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Comment

TURBULENCE AHEAD: WHY THE FIRST DOMESTIC AIRCRAFT CARBON EMISSIONS REGULATIONS ARE A DANGER TO CLIMATE PROTECTION

TAYLOR WILLIAMS*

ABSTRACT

Reducing emission levels from transportation is one of the most vital steps in combating climate change, but domestic aircraft were not subject to this kind of regulation until recently. In July 2020, the Environmental Protection Agency (EPA) proposed the first carbon emission standards for airplanes. While this regulatory move appears to be progress for protecting the environment, it locked in current emissions levels for years to come. The overwhelming majority of aircraft models are already 6% more efficient than the new standard requires them to be. The rule highlights the tension between industry considerations and environmental justice.

This Comment seeks to analyze the various shortcomings of the new aircraft carbon emission standards. It does so by first examining the preceding legal history of emissions regulation and the specifics of the new rule. It then examines the United States' obligations to the International Civil Aviation Organization, the Clean Air Act requirements, the aviation industry's own developments, and the level of deference granted to the EPA's decision. In order to adequately protect the climate and satisfy each of these legal demands, the EPA must reconsider more stringent standards.

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I. INTRODUCTION

BETWEEN 2009 AND 2019, the global airline industry's revenue grew 5.3% per year.[1] In 2019, this growth hit $838 billion.[2] There are over 100,000 commercial flights each day,

[1] Erick Burgueño Salas, *Revenue of Airlines Worldwide 2003–2021*, Statista (July 21, 2021), https://www.statista.com/statistics/278372/revenue-of-commercial-airlines-worldwide [https://perma.cc/Y7R7-V2X2].

[2] *Id.*

transporting over 10 million passengers.[3] This growth provides more than just broader and easier travel; it pushed the transportation industry to become the "center of our socio-economic fabric."[4] The aviation industry has changed every aspect of society, and the environment is no exception.[5] Aircraft noise impacts people living near airports, pollutants contaminate water sources through airport runoff, and aircraft emissions affect air quality and the climate at large.[6]

For example, Brian Gannon and his children live in Boston, Massachusetts, near Logan Airport.[7] They often smell exhaust and fumes from planes throughout their home, neighborhood, and school.[8] Brian frequently makes his children come back inside on days when the fumes are severe.[9] His neighborhood has higher COPD and asthma instances than other areas farther away from the airport, likely due to aircraft emissions.[10] Brian and other individuals who testified at the Environmental Protection Agency (EPA) public hearing on aircraft carbon emission standards are frustrated, left with only empty promises for a cleaner future.[11] Residents and community members begged the EPA to consider their exposure to toxins from greenhouse gas emissions when promulgating the new rules.[12] The EPA ultimately ignored these pleas when it finalized its rule on aircraft greenhouse gas emission standards.

In July 2020, for the first time in the United States, the EPA proposed a rule regulating carbon dioxide emissions from do-

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[3] *Future of Aviation*, INT'L CIV. AVIATION ORG., https://www.icao.int/Meetings/FutureOfAviation/Pages/default.aspx [https://perma.cc/AA9L-FDPU].

[4] *Id.*

[5] FED. AVIATION ADMIN., OFF. OF ENV'T & ENERGY, AVIATION EMISSIONS, IMPACTS & MITIGATION: A PRIMER 1 (2015), https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/primer_jan2015.pdf [https://perma.cc/WTU6-7DQJ].

[6] *Id.*

[7] EPA, EPA–HQ–OAR–2018–0276, PUBLIC HEARING FOR PROPOSAL–CONTROL OF AIR POLLUTION FROM AIRPLANES AND AIRPLANE ENGINES: GHG EMISSION STANDARDS AND TEST PROCEDURES 83 (2020), https://www.epa.gov/sites/production/files/2020-10/documents/airplane-ghg-stnds-nprm-hearing-transcript-20200-09-17.pdf [https://perma.cc/K4Y2-EE4Q] [hereinafter PUBLIC HEARING].

[8] *Id.* at 83–84.

[9] *Id.* at 84.

[10] *Id.* at 83–84.

[11] *See id.* at 41, 68, 77, 83, 91.

[12] *See id.*

mestic airplanes and aircraft engines.[13] The EPA touts the new rule as a major success in the fight for environmental protection.[14] However, as this Comment will discuss, the rule falls short in countless ways. The EPA over-relies on unfounded concerns for industry and global standards. The EPA disregards congressional mandates to reduce emissions by accepting an obsolete regulatory scheme. Further, the EPA does not adequately consider alternative regulations. In order to combat climate change and follow the requirements of the Clean Air Act (CAA), the EPA must go back to the drawing board and create more stringent standards.

Reaching this conclusion requires an overview of climate change in the context of aviation (Section II), a consideration of preceding legislation and regulatory action for carbon dioxide emissions (Section III), a synopsis on what the new regulations entail (Section IV), and an examination of the rule's shortcomings (Section V). Lastly, the conclusion will pull these issues together and emphasize the necessity for more stringent standards on carbon dioxide emissions from aircraft.

II. CLIMATE CHANGE IN THE CONTEXT OF AVIATION

While the new aircraft emissions rule specifically addresses carbon dioxide emissions, a general understanding of greenhouse gases and climate change is necessary to understand the importance of the standards. Greenhouse gases trap heat inside the atmosphere.[15] Higher concentrations of these gases cause global temperatures to rise.[16] Scientists find that the increase in global warming causes climate change to accelerate, which can

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[13] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. 2136 (Jan. 11, 2021) (to be codified at 40 C.F.R. pts. 87, 1030).

[14] *See* Cirium, *US Plan for Aircraft CO_2 Standards Criticised by Green Groups*, FLIGHTGLOBAL (July 23, 2020), https://www.flightglobal.com/engines/us-plan-for-aircraft-co2-standards-criticised-by-green-groups/139454.article [https://perma.cc/B54R-SHPP].

[15] *Greenhouse Gas Emissions: Overview of Greenhouse Gases*, EPA, https://www.epa.gov/ghgemissions/overview-greenhouse-gases [https://perma.cc/T9GU-YDYK] (Apr. 14, 2021).

[16] Melissa Denchak, *Greenhouse Effect 101*, NAT. RES. DEF. COUNCIL (July 16, 2019), https://www.nrdc.org/stories/greenhouse-effect-101 [https://perma.cc/4FS9-ZGFU]; *What is the Greenhouse Effect?*, NASA, https://climate.nasa.gov/faq/19/what-is-the-greenhouse-effect [https://perma.cc/CE6V-X44D] (July 8, 2021).

lead to rising sea levels, droughts, floods, and extreme temperatures.[17] Additionally, climate change impacts health.[18]

The four main greenhouse gases include carbon dioxide, methane, nitrous oxide, and fluorinated gases.[19] Of these four gases, carbon dioxide contributed about 80% of greenhouse gases emitted in 2019.[20] Carbon dioxide enters the atmosphere from burning fossil fuels and typically remains in the atmosphere for extremely long periods of time.[21] After carbon dioxide is emitted, "40 percent still remains [in the atmosphere] after 100 years, 20 percent after 1,000 years, and 10 percent as long as 10,000 years later."[22]

Globally, aircraft account for 2% of carbon emissions that contribute to climate change.[23] Flights from U.S. destinations contribute nearly 25% of those emissions.[24] In the United States, emissions from covered aircraft accounts for 3% of total domestic greenhouse gas emissions.[25] Before July 2020, airplanes and jets were the largest transportation source in the United States not subject to greenhouse gas emissions regulations.[26] Although new technology is developing, an increase in travel and global aviation creates a net increase in greenhouse gas emissions.[27] The International Civil Aviation Organization (ICAO) predicted that carbon dioxide emissions from international aviation could increase by nearly 69% between 2010 and 2020.[28] It also pre-

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[17] *The Causes of Climate Change*, NASA, https://climate.nasa.gov/causes [https://perma.cc/TDT2-NCUR] (July 8, 2021).

[18] Karen Feldscher, *Greenhouse Gases Pose Threat to Public Health*, HARV. T.H. CHAN SCH. OF PUB. HEALTH (Nov. 1, 2011), https://www.hsph.harvard.edu/news/features/bernstein-greenhouse-gases-health-threat [https://perma.cc/7ZWR-KYVU].

[19] *Greenhouse Gas Emissions: Overview of Greenhouse Gases*, *supra* note 15.

[20] *Id.*

[21] Denchak, *supra* note 16.

[22] *Id.*

[23] Timothy Puko, *EPA Proposes Emissions Limits for Jet Aircraft*, WALL ST. J. (July 22, 2020, 1:41 PM), https://www.wsj.com/articles/epa-proposes-emissions-limits-for-jet-aircraft-11595429280 [https://perma.cc/ZQC5-KZ2N].

[24] *Id.*

[25] Kerry Lynch, *EPA Sets Stage to Regulate Aircraft GHG Emissions*, AINONLINE (June 10, 2015, 6:18 PM), https://www.ainonline.com/aviation-news/business-aviation/2015-06-10/epa-sets-stage-regulate-aircraft-ghg-emissions [https://perma.cc/FJX7-DJ99].

