NESCAUM
www.nescaum.org
Northeast States for Coordinated Air Use Management
89 South Street, Suite 602 Boston, MA 02111
Phone 617-259-2000 Fax 617-742-9162
Arthur N. Marin, Executive Director

Comments from the Northeast States for Coordinated Air Use Management
Presented by Paul J. Miller, Ph.D.
Deputy Director & Chief Scientist

Before the House Committee on Science, Space and Technology
Subcommittee on Oversight and Subcommittee on Environment
on
Examining the Underlying Science and Impacts of Glider Truck Regulations

September 13, 2018

Good morning. My name is Paul Miller, and I am Deputy Director and Chief Scientist with the Northeast States for Coordinated Air Use Management (NESCAUM). I thank the Chairs and Ranking Members, and all the members of the Subcommittees for providing NESCAUM with the opportunity today to offer the following comments on the science and impacts of glider kits on air quality.

NESCAUM is a non-profit regional association of state air pollution control agencies in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. NESCAUM provides policy and technical support to our state member agencies in furtherance of their air quality and climate programs. Our member state agencies have the primary responsibility for developing strategies that will attain and maintain air quality that is protective of public health and the environment for their state citizens and for those living in downwind out-of-state areas.

NESCAUM and our member states strongly oppose a repeal of emission requirements for glider kit trucks because of the very serious harm to air quality and public health that will occur if this loophole is re-opened. At its core, absolving new glider vehicles from complying with current engine standards is inconsistent with the Clean Air Act's primary purpose "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare."[1]

Continuing Air Quality Problems in the Northeast

The NESCAUM region, home to over 42 million people, is subject to episodes of poor air quality resulting from ground-level ozone and fine particle pollution. During severe events, the scale of the problem can extend beyond NESCAUM's borders and include over 200,000 square miles across the eastern United States. Local and regional sources as well as air pollution transported hundreds of miles from distant sources outside the region contribute to elevated ozone and fine particle concentrations in the region.

[1] 42 C.F.R. §7401(b)(1) (1990).

Diesel exhaust is a major source of particulate matter (PM) and nitrogen oxides (NOx), which are responsible for tens of thousands of premature deaths, hospital admissions, and lost work and school days in the U.S. annually. Exposure to diesel PM has been linked to increased cancer and non-cancer health risks. EPA considers diesel exhaust a likely human carcinogen via inhalation.[2] The California Air Resources Board (CARB) has listed diesel exhaust as a chemical known to cause cancer and has developed quantitative factors for estimating cancer risk from exposures.[3] In June 2012, the International Agency for Research on Cancer, which is part of the World Health Organization, classified diesel exhaust as a known human carcinogen (Group 1) based on an increased risk for lung cancer.[4] Short-term exposures may cause lung irritation and exacerbation of asthma or allergies, while chronic exposures may result in lung cancer or lung damage.[5] Recent peer-reviewed research continues to strengthen the growing body of scientific evidence that acute and chronic adverse health impacts, including premature mortality, occur from exposure to PM levels below current federal health standards.[6,7]

Glider Vehicle Emissions

In its 2016 Phase 2 rulemaking, EPA correctly recognized that while gliders have a legitimate use in those rare cases where a powertrain can be salvaged from a wrecked vehicle, they have increasingly been marketed and sold to new truck buyers as a way to avoid nitrogen oxides (NOx) and PM control requirements ("pre-emission" engines).[8] We agree with EPA's original analysis, and with its more recent 2017 glider kit emissions testing, which found that these trucks constitute an unacceptably large source of excess NOx and PM emissions having significant adverse impacts on air quality and public health.

EPA estimates that requiring glider vehicles to meet the same NOx and PM emission limits with current engine standards will lead to reductions of 190,000 tons per year (tpy) of NOx and 5,000 tpy of PM emissions in 2025.[9] The reductions grow larger in 2040, with 319,000 tpy of NOx

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[2] EPA. *Integrated Risk Information System (IRIS): Diesel engine exhaust*, p. 11 (February 28, 2003). Available at https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642_summary.pdf.

