

August 31, 2015

Gina McCarthy, Administrator  
U.S. Environmental Protection Agency  
Air and Radiation Docket and Information Center  
Mail Code 28221T  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

*Attention: Docket ID No. EPA-HQ-OAR-2014-0828*

Re: *Proposed Finding That Greenhouse Gas Emissions From Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated To Endanger Public Health and Welfare and Advance Notice of Proposed Rulemaking*

Dear Administrator McCarthy:

The Northeast States for Coordinated Air Use Management (NESCAUM) offer the following comments on the U.S. Environmental Protection Agency's (EPA's) proposed finding, published on July 1, 2015 in the Federal Register, entitled *Proposed Finding That Greenhouse Gas Emissions From Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated To Endanger Public Health and Welfare and Advance Notice of Proposed Rulemaking* (80 Fed. Reg. 37758-37806). NESCAUM is the regional association of air pollution control agencies representing Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. These comments reflect the majority views of NESCAUM as a state membership organization. Individual NESCAUM member state views may differ from the NESCAUM states' majority consensus.

NESCAUM endorses EPA's proposed finding that the six greenhouse gases (GHGs) carbon dioxide (CO<sub>2</sub>), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride endanger the public health and welfare of current and future generations within the meaning of § 231(a) of the Clean Air Act (CAA).

We also agree with the Administrator's determination that GHG emissions from certain classes of aircraft engines contribute to the mix of six GHGs subject to this rulemaking. EPA should adopt GHG standards for new aircraft types and in-production aircraft that will begin to materially reduce CO<sub>2</sub> emissions from the aviation sector over the next 5 to 10 years beyond expected "business as usual" absent a CO<sub>2</sub> standard.

It is important that EPA take this opportunity to address additional pollutant contributions from aircraft as well because the states are preempted from regulating pollution from aircraft by § 233 of the CAA. To this end, EPA should re-visit and revise as needed emission standards for

nitrogen oxides (NO<sub>x</sub>) applicable to new and existing aircraft in order to assist states in meeting ground-level ozone National Ambient Air Quality Standards (NAAQS). The need for additional NO<sub>x</sub> reductions is vital to our states for achieving a potentially revised future ozone NAAQS more protective of public health and welfare, as well as for attaining the current ozone NAAQS. This would additionally benefit states by reducing acidification and deposition that leads to crop and property damage.

**Aircraft GHG emissions endanger the public health and welfare within the meaning of § 231(a)**

NESCAUM supports an endangerment finding under CAA § 231(a) that aircraft GHG emissions endanger public health and welfare. Our support of EPA's proposed finding remains consistent with our previous comments to EPA in 2009 for mobile sources pursuant to CAA § 202(a). The climate science that supported EPA's previous GHG endangerment finding under CAA § 202(a) has only grown stronger since that rulemaking. We do not repeat our previous comments on the abundant scientific evidence supporting EPA's actions in this rulemaking, but incorporate these by reference.<sup>1</sup> We further support EPA's reliance on recent major climate science assessments by the U.S. Global Change Research Program (USGCRP), the Intergovernmental Panel on Climate Change (IPCC), and the National Research Council (NRC) of the National Academies. These assessments reflect a robust peer review process, and incorporate thousands of climate studies that have individually been peer reviewed as well. NESCAUM agrees with EPA that this large body of scientific evidence is consistent with the Agency's peer review policy and OMB guidelines, as well as support by prior legal precedent in *Coalition for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102 (D.C. Cir. 2012).

With regard to endangerment under CAA § 231(a), there is broad continuing consensus that manmade emissions are contributing to adverse changes in climate and that these impacts will get worse over time without corrective action. The IPCC's most recent synthesis of climate science in 2014 stated that:

Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems... Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen."<sup>2</sup>

As summarized by the IPCC, the science reveals that the onset of climate change-related threats is already affecting our member states, this nation, and the world.

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<sup>1</sup> NESCAUM comments to EPA, Docket ID No. EPA-HQ-OAR-2008-0318, submitted November 26, 2008; NESCAUM comments to EPA Docket ID No. EPA-HQ-OAR-2009-0171, submitted June 19, 2009.

<sup>2</sup> IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

**Emissions of GHGs from certain classes of engines “cause or contribute” to endangerment under CAA § 231(a)**

NESCAUM supports EPA’s determination that GHG emissions from certain classes of aircraft engines contribute to the mix of six GHGs subject to this rulemaking.

As recognized by EPA, the aircraft sector is the single largest GHG emissions source not yet regulated among the transportation sectors. The GHG emissions context provided by EPA in the proposed finding indicates the nontrivial share of GHG emissions contributed by the aviation sector. In the international context, global aircraft GHG emissions would rank 9<sup>th</sup> overall compared to total country GHG emissions. Domestic aircraft emissions in the United States are the highest in world, and about seven times greater than aircraft emissions in the next highest country (China). The GHG emissions from covered aircraft in the U.S. are greater than the entire GHG emissions of about 150 countries, and this sector’s emissions are projected to grow in the future in the absence of CO<sub>2</sub> limits (80 Fed. Reg. at 37788-37789).

**Advance Notice of Proposed Rulemaking**

NESCAUM supports development and adoption of GHG standards for U.S. aircraft to address the sector’s contribution to climate change. The U.S. aircraft sector is the single largest GHG emissions source not yet regulated among the domestic transportation sectors.