[26] *Id.*

[27] *Id.*

[28] Stephen Lee, *First Carbon Limits for Airplanes in U.S. Proposed By EPA (1)*, BLOOMBERG L. (July 22, 2020, 11:45 AM), https://news.bloomberglaw.com/envi-

dicted that "[b]y 2045, fuel consumption is projected to increase . . . 3.1 times the 2015 value."[29]

Although some of these statistics may appear nominal, the growth of aircraft emissions is snowballing quickly. In light of the growing climate change crisis, legislative bodies—domestic and abroad—are promulgating new laws and regulations to combat the increasing problem.

III. PRECEDING LEGISLATION AND REGULATORY ACTION

The historical background of the EPA's new carbon emissions rule is complex and nonlinear. Standards have developed from both international and U.S. emissions regulations. This Section explores the major highlights of climate change law and carbon emissions regulations. Specifically, it addresses the Kyoto Protocol and Paris Agreement, the Chicago Convention and ICAO, the Clean Air Act, the 2016 EPA Endangerment Findings, and recent U.S. lawsuits relevant to these new standards.

A. Kyoto Protocol and Paris Agreement

The United Nations Framework Convention on Climate Change led to some of the first global efforts to control climate change.[30] This convention produced both the Kyoto Protocol and the Paris Agreement.[31] The Kyoto Protocol requires participating countries to reduce their emissions and delegate international aviation to ICAO.[32] The Paris Agreement created a goal to limit the increase in global temperature to 1.5 degrees Celsius

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ronment-and-energy/epa-kicks-off-effort-to-regulate-greenhouse-gases-from-airplanes [https://perma.cc/D7QZ-P6T4].

[29] Ewelina Czapla, *Regulating Airplane Greenhouse Gas Emissions*, Am. Action F. (July 24, 2020), https://www.americanactionforum.org/insight/regulating-airplane-greenhouse-gas-emissions [https://perma.cc/788Z-P9J7].

[30] *What is the United Nations Framework Convention on Climate Change?*, United Nations Framework Convention on Climate Change, https://unfccc.int/process-and-meetings/the-convention/what-is-the-united-nations-framework-convention-on-climate-change [https://perma.cc/AWJ6-V4YB].

[31] *See id.*; *The Paris Agreement*, United Nations Framework Convention on Climate Change, https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement [https://perma.cc/9BFH-2F4N].

[32] Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 2303 U.N.T.S. 162 [hereinafter Kyoto Protocol].

above pre-industrial levels.[33] As part of this overall goal, parties must submit their nationally determined emissions contributions and review them every five years.[34] The United States intended to cut its 2005 contribution level by 26–28% by 2025.[35] While the Paris Agreement does not specifically cover international aircraft, it does address greenhouse gas emissions at large.[36] Therefore, the United States would be forced to account for aviation emissions in achieving this reduction. While President Trump withdrew the United States' participation in the Paris Agreement in 2017, President Biden rejoined the agreement in January 2021.[37]

B. Chicago Convention and ICAO

The Convention on International Civil Aviation (Chicago Convention) created ICAO.[38] ICAO is a United Nations organization that sets international aviation standards concerning safety, security, efficiency, and environmental protection.[39] It also acts as a forum for cooperation amongst all related fields of international civil aviation.[40] ICAO works with the member states of the Chicago Convention and other global aviation organizations to create international standards and recommended practices.[41] The Chicago Convention urges its member states to

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[33] Paris Agreement to the United Nations Framework Convention on Climate Change art. 2, ¶ 1(a), Dec. 12, 2015, T.I.A.S. No. 16-1104 [hereinafter Paris Agreement].

[34] *Id.* art. 4, ¶ 9.

[35] INDCs as communicated by Parties, U.S. Cover Note, INDC and Accompanying Information (Mar. 31, 2015, 4:03 PM), https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/United%20States%20of%20America/1/U.S.%20Cover%20Note%20INDC%20and%20Accompanying%20Information.pdf [https://perma.cc/RA47-2MAT].

[36] *See* Paris Agreement, *supra* note 33.

[37] Nathan Rott, *Biden Moves to Have U.S. Rejoin Climate Accord*, NPR (Jan. 20, 2021, 5:45 PM), https://www.npr.org/sections/inauguration-day-live-updates/2021/01/20/958923821/biden-moves-to-have-u-s-rejoin-climate-accord [https://perma.cc/HF2E-9V9G].

[38] *History*, Int'l Civ. Aviation Org., https://www.icao.int/secretariat/TechnicalCooperation/Pages/history.aspx#:~:text=THe%20Convention%20on%20International%20Civil,1945%20until%204%20April%201947 [https://perma.cc/DUE4-L232].

[39] *Id.*

[40] *About ICAO*, Int'l Civ. Aviation Org., https://www.icao.int/about-icao/Pages/default.aspx [https://perma.cc/MHY7-KH5C].

[41] Convention on International Civil Aviation arts. 37–39, Dec. 7, 1944, 61 Stat. 1180, 15 U.N.T.S. 295 [hereinafter Chicago Convention].

work towards uniformity in these regulations and standards.[42] There are currently 193 member states, including the United States.[43]

While ICAO creates standards for global aviation, nations are free to adopt their own domestic standards that can be more or less stringent than ICAO standards.[44] If the nation chooses to adopt less stringent regulations, it must notify ICAO of the differences between its practices and ICAO requirements.[45] However, the Chicago Convention requires member states to adopt emission standards that are at least as stringent as ICAO standards to have their airworthiness certificates recognized internationally.[46] Therefore, if a member state wants ICAO to continue recognizing its airworthiness certificates, it must adopt standards at least as stringent as ICAO standards.[47]

The first ICAO aircraft carbon dioxide emission standards were proposed in 2016 and later approved in 2017.[48] This new proposal was meant to complement the Paris Agreement.[49] In negotiating ICAO carbon dioxide standards, the United States recommended that the international standards' purpose be to reduce carbon dioxide emissions beyond "business as usual."[50] The selected standards "apply to new aircraft type designs from 2020 and to in-production aircraft type designs in 2023."[51] By January 1, 2028, all in-production aircraft that do not meet the standard will no longer be permitted to fly unless they are sufficiently modified.[52] These standards, their implementation, and rulemaking are discussed below.[53]

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[42] *Id.*

[43] *Member States*, INT'L CIV. AVIATION ORG. (Jan. 10, 2019), https://www.icao.int/about-icao/pages/member-states.aspx (click "Member States List (Multilingual)") [https://perma.cc/B7ND-EEDJ].

[44] Chicago Convention, *supra* note 41, art. 38.

[45] *Id.*

[46] *Id.* art. 39.

[47] *Id.*

[48] Press Release, Int'l Civ. Aviation Org., ICAO Council Adopts New CO2 Emissions Standard for Aircraft (Mar. 6, 2017), https://www.icao.int/Newsroom/Pages/ICAO-Council-adopts-new-CO2-emissions-standard-for-aircraft.aspx [https://perma.cc/K3G4-YVR4].

[49] Puko, *supra* note 23.

[50] Lynch, *supra* note 25.

[51] Cirium, *supra* note 14.

[52] *Id.*

[53] *See* discussion *infra* Section IV.

C. U.S. Obligations to ICAO Standards

As previously discussed, ICAO standards are not directly enforceable against member states' manufacturers.[54] Once ICAO standards are approved, a member state must adopt its own domestic standards that are at least as stringent as ICAO standards.[55] Member states who choose to vary their standards in any way from ICAO standards must notify the organization.[56] If a member state fails to sufficiently satisfy ICAO requirements, their airworthiness and type certificates will not be recognized by other member states and, thus, cannot travel in their airspace.[57]

D. Clean Air Act

In 1970, the U.S. government's role in regulating air pollution and emissions shifted significantly: Congress passed the Clean Air Act.[58] This law allowed the creation of federal and state regulations to limit emissions from both stationary and mobile sources.[59] In the context of aviation regulation, this legislation granted the EPA authority to regulate aircraft emissions.[60] If an air pollutant from aircraft engines is found to endanger public health or welfare, the EPA is *required* to regulate and create standards.[61]

Section 231 of the CAA grants the EPA the authority to regulate certain pollutants from airline engines.[62] Specifically, § 231(a)(2)(A) directs the EPA administrator to propose aircraft engine emission standards for "any air pollutant . . . [that] causes, or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare."[63] This directive does not prescribe what those standards must be but, in-

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[54] *See* Chicago Convention, *supra* note 41, art. 38.

[55] *Id.*

[56] *Id.*

[57] *Id.* art. 39.

[58] *Evolution of the Clean Air Act*, EPA, https://www.epa.gov/clean-air-act-overview/evolution-clean-air-act [https://perma.cc/VD32-L9WE] (Oct. 8, 2020).

[59] *Id.*; *see generally* 42 U.S.C. § 7401.

[60] *See* 42 U.S.C. § 7571(a)(2)(B); *Emissions Certification*, Fed. Aviation Admin., https://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/certifications/ [https://perma.cc/VTS5-S625] (July 1, 2014, 10:28 AM).

[61] 42 U.S.C. § 7571(a)(2)(A).

