Evaluating the Impacts of Aviation on Climate Change

Friday, May 4, 2007
2:00 – 3:30 pm

Abstract: The effects of aircraft emissions on the current and projected climate of our planet may be the most serious long-term environmental issue facing the aviation industry. Projections suggest that over the next several decades, the demand for aviation could grow to as much as three times its present level. This projected growth will likely result in higher aviation emissions and associated impacts on the environment, human health and welfare. However, there remain large uncertainties in our present understanding of the magnitude of climate impacts due to aviation emissions. With extensive growth in demand expected in aviation over the next few decades, it is imperative that timely action is taken to understand and quantify the potential impacts of aviation emissions to help policymakers address climate and other potential environmental impacts associated with aviation.

The climatic impacts of aviation emissions include the direct climate effects from carbon dioxide (CO₂) and water vapor emissions, the indirect forcing on climate resulting from changes in the distributions and concentrations of ozone and methane as a consequence of aircraft nitrogen oxide (NOₓ) emissions, the direct effects (and indirect effects on clouds) from emitted aerosols and aerosol precursors, and the climate effects associated with contrails and cirrus cloud formation. To enable the development of the best strategy to mitigate these climatic impacts scientists must quantify these impacts and reduce current uncertainties to enable appropriate action. The only way to ensure that policymakers fully understand trade-offs from actions resulting from implementing engine and fuel technological advances, airspace operational management practices, and policy actions imposed by national and international bodies is to provide them with metrics that correctly capture the climate impacts of aviation emissions. This presentation is aimed at discussing the present state of knowledge of climatic impacts of aviation, examining the key underlying uncertainties and gaps in our scientific knowledge, and to identify and to make prioritized recommendations for the research necessary to resolve the important issues.

BIO: Donald J. Wuebbles is Head of the Department of Atmospheric Sciences at the University of Illinois and Professor in that department as well as in the Department of Electrical and Computer Engineering. He was also the first Director of the Environmental Council at the University of Illinois, from 1996 until August 1999; as Director, he was responsible for oversight and development of educational and research programs at the University of Illinois relating to the environment. Dr. Wuebbles earned his B.S. (1970) and M.S. (1972) degrees in Electrical Engineering from the University of Illinois. He received his Ph.D. in Atmospheric Sciences from the University of California at Davis in 1983. http://www.atmos.uiuc.edu/deptx/fac/don.php