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**BEFORE THE SELECT COMMITTEE ON ENERGY INDEPENDENCE  
AND GLOBAL WARMING  
U.S. HOUSE OF REPRESENTATIVES  
APRIL 2, 2008**

Mr. Chairman and members of the Committee, I appreciate the opportunity to discuss with you today the important issue of aviation emissions and global warming. My testimony will cover the following items: background information on greenhouse gas (GHG) emissions from aircraft, historical regulation of aircraft emissions, the aircraft GHG petitions we have received, the potential use of biofuels, coordination with FAA, and the European Union Emissions Trading Scheme.

The compounds emitted from aircraft jet engines that directly relate to climate change are carbon dioxide (CO<sub>2</sub>) and small amounts of methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). Aircraft operations in the U.S. are estimated to account for about 10 percent of GHG emissions from the U.S. transportation sector. Compared to all sectors in the U.S., aircraft operations account for approximately 3 percent of total U.S. GHG emissions.

Aircraft also emit other compounds that are indirectly related to climate change such as oxides of nitrogen (NO<sub>x</sub>), water vapor, and aerosols. NO<sub>x</sub> is a precursor to cruise-altitude ozone, which is a GHG. An increase in ozone also results in increased tropospheric hydroxyl radical (OH) and reduced CH<sub>4</sub>, and thus offsetting the warming

effect from the increase in ozone. Water vapor and aerosols modify cloud cover, which in turn can either amplify or dampen global warming.

Section 231 of the Clean Air Act gives EPA authority to determine whether aircraft emissions contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, and to set emissions standards following a positive finding. Section 232 of the Act provides FAA the authority to certify aircraft engines for emissions purposes and enforce compliance with EPA's standards. The United Nations International Civil Aviation Organization (ICAO) is chartered to develop international standards that each sovereign country may then adopt. Historically, the most common way for EPA to set aircraft emissions standards for criteria pollutants has been to follow what is adopted by ICAO. This approach was recently upheld as reasonable by the U.S. Court of Appeals for the D.C. Circuit. FAA leads the U.S. delegation to ICAO, and EPA staff serve as technical advisers.

Thus, international standards are first adopted by ICAO, and subsequently EPA initiates a Clean Air Act rulemaking to establish domestic standards equivalent to ICAO's standards. This long-standing practice assures consistency between U.S. and international standards, requirements, and test procedures. Since aircraft and aircraft engines are international commodities, there is commercial benefit to consistency between U.S. and international emission standards and control program requirements. We have established aircraft emission standards covering criteria pollutants for local air quality; however, these standards do not cover CO<sub>2</sub> and other GHGs.

Commercial aircraft use a petroleum-based fuel commonly referred to as jet A kerosene. Industry (manufacturers, operators and airports) and FAA established the Commercial Aviation Alternative Fuels Initiative (CAAFI) in 2006 to explore the potential use of alternative fuels for aircraft for energy security and possible environmental improvements. CAAFI's goals are to have available for certification in 2008 a 50 percent Fischer-Tropsch synthetic kerosene fuel, 2010 for 100 percent synthetic fuel, and as early as 2013 for other biofuels. However, any alternative fuel will need to be compatible with current jet fuel for commercial aircraft to prevent the need for tank and system flushing on re-fueling and to meet comprehensive performance and safety specifications.

As you may know, in February 2008, Boeing, General Electric, and Virgin Atlantic airlines tested a Boeing 747 that was partly powered by a biofuel made from babassu nuts and coconut oil, a first for a commercial aircraft. Boeing has indicated plans for future tests of this fuel using different engines and aircraft types. The company will also test other types of biofuels.

As you are aware, EPA recently received two separate petitions addressing GHG emissions from aircraft. These petitions ask EPA to: a) find that aircraft-related GHG emissions cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare; b) propose regulations to control such emissions; and c) promulgate final regulations. Also, the petitioners highlighted operational measures

and fuel controls as ways to reduce aircraft GHG emissions. There has been considerable study conducted with respect to GHG emissions from the aviation sector. The next step in our process is to seek public comment on these two petitions, including seeking input on the scientific, policy and technical issues that the petitions raise. We plan to solicit public comment and information on the petitions as part of the Advanced Notice of Proposed Rulemaking that we intend to issue later this Spring. In particular, we will request information on potentially available technological controls for aircraft and their engines and operational measures to reduce emissions from aircraft – including information on what is feasible in the near-term or long-term as well as relevant cost and safety information.

We project that aircraft fuel efficiency will improve in the future due to technology developments for lighter and more aerodynamic aircraft and more efficient engine. U.S. aviation emissions have declined in recent years, but due to the expected increase in air traffic and lead times for technology change, it could prove challenging to continue this declining trend.

With respect to coordination with FAA, various offices within EPA and FAA are in frequent contact regarding aviation and environment issues. We have frequently discussed the relationship between measures to control air pollutants such as NO<sub>x</sub> and engine fuel efficiency as part of our past interagency coordination during the ICAO standards setting processes. EPA has had substantial interactions with FAA in the development of aviation GHG inventories. We expect to continue our coordination with

FAA in developing our responses to the two administrative petitions. Finally, EPA participates in the Environmental Working Group that is developing the environmental strategy for the Next Generation Air Transportation System plan.

In regard to international issues, recently, the European Commission proposed to include by 2012 CO<sub>2</sub> emissions from all flights arriving at or departing from a European Union airport, including U.S.-certified aircraft, in the European Union Emissions Trading Scheme (ETS). It would cap aviation-related CO<sub>2</sub> emissions at 100% of the sector's average emissions during 2004-2006. If the proposal is adopted, airlines from non-EU countries will be required to submit CO<sub>2</sub> allowances to cover emissions from flights that arrive at and depart from European airports during the compliance period, or pay a non-compliance penalty. This proposal provides for exclusion for arriving flights from non-EU countries who adopt equivalent GHG mitigation measures for international aviation. EPA technical staff provided aviation emissions data background and information on cap and trade programs for the interagency discussion, and participated in interagency meetings on the U.S. response, but did not participate directly in the formulation or communication of legal positions with respect to the European Union cap on the emission of GHGs from aviation.

The U.S. and other nations have expressed serious concern about the legality of the proposed EU legislation in the context of both the Chicago Convention of 1944, which established the International Civil Aviation Organization, and bilateral air services agreements. At the 36th Session of the ICAO Assembly in September 2007, there was

focus on aviation emissions related to climate change, including discussions on the use of emissions trading. The Assembly agreed to establish a high-level group through ICAO to develop a framework of action that nations could use to address these GHG emissions. A report with recommendations is due to be completed before the next Assembly Session in 2010. In addition, the Assembly urged all countries to not apply an emissions trading system to other nations' air carriers except on the basis of mutual consent between those nations.

As we go forward, we will keep the Committee apprised of EPA's continued evaluation of issues related to aircraft GHGs and our response to the petitions.

Thank you, Mr. Chairman and the members of the Committee for this opportunity. This concludes my prepared statement. I would be pleased to answer any questions that you may have.