



House of Commons
Environmental Audit Committee

Net zero and the UK aviation sector: Government Response to the Committee's Third Report

**Sixth Special Report of Session
2023–24**

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Environmental Audit Committee

The Environmental Audit Committee is appointed by the House of Commons to consider to what extent the policies and programmes of government departments and non-departmental public bodies contribute to environmental protection and sustainable development; to audit their performance against such targets as may be set for them by His Majesty's Ministers; and to report thereon to the House.

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Sixth Special Report

The Environmental Audit Committee published its Third Report of Session 2023–24, [Net zero and the UK aviation sector](#) (HC 404) on 21 December 2023. The Government response was received on 4 March 2024, and is appended below.

Appendix: Government Response

Introduction

The Government welcomes the EAC report on 'Net zero and the UK aviation sector' and the recommendations published on 18 December 2024, following the inquiry into Net zero aviation and shipping. We are grateful to the Committee and to all those who provided evidence for its work.

Aviation is considered to be a hard-to-abate sector when it comes to meeting our target for net zero emissions by 2050. The report's focus on aviation highlights that it is critical that the aviation sector plays its part in delivering the UK's net zero commitment, and the Government is already supporting a variety of technology, fuel, and market-based measures to address aviation emissions. The Jet Zero Strategy, published in July 2022, set out the Government's approach to achieving net zero 2050 for UK aviation – focusing on the rapid development of technologies in a way that maintains the benefits of air travel, whilst maximising the opportunities that decarbonisation brings to the UK¹. Since the publication of the Government's Jet Zero Strategy, we've made significant progress on the delivery of our commitments.

The UK has demonstrated international leadership and took a leading role in the agreement at the 41st ICAO Assembly to adopt net zero carbon emissions by 2050 as the long-term aspirational goal, as well as agreeing an international target to reduce emissions from global aviation fuel by 5% by 2030 at ICAO's Third Conference on Aviation Alternative Fuels in November 2023.

The Government has committed £9.2m funding to the airspace modernisation programme and worked closely with the National Air Traffic Services (NATS) to implement Free Route Airspace (FRA) over Scotland and the west of England, saving a total of 24,000T in CO₂ emissions annually².

On sustainable aviation fuels (SAF), the Government has made significant progress, including the publication of the second SAF mandate consultation, a commitment to consult on introducing a revenue certainty mechanism, and the provision of over £135m funding for the development of SAF production plants in the UK.

The UK is also supporting the development of new and zero-carbon emission aircraft technology through the Aerospace Technology Institute (ATI) Programme. The ATI Programme will receive £685 million from the government from 2022 to 2025, an increase of £235 million on the previous 3-year period, and a further £975m from 2025 to 2030.

1 <https://www.gov.uk/government/publications/jet-zero-strategy-delivering-net-zero-aviation-by-2050>

2 <https://nats.aero/blog/2023/02/west-airspace-deployment-50-days-to-go/>

Industry will provide co-funding, taking the total to more than £1 billion³. In addition, the Government, alongside the Natural Environment Research Council, launched a multi-year, multi-million-pound research programme to better understand and address aviation's non-CO₂ impacts.

Having carefully considered the Committee's report, and the evidence provided, the Government's response to the Committee's recommendations is set out below.

Recommendation 1:

Recommend that the Government actively commission, promote and support research into the total environmental effects of aviation, with a view to incorporating the emerging consensus into all future iterations of its strategy for net zero aviation. (Paragraph 31)

The Government agrees with this recommendation.

In the Jet Zero Strategy, the Government recognises that aviation has both CO₂ emissions and non-CO₂ climate impacts that need to be addressed. Whilst the impact of CO₂ emissions can be quantified, academic research shows that there continues to be significant uncertainty regarding the magnitude of the non-CO₂ impacts on the climate. Through the Jet Zero Strategy, we confirmed our intention to accelerate our work to address aviation's non-CO₂ impacts by better developing our understanding of their impact and potential mitigations.

DfT, alongside the Natural Environment Research Council and the Department for Business and Trade launched a multi-year, multi-million research programme to support the commitments set out in the Jet Zero Strategy. The first call for projects was launched on 13 October 2023 and seeks applications from academic institutions, although collaboration with industry is encouraged. The first call closed on 30 January 2024, and we plan to launch an industry call for projects later this year⁴.

