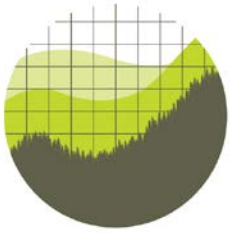

Institute *for* Policy Integrity

new york university school of law

August 31, 2015

Subject: Docket ID No. EPA-HQ-OAR-2014-0828

The Institute for Policy Integrity[1] submits these comments on EPA's endangerment finding and advance notice of proposed rulemaking on greenhouse gas emissions from aircraft.

First, Policy Integrity supports EPA's endangerment finding under Section 231 of the Clean Air Act. In 2009, Policy Integrity submitted a Petition to EPA calling for a cap on greenhouse gas emissions from all vehicle fuels (including aircraft fuels) under Sections 211 and 231 of the Clean Air Act.[2] The third request in our Petition called for EPA to "make a finding under Section 231 that greenhouse gas emissions from aircraft engines cause or contribute to air pollution that may reasonably be anticipated to endanger public welfare." Our fourth request asked for EPA to then work with FAA on regulations capping emissions from aircraft fuel. (The Petition's first two sections focused on non-aircraft vehicle fuels.) EPA's recently proposed endangerment finding under Section 231 is potentially responsive to the third request of our 2009 Petition. **In its final endangerment finding, EPA should clarify whether it considers the finding to respond to the third request of our 2009 Petition under Section 231.**

Second, several economic efficiency problems could undermine the regulatory options that EPA begins to explore in its advance notice of proposed rulemaking. In particular, EPA seems to contemplate an exhaust rate performance standard, aircraft efficiency standard, or similar regulatory scheme that will cover only new aircraft design types and maybe some subset of in-production design types. **Such regulatory approaches could unnecessarily risk inefficiencies from grandfathering, limited compliance flexibility, the rebound effect, enforcement difficulties, and a piecemeal sector-by-sector strategy**—as explained in more detail below. A fuel-based greenhouse gas cap (with offset credits allowed for air conditioning-related emissions), either for aircraft fuels specifically or, ideally, for all vehicle fuels, would correct for many of these inefficiencies. EPA has authority to design a fuel-based cap for aircraft under Section 231, a provision that EPA acknowledges grants "an unusually broad degree of discretion."[3] See our 2009 Petition for more details on how a fuel-based cap under Sections 231 and/or 211 would work.[4] (Also see our 2013 Petition calling for greenhouse gas regulation under Section 115 of the Clean Air Act, to integrate mobile source and stationary source regulation[5]; and see our 2014 policy brief *Shifting Gears: A New Approach to Reducing Greenhouse Gas Emissions from the Transportation Sector*.[6])

[1] Policy Integrity is a non-partisan think tank based at New York University School of Law. No part of this document purports to present NYU's views, if any.

[2] http://policyintegrity.org/documents/7.29.09IPIPetitiontoEPA.pdf

[3] 80 Fed. Reg. at 37,794 n.277.

[4] http://policyintegrity.org/documents/7.29.09IPIPetitiontoEPA.pdf

[5] http://policyintegrity.org/documents/Policy%20Integrity%20Omnibus%20GHG%20Petition%20under%20CAA.pdf

[6] http://policyintegrity.org/files/publications/Shifting_Gears.pdf.

Finally, EPA has requested comments on the factors for establishing the standard's stringency.[7] **EPA should use cost-benefit analysis (reflecting the social cost of carbon and the full range of social benefits) to calibrate the standards.** In particular, EPA should determine stringency independently of the level adopted for international standards through the ICAO/CAEP process, and EPA should adopt more stringent domestic standards than the international requirements, if cost-benefit justified.[8] Policy Integrity has consistently advocated in other contexts for the use of cost-benefit analysis and the social cost of carbon,[9] and those comments apply with equal force here. Similarly, **EPA should continue to pursue aircraft emissions standards even if the ICAO/CAEP process fails to result in the final adoption of international standards.**[10] As Policy Integrity has explained elsewhere in great detail, because the United States is engaged in a repeated tit-for-tat dynamic in international climate negotiations, unilateral and preemptive domestic action can trigger subsequent international reciprocation; further, the Clean Air Act carries an obligation to address international pollution problems.[11]

These comments will now offer some additional details on how a rate-based regulation focused only on new sources risks the economic inefficiencies associated with grandfathering, limited compliance flexibility, the rebound effect, enforcement difficulties, and piecemeal regulation, and how a fuel-based emissions cap could correct many of those problems.