[3] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. *Technical Support Document for Cancer Potency Factors*. 2009. Available at https://oehha.ca.gov/air/crnr/technical-support-document-cancer-potency-factors-2009.

[4] International Agency for Research on Cancer, World Health Organization. *IARC: Diesel Engine Exhaust Carcinogenic* (Press Release No. 213). June 12, 2012. Available at https://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf.

[5] EPA. *Health Assessment Document for Diesel Engine Exhaust* (EPA/600/8-90/057F). Prepared by the National Center for Environmental Assessment, Washington, DC, for the Office of Transportation and Air Quality. 2002.

[6] Di, Q., *et al.*, *Association of short-term exposure to air pollution with mortality in older adults.* JAMA 318.24 (2017): 2446-2456. DOI: 10.1001/jama.2017.17923.

[7] Di, Q., *et al.*, *Air pollution and mortality in the Medicare population*. New England Journal of Medicine 376.26 (2017): 2513-2522. DOI: 10.1056/NEJMoa1702747.

[8] *See, e.g.*, "About Fitzgerald Glider Kits" marketing glider kits with "pre-emission Detroit, Cummins, and Caterpillar engine options." At https://www.fitzgeraldgliderkits.com/about-fitzgerald/ (accessed September 10, 2018).

[9] U.S. EPA and NHTSA, *Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles - Phase 2, Response to Comments for Joint Rulemaking*, p. 1962, Table A-1 (August 2016).

and 8,500 tpy of PM.[10] The extent of emission reductions applied to a sales volume of 5,000 to 10,000 MY2017 glider trucks will avoid 350 to 1,600 premature deaths over the operating life of the vehicles, with monetized health benefits ranging from $1.5 billion to $11.0 billion.[11]

Glider Vehicle Emissions Testing

EPA's glider testing presented in its 2017 report[12] is fully consistent with state practices in obtaining vehicles for testing, using accredited testing laboratories, adhering to regulatory drive cycle test protocols, providing data sets and transparent analysis, maintaining rigorous quality assurance and quality control, repeating test runs, and working collaboratively with an engine or vehicle manufacturer in a testing program. This is not at odds with the EPA's National Vehicle and Fuel Emissions Laboratory approach in testing glider kits as described in EPA Assistant Administrator William Wehrum's letter to the full Committee on August 21, 2018.

We contrast this to a glider emissions testing report by a team at Tennessee Tech University and submitted to EPA by glider manufacturers in support of reinstating the glider kit loophole.[13] That emissions testing was performed at an unaccredited facility owned by a glider manufacturer, did not use a standard regulatory drive cycle test procedure, and did not include supporting data and analysis (*e.g.*, a sample probe filter "was visually inspected" without quantification as a subjective test for ascertaining emissions performance, and no NOx emissions data were presented).[14]

Glider Vehicles and Nitrogen Oxides (NOx)

NOx emissions are of special concern to the Northeast states. NOx is the most egregious contributor to regional ozone concentrations, an important precursor to fine particulate matter formation, and a contributor to multiple other environmental problems such as acid rain and eutrophication of coastal bays and estuaries (Table 1).

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[10] U.S. EPA and NHTSA, *Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles - Phase 2, Response to Comments for Joint Rulemaking*, p. 1962, Table A-2 (August 2016).

[11] U.S. EPA and NHTSA, *Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles - Phase 2, Response to Comments for Joint Rulemaking*, p. 1965 (August 2016).

[12] U.S. EPA, *Chassis Dynamometer Testing of Two Recent Model Year Heavy-Duty On-Highway Diesel Glider Vehicles*, National Vehicle & Fuel Emissions Laboratory, Ann Arbor, MI (November 20, 2017).

[13] *Petition for Reconsideration of Application of the Final Rule Entitled "Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2 Final Rule" to Gliders*, submitted to the U.S. EPA by Fitzgerald Glider Kits, LLC, Harrison Truck Centers, Inc., and Indiana Phoenix, Inc., July 10, 2017, Exhibit 1.

