



Witness 4 of 26, Climate Change
PCCA/W4/1 –Proof of Evidence

Expansion of Bristol Airport to 12mppa

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Planning Application Ref: 18/P/5118/OUT

Proof of Evidence for PCCA

Tim Johnson

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

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

June 2021

1. Introduction

- 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. AEF's membership comprises community and amenity organisations, and locally elected bodies. The Parish Councils Airport Association is an AEF member.
- 1.2 AEF is a member of the DfT's Jet Zero Council¹ and a number of other official engagement groups, and has given oral evidence on the subject of airport expansion to the Airports Commission, the Transport Committee and the Environmental Audit Committee.
- 1.3 I have over thirty years' experience in the aviation and environmental policy field and have been Director of AEF since 1997. During this time I have been a member of the Department for Transport's South East Airports Task Force and External Advisory Board, and currently sit on its Airspace Strategy Board, the Airspace and Noise Engagement Group, and the Jet Zero Council.
- 1.4 I am also the nominated civil society Observer at the UN International Civil Aviation Organisation's Committee on Aviation Environmental Protection (CAEP) where I represent the environmental NGO umbrella group ICASA, the International Coalition

¹ CD 9.56 <https://www.gov.uk/government/groups/jet-zero-council>

for Sustainable Aviation. At CAEP, I lead ICAO's task force supporting its aviation carbon calculator and previously I co-led the group responsible for developing the emission unit (offset) eligibility criteria for CORSIA. I also spent eighteen months as aviation policy adviser to Defra, and was part of the consultancy team that designed the reporting templates for aviation's inclusion in the EU Emissions Trading System.

- 1.5 This statement covers the climate change implications of Bristol Airport's proposal to increase its capacity to 12 million passengers per annum.

2. Aviation and climate change

- 2.1 In 2018, the Intergovernmental Panel on Climate Change (IPCC) issued a special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening efforts to eradicate poverty and deliver sustainable development, and to hasten the global response to the threat of climate change. According to the IPCC, human activities have caused approximately 1.0°C of global warming above pre-industrial levels, and global warming is *likely* to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate². To avoid temperature rises greater than 1.5°C, IPCC modelled pathways show that global net anthropogenic CO₂ emissions must decline by about 45% from 2010 levels by 2030, reaching net zero around 2050. This requires "rapid and far-reaching" transitions in land, energy, industry, buildings, transport, and cities.

- 2.2 Globally, aviation emissions in 2019 were around 1GtCO₂, approximately 2% of all anthropogenic emissions. In the UK, emissions from UK domestic and international flights (based on departing flights only, and excluding military activity) were 38.2MtCO₂e in 2018 (of which 1.5MtCO₂e was generated by domestic flights and 36.7MtCO₂e by international flights). This is around 7% of all UK GHG emissions in 2018 although this figure does not take aviation's non-CO₂ impacts into account.

² CD 9.58 <https://www.ipcc.ch/sr15/chapter/spm/>

BEIS GHG inventory data for 2019³ shows that UK aviation emissions rose to 38.5MtCO₂e, a record high and 10% higher than in 2015. The Climate Change Committee (CCC) highlights⁴ 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. For example, emissions of nitrogen oxides (NO_x) at high altitude (that react to increase atmospheric ozone concentrations and decrease methane) and the formation of contrail cirrus both generate additional warming. 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 alone⁵ (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 2008⁶, its Nationally Determined Contribution under the Paris Agreement, and a range of supporting policies.
- 3.2 The Climate Change Act (CCA) became law in 2008 and committed the UK to an emission reduction of 80% below 1990 levels by 2050. To achieve the target, the Act required the Government to legislate for a series of carbon budgets out to 2050 which place a restriction on the total amount of greenhouse gases the UK can emit in each five-year period. The Act also established the Climate Change Committee (formerly the Committee on Climate Change) as an independent, statutory body to advise the UK and devolved governments on emissions targets and to report to

³ CD9.111 <https://data.gov.uk/dataset/9568363e-57e5-4c33-9e00-31dc528fcc5a/final-uk-greenhouse-gas-emissions-national-statistics>

⁴ CD 9.34

⁵ CD 9.60 <https://www.sciencedirect.com/science/article/pii/S1352231020305689?via%3Dihub#>

⁶ CD 9.2

Parliament on progress made in reducing greenhouse gas emissions and in preparing for and adapting to the impacts of climate change.

