



Witness 4 of 26, Climate Change
PCCA/W4/2 –Summary to Proof of Evidence

Expansion of Bristol Airport to 12mppa

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Summary Proof of Evidence for PCCA

Tim Johnson

Appeal by Bristol Airport Limited (reference number 20/P/2896/APPCON)

Summary of proof of evidence of Tim Johnson on behalf of the Parish Councils Airport Association (PCAA): carbon and GHG impacts

10 June 2021 (version 1)

1. Introduction and scope

1.1 My name is Tim Johnson and I am Director of the Aviation Environment Federation (AEF) which is the principal UK NGO campaigning on aviation's impacts for people and the environment. I have over 30 years experience in the aviation and environment policy field, and currently sit on Department for Transport's Jet Zero Council, as well as being the nominated civil society Observer at the UN International Civil Aviation Organisation's Committee on Aviation Environmental Protection (CAEP).

1.5 This proof of evidence covers the climate change implications of Bristol Airport's proposal to increase its capacity to 12 million passengers per annum, and is broken down into the following sections:

- Aviation and climate change impacts
- Policy context (a) climate policy (b) aviation policy related to climate change
- Policy context for non-CO2 impacts from aviation
- Measures to reduce aviation emissions
- BAL's assessment of greenhouse gas emissions
- BAL's proposed mitigation
- Conclusions

2. Aviation and climate change impacts

- 2.1 In the UK, emissions from UK domestic and international flights were 38.5MtCO₂e in 2019 (of which 1.5MtCO₂e was generated by domestic flights and 37MtCO₂e by international flights). This is around 7% of all UK GHG emissions. The Climate Change Committee (CCC) highlights¹ that emissions from UK domestic and international aviation in 2018 were 124% above 1990 levels.
- 2.3 In addition to carbon dioxide, aircraft have other net climate warming effects. The latest scientific evidence indicates that the aviation sector's total climate warming impact between 2000 and 2018 was three times that associated with its CO₂ emissions alone² (based on the effective radiative forcing metric).

3. Policy context

a) Climate Policy

- 3.1 The UK's response to climate change is governed by the Climate Change Act 2008³ (CCA), its Nationally Determined Contribution under the Paris Agreement, and a range of supporting policies. The Government legislated in June 2019 to amend the UK's CCA target to net zero greenhouse gas emissions by 2050. On 20 April 2021, the Government announced⁴ its plans for the sixth carbon budget including a binding climate change target to reduce emissions by 78% by 2035 compared to 1990, incorporating emissions from international aviation and shipping for the first time.

b) Aviation policy related to climate change

¹ CD 9.34

² CD 9.60 <https://www.sciencedirect.com/science/article/pii/S1352231020305689?via%3Dihub#>

³ CD 9.2

⁴ CD 9.37 <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>

- 3.2 The Department for Transport has published several policy documents relevant to aviation and climate change including the Aviation Policy Framework (APF)⁵ published in March 2013, the Airports National Policy Statement (Airports NPS)⁶ adopted in June 2018, Making Best Use of Existing Runways (also in June 2018)⁷, and the Aviation Strategy 2050 Green Paper published in December 2018.
- 3.3 The Green Paper, MBU and the APF preceded the adoption of the UK's net zero target and the decision to include IAS in future carbon budgets. Their respective climate provisions relate, therefore, to the earlier CCA target of an 80% reduction in emissions below 1990 levels. The level of aviation emissions assumed in these documents, a planning assumption of 37.5MtCO₂, is not compatible with the UK's new trajectory to net zero by 2050.
- 3.4 The Green Paper acknowledged that changes to the UK's climate ambition were likely once it had reviewed CCC's advice, sending a clear signal that the Government intended to be guided by CCC when determining future aviation policy. The Government is expected to update and strengthen its aviation and climate policy advice in 2021 through inclusion of the sector in its Transport Decarbonisation Plan⁸ and the launch of an aviation net zero policy consultation. Responding to the latest CCC Progress Report the Government has said *"this [aviation net zero] consultation represents the growth in government ambition since the green paper, including the 2050 net zero target and further CCC advice on international aviation and shipping"*⁹

⁵ CD 6.1

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/153776/aviation-policy-framework.pdf

