



Jet Zero Council – Tenth Meeting

10:00am – 11:30am, Thursday 18 April 2024

Cranfield University, College Road, Cranfield MK43 0AL

Attendees

Chairs

- The Rt Hon Mark Harper MP, Secretary of State for Transport

Ministerial Attendance

- Anthony Browne MP, Minister for Decarbonisation and Technology, Department for Transport
- Amanda Solloway MP, Minister for Affordability and Skills, Department for Energy, Security and Net Zero (Deputising for the Rt Hon Claire Coutinho MP, Secretary of State for Energy Security and Net Zero)
- Alan Mak MP, Minister for Industry and Economic Security at the Department for Business and Trade, and Minister for the Investment Security Unit at the Cabinet Office (virtual) (Deputising for the Rt Hon Kemi Badenoch, Secretary of State for Business and Trade)

Jet Zero Council CEO

- Emma Gilthorpe, Chief Operating Officer, Heathrow Airport

In Person Member attendance

- Jonathon Counsell, Jet Zero Council Sustainable Aviation Fuels Delivery Group Chair (and Group Head of Sustainability, International Airlines Group)
- Rachel Gardner-Poole, Jet Zero Council Zero Emission Flight Delivery Group Chair
- Professor Sir Iain Gray, Director of Aerospace, Cranfield University (and Chair of the Jet Zero Council Non-CO2 Task and Finish Group)
- Oliver Taylor, VP Business Development, and Integration, bp (deputising for Louise Kingham, SVP, Europe, and Head of UK, bp)
- Professor Sarah Sharples, Chief Scientific Adviser, Department for Transport
- Matt Gorman MBE, Chair, Sustainable Aviation
- Holly-Boyd Bolland, VP Corporate Development and Sustainability, Virgin Atlantic (deputising for Shai Weiss, Chief Executive Officer, Virgin Atlantic)
- Tim Johnson, Director for Strategy, Policy, and Communications at the CAA (deputising for Rob Bishton, Chief Executive Officer, Civil Aviation Authority)
- Colin Tattam, Director Net Zero and Sustainable Industries, Innovate UK Business Connect
- Greg Archer, Director of European Policy, LanzaTech (deputising for Dr Jennifer Holmgren, Chief Executive Officer, LanzaTech)
- Dr Mark Bentall, Head of R&T Programme, Airbus (deputising for Julie Kitcher, Executive Vice President Communications and Corporate Affairs, Airbus)
- Alan Newby, Director of Research and Technology, Rolls-Royce (deputising for Simon Burr, Group Director of Engineering, Technology and Safety, Rolls-Royce)
- Russ Dunn, Chief Technology Officer and Head of Strategy, GKN Aerospace



- Tim Hawkins, Chief of Staff, Manchester Airports Group (deputising for Ken O'Toole, Group Chief Executive, Manchester Airports Group)
- Dominic Weeks, Head of External Affairs and Marketing, ZeroAvia (deputising for Val Miftakhov, Chief Executive Officer, ZeroAvia)

Virtual Member attendance

- Steve Kelly, President, International for 1PointFive
- Neville Hargreaves, Vice President, Waste to Fuels, Velocys
- James Stephens, VP Corporate Affairs, DHL (Deputising for Tom Mackle, Managing Director, DHL)
- Tim Johnson, Director, Aviation Environment Federation
- Kevin Craven, Chief Executive Officer, ADS Group
- Jane Ashton, Director of Sustainability, easyJet (deputising for Johan Lundgren, Chief Executive Officer, easyJet)
- Gary Elliott, Chief Executive Officer, Aerospace Technology Institute
- Maria Laine, President of Boeing UK, Ireland and Nordic region, Boeing
- Stephen Heapy, Chief Executive Officer, Jet2
- Tim Alderslade, Chief Executive, Airlines UK
- Karen Dee, Chief Executive, The Airport Operators Association
- Peter Marton, Multi Pilot Commandor, General Aviation Manufacturers Association (Deputising for Kyle Martin, VP, European Affairs, General Aviation Manufacturers Association)
- Sean Doyle, Chief Executive Officer, British Airways

Department for Transport official attendance

- David Silk, Director for Aviation
- Holly Greig, Deputy Director, Aviation Decarbonisation
- Claire Swadkin, Deputy Director, Low Carbon Fuels (virtual)