DfT also awarded contracts for two research projects in November 2023, focusing on a literature review of existing research on aviation's non-CO₂ impacts, an evaluation of methodologies for measuring aviation's non-CO₂ impacts, and investigating the impact of reducing the aromatic content of kerosene on contrail formation. The findings from these projects will feed into the wider multi-year research programme.

As part of the Jet Zero Council, the Government has set up a Non-CO₂ Task and Finish Group, which brings together experts from industry and academia to identify and progress tasks to help us better understand aviation's non-CO₂ impacts and agree what mitigating actions government and industry should take. The group will also share information and knowledge and aim to build consensus where possible on this complex issue. The Task and Finish Group met in November 2023 to agree a set of short-term actions to take forward in 2024.

In the Jet Zero Strategy, the Government also committed to monitor progress against our emissions reduction trajectory on an annual basis from 2025, with a major review of

3 <https://www.ukri.org/publications/ati-programme-strategic-batches-application-guidance/ati-programme-strategic-batches-what-funding-you-can-get-and-how-to-apply/>

4 <https://www.ukri.org/opportunity/jet-zero-aviations-non-co2-impacts-on-the-climate/>

the Strategy and delivery plan every five years. The first major review will be in 2027, five years after publication of the Strategy in 2022, and we will ensure that findings from this research are considered in the review process.

Recommendation 2:

Recommend that the Government lay before Parliament for approval, without further delay, a draft statutory instrument under section 30 of the Climate Change Act 2008 to define the emissions from international aviation and international shipping which are to be reckoned as emissions from sources in the United Kingdom. (Paragraph 51)

The Government notes this recommendation.

Government has followed the latest advice of the CCC and will include international aviation and shipping emissions (IAS) emissions in the Sixth Carbon Budget. This change allows for them to be accounted for consistently with other emissions as we approach our whole-economy net zero target for 2050.

The Government will legislate for the inclusion of International Aviation and Shipping emissions in the Sixth Carbon Budget at the earliest opportunity, subject to Parliamentary scheduling.

Recommendation 3:

Recommend that the Government work with the Climate Change Committee and Sustainable Aviation on a comparative analysis of the models underpinning the projections for UK aircraft emissions, so as to reach consensus, as far as possible, on the likely impact of measures to be taken by industry and by Government on levels of emissions from UK aviation out to 2050. (Paragraph 53)

The Government notes this recommendation.

Given the complexity of decarbonising the aviation sector, the long lead in times and high levels of uncertainty, the outputs from the modelling undertaken by the Climate Change Committee, the Government and Sustainable Aviation vary as to the projections of likely emissions reductions from UK aviation by 2050.

The Climate Change Committee use the same aviation model as the Government for its emissions projections, however the trajectories vary due to the different underlying assumptions. The Government is awaiting Sustainable Aviation's technical document accompanying their roadmap which will detail the underlying data and assumptions underpinning the modelling allowing for a more detailed comparison.

DfT is continually working to improve its modelling capability and evidence base relating to aviation decarbonisation as part of its monitoring of the Jet Zero Strategy and will consider the evidence presented in Sustainable Aviation's roadmap and the Climate change Committees modelling as part of this process.

Recommendation 4:

Recommend that the Government sustain and enhance its engagement with the aviation industry on the delivery of operational efficiencies from current and future fleets of

aircraft operating through the UK, to maintain the ambition to secure 2% year-on-year CO₂ emissions reductions from fuel and operational efficiencies. The delivery of these reductions must be rigorously monitored against an established baseline: should the rate of progress in reductions fall behind 2%, the potential contribution of system efficiencies to meeting the 2050 net zero target must be urgently reassessed. (Paragraph 78)

The Government notes this recommendation.

The Government recognises that efficiencies in our airspace, aircraft and airports remains a key lever in decarbonising the sector in the near term. As part of our high-ambition scenario in the Jet Zero Strategy, we assume an average annual fuel efficiency improvement of 2% from aircraft, air traffic management and operational efficiencies. We keep the assumptions in the Jet Zero Strategy under close review and will consider whether further action is required to meet the trajectory to net zero, including through our first major review in 2027.