[62] *Id.*

[63] *Id.*

stead, grants discretion to the EPA to create them.[64] The D.C. Circuit's ruling in *National Association of Clean Air Agencies* held that § 231 is given an "exceptionally broad" degree of discretion to determine airplane engine emission standards.[65] Section 231(a)(2)(B) directs the EPA to consult with the Federal Aviation Administration (FAA) on these standards and prevents the EPA from changing the standards if that "change would significantly increase noise and adversely affect safety."[66]

Section 231(b) allows the EPA to consult with the Department of Transportation to ensure the effective date allows for the necessary time to develop any needed technology resulting from the new standards.[67] The statute also requires reasonable consideration of the cost to comply with the new standards.[68] Section 232 directs the Secretary of Transportation to prescribe regulations to ensure compliance with the EPA's standards.[69] The FAA is also required to impose regulations that ensure compliance with the standards.[70] Section 233 grants the federal government the exclusive authority to create aircraft engine emissions standards.[71] States are preempted from adopting or enforcing any aircraft emissions standards unless they are identical to the EPA's standards.[72]

E. 2016 EPA Endangerment Findings

On August 15, 2016, during President Obama's administration, the EPA released Endangerment Findings that gave the EPA authority to regulate airline emissions.[73] As described above, § 7571(a)(2)(A) of the CAA requires the EPA to regulate emissions that endanger public health or welfare.[74] This finding was a scientific assessment that aircraft emissions endanger pub-

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[64] *Id.*; *see* Nathan Richardson, *Aviation, Carbon, and the Clean Air Act*, 38 Colum. J. Env't L. 67, 83–96 (2013).

[65] Nat'l Ass'n of Clean Air Agencies v. EPA, 489 F.3d 1221, 1229 (D.C. Circ. 2007).

[66] 42 U.S.C. § 7571(a)(2)(B)(i)–(ii).

[67] *See id.* § 7571(b).

[68] *Id.*

[69] *Id.* § 7572(a).

[70] *Id.* § 7571(a)(2)(B)(i); *see* Richardson, *supra* note 64, at 73.

[71] *See* 42 U.S.C. § 7573.

[72] *See id.*

[73] *See* Finding That Greenhouse Gas Emissions from Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare, 81 Fed. Reg. 54,422 (Aug. 15, 2016) (to be codified at 40 C.F.R. pts. 87, 1068).

[74] 42 U.S.C. § 7571(a)(2)(A); *see* discussion *infra* Section III.D.

lic health and welfare, which satisfied the prerequisite to regulating those emissions.[75]

First, the EPA recognized that elevated levels of greenhouse gases in the atmosphere endanger the public health and welfare of current and future generations, aligning with the meaning of § 231(a)(2)(A).[76] The specified greenhouse gases were carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluorides.[77] These are the same air pollutants mentioned in the 2009 Endangerment Findings under § 202(a) of the CAA that were the primary cause of climate change.[78] Second, the EPA found the emissions of the six greenhouse gases from certain classes of aircraft engines cause or contribute to the air pollution that endangers public health and welfare under § 231(a)(2)(A).[79]

In 2015, the EPA published these findings as an advanced notice of proposed rulemaking (ANPRM).[80] An ANPRM is an anticipatory notice that an agency is considering regulatory action.[81] The ANPRM discussed issues presented in ICAO proceedings on international carbon dioxide emission standards, perhaps foreshadowing the rules that were to come in 2020.[82]

F. Intended Lawsuits

In January 2020, several environmental groups notified the EPA that they intended to sue the Agency for refusing to imple-

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[75] 42 U.S.C. § 7571(a)(2)(A); *see* discussion *infra* Section III.D; Puko, *supra* note 23.

[76] Finding That Greenhouse Gas Emissions from Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated toEndanger Public Health and Welfare, 81 Fed. Reg. at 54,440.

[77] *Id.*

[78] Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,497 (Dec. 15, 2009).

[79] Finding That Greenhouse Gas Emissions from Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare, 81 Fed. Reg. at 54,440.

[80] 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. 37,758 (July 1, 2015) (to be codified at 40 C.F.R. pts. 87, 1068).

[81] *Abbreviations*, Off. of Info. & Regul. Affs., https://www.reginfo.gov/public/jsp/eAgenda/Abbrevs.myjsp [https://perma.cc/WQF8-84GC].

[82] 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. 37,765–66 (July 1, 2015) (to be codified at 40 C.F.R. pts. 87, 1068).

ment aircraft emission regulations.[83] The groups argued that the 2016 Endangerment Findings required the EPA to promulgate regulations and that the Agency failed to do so.[84] The EPA suggested the proposed rule would come in September 2019.[85] After this timeline passed, the EPA responded and claimed it was working to propose a rule in 2020.[86] Finally, in July 2020, the EPA published its proposed rule for regulating carbon dioxide emissions from aircraft.[87]

IV. SPECIFIC PROVISIONS OF THE RULE

The EPA's new regulations are the first emissions standards for commercial airlines and large business jets.[88] The regulations are the exact standards ICAO created, which prevent manufacturers from reverting to less efficient aircraft models.[89] The regulation will incentivize the development of more fuel-efficient airplane models without letting the aviation industry revert to older models.[90] Aircraft manufacturers will be forced to update and replace their old aircraft with more efficient models.[91] This Section explores the new standards and what they require from manufacturers in greater detail. Specifically, it addresses the emission standards and procedures, the aircraft the standards apply to, the dates the regulations become effective, the feasibility and cost considerations, the public hearing on the regulations, and the comments formally received in response to the regulations.

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[83] David Shepardson, *U.S. Environmental Groups Plan to Sue Trump Administration on Airplane Emissions*, REUTERS, https://www.reuters.com/article/us-usa-airplanes-emissions/u-s-environmental-groups-plan-to-sue-trump-administration-on-airplane-emissions-idUSKBN1ZT2LV [https://perma.cc/2MYQ-PZPG] (Jan. 30, 2020, 12:20 PM).

[84] *Id.*

[85] *Id.*

[86] *Id.*

[87] Reese Oxner, *U.S. Implementing 1st-Ever Airplane Emission Rules; Critics Say They're Ineffective*, NPR (Dec. 28, 2020, 4:23 PM), https://www.npr.org/2020/12/28/950863508/u-s-implementing-1st-ever-airplane-emission-rules-critics-say-theyre-ineffective [https://perma.cc/6H4K-WACZ].

[88] Puko, *supra* note 23.

[89] *See id.*

[90] Czapla, *supra* note 29; Lee, *supra* note 28.

[91] Lee, *supra* note 28.

A. Overview

The EPA conducted an extensive peer review before issuing the proposed rule.[92] Such review is consistent with specific Office of Management and Budget requirements.[93] One of the two reports relied on discusses the technologies likely to be used in compliance with the proposed standards and their associated costs.[94] The other report revolved around the methodology and results of the emissions inventory modeling.[95]

The standards are considered "anti-backsliding" regulations, meaning they prevent manufacturers from reverting to older, less fuel-efficient aircraft.[96] This type of regulation sets the floor for future emissions.[97] Aircraft being designed but not yet certificated, and current in-production planes are subject to the regulations.[98] Notably, in-service aircraft are not covered by the new standards.[99] In order to have flexibility amongst aircraft models, the emission standards are based on a mathematical formula that accounts for several different factors.[100]

B. Emission Standards and Procedures

The EPA first notes the importance of harmonizing with ICAO's carbon dioxide standards to consistently regulate international transactions.[101] The EPA's standards match the "scope, stringency, and timing" of the carbon dioxide standards used by ICAO.[102] As mentioned above, the metric used to set the emission standards is a mathematical formula.[103] The metric measures fuel efficiency,[104] which is directly related to carbon dioxide emitted by aircraft engines.[105]

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[92] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. 2136, 2137 (Jan. 11, 2021) (to be codified at 40 C.F.R. pts. 87, 1030).

[93] *Id.*

[94] *Id.*

[95] *Id.*

[96] *Id.*; Lee, *supra* note 28; Puko, *supra* note 23.

[97] Czapla, *supra* note 29.

[98] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2136, 2138.

[99] *See id.*

[100] *Id.* at 2142–43.

[101] *Id.* at 2148.

[102] *Id.* at 2144.

[103] *Id.* at 2172.

[104] *Id.* at 2144.

[105] *Id.* at 2145; *Fuel Efficiency*, Int'l Air Transp. Ass'n, https://www.iata.org/en/programs/ops-infra/fuel/fuel-efficiency [https://perma.cc/7FXM-ZVUQ].

The fuel efficiency metric was designed as a formula to account for differences in airplane types, designs, technology, and uses.[106] ICAO designed its standards to "differentiate between fuel-efficiency technologies" of aircraft and "equitably capture improvements in propulsive and aerodynamic technologies."[107] Because of the difficulty in identifying a standardized empty weight of each plane, the metric is based on maximum takeoff mass (MTOM) rather than overall weight.[108] Because of this, compliance will not be easily accomplished by simply using weight reduction technologies.[109]

The carbon dioxide metric takes an average of three "Specific Air Range (SAR) test points" normalized by a reference geometric factor that represents the physical size of the plane.[110] SAR points measure the distance a unit of fuel will take an airplane.[111] Measurements of these points are taken at three weight points to give an accurate idea of the range of "day-to-day" airplane operations.[112] The measurements are correlated against a plane's MTOM, as it is an already certificated reference point.[113] Comparison between the reference point and the measurement will determine if an airplane complies with the regulations.[114]

C. Applicable Aircraft and Effective Dates

In sum, the EPA's rule applies to manufacturers of civil subsonic jet airplanes with an MTOM of more than 5,700 kilograms and civil subsonic propeller-driven airplanes with an MTOM greater than 8,618 kilograms.[115] The timing and stringency levels depend on where an airplane is in the development process.[116] The standards become effective immediately for a new type design, with an application submitted for certification on or after January 11, 2021.[117] If the new type design has an MTOM of 60,000 kilograms or less and has nineteen passenger

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[106] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2145.