- 3.3 As a Party to the United Nations Framework Convention on Climate Change (UNFCCC), the UK is a signatory to the Paris Agreement which is a legally binding international treaty on climate change. It was adopted by 196 Parties at the COP 21 in Paris on 12 December 2015, and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2 degrees Celsius, aiming for warming of not more than 1.5 degrees Celsius, compared to pre-industrial levels.
- 3.4 Following the IPCC's 2018 special report on the need for net zero emissions by around 2050 in order to have a reasonable probability of keeping global temperature rises at or below 1.5°C, the Climate Change Committee (CCC) published 'Net Zero: the UK's contribution to stopping global warming'⁷ (May 2019). This report responded to a request from the Governments of the UK, Wales and Scotland, asking the Committee to reassess the UK's long-term emissions targets. CCC's report recommended a new emissions target: that the UK should achieve net-zero greenhouse gases by 2050. The report noted that a *"net-zero GHG target for 2050 will deliver on the commitment that the UK made by signing the Paris Agreement. However, this is only possible if clear, stable and well-designed policies to reduce emissions further are introduced across the economy without delay. Current policy is insufficient for even the existing targets."*
- 3.5 Following publication of the CCC's net zero advice, the Government legislated in June 2019 to amend the UK's CCA target to net zero greenhouse gas emissions by 2050.
- 3.6 Under the original provisions of the Act, emissions from international aviation and shipping (IAS) were not included formally in the five yearly carbon budgets, although 'headroom' for these emissions was provided. In September 2019, CCC chair Lord

⁷ CD 9.9 <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>

Deben wrote to the Secretary of State for Transport setting out the implications of the net zero target for international aviation and shipping (IAS) emissions⁸. The letter stressed that the Committee's advice for the UK to achieve net zero by 2050 was based on an assumption that IAS emissions would be included within the target, and that without this, a more ambitious target would be likely to be required. The letter further argued that addressing IAS emissions was strategically important as aviation is likely to be the largest emitting sector in the UK by 2050, even with strong progress on technology and limiting demand. Formal inclusion of IAS emissions would help to guide long-term policy approaches and infrastructure investment decisions, CCC argued. This recommendation to legislate for the inclusion of IAS was repeated in December 2020 when the CCC advised that emissions from these sectors should be included formally when setting the level of the sixth carbon budget running from 2033 to 2037.

- 3.7 On 20 April 2021, the Government announced⁹ its plans for the sixth carbon budget including a binding climate change target to reduce emissions by 78% by 2035 compared to 1990. A Statutory Instrument, the Carbon Budget Order 2021¹⁰, was subsequently laid before Parliament on 21 April 2021 and will be enshrined in law by the end of June 2021. Importantly, the Government announced that the sixth carbon budget would incorporate emissions from international aviation and shipping for the first time:

“For the first time, this Carbon Budget will incorporate the UK’s share of international aviation and shipping emissions – an important part of the government’s decarbonisation efforts that will allow for these emissions to be accounted for consistently.”

⁸ CD 9.11 <https://www.theccc.org.uk/publication/letter-international-aviation-and-shipping/>