⁶ CD 6.9

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/858533/airports-nps-new-runway-capacity-and-infrastructure-at-airports-in-the-south-east-of-england-web-version.pdf

⁷ CD 6.4

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/714069/making-best-use-of-existing-runways.pdf

⁸ CD 9.16 <https://www.gov.uk/government/publications/creating-the-transport-decarbonisation-plan>

⁹

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/928005/government-response-to-ccc-progress-report-2020.pdf

- 3.5 In the absence of these forthcoming revised plans and policies, weight should be attached to the CCC's policy recommendations on how aviation emissions can be managed in a manner consistent with achieving the net zero climate target. This approach was taken by the Examining Authority for the DCO application to reopen Manston Airport as an air freight hub.
- 3.6 CCC's advice to the Government on the implications of the net zero target for the aviation sector is contained in the letter from Lord Deben to the Secretary of State for Transport in September 2019, in the 2020 Progress Report and in the Sixth Carbon Budget advice¹⁰ published by the CCC on 9 December 2020. The 2019 letter and 2020 Progress Report advise the Government that the new 'planning assumption' for the sector should be net zero emissions by 2050 with the UK's international flights reaching net zero emissions by 2050 at the latest, and domestic aviation potentially earlier. This replaces its previous advice that UK aviation emissions in 2050 should be no higher than in 2005 (a level of 37.5MtCO₂)¹¹.
- 3.8 The 'balanced pathway' modelled by the CCC anticipates residual annual aviation emissions of 23MtCO₂e by 2050 (compared to 38.5MtCO₂e in 2019) and the need to constrain future passenger growth to around 365mppa (compared to 296.8mppa in 2019). The CCC recommended therefore that there should be no net increase in airport capacity since existing UK airport capacity allows for at least 370mppa. CCC argues that new airport capacity can be justified only if accompanied by 'restrictions' elsewhere, or if the industry outperforms already ambitious assumptions about emissions reductions.

4. Policy context for non-CO₂ impacts from aviation

- 4.1 In the Sixth Carbon Budget advice, the CCC recommends that the Government should set non-CO₂ targets to prevent additional warming by 2050. Several areas of Government policy and guidance acknowledge non-CO₂ impacts including current

¹⁰ CD 9.34 <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

¹¹ CD 9.3

advice on GHG reporting¹² for businesses and the ‘Green Book Supplementary Guidance: valuation of energy use and greenhouse gas emissions for appraisal’¹³.

5. Measures to reduce aviation emissions

5.1 Future forecasts of technological and operational efficiency gains, plus the scale of deployment of sustainable aviation fuels and carbon removals, are highly uncertain and will be dependent on market, consumer and regulatory forces, the level of carbon pricing, and investment decisions. The Covid-19 pandemic has also increased the level of uncertainty.

5.2 Solutions are likely to be expensive and difficult to deliver, and take-up is likely to be slow (use of sustainable aviation fuels in 2019 was less than 0.1% of total aviation fuel use) as the current incentives and regulations for the industry to pay for these measures are very weak. Specifically:

- Biofuels are hard to produce sustainably at scale, while sources of sustainable waste will be limited
- E-kerosene will require large amounts of surplus renewable electricity to produce, and is not yet commercially available
- step changes in aircraft propulsion, such as the use of electric or hydrogen power, are unlikely to be available for the 100-plus-seat aircraft market before 2050
- there are currently no plans for increasing the stringency of ICAO’s aircraft CO2 standard for manufacturers, while one reported consequence of the pandemic is the cancellation of aircraft new orders, which has offset the decision by some airlines to retire older, less efficient aircraft early
- up to 10% of the emission reduction assumed in the DfT’s 2017 demand and CO2 forecasts are attributable to carbon pricing, but the UK ETS and CORSIA (the only carbon pricing mechanisms currently applied to UK aviation) are

¹² CD 9.54 <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020>

¹³ <https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal>

unlikely, when averaged across all flights, to be equivalent to the BEIS cost of carbon assumed in the modelling

- carbon removals will be needed to balance residual aviation emissions in 2050 to meet net zero (estimated in the CCC balanced pathway to be approximately 23MtCO₂) but the Government acknowledged in its December 2020 call for evidence¹⁴ that the market for GGRs is currently constrained by a range of barriers that will need to be overcome to achieve the scale of removals that the CCC estimates will be required by 2050.

