
Guest editorial

Dear Reader,

It is my pleasure to present you with a special issue on *aviation fuels and environment* of the *Aircraft Engineering and Aerospace Technology (AEAT) Journal*.

As explained in the report of the Intergovernmental Panel on Climate Change, the share of the transportation sector in total energy-related CO₂ emissions is approximately 23%, with a value of 6.7 GtCO₂. If transportation-induced emissions are investigated in detail, air transportation is found to be responsible for approximately 3%–4% of total energy-related CO₂ emissions. According to forecasts, the rise in the number of travelers choosing air transportation and the growth of aircraft fleets across the world is expected to lead to an increased share of greenhouse gas emissions created by the aviation industry. Fuel consumption of the worldwide aviation industry is reported by the International Civil Aviation Organization to have been approximately 160 Mt in 2015. Additionally, fuel consumption is estimated to increase by 2.2 to 3.1 times from 2015 to 2045.

In this respect, the aviation industry should make progress to fight against major environmental issues, such as climate change, global warming and so on. In recent decades, various advances in combustion technology have taken place, as well as ground-breaking progress in fuel technology. A reflection of these technical developments on aerial vehicles has appeared as consumption of new generation fuels, including biofuels, fuel additives, improvement of combustion efficiency, advanced combustion/fuel systems and others. Biofuel utilization, in particular, has a great potential to reduce the environmental impact of aviation. With respect to technological progress in alternative fuel production, it seems possible to increase more

environmentally friendly fuel consumption. Similarly, various fuel additives are used to reduce emissions.

For a better future and sustainability, the International Civil Aviation Organization takes responsibility to minimize the environmental impact of the global aviation industry. Within this framework, policies have been formulated and updates standards along with recommended practices related to aircraft emissions have been developed. One of these, the encouragement of alternative fuels, has been declared pursuant to “2050 ICAO Vision for Sustainable Aviation Fuels.” Furthermore, the Sustainable Aviation Fuels Guide has been published to explain how sustainable aviation fuels can be deployed to reduce CO₂ emissions from international aviation activities and describes fuel production pathways, usage constraints, environmental and other benefits, as well as policy perspectives on the use and development of these fuels.

It is the duty of researchers and scientists to find solutions on how to overcome the environmental issues on which governments, international organizations and other institutions have concerns. For this purpose, this special issue aims to gather together papers related to aviation fuels and the environment from different perspectives.

I would like to thank the authors for their high-quality research. In addition, I would like to express my gratitude to the reviewers who contributed and improved the quality of the papers. Finally, thanks also go to Prof Dr Philip Webb, the Editor-in-Chief of *Aircraft Engineering and Aerospace*, and the editorial staff for their continuous support in preparing this special issue.

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