Department of Energy, Security and Net Zero

- Katie Ostheimer, Deputy Director, Hydrogen Economy

Department for Business and Trade

- Paul Griffiths, Deputy Director, Head of Aerospace Team

Additional attendees

- David Lees, CEO Bristol Airport (virtual)
- Paul Hutton, Cranfield Aerospace CEO (observing)
- Andy Johnston, Jet Zero Communications & Engagement Network Chair (and External Relations Manager, GKN Aerospace) (observing)
- Richard Coates, Special Adviser to the Secretary of State for Transport
- Jet Zero Council Secretariat
- Ministerial Private Secretaries

Apologies

- Rannia Leontaridi, Director General, Aviation and Maritime Security
- Thomas Woldbye, Chief Executive Officer, Heathrow Airport
- David Bunch, UK Country Chair, Shell



- David Lee, Professor of Atmospheric Science and Director of the Centre for Aviation, Transport, and the Environment, Manchester Metropolitan University
- Luke Farajallah, Chief Executive, Loganair
- Richard Knighton KCB FEng, Chief of the Air Staff, Royal Air Force
- Professor Piers Forster (Interim Chair, Committee on Climate Change)
- Baroness Brown Julia King DBE FEng FRS, Jet Zero Council Adviser (and Crossbench Member of the House of Lords)

Actions

- Zero Emission Flight Delivery Group (ZEF DG) to continue work to map research and development across government and industry, and to identify gaps or areas for further funding.
- DfT Chief Scientific Adviser, Sarah Sharples to engage closely with the Department for Science, Innovation and Technology to encourage greater join up within the Jet Zero Council.
- ZEF DG to do further work on understanding what is occurring internationally regarding hydrogen to support the building of international relationships and further accelerate technological developments in this space.
- Ensure that the focus does not shift away from non-CO2 impacts and carbon capture by providing an update on the progress made through the non-CO2 task and finish group at an upcoming Jet Zero Council.
- ZEF DG to explore work across government and industry on the electricity demands, infrastructure and investment that will be required to bring commercialised hydrogen aircraft to market.
- ZEF DG to consider the skills required in the hydrogen space and to work with the Jet Zero Council to develop these across the sector.

Summary of Meeting

- ZEF Delivery Group Chair, HMG Officials and representatives from airports, academia and manufacturing gave an overview of hydrogen in aviation and the Council discussed areas for greater focus and collaboration to support the transition to Zero Emission Flight. Provided recommendations for moving forward.
- Department of Transport officials provided an update on the government's sustainable aviation fuel (SAF) programme.



Readout

1. Opening remarks

The Secretary of State for Transport welcomed members to the tenth meeting of the Jet Zero Council.

The Secretary of State highlighted the recent successes of the Council since its ninth meeting including [the transatlantic 100% SAF flight by Virgin Atlantic](#), [the agreement at CAAF-3 to reduce global aviation emissions by 5% by 2030](#), and [the ATI's publication of the first non-CO2 roadmap](#). He noted Cranfield's history of working with innovation in aviation, referencing [ZeroAvia's world first hydrogen fuel cell powered flight of a commercial-grade aircraft](#), which took place at Cranfield University. He highlighted the upcoming SAF revenue certainty mechanism consultation, and flagged the government response to the SAF mandate consultation will be published shortly¹.

Finally, he noted that this was the last official engagement of JZC CEO Emma Gilthorpe before beginning her new role as CEO of Royal Mail Group. He thanked her for her continued support of the Jet Zero Council since her appointment in 2021 and noted the process to replace her would be circulated in due course.

2. Hydrogen in Aviation

Rachel Garnder-Poole (RGP) opened the session and gave a brief overview of the current zero emission flight delivery group, as well as its three subgroups (infrastructure, aircraft, and regulation). Looking further ahead, RGP walked members through a proposed "hydrogen in aviation" roadmap between 2025-2050, containing confirmed policy commitments and suggested 2028 milestones from the zero-emission flight delivery group. Confirmed milestones included zero emission routes by 2030, a target of 10gw of UK low carbon hydrogen production, Net Zero UK domestic aviation by 2040 and UK ground operations zero emission by 2040 and the net zero 2050 goal. Suggested milestones by 2028 are a showcase zero-emission flight through a multi-hop tour of UK airports, the positioning of UK supply chains to be globally competitive for large commercial zero emission aircraft, and key regional and UK hub airports being ready to support commercial hydrogen and battery electric aircraft.

Holly Greig (DfT) set out the potential zero-emission flight has to become part of the aircraft mix, with the Jet Zero Strategy's High Ambition scenario forecasting 27% of air traffic movements to be zero emission by 2050. She also highlighted the role for hydrogen as a feedstock for SAF, and potential for use in the decarbonisation of airport operations such as for airside vehicles. She noted however the challenges in supporting hydrogen's deployment in aviation, including an uncertain trajectory of technology development, demand forecasts from aviation for low carbon hydrogen, infrastructure challenges including at airports and scientific uncertainty on the non-co2 climate impacts.



