Insight

Regulating Airplane Greenhouse Gas Emissions

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Executive Summary

- The Environmental Protection Agency (EPA) has issued a first-ever proposed rule to establish greenhouse gas emissions standards for aircraft.
- The rule is based on the United Nations International Civil Aviation Organization's carbon dioxide emissions standards for new aircraft and engines.
- The rule's adoption will allow domestic aircraft manufacturers to continue operating within the global marketplace by certifying their products meet international standards.

Introduction

This week the Environmental Protection Agency (EPA) announced the issuance of the "Control of Air Pollution from Aircraft and Aircraft Engines: Proposed Greenhouse Gas Emissions Standards and Test Procedures" proposed rule. If finalized, this rule will be the first regulation governing aircraft greenhouse gas (GHG) emissions, particularly carbon dioxide, in the United States. The transportation sector is now the leading contributor of carbon dioxide emissions in the United States, and air travel accounts for 12 percent of those emissions.

The proposed rule mirrors standards created by the United Nations International Civil Aviation Organization (ICAO), of which the United States is a member. By instituting a standard that is in line with the international community, domestic manufacturers are guaranteed regulatory uniformity with their competitors abroad.

The Proposed Rule

The proposed rule is not the first EPA regulation to take ICAO standards into consideration. Historically, international emission standards for pollutants have first been adopted by ICAO, and then by the EPA under Clean Air Act (CAA) section 231 to establish domestic standards that are at least as stringent as those of ICAO. Under CAA section 232, the Federal Aviation Administration (FAA) is then required to issue regulations that ensure compliance with the EPA aircraft engine emission standards when issuing airworthiness certificates.[1]In 1997, the EPA issued its final rule for the emissions of nitrous oxides and carbon monoxide based on the ICAO's standards. Those standards will be updated by this rulemaking in accordance with the current ICAO standards.

The ICAO began its pursuit of greenhouse gas standards over a decade ago when it established three environmental goals to limit or reduce the number of people affected by significant aircraft noise, the impact of aviation emissions on local air quality, and the impact of aviation GHG emissions on the global climate.[2] According to ICAO's Aviation and Environmental Outlook, in 2015, international aviation consumed approximately 160 million metric tons (Mt) of fuel, resulting in 506 Mt of carbon dioxide emissions. By 2045, fuel consumption is projected to increase by 2.2 times, or 3.1 times the 2015 value.[3] Efficiencies in the operations of aircraft and airports, in combination with advanced fuels will likely slow the growth of emissions as consumptions increases, but increased emissions are expected.

ICAO's standards were adopted in 2017 and are based on the ICAO's carbon dioxide metric system. This metric is a measure of aircraft fuel burn performance created by considering fuel burn at three different points within an aircraft's flight at a specific altitude.[4] The metric is specifically concerned with the emission of carbon dioxide and nitrous oxide. ICAO determined that the standard would apply to new aircraft type designs from 2020, and to aircraft type designs already in production as of 2023. The designs of those in-production aircraft that do not meet the standard by 2028 will be modified.[5]

The EPA's proposed rule follows the ICAO's standards and applies to the manufacturers of new aircraft and aircraft engines rather than operators, such as airlines. In particular, it is applicable to certain classes of engines used by civil subsonic jet airplanes with a maximum takeoff mass greater than 5,700 kilograms (kg) and by civil larger subsonic propeller-driven airplanes with turboprop engines having a maximum takeoff mass greater than 8,618 kg. When the EPA's rule and FAA's follow-on rule are finalized, such aircraft produced domestically will be able to certify their adherence to international standards.

Why Now?

According to an EPA analysis, "all manufacturers have products that either already meet the

standards or have new products under development that will meet the standards by their effective dates."[6] The EPA explained that, as a result, manufacturers would not see additional costs in adhering to the rule beyond relatively minimal reporting costs.

The rule has been criticized as ineffective because it fails to impose more stringent standards on fuel burn performance. While the proposed rule will not reduce greenhouse gas emissions, it will prevent backsliding as new fuel sources are developed or technologies are implemented. And with the ability to certify the performance at home, domestic producers will not be impeded in continuing to participate in the global marketplace.

[1] https://www.epa.gov/sites/production/files/2020-07/documents/aircraft-ghg-nprm-2020-07-22.pdf

[2] https://www.epa.gov/sites/production/files/2020-07/documents/aircraft-ghg-nprm-2020-07-22.pdf

[3] https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg17-23.pdf

[4] https://www.icao.int/environmental-protection/Documents/CO2%20Metric%20System%20-%20Information%20Sheet.pdf

[5] https://www.icao.int/newsroom/pages/icao-council-adopts-new-co2-emissions-standard-for-aircraft.aspx

[6] https://www.epa.gov/sites/production/files/2020-07/documents/420d20004.pdf