[14] US EPA Memorandum: Teleconference with Tennessee Tech University Regarding Glider Test Report Summarized in June 2017 Letter; Tennessee Tech University – Summary of Heavy Duty Truck Study and Evaluation of the Phase II Heavy Duty Truck Rule, November 13, 2017 (https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0827-2416).

Table 1. Adverse public health and environmental impacts of NOx in the Northeast

Ozone and PM2.5	• Reduces lung function, aggravates asthma and other chronic lung diseases • Can cause permanent lung damage from repeated exposures • Contributes to premature death
Acid Deposition	• Damages forests • Damages aquatic ecosystems, e.g., Adirondacks and Great Northern Woods • Erodes manmade structures
Coastal Marine Eutrophication	• Depletes oxygen in the water, which suffocates fish and other aquatic life in bays and estuaries, e.g., Chesapeake Bay, Narragansett Bay, and Long Island Sound
Visibility Impairment	• Contributes to regional haze that mars vistas and views in urban and wilderness areas

Based on recent historical monitoring data, large parts of the Northeast region violate the recently strengthened 0.070 ppm 8-hour average ozone national ambient air quality standard (NAAQS). In addition, the CT-NJ-NY region continues to violate the 2008 0.075 ppm ozone NAAQS and remains at risk of failing to maintain the 1997 0.08 ppm 8-hour NAAQS. Air quality monitoring data in recent years no longer show a declining trend in peak ozone concentrations in this region. And in early July of this year, the New York City metropolitan region saw a 1-hour ozone average of 0.143 ppm, a peak level not seen in this area in over 10 years.

As shown in Figure 1, NOx pollution within the New York City metropolitan area is readily visible from satellite observations of the polluted air column over the Mid-Atlantic and Northeast U.S.

Figure 1. 2011-2016 week day nitrogen dioxide column concentrations observed by NASA's Ozone Monitoring Instrument (OMI). Nitrogen dioxide is a component of NOx.

