



15 November 2023

Director, Aviation White Paper Project Office
Aviation White Paper
Department of Infrastructure, Transport, Regional Development, Communications and the Arts
GPO Box 594
CANBERRA ACT 2601

Dear Aviation White Paper Project Office

Re: Consultation on the Aviation Green Paper

CSIRO welcomes the opportunity to provide input into the Department of Infrastructure, Transport, Regional Development, Communications and the Arts' consultation on the Aviation Green Paper.

As Australia's national science agency, CSIRO is a trusted advisor to community, industry and government and provides applied science and technology solutions for the challenges and opportunities associated with achieving truly sustainable aviation sector.

CSIRO's work in sustainable aviation fuels and our recently released [Sustainable Aviation Fuel Roadmap](#) builds consensus on developing an Australian sustainable aviation fuel industry and identifies opportunities to produce and scale production using Australian feedstocks. The roadmap is noted throughout the Aviation Green Paper.

CSIRO is a member of the Jet Zero Council, representing the Research and Development sector. The council provides leadership in efforts to deliver net zero aviation in Australia, and its work will complement the Government's Aviation White Paper.

The contributions from the roadmap and council membership will provide important insights to the energy sector aspects of green aviation. Thus, this submission will focus on CSIRO's capabilities and research on developing enabling technologies such as batteries and advanced materials which align with CSIRO's manufacturing business unit capabilities.

CSIRO's Batteries research

CSIRO is heavily involved in the development of batteries for a range of applications including aviation. For example, CSIRO is working on battery management systems, lightweight packaging and charging systems designed to maximise system capability. Current challenges that are being addressed include:

- Aviation batteries need to operate at high power to deliver maximum energy, which is particularly important during take-off and landing.
- Batteries also need to charge quickly so they can be used optimally but fast charging can impact on the life of the device.
- For lithium-ion batteries used in aviation, there is a need to maximise the energy density at the cell level, as this has a significant impact on the final energy density of the packaged battery.

- CSIRO is looking at range of different lithium battery chemistries, to ensure the technologies developed are suitably robust for aviation applications and will not cause a hazard during operation.

CSIRO's Advanced Materials research

CSIRO is expanding our capability in advanced manufacturing and applying expertise to develop new techniques and improved materials for aviation. Additive manufacturing and shape memory alloys are being utilised to create complex geometrical structures required for aviation from lighter and stronger materials. Implementation of these materials can contribute to the sustainability of the sector as lowering the weight of an aircraft can improve fuel efficiency.

We have developed conductive polymers and multifunctional coatings for aerospace to reduce adhesion of contaminants and improve the material cycle. For example, in partnership with international aircraft manufacturer Boeing we developed Paintbond, an adhesion promoter which allows fresh topcoat to bond firmly to the previous layer, removing the need for sanding, improving worker safety and reducing environmental impact.

We would be pleased to provide further detail on the activities referenced in this submission. For more information, please contact GovernmentRelations@csiro.au.

Yours sincerely



Dr Marcus Zipper
Director, CSIRO Manufacturing