



Aviation and Climate Change The Views of Aviation Industry Stakeholders February, 2009

Introduction and Background



The aviation industry constitutes one of the most dynamic, forward-looking, and innovative sectors of our nation’s economy. Commercial and general aviation are a vital part of the transportation infrastructure, providing mobility to citizens, facilitating commerce and helping to maintain the United States’ global economic leadership. Aviation is a source of many working-family jobs and provides vital links to thousands of communities. Aviation represents approximately 5.6 percent of the nation’s GDP, contributing over \$1.2 trillion annually to the economy and providing 11 million jobs.¹



Aviation has established an outstanding track record in reducing its environmental impact through a combination of regulatory and market forces. We are committed to doing our part to mitigate aviation’s contribution to climate change in a context of continued growth and vitality for the industry. The undersigned stakeholders, representing hundreds of manufacturers and airports, thousands of commercial and private operators, and millions of employees, work hard to connect our world and are committed to working just as hard to protect our planet.



Aviation has worked on limiting emissions associated with climate change for decades. Because of our aggressive pursuit of greater fuel efficiency, greenhouse gas (GHG) emissions from aviation constitute only a very small part of total U.S. GHGs, less than 3 percent.²



Over the past four decades, we have improved aircraft fuel efficiency by over 70 percent³, resulting in tremendous GHG savings. During this time, passenger and cargo traffic increased over six fold, making our industry an extremely GHG-efficient economic driver.⁴ This improvement has been driven by our industry’s market demand for efficiency. Given the significance of fuel costs to the economic viability of our industry, our economic and environmental goals converge. Nonetheless, we also recognize that we have an obligation to further limit aviation’s greenhouse gas footprint even as aviation grows to meet rising demand for transportation around the world.



¹ FAA, “The Economic Impact of Civil Aviation on the U.S. Economy,” (October 2008). Available at: http://www.faa.gov/about/office_org/headquarters_offices/ato/media/2008_Economic_Impact_Report_w_eb.pdf

² This figure includes all U.S. aviation, commercial aviation, general aviation, and the military. U.S. Environmental Protection Agency, *Inventory of Greenhouse Gas Emissions and Sinks: 1990-2006* (April 15, 2008).

³ International Civil Aviation Organization, *Environmental Report 2007*, page 107.

⁴ Our environmental improvements have not only been in the emissions area. Over the same time period we reduced the number of people impacted by aircraft noise by 95%, and reduced oxides of nitrogen emissions substantially – Report to the U.S. Congress: “*Aviation and the Environment - A National Vision Statement, Framework for Goals and Recommended Actions.*” (2005).



This paper does not advocate for or against particular legislative, regulatory or other solutions. Rather it offers a constructive set of principles to frame the discussion of policy tools to address aviation and climate change. These principles represent the shared vision of the labor, manufacturing, operator and service sectors representing every kind of airplane, airport, service provider, and worker in the industry.



It is clear that to further reduce aviation's impact on climate change requires a partnership between the industry, labor and government. The principles outlined below illustrate a broad consensus that is also reflected in much of the environment work at the International Civil Aviation Organization (ICAO) - that solutions lay in four main areas: technology, infrastructure, operations, and economic measures.



General Guiding Principles: The public policy debate over aviation and climate change should be guided by the following overarching principles:

Cost-benefit analysis is vital. Any proposed measures to address aviation's impact on the environment should include a rigorous analysis of the expected benefits weighed against the cost to the economy, industry, jobs, communities, and the transportation infrastructure, and should take account of the costs and benefits of intermodal substitution. Likewise, they should address possible tradeoffs between environmental effects, such as between emissions and noise.