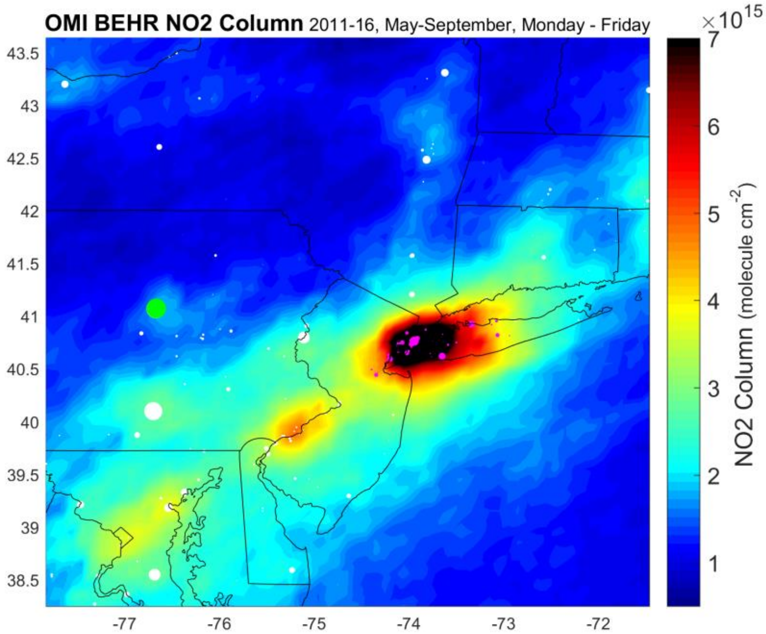
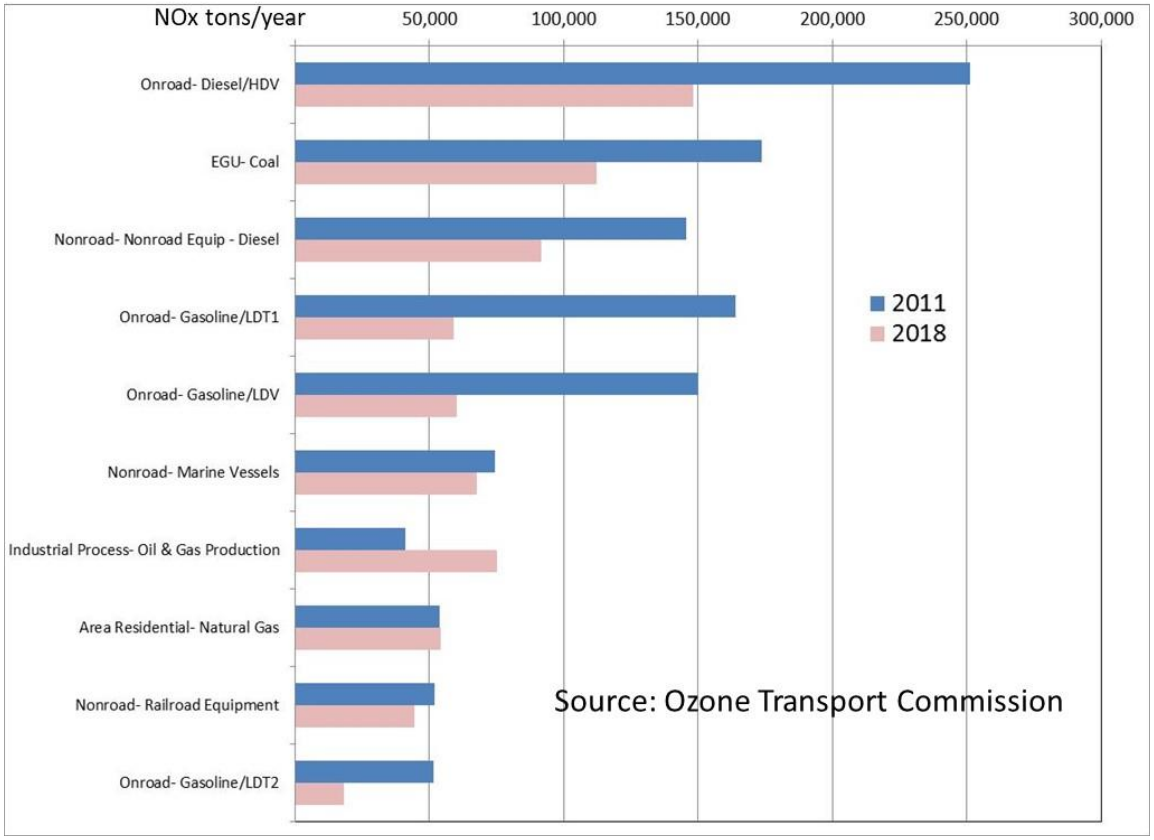


Figure 2 shows that on-road diesel vehicles, which include heavy duty vehicles (HDV), are the largest source of estimated NOx emissions in this region. And this likely understates the impact of highway trucks, as the diesel HDV truck emission estimates do not account for glider vehicles, which are not included in the mobile source emission model used to develop the inventories.

Figure 2. On-road diesel vehicles are the largest NOx source sector in Northeast/Mid-Atlantic (DC to Maine)



According to EPA, glider vehicles with pre-2001 engines have 20 to 40 times higher NOx and PM emissions than a fully compliant modern truck. As shown in Figure 3, production of just 5,000 glider vehicles with pre-2001 engines would approach the entire NOx and PM emissions from a typical year's production of 250,000 fully compliant new heavy-duty trucks (Class 8).[15] This will forego achieving the significant public health and environmental benefits from the greater than 90% reduction in NOx and PM reductions from current emissions-compliant on-road heavy duty trucks.[16]