[107] *Id.*

[108] *Id.*

[109] *Id.*

[110] *Id.*

[111] *Id.*

[112] *Id.*

[113] *Id.* at 2146.

[114] *Id.*

[115] *Id.*

[116] *See id.* at 2145.

[117] *Id.* at 2137.

seats or fewer, the standards apply for certification applications submitted on or by January 1, 2023.[118] Compliance for in-production planes will be required beginning January 1, 2028.[119]

A notable category of aircraft that the EPA does *not* cover in its rule is in-service planes.[120] Before the EPA proposed the rule, it considered applying the standards to aircraft already in service.[121] Ultimately, the EPA decided not to require airplanes currently in use to comply with the new standards, sparking outrage amongst many environmental groups.[122] However, certain modifications made to in-service airplanes that increase greenhouse gas emissions will trigger a requirement to follow the standards beginning January 1, 2023.[123]

The definitions of "in-production" and "new type design" are critical because falling under the terms implicates which effective date by which a manufacturer is required to comply.[124] An in-production plane is an airplane that has already received a Type Certificate from the FAA and manufacturers either have "existing undelivered sales orders or would be willing and able to take new sales orders."[125] A Type Certificate is the FAA's approval that "ensures [ ] the manufacturer's designs meet the minimum requirements for airplane safety and environmental regulations."[126] Each new type design airplane is issued a Type Certificate once unless the design is modified throughout its production.[127]

A new type design airplane has "never been manufactured prior to the compliance date of a rule," but the manufacturer has applied for the original certification with the FAA.[128] These new type designs are very infrequent and typically take eight to ten years to develop fully.[129] Therefore, manufacturers must receive sufficient notice so they can make design modifications

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[118] *Id.* at 2138.

[119] *Id.*

[120] *See id.*

[121] Lynch, *supra* note 25.

[122] *Id.*; Shepardson, *supra* note 83.

[123] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2138.

[124] *See id.* at 2147.

[125] *Id.*

[126] *Id.* at 2147 n.78.

[127] *Id.*

[128] *Id.* at 2147.

[129] *Id.*

and receive certifications.[130] For new type designs, the standards applied at the time of certification usually remain frozen for five years to allow for approval.[131] Because of the significant time and money invested in developing a new type design, manufacturers stress the importance of having future standards at least eight years in advance.[132]

D. Feasibility and Costs

Before exploring the feasibility studies and costs, the EPA made special note of the market considerations for the aviation industry.[133] The aviation industry is uniquely global.[134] Planes and their parts are sold worldwide, and to continue to support this market, the EPA argues that international regulatory compliance is critical.[135] The EPA explains that if the United States decided to enforce more stringent standards, manufacturers would no longer be able to receive international FAA certification and would thus have to seek it through other certifying bodies.[136] This certification is a key factor in airlines' purchasing decisions.[137] A change in standards could potentially put U.S. manufacturers at a competitive disadvantage in exporting their aircraft.[138] With this market consideration in mind, the EPA heavily focused on reaching standards that are already feasible for manufacturers.[139]

In analyzing the technological feasibility of the new standards, the EPA used a study performed by an outside contractor.[140] The contractor conducted a detailed literature search, held several interviews with aviation industry leaders, and conducted modeling to estimate the cost of modifying in-production planes.[141] The study concluded by projecting that the proposed rule would not require manufacturers to make technical improvements to their aircraft that would not happen if the rule

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130 *Id.*
131 *Id.*
132 *See id.* at 2147 n.90.
133 *Id.* at 2165.
134 *Id.*
135 *Id.*
136 *Id.*
137 *Id.*
138 *Id.*
139 *Id.* at 2165–66.
140 *Id.* at 2165.
141 *Id.* at 2166.

were not promulgated.[142] Most of the aircraft in-service already surpass the new emission standards.[143] Additionally, the few in-production airplanes that do not meet the carbon dioxide standards are at the end of their production life.[144] These planes are anticipated to go out of production before the 2028 effective date and be replaced by newly developed models that meet the standards.[145]

E. Public Hearing

The EPA held a virtual public hearing on September 17, 2020.[146] The purpose of this hearing was to receive comments from any interested parties on the newly proposed rule.[147] Authority for this hearing is given under § 307(d) of the CAA.[148] Each presenter had five to ten minutes for the oral presentation of their remarks.[149] In total, twenty different parties gave their virtual testimony.[150]

1. Disappointed Parties

The majority of parties who gave their testimony at the hearing expressed disappointment with the proposed rule and the EPA's decision-making.[151] The resounding theme of the majority's concern was the need for more stringent regulations on carbon dioxide emissions given the urgency that climate change poses.[152] The common argument among the disapproving parties centered around ICAO's failure to provide a sufficient standard.[153] Many shared that the findings and research relied on by ICAO used outdated data.[154] Some suggested that the ICAO standards are insufficient at large and conflicts with the goals of

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142 *Id.* at 2167.

143 *Id.* at 2166.

144 *Id.* at 2167–68.

145 *Id.* at 2168.

146 Public Hearing for Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 85 Fed. Reg. 52,514 (Aug. 26, 2020) (to be codified at 40 C.F.R. pts. 87, 1030).

147 Public Hearing, *supra* note 7, at 6.

148 42 U.S.C. § 7607(d); Public Hearing, *supra* note 7, at 8.

149 Public Hearing, *supra* note 7, at 9, 11.

150 *See generally id.*

151 *See id.* at 12, 21, 41–51, 64–86, 91–98.

152 *See id.*

153 *See id.* at 13, 48, 50, 72.

154 *See id.* at 14, 48, 72.

the Paris Agreement.[155] After noting ICAO's lackluster efforts, several commenters emphasized the EPA's opportunity to take aggressive measures.[156]

While many of the participants represented large organizations and groups, several proud, private citizens were also willing to voice their concerns.[157] Similar to Brian Gannon, their testimonies revolved around their anecdotes and experiences.[158] Many testifiers live close to large airports and shared how the increased pollution and emissions severely impacts the air quality of their neighborhoods.[159] They share deep concerns for the world their children will be handed one day.[160] Increased child asthma, higher COVID-19 morbidity rates, and increased cancer cases are all characteristics these neighborhoods share.[161] Kent Palosaari's nonprofit, Mira's Garden, built a community garden underneath the landing area at the SeaTac International Airport.[162] Kent had the vegetables from the garden tested by the University of Arizona and found the garden's produce was too toxic to consume safely.[163] While these commenters spoke mainly from personal stories and experiences rather than scientific data on greenhouse gases, they felt obligated to share how climate change impacts their lives every single day.[164] They strongly urged the EPA to take advantage of this regulatory opportunity to slow greenhouse gases' impacts on the planet.[165]

2. Satisfied Parties

On the other end of the spectrum, many members of the airline industry and manufacturers expressed their full support for the EPA's proposed rule.[166] The most prevalent argument from this group was the need for harmonization with ICAO's global standard.[167] They argued that having a "patchwork" of standards

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155 *Id.* at 22.
156 *Id.* at 42, 70.
157 *See id.* at 41–46, 48–51, 64–73, 81, 83, 85, 91, 93.
158 *See id.*
159 *See id.*
160 *See id.* at 64–73, 81, 83, 85, 91, 93.
161 *See id.* at 75, 83, 91, 93.
162 *Id.* at 91–93.
163 *Id.* at 92.
164 *See id.* at 41, 64, 77–78, 83, 91.
165 *Id.*
166 *See id.* at 24–37, 54–62, 87–90.
167 *See id.* at 27, 36, 62.

would create an unnecessary level of uncertainty.[168] Relying on the fact that most of the domestically manufactured aircraft are exported, they argued that having a different standard than the rest would wreak havoc on the airline industry's economic viability.[169] In order to remain competitive in the market, the United States needs to follow the unified standard.[170] Even further, COVID-19 has already dramatically changed the outlook of airlines.[171]

Another common argument the supporters discussed was the aviation industry's own efforts to innovate and reduce emissions.[172] Peter Prowitt, an executive director of global government relations for GE Aviation, shared many of GE Aviation's developments in the area of fuel efficiency.[173] A significant portion of the research and development budget for GE Aviation focuses on fuel efficiency.[174] The captain of a 737 U.S. legacy airline, Kathi Hurst, also discussed the importance of the bigger picture.[175] Hurst noted that aircraft engine technology is only one component of reducing greenhouse gas emissions.[176] Other areas, including air traffic control technology, individual airport configuration, and pilot operating techniques, all contribute to emissions.[177]

F. Notice and Comment

Following agency requirements,[178] the EPA opened the sixty-day notice and comment period from August 19, 2020, to October 19, 2020.[179] The EPA received 124 publicly submitted comments.[180] Similar to the testimony given in the evidentiary