Grandfathering: By exempting all in-use aircraft and potentially reducing the stringency of regulation for (or even exempting) many newly constructed aircraft of in-production design types, EPA risks creating perverse economic incentives that could undermine the environmental goals of regulation.

CAEP is considering limiting its international standards—and so EPA is considering limiting its domestic standards—to only new aircraft design types, potentially excluding all newly built aircraft to be manufactured in the future under a design type that is already in-production.[12] Alternatively, CAEP and EPA are considering covering changed, redesigned, or improved aircraft of in-production types if the change adversely affects carbon emissions;[13] changed in-production types could be subject either to the same or less stringent standards than new types.[14] In-use aircraft built before the effective date of potential regulation seem to be mostly off the table, even though EPA acknowledges that its regulatory authority under Section 231 is not limited to new aircraft only.[15]

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[7] 80 Fed. Reg. 37,797.

[8] *See* 80 Fed. Reg. at 37,805 (asking for comments on setting more stringent standards than ICAOA/CAEP).

[9] *See*, *e.g.*, Policy Integrity's comments to EPA on the proposed mercury standards for power plants, arguing in favor of a cost-benefit approach, http://policyintegrity.org/documents/Policy_Integrity_Comments_on_Utility_MACT.pdf; *see generally*, Richard L. Revesz & Michael A. Livermore, *Retaking Rationality: How Cost-Benefit Analysis Can Better Protect the Environment and Our Health* (2008); *see also* Policy Integrity et al.,'s comments to EPA on the Clean Power Plan, supporting use of the social cost of carbon, http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2013-0602-23545.

[10] *See* 80 Fed. Reg. 37,805 (asking for comments on this outcome).

[11] *See* Policy Integrity et al. Comments on the Clean Power Plan's Use of the Social Cost of Carbon, http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2013-0602-23545.

[12] 80 Fed. Reg. at 37,791.

[13] 80 Fed. Reg. at 37,792-93.

[14] 80 Fed. Reg. at 37,802. See also *id.* at 37,803 (noting it is "challenging" to "set a level of stringency that is reasonable for in-production aircraft to meet, but at the same time provide an incentive for new type aircraft to improve").

[15] 80 Fed. Reg. at 37,791 n.203.

EPA is well aware of the dangers of treating existing sources differently from new sources, as inefficient grandfathering has long undermined EPA's regulation of power plants and other stationary sources. Different standards for new and existing sources distort the economic analysis that owners (and manufacturers) undertake when deciding whether to buy (or build) a new source, upgrade an old source, or continue operating (or selling) the existing source. Due to the additional and more stringent regulatory treatment, new, cleaner sources become relatively more expensive—and keeping older, dirtier sources in operation becomes relatively cheaper—than if the level of regulation were coordinated to maximize efficiency across all sources. Though the problems of grandfathering are somewhat lessened for sources with short lifespans, both individual aircraft and design types can stay in operation for decades.[16] For more on the problems with grandfathering, see Policy Integrity's comments on power plant regulations[17] and Richard L. Revesz's extensive scholarship on the subject.[18]

EPA reports that CAEP is currently making an assumption that "in-product aircraft will respond to the new type standard, even though the standard would not apply to them . . . [because] the aviation sector is competitive enough that market forces will drive manufacturers to voluntarily upgrade their fleet to meet any new type aircraft standard."[19] Drawing from its extensive history witnessing the problems of grandfathering among long-lived stationary sources, and the powerful economic incentives that arise when older, dirtier sources are exempt from regulation, EPA should seriously reexamine the validity of this assumption in the context of aircraft regulation. Market forces alone, such as fuel savings from more energy-efficient aircraft, are unlikely to achieve the socially optimal level of energy conservation, because private aircraft manufacturers and operators have no incentive to fully account for negative externalities like pollution.

To avoid the perils of grandfathering, the best regulatory option may be a fuel-based emissions cap, as advocated in Policy Integrity's 2009 Petition, because it puts all purchasers of fuel on equal footing, preserving the market incentives that favor newer, cleaner sources over time. Such a fuel-based cap could include some *temporary* transition relief for existing, in-use aircraft and existing, in-production types, if such relief is cost-benefit justified. A second-best alternative to a fuel-based cap would be to set performance standards for all aircraft and design types together in a way that minimizes the perverse incentives of any disparity in stringency or treatment between new and existing sources; again, transition relief likely should be phased out over time. See Richard L. Revesz & Allison L. Westfahl Kong, *Regulatory Change and Optimal Transition Relief*, for details on why coordinating new and existing source standards is essential to minimize grandfathering.[20] If EPA pursues the much less efficient option of covering only "changed" in-production types, the definition of modification should be clear, should eliminate potential loopholes, and should include any design upgrade that makes simultaneous

[16] *See* 80 Fed. Reg. at 37,793 (explaining that the Boeing 747-8 aircraft entered into service in 2011, but fell under a type certification dating back to 1969).