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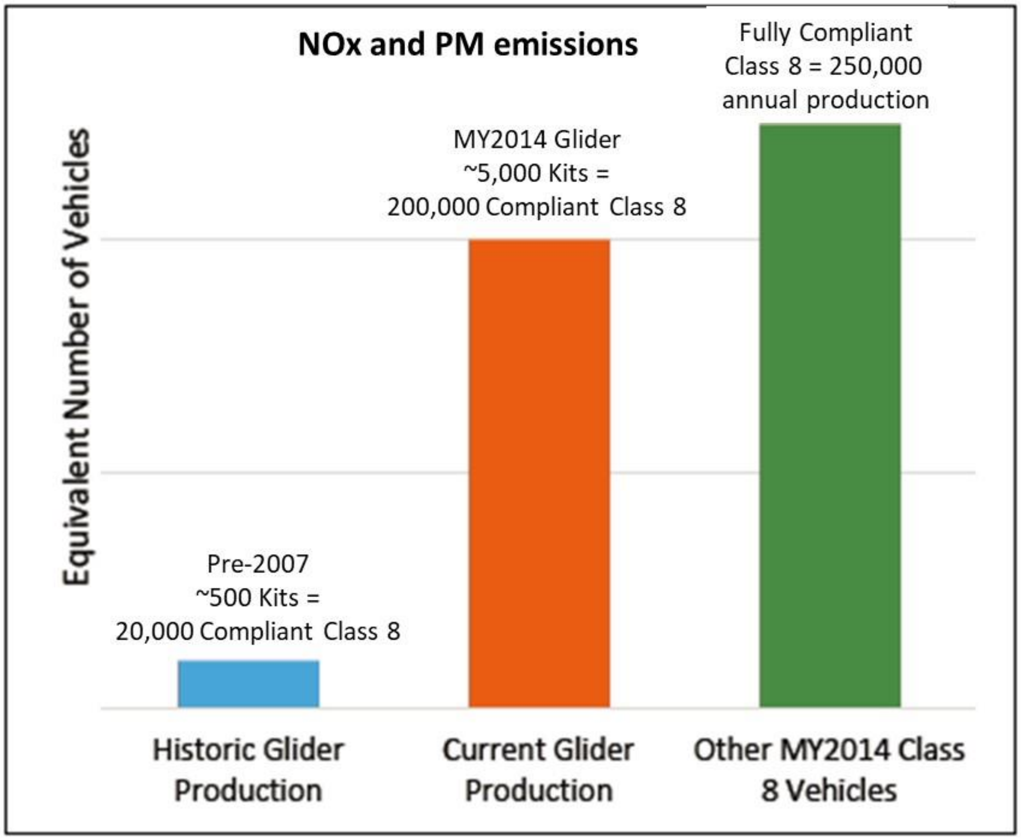
[15] U.S. EPA, *Frequently Asked Questions about Heavy-Duty "Glider Vehicles" and "Glider Kits,"* EPA-420-F-15-904 (July 2015).

[16] 66 Fed. Reg. 5002, *Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*, (January 18, 2001). We note that the ability to achieve the deep reductions in PM emissions is made technically feasible through lowering the sulfur content of diesel. The predominant impact of lower sulfur diesel on PM emissions is to enable the use of advanced diesel particulate controls (much as removing lead from gasoline was needed to enable the use of effective catalytic converters with gasoline vehicles). While lowering diesel sulfur content was necessary to enable more advanced controls, it should be recognized that only a very small amount of direct PM reductions comes from reducing diesel sulfur content alone (*i.e.*, reductions in direct sulfate emissions, while large on a percentage basis, are small on a total PM mass basis). 66 Fed. Reg. at 5031, Fig. II.D-2.

Figure 3. Comparison of NOx and PM emissions from increased glider vehicle production



Hamstringing the states' ability to protect public health at lower cost

The EPA's failure to meet statutory deadlines in designating nonattainment areas under the Clean Air Act and its persistent failure to fully address interstate ozone transport have been detrimental to the states' interests in protecting public health. Re-opening this large loophole to allow the unconstrained production and sale of highway trucks lacking modern pollution controls will greatly increase emissions in our region and across the country. Failing to hold glider vehicles to modern pollution standards also will burden the states, who will be required to offset the excess emissions at potentially much higher costs for decades to come. Table 2 compares historical NOx control costs at the state and national levels with estimated control costs of a glider vehicle equipped with an engine meeting current emission standards. The glider vehicle control cost is estimated at about $670 per ton of NOx reduced, which falls well below the other measures in Table 2.