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[168] *Id.* at 62.
[169] *See id.* at 27, 36, 62.
[170] *Id.* at 35–36.
[171] *See id.* at 35, 55.
[172] *See id.* at 30, 54, 88.
[173] *Id.* at 29.
[174] *Id.* at 30.
[175] *Id.* at 59.
[176] *Id.* at 60.
[177] *Id.* at 60–61.
[178] 5 U.S.C. § 553(c).
[179] Gordon Gilbert, *U.S. EPA Publishes Aircraft Emissions Proposal*, AINonline (Aug. 24, 2020, 9:17 AM), https://www.ainonline.com/aviation-news/business-aviation/2020-08-24/us-epa-publishes-aircraft-emissions-proposal [https://perma.cc/W77A-49EG].
[180] Comment Letters on Proposed Rule for Control of Air Pollution from Airplanes and Airplane Engines: Greenhouse Gas Emission Standards and Test Procedures, Regulations.gov, https://www.regulations.gov/document/EPA-HQ-

hearing, there were two primary voices in the submitted comments: those from the aviation industry and those representing environmental protection groups.[181] The manufacturing and aviation industry representatives reaffirmed their overall support of the EPA's proposed rule, while the environmentalists maintained their disapproval of the standards.[182] The EPA addressed various submitted comments in the finalized rule.[183] The main issue the EPA recognized from the comments was the stringency of the standards.[184]

Concerning this stringency, the EPA recognized two main arguments presented in the submitted comments.[185] The EPA noted that the relevant provisions under the CAA "confer an unusually broad degree of discretion on the EPA to adopt aircraft engine emission standards as the [a]gency determines are reasonable."[186] Important factors to consider in adopting technology-based standards include cost, emission reductions, safety, and noise.[187] Balancing the feasibility of technology-forcing standards and the safety of pushing technology too quickly, the EPA determined the anti-backsliding regulations are sufficient.[188] While the final rule recognized various arguments for altering the proposed rules, the EPA only changed a minor reporting provision.[189]

V. ANALYSIS OF THE RULE

The anti-backsliding emissions standards are not sufficient for actually reducing carbon dioxide emissions. This Section explores this shortcoming and the tensions between aviation in-

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OAR-2018-0276-0001/comment [https://perma.cc/2BWK-S7EL] [hereinafter Comment Letters].

[181] Gordon Gilbert, *EPA's Aircraft Emissions Rule Signed into Law*, AINONLINE (Dec. 29, 2020, 10:30 AM), https://www.ainonline.com/aviation-news/business-aviation/2020-12-29/epas-aircraft-emissions-rule-signed-law [https://perma.cc/WF2Q-MEYV]; *see generally* Comment Letters, *supra* note 180.

[182] Gilbert, *supra* note 181; *see generally* Comment Letters, *supra* note 180.

[183] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. 2136, 2156 (Jan. 11, 2021) (to be codified at 40 C.F.R. pts. 87, 1030).

[184] *Id.* at 2156–58.

[185] *Id.* at 2157.

[186] *Id.*; *see* Nat'l Ass'n of Clean Air Agencies v. EPA, 489 F.3d 1221, 1229–30 (D.C. Cir. 2007).

[187] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2157.

[188] *Id.* at 2158.

[189] *Id.* at 2138.

dustry groups and environmental groups. Specifically, it addresses the United States' freedom to differ from ICAO standards, the ways the standards violate the CAA, the airline industry's fuel-efficiency development, and the finding that the regulations are arbitrary and capricious. This Section ends by noting the most recent developments and lawsuits regarding the new regulations.

A. The EPA Is Not Strictly Bound to ICAO Standards

First, any standards or recommended practices ICAO promulgates are not directly binding on the United States.[190] While ICAO aims to promote unity in global standards, there is an allowance for deviation among member states.[191] If a member state becomes so negligent to fall below ICAO standards, "[o]nly national governments can consider holding other countries" accountable.[192] Normally this accountability is in "the form of country-to-country sanctions."[193] When disagreements between member states occur, they are typically solved through settlement and arbitration.[194] If member states do not reach a resolution through these mechanisms, they can lose their voting rights in the voting assembly.[195] If a member state refuses to follow a final order after arbitration or settlement, member states can revoke airworthiness certificates and bar the noncompliant member state's aircraft from flying through their territories.[196] To date, there have only been five disputes that fall under this governing article in the Chicago Convention.[197] Out of these five cases, ICAO Council has never decided on the merits of the cases.[198] Instead, member states resolved each case through mediation and negotiation.[199] There is an extensive dispute process

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[190] *Frequently Asked Questions: If My State is Being Negligent in its Responsibilities Under the Chicago Convention, Can ICAO Reprimand or Penalize it in Some Manner?*, Int'l Civ. Aviation Org., https://www.icao.int/about-icao/FAQ/Pages/icao-frequently-asked-questions-faq-2.aspx [https://perma.cc/6QC5-WANZ] [hereinafter *ICAO Reprimand*].

[191] Chicago Convention, *supra* note 41, art. 38.

[192] *ICAO Reprimand*, *supra* note 190.

[193] *Id.*

[194] Chicago Convention, *supra* note 41, arts. 84, 85.

[195] *Id.* art. 88.

[196] *Id.* art. 87.

[197] Mathieu Vaugeois, *Settlement of Disputes at ICAO and Sustainable Development*, *in* Occasional Paper Series: Sustainable International Civil Aviation 1, 4 (McGill Univ. Ctr. for Rsch. in Air and Space L. ed., 2016).

[198] *Id.* at 6.

[199] *Id.*

before member states revoke certificates, and it would take significant noncompliance with ICAO standards to reach this point.

The aviation industry's support of the new rule largely relies on the need for uniform, global standards.[200] They argue that without these standards, the United States' airworthiness certificates will no longer be recognized by ICAO, creating a competitive disadvantage for United States aircraft manufacturers.[201] Aside from considering ICAO's complex dispute system, this argument also ignores the plain language of ICAO requirement.[202] The requirement says member states' standards must be *at least as stringent as* ICAO standards if they want their airworthiness certificates to be recognized.[203] The only way for a certificate to be denied recognition is if the member states' standards fall *below* the strength of ICAO standards.[204] Nothing in this requirement prevents the EPA from going beyond ICAO standards and having more stringent standards.[205]

The aviation industry's argument that different regulations would revoke their airworthiness certificates suggests that environmental groups want less stringent standards.[206] This logic mischaracterizes the request of environmental proponents. The problem is not with the regulation in general; the problem is with the stringency—or lack thereof—of the standards. The severity of climate change demands standards that actually reduce

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[200] Coral Davenport, *E.P.A. Proposes Airplane Emission Standards That Airlines Already Meet*, N.Y. TIMES (July 22, 2020), https://www.nytimes.com/2020/07/22/climate/airplanes-climate-change.html [https://perma.cc/U82V-PH8A].

[201] Gen. Elec. Co., Comment Letter on Proposed Rule for Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures (Oct. 19, 2020), https://www.regulations.gov/comment/EPA-HQ-OAR-2018-0276-0157 [https://perma.cc/D8SJ-9UXS].

[202] *See* Chicago Convention, *supra* note 41, art. 38.

[203] *International Civil Aviation Organisation (ICAO)*, SKYBRARY, https://www.skybrary.aero/index.php/International_Civil_Aviation_Organisation_(ICAO) [https://perma.cc/AST3-ZRAG] (Apr. 3, 2019, 2:04 PM); *see* Chicago Convention, *supra* note 41, art. 33.

[204] *See* Chicago Convention, *supra* note 41, art. 33.

[205] *See* Mark Edward Peterson, *The UAV and the Current and Future Regulatory Construct for Integration into the National Airspace System*, 71 J. AIR L. & COM. 521, 559 n.197 (2006).

[206] *See* Env't Def. Fund, Inst. for Pol'y Integrity at N.Y. Univ. Sch. of L., Mont. Env't Info. Ctr., Nat. Res. Def. Council, Sierra Club & Union of Concerned Scientists, Comment Letter on Proposed Rule for Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures 18 (Oct. 19, 2020), https://www.regulations.gov/comment/EPA-HQ-OAR-2018-0276-0183 [https://perma.cc/3CJA-KX8J].

emissions.[207] Stronger standards could do this without disqualifying the United States from using the ICAO certification process.[208] An example of a vastly different regulatory scheme for emissions is the European Union Emissions Trading System (EU ETS). The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is ICAO's global offsetting scheme used by airlines and aircraft operators.[209] EU ETS is a cap-and-trade emissions regulatory scheme for nations in the EU.[210] While both frameworks have similar goals, they accomplish them in vastly different ways. Nonetheless, EU ETS and ICAO negotiated to allow both systems to coexist.[211] There are significant administrative challenges to existing side-by-side, but until ICAO implements CORSIA, EU ETS only applies to flights in the European Economic Area.[212] If EU ETS and ICAO can coincide, then more stringent standards from the EPA will not be a problem.

Further, if a member state decides to adopt a more stringent standard, the only burden is the requirement to notify ICAO of any differences in their rule from ICAO standards.[213] These differences are published by the FAA in the Aeronautical Information Publication (AIP).[214] Every member state publishes an AIP, which is updated on a twenty-eight-day cycle.[215] The AIPs of each member state are readily available online.[216] Annex 16 to the Chicago Convention discloses the differences from ICAO

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[207] *See* Elizabeth Dunbar, *Is 2030 the Deadline for Climate Action?*, MINN. PUB. RADIO NEWS: CLIMATE CURIOUS (Oct. 22, 2019, 4:04 PM), https://www.mprnews.org/story/2019/10/22/climate-curious-is-2030-the-deadline-for-climate-action [https://perma.cc/4BKX-SCN2].