[17] http://policyintegrity.org/documents/Policy_Integrity_Comments_on_GHG_NSPS_for_EGUs.pdf

[18] *See* Revesz & Allison L. Westfahl Kong, *Regulatory Change and Optimal Transition Relief*, 105 Nw. U. L. Rev. 1581 (2011); Jonathan Remy Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation*, 101 Nw. U. L. Rev. 1677 (2007); *see also* Revesz & Jack Lienke, *Struggling for Air: Power Plants and the 'War on Coal'* (forthcoming 2015).

[19] 80 Fed. Reg. at 37,804.

[20] 105 Nw. U. L. Rev. 1581 (2011).

emissions improvements cost-benefit justified, not necessarily just those upgrades that cause increased carbon emissions.

Both in its efforts through the ICAO/CAEP process on international standards, and in considering domestic standards, EPA should learn from its experience with the perils of grandfathering and should carefully calibrate the optimal coverage of new and existing sources.

Limited Compliance Flexibility: Though EPA affirms the desirability of a "whole aircraft" approach (as opposed to considering only engine technology),[21] both CAEP and EPA seem to limit consideration to options for technological upgrades of structures, propulsion, and aerodynamics, thus ignoring the potential to reduce greenhouse gas emissions through on-ground or in-air operations. The FAA has long recognized the importance of operational decisions, as well as air conditioning systems, to aviation emissions.[22] Yet a rate-based performance or efficiency standard fails to create incentives for aircraft to pursue the full range of operational improvements, some of which may be much more cost-effective than technological upgrades. A fuel-based emissions cap will direct the market to identify all the lowest-cost emissions reductions, whether from technological or operational changes. See Policy Integrity's 2009 Petition.

Similarly, it is not clear whether CAEP's carbon dioxide metric, which "uses multiple Specific Air Range test points to represent cruise fuel burn,"[23] would account for on-ground or in-air operations, or for air conditioning emissions. If CAEP and EPA are truly committed to a "whole aircraft" approach, they should not rule out operational changes.

Finally, though EPA could explore rate-based trading schemes to allow efficient over- and under-compliance by specific design types or individual aircraft, a mass-based approach is a less complicated way to achieve flexible compliance efficiencies, including trading.[24]

Rebound Effect: A rate-based performance standard risks being undermined by increased air travel as aircraft become more efficient in response to the regulation. The "rebound effect" phenomenon, well known to EPA from its regulation of motor vehicle emissions,[25] is not mentioned in the advanced notice of aircraft regulation. A fuel-based cap efficiently solves the rebound effect problem in ways that rate-based performance standards cannot. See Policy Integrity's 2009 Petition.

Enforcement Difficulties: EPA notes concerns about the resource burdens on certification authorities and manufacturers of retesting in-production aircraft.[26] In comparison, a fuel-based cap, which only requires fuel distributors to hold an emissions credit for every unit of fuel sold, may be much easier to monitor and enforce. See Policy Integrity's 2009 Petition.

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[21] 80 Fed. Reg. at 37,797.

[22] http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/aeprimer.pdf

[23] 80 Fed. Reg. at 37,796.

[24] *See* Policy Integrity's Comments on the Clean Power Plan, arguing for a mass-based standard in favor of a rate-based one, http://policyintegrity.org/documents/111%28d%29_comments_FINAL.pdf.

[25] *E.g.*, 77 Fed. Reg. at 62,924; s*ee also* EPA's Clean Power Plan, discussing the rebound effect.

[26] 80 Fed. Reg. at 37,795.

Piecemeal Inefficiencies: By continuing to regulate one source category at a time and in isolation, an aircraft performance standard fails to take advantage of potentially great efficiencies from a regulatory system that would allow inter-sector trading of emissions credits. Moving toward a fuel-based cap would allow the market to identify the lowest-cost abatement opportunities across the entire transportation sector, whether from aircraft, cars, trucks, motorcycles, buses, marine vessels, or other mobile vehicles. See Policy Integrity's 2009 Petition. Furthermore, a fuel-based cap for mobile sources would be easier to integrate with a cap on stationary sources in the future, for example under Section 115 of the Clean Air Act. See Policy Integrity's 2013 Petition.

Sincerely,

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