NESCAUM supports a “whole aircraft” approach that does not exclusively focus on aircraft engines in recognition that emissions are influenced by aerodynamics, weight, and engine-specific fuel consumption. NESCAUM also urges EPA to adopt GHG standards for new aircraft types and in-production aircraft that will begin to materially reduce CO<sub>2</sub> emissions from the aviation sector over the next 5 to 10 years beyond expected “business as usual” absent CO<sub>2</sub> emission standards. In furtherance of this goal, it is imperative that the reference scenario from which future aircraft GHG reductions are compared realistically reflects current aircraft performance. If the reference scenario is based on outdated aircraft performance, it will result in erroneously inflated estimates of future GHG reductions relative to current emissions.

**EPA and FAA should work towards holistically reducing airport-related air pollution**

In addition to adopting aircraft emission standards, EPA and FAA should also collaboratively work with states and airport authorities in seeking out and implementing measures at airports that will reduce air pollution across the full spectrum of activities associated with airport operations. Airport-related activities result in the emission of a host of air pollutants that adversely affect public health and the environment, including GHGs, NO<sub>x</sub>, hydrocarbons (HC), particulate matter (PM), carbon monoxide (CO), and toxics. NO<sub>x</sub> and HC are precursor emissions of ground-level ozone, which causes lung irritation and aggravates diseases such as asthma, chronic bronchitis, and emphysema. PM has adverse cardiopulmonary effects and contributes to regional environmental problems such as haze and acid rain. Toxics such as benzene and formaldehyde are known or probable human carcinogens.

EPA and FAA should work together to implement aircraft operational changes, such as single engine taxi, reduced gate and runway idling, and reduced use of reverse thrust (used at the pilot's discretion), which cost little or nothing to implement and provide fuel-use savings and emissions reductions. Ground support equipment is another opportunity for reducing airport-related emissions. Electrification of ground support equipment provides reductions in all pollutants, and can save the airport operators and air carriers money over the long term due to the increased efficiency of electric motors compared to gasoline and diesel engines.<sup>3</sup>

### **EPA and FAA should pursue PM emission reductions from commercial aircraft engines**

EPA and FAA should work through ICAO to establish an appropriately rigorous method for quantifying volatile and nonvolatile PM emissions from certified commercial aircraft engines, and based on the method, adopt aircraft engine PM limits that better protect public health.

### **In adopting GHG limits, EPA should revisit NOx standards for aircraft**

According to current EPA regulations, previously certified aircraft turbofan and turbojet engines with rated thrusts greater than 26.7 kilonewtons (kN) manufactured after December 31, 2012 basically must meet at least Tier 6 NOx emission standards (also known as CAEP/6).<sup>4</sup> At the time EPA set the Tier 6 NOx standards, it also set more stringent Tier 8 NOx standards (also known as CAEP/8) for newly certified aircraft engines after December 31, 2013. Unlike the Tier 6 NOx standards, however, EPA did not set a production cut-off date after which most previously certified engines would have to meet Tier 8 requirements.

In light of on-going ozone nonattainment problems as well as health and economic impacts in our region and elsewhere, NESCAUM recommends that EPA take the opportunity with the rulemaking for GHG aircraft standards to revisit its current NOx requirements for aircraft engines. EPA should establish a production cut-off date after which Tier 8 requirements will apply to newly manufactured aircraft engines in place of Tier 6. ICAO is likely to revisit aircraft NOx requirements, but it is not likely to adopt new NOx requirements (if at all) prior to 2022 under its current process. While EPA and the Federal Aviation Administration (FAA) should push for more stringent NOx requirements in the ICAO process, EPA should act now to establish a production cut-off date of December 31, 2018 after which newly manufactured aircraft engines must meet Tier 8 NOx requirements rather than Tier 6.

### **Summary of comments**

NESCAUM supports a positive finding under CAA § 231(a) that GHG emissions from aircraft endanger the public health and welfare, and emissions from certain aircraft engine classes cause or contribute to that endangerment. In adopting GHG regulations for aircraft, NESCAUM supports a “whole aircraft” approach that does not exclusively focus on aircraft engines. EPA and FAA should also collaboratively work to reduce air pollution associated with airport

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<sup>3</sup> NESCAUM & Center for Clean Air Policy, *Controlling Airport-Related Air Pollution*, NESCAUM (Boston, MA) 2003; available at [http://www.nescaum.org/documents/aviation\\_final\\_report.pdf](http://www.nescaum.org/documents/aviation_final_report.pdf).

<sup>4</sup> *Control of Air Pollution From Aircraft and Aircraft Engines; Emission Standards and Test Procedures*, 77 Fed. Reg. 36342-36386 (June 18, 2012).

operations, as well as work towards reducing aircraft engine PM emissions. Finally, NESCAUM requests that EPA revisit NOx requirements for aircraft engines and establish a Tier 6 production cutoff date after which only cleaner engines meeting Tier 8 limits may be manufactured.

If you have any questions about NESCAUM's comments, please contact Dr. Paul Miller, NESCAUM Chief Scientist, at [pmiller@nescalum.org](mailto:pmiller@nescalum.org).

Sincerely,



Arthur Marin  
Executive Director

cc: NESCAUM directors  
David Conroy, EPA Region 1  
Richard Ruvo, EPA Region 2