We have worked closely with NATS to implement Free Route Airspace (FRA). The first deployment of FRA was rolled out in Scotland in 2021 and will save 12,000 tonnes CO₂ every year (equivalent to the power used by some 3,500 family homes). The second tranche was deployed over the west of England in March 2023 will save a further 12,000 tonnes CO₂ each year.

The Government is supporting the development of new low and zero-carbon emission aircraft technology through the Aerospace Technology Institute (ATI) Programme. The Programme will receive £685m of government funding between 2022 and 2025, and a further £975m between 2025 and 2030.

Recommendation 5:

Recommend that the Department for Transport and the Civil Aviation Authority intensify their work on airspace modernisation, bearing in mind the overarching principle of environmental sustainability. (Paragraph 79)

The Government agrees with this recommendation.

A refreshed Airspace Modernisation Strategy (AMS) was published in January 2023 which extends the strategy out to 2040, reaffirming our commitment to delivering this key infrastructure programme⁵. The AMS sets out the ways, means and ends of modernising airspace through nine elements that will modernise aircraft-based navigation and airspace management.

Sustainability is an overarching principle of the strategy. The environmental benefits of the strategy will contribute towards our Jet Zero emissions reductions targets for the aviation sector. One core element is airspace integration, which will enable new and innovative aircraft to share the skies safely alongside existing air traffic. These new technologies, such as Uncrewed Aircraft Systems (UAS or commonly known as drones) and certified electric, Vertical Take-Off and Landing aircraft (eVTOLs), could help facilitate some modal shift

5 <https://www.caa.co.uk/commercial-industry/airspace/airspace-modernisation/airspace-modernisation-strategy/about-the-strategy/>

from road or rail for passenger journeys, deliveries or freight to more sustainable electric options, and open up new aviation markets. It is anticipated that technologies supporting UAS and eVTOLs will also benefit the future operation of other aircraft.

DfT and the CAA are looking at ways to streamline processes and accelerate advancement through the Airspace Modernisation programme whilst maintaining a stable framework for delivery.

Recommendation 6:

Recommend that the Government take every opportunity to establish in its policy instruments for a UK SAF industry the strongest safeguards to ensure significant lifecycle emissions savings from the use of SAFs developed in the UK. (Paragraph 111)

The Government agrees with this recommendation.

The Government's vision is for the UK to be a global leader in the development, production, and use of SAF, allowing us to grow the sector sustainably and achieve net zero flight. Building domestic SAF production capacity represents not only a significant economic opportunity but also a means for strengthening our energy security.

The UK will introduce a SAF mandate from 2025, requiring at least 10% of UK aviation fuel to be SAF by 2030. Fuel suppliers will receive awards, (in the form of tradable certificates) for the SAF they supply, proportionate to the GHG savings of their fuel.

The mandate will introduce strict sustainability criteria to ensure SAF delivers genuine GHG emission savings. Fuels eligible for award include waste and residue derived biofuels, recycled carbon fuels and power to liquid fuels.

Fuel producers will need to evidence the lifecycle emissions of their fuels to receive awards and fuels will need to deliver minimum GHG savings over fossil kerosene.

The Government is supporting a UK industry through our £135 million Advanced Fuels Fund (AFF) which is supporting 13 first-of-a-kind projects to reach commercial scale by overcoming perceived technological and construction risks. This has set us on the path to achieve our shared ambition of having 5 plants under construction by 2025⁶.

Recommendation 7:

Recommend that in its forthcoming Land Use Strategy the Government establish clear and unambiguous criteria as to the type of land which is to be allocated to growing feedstocks for SAF. The Government must also take every opportunity in international forums to press for the highest standards of sustainability in the production of SAF feedstocks. (Paragraph 112)

The Government partially agrees with this recommendation.

The forthcoming SAF mandate will support SAF that is derived from wastes, residues, or low carbon energy. Strict sustainability criteria will ensure significant GHG emissions savings are delivered and will provide protections against land use change and loss of biodiversity.

6 <https://www.gov.uk/government/publications/advanced-fuels-fund-competition-winners/advanced-fuels-fund-aff-competition-winners#background>

The Government takes every opportunity in international forums to press for the highest standards of sustainability in the production of SAF.

Recommendation 8:

Recommend that Ministers and officials work vigorously at the ICAO and in all other relevant international bodies for the establishment of a global regulatory standard for SAFs which is comprehensive and rigorous. (Paragraph 113)

The Government agrees with this recommendation.