Katie Ostheimer (DESNZ) highlighted [DESNZ's goal to achieve 10GW in hydrogen power by 2030](#). She acknowledged the difficulty in decarbonising aviation but noted that hydrogen has a huge potential for use in the aviation sector.

Paul Griffiths (DBT) highlighted DBT's work to continue supporting the aerospace sector and balancing growth whilst decarbonising. He noted they will continue to co-invest with industry via the ATI to develop and demonstrate new aircraft technology with a further [£975m of funding from 2025-2030](#) as well as supporting the [Hydrogen Capability Network](#) and, alongside DfT, the [non-CO2 programme](#).

Dr Mark Bentall (Airbus) then provided a manufacturing perspective highlighting Airbus' current focus on being the first major manufacturer to deliver a hydrogen-powered commercial aircraft by 2035, and that between 2020-2027 they are focusing on establishing and testing the technology required to deliver this. [Furthermore, Airbus has successfully tested a hydrogen fuel cell 'iron pod' engine concept, reaching 1.2MW of power.](#) He recommends focusing on ensuring world leading hydrogen research and development is available in the UK, developing a hydrogen skilled workforce and creating a network of hydrogen-ready airports.

Dave Lees (Bristol Airport, CEO) laid out Bristol Airport's work in this field, noting their focus on the safety of nascent hydrogen technology. Bristol Airport recently undertook a two-week trial of hydrogen refuelling of ground support equipment in a live airside environment through '[Project Acorn](#)'. He raised the importance of land planning in the hydrogen space, with Bristol being one of the first UK airports to consider this in their upcoming masterplan. He highlighted the importance of stable policy with clear targets, price competitiveness of hydrogen, and supportive policy that recognises high airport transition development costs and multiple parallel fuel types. He also recommended developing a National Hydrogen Academy to develop skills.

Professor Sir Iain Gray (UK-ARC) provided an academic perspective, mapping out the hydrogen work being conducted across UK-Aerospace Research Consortium (UK-ARC). UK-ARC was set up by 11 leading universities in the aerospace space, and now has over 100 universities part of the consortium. UK-ARC have identified three key workstreams, hydrogen in the aircraft, hydrogen in the airport and hydrogen to the airport. They recommended further considering the role of the funding from the Department for Science, Innovation and Technology into universities and would like to see more clarity on the needs of the industry so academia can work to develop solutions.

Members then engaged in a discussion, chaired by Minister Solloway. Key discussion points included:

- Members were excited about the proposed timeline and noted that skills and knowledge in this space need to continue to be developed.

- Members noted that it was important to ensure all industry plans and energy requirements are properly integrated into the energy system operator. Infrastructure needs to be considered alongside green electricity supply needs, especially when larger scale aircrafts come into service.
- Members highlighted the importance of regulation closely following the development of technology, not just domestically but internationally. There is significant UK collaboration in place and the focus now should shift to international collaboration.
- Members noted that a clearer picture is needed on the scale of investment that will be needed for delivery, not just on an individual basis but across the sector.

3. Sustainable Aviation Fuel update

Claire Swadkin (DfT) gave an update on the HMG SAF programme noting that they were on track to deliver the government response to the second SAF Mandate consultation and the revenue certainty mechanism options for delivery consultation. She noted that the hope is that this work will create long term conditions for SAF usage.

Key discussion points included:

- Members reflected on the progress in the [global uptake of SAF, from 0.25 mega tonnes internationally in 2022 to 1.5 mega tonnes projected for 2024.](#)
- Members noted their support for SAF as an option, however noted that to make it net zero, carbon capture must be used and built into the plan.
- Members reflected on the complexity of the financial balancing act required regarding SAF and expressed concerns that there could be a gap between the introduction of the SAF Mandate (2025) and the introduction of the revenue certainty mechanism (2026). This gap makes it challenging to engage with banks to secure finance for plants.

4. Closing remarks & AOB

The JZC CEO summarised the meeting, noting that there is progress to be made, but that there is a large amount of momentum surrounding hydrogen. She also noted that policy direction from government has been clear and well-supported. She also expressed that the UK-ARC is a useful way to understand the picture across academia.

Minister Browne (DfT) closed the meeting and thanked all for attending and contributing. He noted the eleventh Jet Zero Council meeting will take place at Farnborough Air Show.