5.3 The industry's ability to use CORSIA, and the extent to which it will be able to rely on the UK ETS, for compliance with the Sixth Carbon Budget is uncertain for the following reasons:

- CORSIA's goal, to keep emissions from international aviation at or below 2020 levels, is not aligned with a Paris-compatible trajectory and is scheduled to end in 2035, midway through the Sixth Carbon Budget
- in its Sixth Carbon Budget report, CCC advised the Government that CORSIA should be additional to action to bring the sector's actual emissions into line with net zero, and that it should not be used for compliance with domestic effort required under the Climate Change Act.
- on the wider issue of offsets, the CCC's 2019 net zero recommendations, and 2021 advice for BEIS, advised against relying on the use of international carbon units (or 'credits')¹⁵ for meeting UK 2050 climate obligations.

6. BAL's assessment of greenhouse gas emissions associated with an increase in capacity from 10 to 12mppa

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/941191/green-house-gas-removals-call-for-evidence.pdf

¹⁵ CD 9.9 <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>

- 6.1 BAL's Environmental Statement Addendum Volume 1 and Appendices¹⁶ shows that the emissions associated with flights in 2050 would be 18.9% higher than without development (central scenario). The upper emissions scenario, based on DfT's 2017 aviation forecast assumptions¹⁷ estimates emissions to be 410.65KtCO₂e and 488.29KtCO₂e, without and with development respectively, but this is surprisingly low given DfT's forecast, using the same assumptions, estimated the airport would emit 500KtCO₂e in 2050 (with a passenger throughput of 10.2mppa). Extrapolating this data to show 2050 with development would suggest a figure closer to 600KtCO₂e (assuming a similar aircraft fleet mix).
- 6.2 Non-CO₂ impacts have not been included in the airport's assessment of the climate implications of expansion on the basis of uncertainty.
- 6.3 BAL assessment is based on an assumption that emissions should be assessed against the CCC's pre-net zero aviation planning assumption of 37.5MtCO₂, although this ignores the CCC's most recent advice to Government that this planning assumption should be superseded by a new sectoral goal of net zero emissions by 2050. Without prejudice to this view, Womble Bond Dickinson's letter of 5 May 2021 on behalf of BAL argues further that international aviation's inclusion in the Sixth Carbon Budget would, in any event, no longer require the industry to meet the 'planning assumption' of 37.5MtCO₂. It is wrong however to imply that there is no benchmark for these emissions during the period 2033-2037, or indeed out to 2050. The CCC's modelled balanced pathway to net zero provides figures for the levels of UK aviation emissions in interim years, namely 31MtCO₂e by 2035 and 23MtCO₂ by 2050. The CCC's balanced pathway to net zero for the sector, which accompanied the CCC's 2020 Sixth Carbon Budget is, therefore an appropriate benchmark for assessing the application in the absence of 'updated Government policy.
- 6.4 Both the old and new planning assumptions require an assessment of total UK aviation emissions, factoring in possible increases from other airport expansions.

¹⁶ CD2.20.6

¹⁷ CD 6.2 <https://www.gov.uk/government/publications/uk-aviation-forecasts-2017>

DfT's latest forecasts (2017) assume UK CO₂ emissions associated will be 37MtCO₂ by 2050 even without significant new airport infrastructure, leaving almost no headroom for further expansion at any airport even assessed against the old 37.5 Mt benchmark. The Government's MBU, based on modest traffic increases, increased this figure to 37.9MtCO₂ in 2050 (rising to 40.8MtCO₂ if a third runway at Heathrow is included). AEF's analysis of planned growth at UK airports (based on master plans or planning documents) shows, by contrast, more than 530mppa by 2050 if all airports are allowed to proceed (or 490mpaa without a third runway at Heathrow). This implies that either the MBU assessment has significantly underestimated the growth associated with this policy, and hence the likely increase in carbon emissions, or that not all airport expansion plans can go ahead. Given that approval has recently been given to Stansted and Southampton (subject to any legal challenges), there is little or no headroom to accommodate growth at other airports consistent with the MBU growth assessment.