A central framework. The federal government has exclusive jurisdiction over U.S. aircraft regulations. This process should continue to be informed by U.S. participation in international aviation standards and recommended practices set by ICAO. It is critical that this international approach and federal pre-emption be maintained in aviation regulatory matters, as it would be impracticable to subject aircraft to different environmental rules in different jurisdictions. This is why the Federal Aviation Administration (FAA) and Environmental Protection Agency (EPA) retain authority over aviation environmental regulations, and why local limits on airport access such as noise restrictions can be implemented only if they meet strict federal criteria consistent with ICAO standards.

The international dimension. Aviation is a global industry and requires global solutions. This is especially true with climate change, since GHG emissions are long lasting and ubiquitous. Any environmental measures affecting aviation should be in conformity with the policies being developed cooperatively by the 190 contracting states of the Chicago Convention through ICAO, including the prohibition against taxing fuel used in international operations. The integrity of the international aviation system is based on the establishment of limits on the ability of any one country to impact the flying rights of another country. The European Union's (EU) unilateral decision to subject non-EU aviation to its Emissions Trading Scheme (ETS) puts this principle at risk and preempts the international treaty rights of other countries.

Need for a comprehensive energy policy. Climate change policy must be developed in the context of a comprehensive national energy policy that expands environmentally responsible access to domestic energy supply, accelerates development of alternative fuels and promotes conservation and efficiency.

Debate based on facts and science. The public policy debate over aviation and the environment should be informed by science and facts. Aircraft release only one of the six GHGs currently covered by international climate treaties, carbon dioxide (CO₂). The U.N. Intergovernmental Panel on Climate Change (IPCC) has confirmed that we know a lot about CO₂ effects from the multitude of industrial sources in the world, making that the appropriate focus for industry action. But more needs to be known about the effects of water vapor from aviation and of oxides of nitrogen released at altitude. What is known about the atmospheric effects of aviation is the result of the

only IPCC industry-specific study, *Aviation and the Global Atmosphere*⁵, in which the aviation industry played a critical role in providing guidance, data and technical expertise. The aviation industry is strongly supportive of continued research to improve scientific understanding of the effects of non-carbon aviation GHGs and the nature of the nitrogen cycle.

Specific Design Principles: Any initiatives or measures to address aviation and climate change should be based on the following principles:

Air traffic control modernization. The most effective action our nation can take today to reduce aviation's GHG emissions is to modernize the country's antiquated air traffic control (ATC) system. The IPCC estimated in 1999 that "*improvements in air traffic management could help to improve overall fuel efficiency by 6-12%.*"⁶ The Congress should move forward promptly to renew this vital component of the nation's infrastructure and should facilitate acquisition of the necessary equipment by operators for the existing fleet of airplanes so they can operate in a modernized airspace. This is an inherently federal responsibility essential for reducing greenhouse gas emissions.

Technology and research. As noted, we have improved the fuel efficiency of aircraft by over 70 percent over the last four decades and are committed to continuing this trend. New commercial aircraft like the Boeing 787 and new-design business jets, for example, offer double-digit improvements in fuel efficiency over previous generation airplanes. We are also adding aerodynamic improvements such as winglets to the existing fleet wherever we can. These improvements have been driven by customer demand and market forces, not by regulation. In 2001, a report by ICAO's Committee on Aviation Environmental Protection (CAEP) said that market forces made irrelevant the need for any emissions standards for aviation fuel. In fact, during the same period in which jet engine fuel efficiency improved by 70 percent without government carbon emission standards, federal emission standards for the auto industry only produced about a 15 percent improvement.⁷ Further research and development is also necessary to transform the air transportation system. The aviation manufacturing industry is committed to continuing to bring to market more efficient products. Long-term reductions in GHG emissions, however, will depend on new technologies not yet developed. Only the government can provide the necessary level of participation to support and co-finance pre-competitive environmental research and development programs through system demonstration. This type of research has been done in the past by the FAA and the National Aeronautics and Space Administration (NASA). The federal government should restore and significantly increase funding for aeronautics research at the FAA and NASA.

