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Sustainable 'green' aviation: Challenges and opportunities

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A mong all modes of transportation, travel by airplanes continues to experience the fastest growth. Currently, there are approximately 500,000 air vehicles (335,000 Active General Aviation Aircraft, 18,000 Passenger Aircraft, 90,000 Military Aircraft, 27,000 Civil Helicopters, and 30,000 Military Helicopters). They are responsible for 9% of fuel consumption and 2% of all greenhouse gas (GHG) emissions worldwide. These numbers are forecasted to double by 2050. Therefore the environmental issues such as noise, emissions and fuel burn (consumption), for airplanes have become important for energy and environmental sustainability. This presentation provides an overview of energy and environmental issues related to air transportation. Topics dealing with noise and emissions mitigation by technological solutions including new aircraft and engine designs/technologies, alternative fuels, and materials as well as examination of aircraft operations logistics including Air-Traffic Management (ATM), Air-to-Air Refueling (AAR), Close Formation Flying (CFF), and tailored arrivals to minimize fuel burn are discussed. The ground infrastructure for sustainable aviation, including the concept of 'Sustainable Green Airport Design' is also covered.

Biography

Ramesh K Agarwal is the William Palm Professor of Engineering and the Director of Aerospace Research and Education Center at Washington University in St. Louis. From 1994 to 2001, he was the Sam Bloomfield Distinguished Professor and Executive Director of the National Institute for Aviation Research at Wichita State University in Kansas. From 1978 to 1994, he worked in various scientific and managerial positions at McDonnell Douglas Research Laboratories in St. Louis. He became the Program Director and McDonnell Douglas Fellow in 1990. He received PhD in Aeronautical Sciences from Stanford University in 1975, MS in Aeronautical Engineering from the University of Minnesota in 1969 and BS in Mechanical Engineering from Indian Institute of Technology, Kharagpur, India in 1968. He is the author and co-author of over 400 publications and serves on the editorial board of 20+ journals. He has given many plenary, keynote and invited lectures at various national and international conferences worldwide. He is a Fellow of sixteen societies including the Institute of Electrical and Electronics Engineers (IEEE), American Association for Advancement of Science (AAAS), American Institute of Aeronautics and Astronautics (AIAA), American Physical Society (APS), American Society of Mechanical Engineering Education (ASEE). He has received many prestigious honors and national/international awards from various professional societies and organizations for his research contributions.

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