Table 2. Comparison of glider vehicle NOx control cost effectiveness (bottom row) to other state and national NOx control measures.

Source	Cost Effectiveness ($/ton NOx)
ICI Boilers (area & point sources)	$750 - $7,500 (Low NOx Burners) $1,300 - $3,700 (SNCR) $2,000 - $14,000 (SCR)
Combustion Turbines – SCR	$2,010 - $19,120
Tier 2 Light-duty Vehicle Emissions & Gasoline Sulfur	$2,100*
10 ppm Sulfur Gasoline	$4,500**
MY2012+ Heavy-HDV engine control technology	**$672*** **

*Based on EPA RIA, Tier 2 Motor Vehicle Standards and Gasoline Sulfur, Dec. 1999, Table VI-8, uncredited, NOx tons only.
**Based on 0.89 cents/gal EPA estimate and NESCAUM projected 2017 NOx reductions from gasoline on-road vehicles.
***Based on EPA RIA, HDV engine and diesel fuel standards, Dec. 2000, p. V-7 (NOx tons only from Table VI.C-1) using variable and operating costs of control technology. Low sulfur fuel cost assumed same for gliders.

An additional consideration is that U.S. companies are thriving as they have become leaders in many of the advanced emission reducing technologies that will continue to be in demand around the world for years to come. A preferential exemption for glider engines and vehicles from these long-established modern emission standards puts these companies at a competitive disadvantage, thus undercutting businesses employing hundreds of thousands of workers across the U.S. Furthermore, the proposed rulemaking portends a ‘race to the bottom’ if more truck manufacturers are drawn into glider production, leading to even greater harmful impacts to air quality and public health.

Glider vehicles are new motor vehicles under the Clean Air Act (CAA)
The plain language of the CAA unambiguously requires EPA to regulate glider vehicles and engines in glider vehicles as new motor vehicles. The Act requires EPA to establish and revise emission standards for any air pollutant from any class of “new motor vehicles or new motor vehicle engines.” 42 U.S.C. § 7521(a)(1). The CAA specifies that a motor vehicle is “new” up to the point when its title is “transferred to an ultimate purchaser.” 42 U.S.C. § 7550(3). “Ultimate purchaser” is, in turn, defined as “the first person who in good faith purchases such new motor vehicle or new engine for purposes other than resale.” 42 U.S.C. § 7550(5).

To re-state, it is the passage of title to the "ultimate purchaser," not the status of the engine or other vehicle components, that establishes glider vehicles as "new motor vehicles" under the CAA. A glider vehicle clearly fits the definition of "new motor vehicle" because the ultimate purchaser is the first to take title to the vehicle. There is no "ultimate purchaser" prior to this point who previously held title to the glider vehicle. Under these definitions, glider vehicles and glider vehicle engines—like all other classes of vehicles and engines—are "new" until purchased by a consumer to be put into use. Accordingly, section 202(a)(1) mandates that EPA regulate their emissions.

This plain language of the CAA also specifies that "new motor vehicle engine" can mean either "an engine in a new motor vehicle" or "a motor vehicle engine the equitable or legal title to which has never been transferred to the ultimate purchaser." 42 U.S.C. § 7550(3). To have any independent meaning, the term "engine in a new motor vehicle" must be understood to encompass used and rebuilt engines in new motor vehicles, *i.e.*, engines that have, at some point in the past, been purchased by a person to be used "for purposes other than resale." 42 U.S.C. § 7550(3) & (5).

This plain language interpretation of Section 202 in its statutory context comports with the purpose of the CAA generally and with the more specific purpose of Section 202. 42 U.S.C. §§ 7401 (b) & (c) & 7521(a)(3). Section 202 is targeted at new motor vehicles and engines that "cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." 42 U.S.C. § 7521(a)(1). Congress intended these emissions to decline substantially, over time, under EPA's regulation, providing that emissions standards for new motor vehicles and engines may only be revised in ways that "require reduction of emissions from the standard that was previously applicable." 42 U.S.C. § 7521(b)(1)(C). Unsurprisingly, the CAA reflects Congress's particular concern with emissions from heavy-duty trucks and engines. With respect to them, Congress mandated that EPA's emissions standards "reflect the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the model year to which such standards apply." 42 U.S.C. § 7521.