⁵ Intergovernmental Panel on Climate Change (IPCC), *Aviation and the Global Atmosphere*, 1999. Note that the IPCC confirmed its aviation-specific findings again in its Fourth Assessment Report in 2007.

⁶ Intergovernmental Panel on Climate Change (IPCC), *Aviation and the Global Atmosphere*, 1999.

⁷ ICAO Committee on Aviation Environmental Protection Fifth Meeting, *Working Paper CAEP/5-WP/86*, Section 1.1.6.1, page 1-2.

Environmentally friendly alternative aviation fuels. As an industry, we are driving the research, development and deployment of commercially viable, sustainable alternative jet fuels. Most notably in this regard, our industry has worked with the FAA, the Air Force, the Department of Defense, other government agencies, academia, and fuel producers through the Commercial Aviation Alternative Fuels Initiative (CAAIFI) to generate and execute roadmaps to develop, certify and commercially implement such fuels within the next few years. We are committed to ensuring that these fuels are more sustainable on a lifecycle basis than today's jet fuels and that feedstocks used will not compete with food uses. In addition, the general aviation industry, working with fuel producers and the FAA, is committed to the development and deployment of an unleaded aviation gasoline to replace the low-lead fuel used today.

Operational measures. Commercial airlines, their pilots, and general aviation operators have incorporated technological improvements, reduced aircraft weight, modernized their fleets, and improved the efficiency of their operations at every stage of flight and on the ground. The U.S. airlines have committed to a further 30 percent improvement in fuel efficiency between 2005 and 2025. Fuel and emissions saving procedures have already been developed that allow pilots to descend from cruise altitude more efficiently through continuous descent approaches (CDAs) and to navigate more precisely through required navigation procedures (RNP). While many of these procedures are now in use in high density traffic areas, widespread use depends upon the sorely-needed modernized ATC system.

Ground infrastructure investment. Congestion in many parts of the country's aviation system is caused not just by an outdated air traffic control system, but also by constraints on the ground due to inadequate airport infrastructure at our busiest airports. Additional airport infrastructure is needed to ensure that airplanes spend less time circling in congested airspace, get on the ground more quickly and to improve ground movement efficiency. In addition to infrastructure improvements that reduce congestion, many airports are instituting a broad array of measures to reduce the GHG emissions associated with airport operations and facilities, including incorporating energy-efficient and green building concepts, recycling, converting to low emission vehicle fleets, and providing aircraft emission reducing services at gates. Recognition of, and broad support for, continued implementation of such GHG emission-reducing measures are necessary.

Economic measures. Economic measures in the form of positive incentives can further enhance the industry's efforts and augment the gains achieved through regulations and market forces. Measures that impose fees, charges or taxes, whether directly or indirectly are unnecessary and counterproductive in light of industry initiatives. Should any climate measures raise revenues, however, those revenues should be reinvested into aviation to support initiatives that directly reduce aviation's greenhouse gas footprint and for research into technologies that are directly applicable to improving aviation's GHG emissions.

Signatories, February 17, 2009

1. Aerospace Industries Association (AIA)
2. Air Carrier Association of America (ACAA)
3. Aircraft Owners and Pilots Association (AOPA)
4. Air Line Pilots Association, International (ALPA)
5. Airport Consultants Council (ACC)
6. Airports Council International – North America (ACI-NA)
7. Air Traffic Control Association (ATCA)
8. American Association of Airport Executives (AAAE)
9. Cargo Airline Association (CAA)
10. Experimental Aircraft Association (EAA)
11. General Aviation Manufacturers Association (GAMA)
12. Helicopter Association International (HAI)
13. International Air Transport Association (IATA)
14. National Agricultural Aviation Association (NAAA)
15. National Air Carrier Association (NACA)
16. National Air Traffic Controllers Association (NATCA)
17. National Air Transportation Association (NATA)
18. National Association of State Aviation Officials (NASAO)
19. National Business Aviation Association (NBAA)
20. Regional Airline Association (RAA)