focus on line haul and switcher locomotives. This strategy will go a long way to bringing clean air to communities who are disproportionately impacted by air pollution.

D. Refuse Trucks

The operational profile - with stop-and-start operations, high idle time, low speeds, defined routes, and trucks that return to the same location to fuel at the end of a shift – is the

[13] BNSF, *BNSF leads the charge on testing battery-electric locomotive*, (August 7, 2019), *available at* https://www.bnsf.com/news-media/railtalk/service/battery-electric-locomotive.html.

ideal operational profile for electrification. The California Air Resources Board, the agency responsible for mobile source regulation of trucks in California, released a draft Technology Assessment that explained why refuse trucks have the optimal characteristics for truck electrification:

- Defined routes and depots make charging stations simple;
- Urban drive cycles help optimize the use of regenerative braking, which captures energy; and
- Lower average speeds have less power requirements and routes under 100 miles are both optimal to limit the size and weight of the battery.

As the California Air Resources Board explicitly noted, there are "great opportunities for battery electric vehicle penetration [in] urban vehicles … like transit buses, school buses, and refuse collection vehicles."[14]

We are starting to see more deployments of electric refuse trucks nationally. For example, Ada County Idaho is using some of the VW scandal dollars to replace three diesel refuse trucks with electric refuse trucks.[15] In addition, Palo Alto, California, New York, New York, Chicago, Illinois, Carson, California, and Los Angeles, California, are also seeking to deploy electric refuse trucks or already have electric refuse trucks in service.

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[14] California, Draft Technology Assessment: Medium- and Heavy-Duty Battery Electric Trucks and Buses, at p. VII-1, *available at* https://www.arb.ca.gov/msprog/tech/techreport/bev_tech_report.pdf.

[15] Idaho DEQ, *Volkswagen 2019 Program*, *available at* https://www.deq.idaho.gov/media/60183250/vw-app-summary-table.pdf.

For many neighborhoods, refuse trucks are the largest and most polluting vehicles going through the neighborhood. As such, advancing zero-emission refuse trucks is critical to addressing neighborhood level pollution. In addition, we have experienced many communities excited about electric refuse trucks because they are likely quieter than their combustion counterparts. The federal government should explore how to increase the deployment of zero-emission refuse trucks through supporting planning efforts. Often charging infrastructure given tight spatial constraints in refuse truck depots can pose hurdles to zero-emissions refuse trucks. Cities need planning support and technology support to help achieve the transformation to zero-emission refuse trucks. In addition, the federal government should explore ways to support cities in purchasing zero-emission refuse trucks for sanitation collection.

E. Ports and Cargo Equipment

For too many years communities in the shadow of the freight and logistics industry have suffered the health consequences of the internal combustion engine. While the freight industry brings economic benefits to regions throughout the nation, the trucks, ships and trains that move cargo impose immense health burdens on communities throughout the nation. Our nation's ports provide another key sector that is prime for zero-emissions. There is already precedent of two ports committing to a zero emission future in the San Pedro Bay Ports in California. The Mayors of Long Beach, Robert Garcia, and Los Angeles, Eric Garcetti, created an executive directive in July of 2017 directing the port staff at these twin ports to pursue 100% zero-emission cargo equipment by 2030 and 100% zero-emission drayage trucks by 2035. This ambitious directive should be the norm for ports across the country because of the acute risks these facilities pose on communities.

There is a lot that the federal government can do to support the transition to zero-emission ports. This Committee should work with other legislators and regulators at the Environmental Protection Agency to implement the suggestions recommended by Angelo Logan of the Moving Forward Network during his testimony before the United States House Select Committee on the Climate Crisis delivered on July 16, 2019.[16] In addition, this Committee should explore how agencies like the Department of Energy can be helpful in supporting port authorities and states plan for and deploy charging infrastructure at our ports. While zero-emission cargo equipment and trucks are starting to be deployed at ports, often having a way to charge or fuel this equipment is a big constraint. In addition, there is significant work that can be done to ensure more resiliency at our ports through the deployment of clean energy resources (e.g. battery storage, microgrids, etc.). These are efforts that will not only make our ports safer and better operationally, but much cleaner.

III. Conclusion

I don't come here today to say that the transformation to a truly clean economy will be easy. Rather, I come to state that we can do it, and we need all the levers of government at the federal, state, and local levels to push in the direction of zero-emissions. In particular, the federal government plays a critical role in setting the tone nationally to address vehicle pollution. This committee should continue to support zero-emissions with a particular focus on providing additional resources for planning and deploying larger numbers of vehicles in fleets.

[16] Angelo Logan, *Testimony Before House Select Committee on the Climate Crisis*, (July 16, 2019) *available at* https://docs.house.gov/meetings/CN/CN00/20190716/109789/HHRG-116-CN00-Wstate-LoganA-20190716.pdf.

The vehicles are coming and manufacturers at least initially appear to be up to the challenge of producing zero-emission vehicles. The main impediment that could squelch progress is a lack of infrastructure, which this Committee in concert with others can help alleviate.