[208] *See* Chicago Convention, *supra* note 41, art. 33.

[209] *CORSIA Explained*, AVIATION BENEFITS BEYOND BORDERS, https://aviationbenefits.org/environmental-efficiency/climate-action/offsetting-emissions-corsia/corsia/corsia-explained/ [https://perma.cc/BK68-GKZ7].

[210] *EU Emissions Trading System (EU ETS)*, EUR. COMM'N, https://ec.europa.eu/clima/policies/ets_en [https://perma.cc/5UX9-3RTC].

[211] *Reducing Emissions from Aviation*, EUR. COMM'N, https://ec.europa.eu/clima/policies/transport/aviation_en [https://perma.cc/M5DA-7PX7].

[212] *Id.*

[213] Chicago Convention, *supra* note 41, art. 38.

[214] *Aeronautical Information Publications (AIPs)*, SKYBRARY, https://www.skybrary.aero/index.php/Aeronautical_Information_Publications_(AIPs) [https://perma.cc/4TWH-EAP3] (July 20, 2017, 1:44 PM).

[215] *Id.*

[216] *See Unmanned Aircraft Systems (UAS) Resources: Electronic AIPs by Country (Alphabetical)*, EMBRY-RIDDLE AERONAUTICAL UNIV.: HAZY LIBR. & LEARNING CTR., https://erau.libguides.com/UAS/eAIP [https://perma.cc/99CV-NNEC] (July 12, 2021, 11:51 AM).

standards regarding environmental protection.[217] There are countless changes noted in the AIP for aircraft noise alone.[218] Therefore, it appears to be at least possible to stray from the exact ICAO standards.

In fact, not only is it possible, but it has also happened before. The EPA did this when they phased out in-service aircraft due to noise on a faster timeframe than called for by ICAO standards.[219] ICAO allowed member states with "serious airport noise problems" to implement the phase-out program more aggressively.[220] Not only was this a change from ICAO standards, but it also came with compliance costs nearing at least $2.1 billion, according to the 1990 General Accounting Office report.[221] Promulgating more stringent emissions standards would not be the first break from ICAO standards for the United States.

Beyond the notification requirement, ICAO does not stand in the way of the EPA adopting more stringent carbon emissions standards. As long as the EPA promulgates standards at least as stringent as ICAO's, the airworthiness certificate will be recognized. Thus, without the risk of losing recognition of the certificates, there is not a competitive disadvantage for having more stringent standards.

B. EPA Standards Violate the Clean Air Act

The primary purpose of the CAA is pollution prevention.[222] Congress defined "pollution prevention" as "the reduction or elimination, through any measures, of the amount of pollutants produced or created at the source."[223] The entire goal Congress

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[217] Chicago Convention, *supra* note 41, annex 16.

[218] *See GEN 1.7 Differences from ICAO Standards, Recommended Practices, and Procedures*, Fed. Aviation Admin., https://www.faa.gov/air_traffic/publications/atpubs/aip_html/part1_gen_section_1.7.html [https://perma.cc/Y39E-LDAU] (Aug. 5, 2021).

[219] 49 U.S.C. § 47528(a); U.S. Gen. Acct. Off., GAO-01-1053, Aviation and the Environment: Transition to Quieter Aircraft Occurred as Planned, but Concerns About Noise Persist 1, 35 (2001), https://www.gao.gov/assets/gao-01-1053.pdf [https://perma.cc/97F9-4PAG] [hereinafter Aviation and the Environment].

[220] Int'l Civ. Aviation Org., *Agenda Item 2: Review of Aviation Emissions Related Activities Within ICAO and Internationally: Parallels Between Noise and CO_2 Environmental Goals* ¶ 2.2 (Int'l Civ. Aviation Org. Working Paper No. GIACC/3-IP/1, 2009), https://www.icao.int/environmental-protection/GIACC/Giacc-3/Giacc3_ip01_en.pdf [https://perma.cc/2GWM-PM5Z].

[221] Aviation and the Environment, *supra* note 219.

[222] 42 U.S.C. § 7401(b)–(c).

[223] *Id.* § 7401(a)(3).

had in mind with the CAA was actually to *reduce* pollution and emissions.[224] As previously discussed, for the EPA to regulate emissions, the EPA must demonstrate the pollutant "endanger[s] public health or welfare."[225] Following this directive, the EPA would not be able to regulate emissions if there was not a clear need to reduce its impact on society's health and welfare.[226] It logically follows that such regulation should actually reduce emissions.

The EPA's transparency regarding the new rule's impact has been crystal clear: no anticipated reduction in emissions.[227] As explicitly stated in the final rule, the EPA does not expect a reason for "manufacturers to make technical improvements to their airplanes that would not have occurred in the absence of the rule."[228] There is effectively no change happening that would not happen without the rule.[229] Not only does the current technology in place already meet the standards, but in 2019, aircraft were already 6% *more* fuel-efficient than the standards require.[230] The very few planes that do not already comply with the new standards will be out of use before the effective date in 2028.[231]

In the *National Association of Clean Air Agencies* case, the D.C. Circuit Court found that the EPA is not compelled to regulate at the "greatest degree of emission reduction achievable."[232] Further, the circuit court agreed that the EPA is not required to "achieve a 'technology-forcing' result" and has large discretion in "determining what standard is most reasonable for aircraft

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[224] *The Clean Air Act*, UNION OF CONCERNED SCIENTISTS, https://www.ucsusa.org/resources/clean-air-act [https://perma.cc/3C4Q-XF7W] (Feb. 1, 2012); *see* Statement by President George Bush upon Signing S. 1630, 26 WEEKLY COMP. PRES. DOC. 1824 (Nov. 19, 1990).

[225] 42 U.S.C. § 7571(a)(2)(A); *see* discussion *supra* Section III.D.

[226] *See* 42 U.S.C. § 7571(a)(2)(A).

[227] Lee, *supra* note 28; *see* Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. 2136, 2165 (Jan. 11, 2021) (to be codified at 40 C.F.R. pts. 87, 1030).

[228] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2167.

[229] Press Release, Annie Petsonk, International Couns., Env't Def. Fund, EPA's Proposed Aircraft CO_2 Standard Wholly Insufficient to Tackle Climate Change (July 22, 2020), https://www.edf.org/media/epas-proposed-aircraft-co2-standard-wholly-insufficient-tackle-climate-change [https://perma.cc/7G8R-DWN8].

[230] Cirium, *supra* note 14.

[231] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2167.

[232] Nat'l Ass'n of Clean Air Agencies v. EPA, 489 F.3d 1221, 1226 (D.C. Cir. 2007) (citations omitted).

engines."[233] In this case, the EPA lowered permissible nitrous oxide emissions reductions from 16% to 12% to reflect the new ICAO standards.[234] The court found that the EPA was not required to adopt the more stringent measures simply because they reduced emissions the most.[235] However, there is a significant distinction between the nitrous oxide emissions regulations and the new carbon dioxide emissions: the carbon dioxide regulations do not reduce current emissions *at all*.[236] The nitrous oxide regulation options were between varying reduction percentages, while the new carbon dioxide standards do not reduce emissions in the first place.[237] The *National Association of Clean Air Agencies* case emphasizes the EPA's regulatory discretion, but the new standards do not even qualify for this permitted deference.

In sum, the new carbon dioxide emissions standards for aircraft do not meet the CAA requirements. The EPA is granted significant deference in choosing the appropriate and reasonable standards, but there must be an actual reduction for this deference to apply. The EPA's new standards fail to accomplish this.

C. The Industry Is Ready For More Stringent Standards

Aviation manufacturers and industry leaders insist on the importance of having necessary lead times of eight to ten years.[238] Manufacturers design planes eight to ten years in advance, so it is important they consider the appropriate standards that will be in place that far in the future.[239] Because of this extended lead time, these obsolete standards will lock the requirements in place for at least a decade.[240] The effective date for the new stan-

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[233] *Id.*

[234] *Id.* at 1225.

[235] *Id.* at 1230.

[236] *See* Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2167.

[237] *See id.*

[238] *Id.* at 2147; *see generally* John Andrew Marsh, Framework and Strategies for Reducing Aircraft Lead Time (May 9, 2014) (M.B.A. thesis, MIT Sloan School of Management, and M.S.M.E. thesis, MIT Department of Mechanical Engineering), https://dspace.mit.edu/bitstream/handle/1721.1/90755/891370270-MIT.pdf?sequence=2&isAllowed=y [https://perma.cc/BVL4-9BJJ].

[239] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2147.

[240] *U.S. EPA Finalizing First-Ever Airplane Emissions Rules*, CNBC, https://www.cnbc.com/2020/12/28/us-epa-finalizing-first-ever-airplane-emissions-rules-.html [https://perma.cc/E9AB-KDW8] (Dec. 28, 2020, 11:47 AM).

dards is 2028—seven years from now.[241] In the last ten years, aviation emissions increased by 44%.[242] If this pace is kept, emissions will triple again by 2050.[243] While recognizing the importance of giving the aviation industry time to adjust to new standards, there must be some level of compromise.