In November 2023 agreement was reached at ICAO's Third Conference on Aviation Alternative Fuels (CAAF/3) on a target to reduce emissions from global aviation fuel by 5% by 2030, as part of a comprehensive framework to scale-up production and deployment of cleaner aviation fuels. The UK took a leading role in working for this agreement and intends to continue to be a global leader in aviation decarbonisation and the production and use of SAF. Importantly, the agreement enshrined the sustainability approach from the Carbon Offsetting and Reduction Scheme for International Aviation as the basis for determining the sustainability of SAF used in international aviation.

International Civil Aviation Organization adopted the first comprehensive global approach for ensuring the sustainability of SAF, as part of CORSIA in November 2021. The CORSIA sustainability approach measures SAF against 14 environmental and socio-economic sustainability criteria. It also includes a globally agreed lifecycle analysis methodology, feedstock classification and accounts for indirect land-use change (ILUC). The approach is the product of many years of technical work in ICAO to develop an internationally agreed sustainability standard for SAF, in which the UK has played a leading role. While it is different to the standards we have in the UK, the government believes it is a comprehensive and robust basis for determining SAF sustainability internationally. It is referenced in international law under Annex 16, Volume IV of the Chicago Convention on International Civil Aviation.

The UK continues to negotiate through ICAO groups and forums to further bolster and strengthen the CORSIA sustainability framework, to ensure global SAF production delivers genuine GHG savings and minimises the risk of other negative impacts.

Recommendation 9:

Recommend that the Government make swift progress on the implementation of a price support mechanism to incentivise investment for SAF production pathways. (Paragraph 115)

The Government notes this recommendation.

In September last year, the government committed to introduce a revenue certainty mechanism to support SAF production in the UK. The intention is that it will be industry funded. Alongside this written ministerial statement, the government published a delivery plan outlining the timeline for how such a mechanism could be delivered by the end of 2026. In parallel, the government included a provision in the Energy Act 2023 that commits to publishing a consultation on the options for designing and implementing a revenue certainty mechanism within six months of the receiving Royal Assent, which happened on 26 October 2023.

A range of factors and revenue certainty options will need to be carefully considered as part of the consultation, including interactions with the SAF mandate, deliverability, and affordability (cost impacts), whether the options make SAF plant projects in the UK investible, and potential unintended consequences. The government will continue to work with industry through the Jet Zero Council to develop a revenue certainty mechanism. We recognise that a UK SAF industry would bring many benefits from green jobs, skills, energy security and investment in the UK.

Recommendation 10:

Recommend that the Government establish a target under the Jet Zero Strategy for the full roll-out of zero-emission aircraft on a minimum number of routes essential to UK connectivity by 2040, with a view to encouraging the greater take-up of ZEF aircraft on commercially-operated short haul routes within the UK. (Paragraph 143)

The Government partially agrees with this recommendation.

In the Jet Zero Strategy Government committed to ensuring the UK is at the forefront of deploying zero emission aircraft, with an aspiration to have zero emission routes connecting different parts of the United Kingdom by 2030. Zero emission aircraft are emerging with a range of hydrogen aircraft development and test programmes underway globally. In addition, certified all-electric pilot training aircraft are already in use. We are keen to accelerate the development of these aircraft and welcome industry ambition to scale up the technology to larger commercial passenger usage.

The Government have also set an earlier target for UK domestic aviation to reach net zero by 2040. Whilst we recognise that domestic aviation accounts for only a small proportion of our overall emissions from aviation, this target is an important stepping-stone on our way to achieving Jet Zero. Technologies needed to decarbonise international flights may be available earlier for shorter, domestic routes, and we see this target as acting to incentivise the adoption of low, and zero emission fuels and technology in the UK. A Government funded research project on the 2040 target was completed in 2023, will be published in due course, and we will be using this as the basis for a forthcoming call for evidence.

The Government is supporting the development of new low and zero-carbon emission aircraft technology through the Aerospace Technology Institute (ATI) Programme. The Programme will receive £685m of government funding between 2022 and 2025, and a further £975m between 2025 and 2030.

Recommendation 11:

Recommend that the Government, when promoting research into the non-CO₂ effects of aviation, include in its strategy the funding of research into the effects on the atmosphere and climate of aircraft using zero-emission flight technologies. (Paragraph 144)

The Government agrees with this recommendation.