A contrary interpretation would undermine the purpose of the CAA to protect air quality and promote the public health and welfare, by in effect, creating a loophole for the use of previously owned engines in new truck bodies as substitutes for new, compliant vehicles, even when that would vastly increase pollution. It seems rather implausible that in drafting the CAA, Congress intended for the single emissions sector of heavy-duty trucks built from glider kits to be the only mobile emissions source that was completely exempt from federal regulation.

Safety concerns

It is important to note that the typical older engines used with glider vehicles lack the electronic capacity to run many modern safety features found in modern emission-compliant trucks. Key safety features typically lacking in "pre-emission" glider vehicles include electronic stability control (rollover prevention), adaptive cruise (speed) control, and lane departure warnings (collision avoidance).[17] Pre-2000 engines, among the most popular in glider vehicles, are exempt from maintaining electronic log books (e-logs) that would provide real-time logging of driving hours and rest times.[18] Without this feature, drivers may operate for longer periods than allowed, resulting in greater driver fatigue on the roads.

Conclusion

Our states have long supported and relied upon strong – and smart – federal regulation to ensure that harmful air emissions are gradually reduced over time. Within this cooperative framework, cleaner on-road heavy duty vehicles are vital to our states' efforts to attain and maintain air quality standards.

In sum, there is no way to understand the dramatic increase in sales of glider kits with old, dirty ("pre-emission") engines except as a concerted effort to circumvent critical public health protections. Exempting glider vehicles from modern emissions standards unnecessarily exposes the nation's citizens to elevated emissions of harmful pollutants, and it unfairly penalizes the many businesses in our states and across the country that operate in compliance with modern emission standards.

[17] Testimony to EPA by Robert Nuss, Nuss Truck & Equipment, Docket ID No. EPA-HQ-OAR-2014-0827-4307 (Dec. 4, 2017), accessed at https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0827-4307 on September 11, 2018.

[18] Federal Motor Carrier Safety Administration, *FAQs on ELD Rule*, https://www.fmcsa.dot.gov/faq/if-vehicle-registration-commercial-motor-vehicle-reflects-model-year-2000-or-newer-b-0, accessed on September 11, 2018.

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89 South Street, Suite 602 Boston, MA 02111
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Arthur N. Marin, Executive Director

Speaker's Bio
Paul J. Miller, Deputy Director & Chief Scientist
NESCAUM

Dr. Paul J. Miller is Deputy Director and Chief Scientist of the Northeast States for Coordinated Air Use Management (NESCAUM) in Boston, Massachusetts where he provides technical and policy coordination among the air quality agencies of eight northeastern states. Dr. Miller returned to NESCAUM in January 2006 after previously being with NESCAUM from 1995-1999 as Senior Science and Policy Advisor. He has contributed to state efforts on ozone transport, acid rain, regional haze, and other air issues.

From 1999-2005, Dr. Miller was the Air Quality Program Coordinator with the Commission for Environmental Cooperation (CEC) in Montreal, Quebec. The CEC is a trinational intergovernmental agency created by Canada, Mexico and the United States to promote environmental cooperation among the three NAFTA trading partners.

Dr. Miller has been a Senior Fellow at Princeton University's Center for Energy and Environmental Studies. Previous to Princeton, he was Senior Energy Fellow at the W. Alton Jones Foundation in Charlottesville, Virginia. He also was a National Research Council Associate at the Joint Institute for Laboratory Astrophysics, University of Colorado and the National Institute of Standards and Technology, in Boulder, Colorado.

Dr. Miller has a B.S. in Chemistry from Purdue, a Ph.D. in chemical physics from Yale, and a law degree from Stanford.