- 6.5 The increase in cumulative emissions from submitted planning applications at airports throughout the UK, including at Heathrow, Stansted, Leeds-Bradford, Manston and Southampton, as well as Bristol, would exceed both the 37.5MtCO₂ and 23MtCO₂ policy tests by a considerable margin. Analysis by the AEF¹⁸, using data extrapolated from the DfT's 2017 forecasts, shows that current airports expansion plans could cumulatively increase emissions in 2050 by a further 8.87MtCO₂e.

7. BAL's proposed mitigation

- 7.1 BAL's proposed mitigation of climate impacts it set out in its Carbon Roadmap¹⁹ and Draft Carbon and Climate Change Action Plan (CCCAP)²⁰ in accordance with draft Condition 15. However, the proposed measures are subject to a number of limiting factors:

¹⁸ CD 9.59 <https://www.aef.org.uk/uploads/2021/05/Cumulative-airport-emissions.pdf>

¹⁹ CD 9.10 <https://www.bristolairport.co.uk/about-us/environment/carbon-roadmap>

²⁰ CD 9.48

- while BAL commits to its Scope 1 and 2 emissions being net zero by 2021 these account for just 0.67% of the total emissions associated with the airport's operations (including Scope 3 emissions)
- attaining this goal, as well as BAL commitment to carbon neutral journeys to and from the airport, relies on offsetting. At least 90% of the offset projects are likely to be international offset credits contrary to the CCC's advice that these should not be used to meet the UK's net zero commitment, and therefore should not be regarded as appropriate mitigation
- transitioning to the use of carbon removals instead of offsets is likely to be very small scale by 2030.
- the Draft CCCA acknowledges that it can only guide and influence Scope 3 emissions (which account for over 99% of total airport emissions), relying primarily on future, as yet unpublished, Government policy to achieve its net zero 2050 goal
- increasing the airport's capacity by 2mppa while increasing the public transport modal share goal by only 2% will still result in an additional 1,460,000 passenger trips per annum arriving at or departing from the airport by road
- planned efforts to publish a league table of operators' noise and emissions will only be useful if BAL uses operator specific data that goes beyond aircraft manufacturers' data for carbon emissions (something the industry has strongly resisted to date)
- financial incentives and penalties to encourage more efficient operations, perhaps using differential landing charges are unlikely to be put in place until 2030.
- reducing the track miles flown may be compromised by a need to prioritise the reduction of noise.

7.2 As a planning condition the Draft CCCAP cannot guarantee that emission reductions will be delivered at the scale and pace required.

8. Conclusion on climate change

- 8.1 Aviation will be one of the most difficult sectors to decarbonise. The last year for which data is available (2019) recorded the highest-ever level of CO₂ from UK civil aviation²¹, continuing a trend which has seen annual increases in most years since 2012.
- 8.2 The UK's commitment to achieve net zero emissions across all sectors by 2050, which the UK enshrined in law in 2019, will require profound changes both to how we supply our energy and also to how we live our lives, including in relation to transport and travel. The prime minister has committed to 'build back better' from Coronavirus, describing climate change (in November last year) as "the most enduring threat to our planet".²²
- 8.3 The increased emissions associated with BAL's application – whether assessed against the old threshold of 37.5MtCO₂ or the CCC's net zero modelling – will have a material impact on the Government's ability to meet its greenhouse gas reduction targets, and as such is in my view incompatible with the UK's commitment to achieve net zero emissions across all sectors by 2050. The proposed condition for mitigation is limited in its ability to ensure emissions reductions, being largely dependent on the wider actions of industry and Government.
- 8.4 The application is in direct contravention of the CCC's recommendation that there should be no net increase in airport capacity. As existing aviation policy predates the UK's net zero commitment, and the Government has said that the forthcoming aviation consultation will reflect increased ambition, weight should be given to the CCC's recommendations for the sector when assessing the climate implications of this application.

²¹ CD 9.34 <https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Aviation.pdf>

²² CD 9.52 <https://www.ft.com/content/6c112691-fa2f-491a-85b2-b03fc2e38a30>