The CAA was not ignorant of the necessary lead time aircraft manufacturers uniquely require. Section 231(b) of the Act mandates EPA regulations take effect only after the necessary period "to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance."[244] On the other hand, there is not unlimited time for the aviation industry to increase its fuel efficiency.[245] Many argue that the CAA was intended to be "technology-forcing."[246] Technology-forcing is a strategic regulatory scheme that establishes "currently unachievable and uneconomic performance standards to be met at some future point in time."[247] There is usually an allotted period for industries to research and develop technology that complies with the new standards.[248] This scheme is often thought to incentivize technology development and innovation better than other regulatory methods.[249] There is usually an asymmetry of information between industries and Congress.[250] Industries may tend to "exploit this information asymmetry by" minimizing their actual technology capabilities, "underinvesting in R&D, and claiming that the standards cannot be met."[251] Congress is often in no position to disagree because

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[241] Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2148.

[242] XINYI SOLA ZHENG & DAN RUTHERFORD, INT'L COUNCIL ON CLEAN TRANSP., FUEL BURN OF NEW COMMERCIAL JET AIRCRAFT: 1960 TO 2019 1 (2020).

[243] *Id.*

[244] 42 U.S.C. § 7571(b).

[245] *See* Dunbar, *supra* note 207.

[246] Note, *Forcing Technology: The Clean Air Act Experience*, 88 YALE L.J. 1713, 1714–16 (1979).

[247] John Miranowski, *Technology Forcing and Associated Costs and Benefits of Cellulosic Ethanol*, CHOICES, 1st Quarter 2014, at 1, https://www.choicesmagazine.org/UserFiles/file/cmsarticle_365.pdf [https://perma.cc/M76A-LRW5].

[248] *Id.*

[249] *Id.*

[250] David Gerard & Lester B. Lave, *Implementing Technology-Forcing Policies: The 1970 Clean Air Act Amendments and the Introduction of Advanced Automotive Emissions Controls in the United States*, 72 TECH. FORECASTING & SOC. CHANGE 761, 764 (2005).

[251] *Id.*

of its lack of information.[252] Technology-forcing standards encourage innovation while also effectively regulating emissions.

The best example of technology-forcing standards is the CAA's standards for automobile emissions.[253] Smog and pollution from cars were growing out of control in the 1950–60s.[254] Technology-forcing policies were adopted after trouble with collusion amongst automobile industry members attempting to discourage stronger emission standards.[255] Amendments to the CAA in 1970 allowed for infeasible standards, and the Supreme Court in *Union Electric Co. v. EPA* agreed the scheme was intended to incentivize "rapid improvements in air pollution control technology."[256] The EPA reported that "new passenger vehicles are 98–99% cleaner for most tailpipe pollutants" than in the 1960s.[257] "[L]evels of lead in the air decreased by 94% between 1980 and 1999."[258] The EPA even claims this improvement is from EPA vehicle emissions standards and says they "directly sparked the development and implementation of a range of technologies."[259]

Aviation industry members urge the EPA not to impose stricter standards because of the cost to manufacturers to invest in new technology. In the long run, reductions in air pollution prove to be very cost-effective.[260] The EPA states that Americans receive nine dollars' worth of benefits to public health and the environment for every dollar spent on emission reduction programs.[261] On top of that, jobs are created to enforce the emissions reduction programs. The EPA proudly states that the "vehicle emissions control industry employs approximately 65,000 Americans with domestic annual sales of 26 billion."[262]

Further, this argument completely disregards the significant growth the aviation industry has already achieved. There is an

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[252] *Id.*

[253] Miranowski, *supra* note 247.

[254] Gerard & Lave, *supra* note 250, at 765–66.

[255] Miranowski, *supra* note 247.

[256] *Id.*; *see* Union Elec. Co. v. EPA, 427 U.S. 246, 256–58 (1976).

[257] *History of Reducing Air Pollution from Transportation in the United States*, EPA, https://www.epa.gov/transportation-air-pollution-and-climate-change/accomplishments-and-success-air-pollution-transportation [https://perma.cc/BE95-QWQW] (Apr. 7, 2021).

[258] *Id.*

[259] *Id.*

[260] *Id.*

[261] *Id.*

[262] *Id.*

industry-wide strategy of cutting 2005 net carbon emissions in half by 2050.[263] This goal pushes the aviation industry to develop its fuel-efficient technologies.[264] U.S. aircraft have improved their fuel efficiency by nearly 40% between 2000 and 2019.[265] Airlines and manufacturers are investing millions in creating more sustainable aircraft.[266] Airbus recently unveiled their fleet of zero-emission aircraft powered by hydrogen technology rather than kerosene-based fuel and hope to begin flying by 2035.[267] Airbus is also exploring a propeller aircraft or blended wing concept, comparable to the U.S. military aircraft B-2 Spirit.

Similarly, Boeing's 787 Dreamliner sparked a new generation of planes, which increased fuel efficiency by nearly 25% from its older aircraft.[268] This wave of innovation is not limited to the dominating corporations like Airbus and Boeing.[269] A Colorado aerospace startup, Boom, is drawing attention for its plan of building a Concorde-like aircraft that uses sustainable fuels but can also break the sound barrier.[270] Both Japan Airlines and Virgin Atlantic Airways have invested in the startup.[271] The U.S. Air Force has contracted Boom to study supersonic transportation as a potential future Air Force One aircraft.[272] San Francisco has partnered with Neste, a Finnish company, to support alternative fuel options.[273] Neste recently announced a collaboration with Shell to produce more biofuel options.[274] JetBlue also committed to utilizing sustainable fuels for its flights from the San Francisco airport.[275] While technology-forcing standards would cause potential disruption to manufacturers, their efforts clearly would not be starting from zero. The aviation industry's innovation has grown far more than it may suggest.

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263 Cirium, *supra* note 14; Lynch, *supra* note 25.

264 Lee, *supra* note 28.

265 *Id.*

266 Thomas Pallini, *Airbus' New Zero-Emission Concepts Reveal the Direction of the Aviation Industry's Planes of the Future—Here's Why Today's Aircraft Aren't Cutting It*, BUS. INSIDER (Sept. 27, 2020, 7:22 AM), https://www.businessinsider.com/airbus-new-zero-emission-aircraft-history-of-sustainable-planes-2020-9 [https://perma.cc/56TZ-DD3F].

267 *Id.*

268 *Id.*

269 *Id.*

270 *Id.*

271 *Id.*

272 *Id.*

273 *Id.*

274 *Id.*

275 *Id.*

In the end, the aircraft manufacturing industry is not entirely unprepared for advancing fuel-efficiency technology. Industry leaders across the globe are moving in this direction without the new regulations. Thus, adopting stricter standards would only encourage more movement.

D. The Standards Are Arbitrary and Capricious

The EPA's new standards for aircraft emissions were passed as informal rulemaking under § 553 of the Administrative Procedure Act.[276] While agencies are usually granted significant deference in making decisions and promulgating rules, a rule may be set aside under judicial review if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."[277] A court cannot replace its judgment with the agency's judgment, but the agency "must examine the relevant data and articulate a satisfactory explanation for its action."[278] The EPA rules are arbitrary and capricious if the agency "relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation . . . that runs counter to the evidence before the agency . . . ."[279] In *Motor Vehicle Manufacturers Ass'n of the United States, Inc. v. State Farm Mutual Automobile Insurance Co.* the United States Supreme Court found that the National Highway Traffic Safety Administration's (NHTSA) rescission of the automatic seatbelt requirement was arbitrary and capricious.[280] The Court held that failing to consider modifying the automatic seatbelts and failing to give any suitable explanation for changing its approach made the EPA's action arbitrary and capricious.[281] Further, the EPA did not sufficiently consider whether airbags would be an appropriate replacement for automatic seatbelts.[282] Overall, the EPA's failure to explain its reasoning and assessment of alternatives was arbitrary and capricious.[283]

Here, the EPA's decision-making closely aligns with the NHTSA's. The CAA, in § 231, mandates important factors to

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[276] 5 U.S.C. § 553.

[277] Citizens to Pres. Overton Park, Inc. v. Volpe, 401 U.S. 402, 403 (1971).

[278] Motor Vehicle Mfrs. Ass'n of U.S. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 30 (1983).

[279] *Id.* at 43.

[280] *Id.* at 46.

[281] *Id.* at 48.

[282] *Id.*

[283] *See id.*

consider in creating aircraft emissions standards.[284] These factors include how emissions contribute to air pollution; endangerment of public health and welfare; and noise, safety, and technology requirements.[285] Notice that Congress did *not* include considerations of global unity and aviation industry benefit in the statute.[286] Nearly the entire justification for the rule is based on the competitive advantage for the aviation industry to have globally unified standards.[287] There is no explanation of how the new standards will reduce emissions, affect air pollution, or benefit public health.[288] The statute even allows the EPA to reject certain standards if they create a hazard to air safety, but the EPA does not even mention safety concerns.[289] Nowhere in the rule does the EPA adequately explain how the new standards will accomplish the goals of the CAA.[290] The EPA overrelied on impacts to the aviation industry and global unity, making this action arbitrary and capricious.[291]

As discussed in the comment submitted by Earthjustice and several other advocacy groups, the EPA did not adequately consider appropriate alternatives to the new standard.[292] In the rule, the EPA briefly mentions that it considered two other alternative standards, but ultimately, the alternative standards were not worth the burden of breaking with global harmonization.[293] One of the alternatives was moving the effective date up by five

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284 42 U.S.C. § 7571.