Through the Jet Zero Strategy, we confirmed our intention to accelerate our work to address aviation's non-CO₂ impacts by better developing our understanding of their impact and potential mitigations.

Last year we launched a multi-year, multi-million aviation non-CO₂ research programme to support this objective, with the first calls for academic-led projects opened in October 2023 delivered through the Natural Environment Research Council. Further calls are expected in 2024 and 2025, including a second competition line to allow for applied research and industry-led R&D proposals.

The programme improves our understanding of how non-CO₂ emissions interact with climate over time, and consider how to mitigate their impacts. This will subsequently inform industry funding and government policy and investment decisions. This may include the use of alternative fuels and other approaches to mitigating aviation's non-CO₂ impacts, including but not limited to, contrail prediction and avoidance technology.

Understanding and mitigating for the climate impacts of hydrogen-powered aircraft is a key focus of this research programme. It was also a dedicated thematic strand under the first call for academic-led proposals.

In addition, the Government coordinates with and seeks to learn from international projects looking into aviation's non-CO₂ climate impact. This includes work through the International Civil Aviation Organization (ICAO) and projects in Europe and North America.

Recommendation 12:

Recommend that the Government implement its proposed changes to the UK ETS so as to remove conventional aviation fuel from free allocations, and that it consults on a methodology to include SAF in the ETS in a way which does not inhibit the development and use of SAF in UK aviation. (Paragraph 160)

The Government agrees with this recommendation.

We are committed to enhancing the effectiveness of the UK ETS for aviation; and we will take forward the commitments in the Developing the UK ETS government response, which was published on 3 July 2023. The decision to phase-out aviation free allocation by 2026 is implemented by not extending existing free allocation arrangements for the aviation sector into the UK ETS's 2026–2030 allocation period. Furthermore, during the current phase-out period there is a cap on the maximum amount of free allocation aircraft operators are eligible to receive per year.

Regarding SAF, we will continue to develop proposals on how the UK ETS should treat the use of SAF by aircraft operators and will consult on these in due course. While SAF will continue to be zero rated under the UK ETS in the short-term, the UK ETS Authority will continue to explore alternative options to SAF being zero rated in the future. Proposals will take into account other SAF policy and incentives, as well Government's wider objectives to support the development and use of SAF in the UK as set out in the Jet Zero Strategy.

Recommendation 13:

Recommend that an initial review of the Jet Zero Strategy and the modelling underlying its 'high ambition' scenario be undertaken no later than the end of 2025, with a view to determining whether the Strategy remains on track to meet the interim emissions reductions projected for 2030 and 2040 as well as the overall reductions projected for 2050. (Paragraph 201)

The Government notes this recommendation.

The Government are committed to a data led approach in our policy making and we remain transparent in our modelling towards Jet Zero.

We will monitor progress against our emissions reduction trajectory on an annual basis from 2025, with a major review of the Strategy and delivery plan every five years. The first major review will be in 2027, five years after publication of the Strategy in 2022. We are consistently reviewing and updating our underlying evidence and analysis relating to aviation decarbonisation, and any updated modelling as a result of this will be included in our reviews of the Jet Zero Strategy.

To further our monitoring and to effectively track progress against our Jet Zero targets, we plan to produce a comprehensive monitoring and evaluation framework which will include suggestions for appropriate data collection methods, monitoring metrics, and evaluation activities.

Recommendation 14:

Should the evidence of the review indicate that technological measures alone will not deliver the emissions reductions predicted, we recommend that Ministers reconsider the role of demand management measures in aviation emissions policy. In preparation for the outcome of that review, we recommend that the Government develop policy proposals on demand reduction, including consideration of greater use of digital technologies, reducing the cost of rail travel, and a frequent flyer levy, should these then be required (Paragraph 203).

The Government notes this recommendation.

The Jet Zero Strategy sets out details on how the aviation sector can achieve net zero without government intervening directly to limit aviation growth. DfT analysis shows that in all modelled scenarios we can achieve our net zero targets by focusing on new fuels and technology, rather than capping demand, with knock-on economic and social benefits. If we find that the sector is not meeting the emissions reductions trajectory, we will consider what further measures may be needed to ensure that the sector maximises in-sector reductions to meet the UK's overall 2050 net zero target.