285 *Id.* §§ 7571(a)(2)(A), (b)–(c).

286 *See id.* § 7571.

287 *See* Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. 2136, 2165–66 (Jan. 11, 2021) (to be codified at 40 C.F.R. pts. 87, 1030).

288 Ctr. for Biological Diversity, Earthjustice, Sierra Club, Friends of the Earth & Nat. Res. Def. Council, Comment Letter on Proposed Rule for Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures 13 (Oct. 16, 2020), https://www.regulations.gov/comment/EPA-HQ-OAR-2018-0276-0150 [https://perma.cc/X7BU-PWFD].

289 42 U.S.C. § 7571(c).

290 Ctr. for Biological Diversity et al., *supra* note 288.

291 Christopher Surgenor, *US Environmental Groups Say Proposal by EPA to Adopt Rules Equivalent to ICAO Aircraft CO2 Standards Is Illegal*, GREEN AIR (Nov. 9, 2020), https://www.greenairnews.com/?p=303 [https://perma.cc/B43N-W5P6?type=image].

292 Ctr. for Biological Diversity et al., *supra* note 288.

293 Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. 2136, 2145 (Jan. 11, 2021) (to be codified at 40 C.F.R. pts. 87, 1030).

years.[294] The EPA found this rule had limited additional costs but offered no greater reduction in emissions.[295] This is because even in five years' time, all but one noncompliant plane model will be at the end of its term.[296] The second alternative also moved up the effective date but imposed more stringent standards as well.[297] The EPA found that this approach gave greater reductions in emissions with limited costs, but not enough to justify breaking from global standards.[298]

Notably, this second alternative was the scheme the United States supported in negotiations for ICAO standards.[299] ICAO discussed ten sets of standards in choosing which one to adopt.[300] The two alternatives the EPA considered were both options for ICAO standards.[301] The standard that ICAO chose was not the standard the United States supported.[302] But, similar to the *State Farm* case, the EPA did not explain why it no longer thought this alternative was sufficient.[303] Wouldn't the EPA have data and studies to support this alternative during ICAO negotiations?[304] Suddenly, the EPA no longer supported the standard and failed to disclose why in the new rule.[305] Instead, the EPA stated that the alternative is not worth "deviating from the international standards and disrupting international harmonization."[306] The EPA must adequately explain why its previously

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294 EPA, EPA-420-R-20-028, AIRPLANE GREENHOUSE GAS STANDARDS: TECHNICAL SUPPORT DOCUMENT (TSD) 130 (2020), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1010U0W.pdf [https://perma.cc/22QB-ZMBA] [hereinafter TECHNICAL SUPPORT DOCUMENT].

295 Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2145.

296 TECHNICAL SUPPORT DOCUMENT, *supra* note 294.

297 *Id.*

298 Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2145.

299 TECHNICAL SUPPORT DOCUMENT, *supra* note 294, at 131.

300 *Id.* at 123–24.

301 *Id.* at 131.

302 *See generally United States Position on the ICAO Aeroplane CO2 Emissions Standard*, EPA (Feb. 1–12, 2016), https://www.regulations.gov/document/EPA-HQ-OAR-2018-0276-0002 (click "Download") [https://perma.cc/6UYZ-PYHL].

303 *See* Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2145; *see* Motor Vehicle Mfrs. Ass'n of U.S. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983).

304 *See* Ctr. for Biological Diversity et al., *supra* note 288.

305 *See* Control of Air Pollution from Airplanes and Airplane Engines: GHG Emission Standards and Test Procedures, 86 Fed. Reg. at 2145.

306 *Id.*

supported rule is no longer worth pursuing.[307] Because the EPA failed to discuss its change of mind, its action is arbitrary and capricious.[308]

Earthjustice's submitted comment also raised a crucial issue with how the EPA analyzed the second alternative.[309] The EPA concluded that emissions reductions with this alternative were limited because of the impacts from one airplane model—the Airbus A380.[310] In the Technical Support Documents to the rule, the EPA fully acknowledged that although one model largely influenced the analysis, the analysis was done before Airbus announced the end of production of that exact model.[311] So, the analysis results for the second alternative are no longer accurate, but the EPA failed to give the option adequate consideration in light of this announcement.[312] Accordingly, this behavior is blatantly arbitrary and capricious because the EPA used an inaccurate and outdated analysis for the alternative.[313]

Ultimately, given the failure to sufficiently consider congressionally mandated factors, overreliance on external factors, and inaccurate analysis of alternatives, the EPA action is clearly arbitrary and capricious.

E. Future Action

In January 2021, eleven states and the District of Columbia strongly urged the EPA to strengthen the newly adopted standards.[314] The state attorneys general, led by California, argued that the EPA must adopt more effective standards to mitigate existing and growing climate damage.[315] Other states joining the fight include Connecticut, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, New York, Oregon, Vermont, and Washington.[316] On January 15, 2021, a coalition of environmental groups including Earthjustice, Sierra Club, Friends of the Earth,

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[307] *See State Farm*, 463 U.S. at 46–51.

[308] *See* Ctr. for Biological Diversity et al., *supra* note 288.

[309] *Id.* at 16.

[310] Technical Support Document, *supra* note 294, at 134–35.

[311] *Id.*

[312] *Id.*

[313] Ctr. for Biological Diversity et al., *supra* note 288, at 16.

[314] David Shepardson, *Eleven U.S. States Urge EPA to Toughen Planned Airplane Emissions Rules*, Reuters, https://www.reuters.com/article/us-usa-airlines-emissions/eleven-u-s-states-urge-epa-to-toughen-planned-airplane-emissions-rules-idUSKBN2742QI [https://perma.cc/G6UE-QCYW] (Oct. 19, 2020, 3:19 PM).

[315] *Id.*

[316] *Id.*

and the Center for Biological Diversity filed a lawsuit in the U.S. Court of Appeals for the D.C. Circuit against the EPA.[317] This group attacked the Trump administration for its obsolete standards and urges the court to challenge the adoption of the standards.[318]

President Biden campaigned on a strong platform for environmental protection and policy.[319] Many of his promised policies include the Green New Deal, net-zero emissions, and stronger infrastructure to withstand the impacts of climate change. President Biden began to roll out these policies by rejoining the Paris Climate Agreement.[320] On January 20, 2021, President Biden signed the executive order, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis."[321] This executive order highlights several regulations and policies the administration seeks to reevaluate to promote climate protection, specifically in aviation.[322] On January 27, 2021, President Biden signed a similar executive order titled "Tackling the Climate Crisis at Home and Abroad" that mentions similar goals as the aforementioned executive order.[323] While these promises and steps are in the right direction, the partisan nature of climate change often dampers strong policies.[324] The future of emissions regulation appears unclear.

VI CONCLUSION

In conclusion, the EPA's new aircraft carbon emissions standards fell short of providing effective change. Climate change impacts every facet of the environment, and greenhouse gases

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317 Press Release, Ctr. for Biological Diversity, Lawsuit Challenges Trump Administration's Failure to Cut Airplane Climate Pollution: First-Ever Airplane Emissions Rule Fails to Reduce Greenhouse Gases (Jan. 15, 2021), https://biologicaldiversity.org/w/news/press-releases/lawsuit-challenges-trump-administrations-failure-to-cut-airplane-climate-pollution-2021-01-15/ [https://perma.cc/EB53-XBG7].

318 *Id.*

319 *The Biden Plan for a Clean Energy Revolution and Environmental Justice*, DEMOCRATIC NAT'L COMM., https://joebiden.com/climate-plan/ [https://perma.cc/3NB8-A8U8].

320 Rott, *supra* note 37.

321 Exec. Order No. 13,990, 86 Fed. Reg. 7037, 7037 (Jan. 20, 2021).

322 *Id.* at 7040.

323 *See generally* Exec. Order No. 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021).

324 *Public Divides over Environmental Regulation and Energy Policy*, PEW RSCH. CTR. (May 16, 2017), https://www.pewresearch.org/science/2017/05/16/public-divides-over-environmental-regulation-and-energy-policy/ [https://perma.cc/J5HZ-4FX9].

produced from emissions drive the damage. The EPA's proud claim that this is a milestone in climate protection is deceptive. The finalized rule adopted the equivalent of ICAO standards, which an overwhelming majority of manufacturers already meet. Because of these obsolete standards, aircraft carbon emissions levels will be locked in for years to come. The aircraft industry praises the EPA for its commitment to global harmonization. Environmental activists correctly criticize the sufficiency of the standards for several reasons. First, the EPA created a fictitious barrier by claiming they cannot impose more stringent standards than ICAO. The EPA also violated the CAA by not promulgating standards that actually reduce emissions. Additionally, the aviation industry drives its fuel-efficiency technological developments and is prepared to take a step further in this direction. And lastly, the EPA's action is arbitrary and capricious because the EPA failed to adequately consider alternatives and relied too heavily on external factors. It is vital for the protection of our planet that the EPA reconsider the emissions standards that satisfy these legal obligations.