⁹ CD 9.37 <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>

¹⁰ CD 9.38 <https://www.legislation.gov.uk/ukdsi/2021/9780348222616>

b) Aviation policy related to climate change

- 3.8 The Department for Transport has published several policy documents relevant to aviation and climate change including the Aviation Policy Framework (APF)¹¹ published in March 2013, the Airports National Policy Statement (Airports NPS)¹² adopted in June 2018, Making Best Use of Existing Runways (also in June 2018)¹³, and the Aviation Strategy 2050 Green Paper published in December 2018.
- 3.9 The Airports NPS, it said, provided “the primary basis for decision making on development consent applications for a Northwest Runway at Heathrow Airport, and will be an important and relevant consideration in respect of applications for new runway capacity and other airport infrastructure in London and the South East of England.” It went on to state that “The Airports NPS does not affect Government policy on wider aviation issues, for which the 2013 Aviation Policy Framework and any subsequent policy statements still apply.”
- 3.10 The APF states that the Government’s objective is to ensure that the aviation sector makes a significant and cost-effective contribution towards reducing global emissions, primarily through international action in order to minimise issues of competitiveness and to avoid carbon leakage. Alongside the Government’s aspirations for progress at ICAO, the APF highlights a key role for the EU Emissions Trading System (EU ETS). The aviation sector became subject to the requirements of the EU ETS in 2012. At the time of publication of the APF legislation was in place for the EU ETS to cover all flights departing or arriving at airports in the EEA region. To address political pressure from non-EU states about the scope of the scheme, however, the European Commission was negotiating with EU Member States to ‘stop

¹¹ CD 6.1

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

¹² 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

¹³ CD 6.4

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

the clock' for one year to await the outcome of ICAO's Assembly discussions on a global market-based measure. The scope of the EU ETS was subsequently reduced to intra-EU flights only, initially for twelve months, and then as a permanent amendment.

3.11 In June 2018, the Government published 'Making Best Use of Existing Runways' (MBU) in which it set out its support for airports beyond Heathrow to make best use of their capacity, while recognising that this could lead to increased air traffic which could in turn increase carbon emissions. The Department's modelling of carbon emissions was based on modest growth assumptions, estimating that there would only be a 2% increase in air traffic movements by 2050 without Heathrow expansion (compared to the 2050 baseline), and 1% with Heathrow expansion. This, it was predicted, would result in emissions rising from 37MtCO₂ in the baseline scenario to 37.9MtCO₂ without Heathrow expansion, and to 40.8MtCO₂ with Heathrow expansion. These increases in emissions were assessed against 'carbon traded' and 'carbon capped' scenarios developed by the Airports Commission. The traded scenario allowed for the increase in emissions on the basis that reductions would be made elsewhere in the global economy, although this approach relied on a global trading scheme being in place which is not the case currently. The carbon capped scenario identified additional mitigation to keep emissions at or below 37.5MtCO₂. The Government concluded that there was significant uncertainty over the likely costs of additional measures (such as single engine taxiing and the uptake of 'renewable fuels') but that on balance a combination of measures was likely to be available to meet the planning assumption.

3.12 Aviation 2050 - The Future of UK Aviation¹⁴ was published as a Green Paper consultation in December 2018. No White Paper has yet been published. The Green Paper notes that "Growth can have significant environmental impacts which affect local communities and increase emissions. There are also significant infrastructure

¹⁴ CD 6.5

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/769695/aviation-2050-web.pdf

constraints which require urgent attention, such as the need to modernise our airspace, improve transport links to airports and consider whether new runways are required. Therefore, while the government supports continued growth in aviation over the next 30 years, it also believes that the UK must be more ambitious on environmental protection to ensure that growth is sustainable.” The Green Paper expresses support for airports making best use of their existing runway capacity though it specifies that this is subject to economic and environmental issues being addressed.

- 3.13 The Green Paper restates the Government’s preference for international action and its hopes for a long-term, Paris-compatible goal at ICAO, but adds that “The government recognises that international action takes time, so will also consider appropriate domestic action to support international progress.” The Government would accept, the Green Paper says, the CCC’s recommendation that emissions from UK-departing flights should be at or below 2005 levels in 2050. Specifically, in relation to airport expansion, the Green Paper states that the Government’s long-term vision and pathway for addressing UK aviation’s impact on climate change will require planning applications for capacity growth (a) to provide a full assessment of emissions, drawing on all feasible, cost-effective measures to limit their climate impact, and (b) to demonstrate that their project will not have a material impact on the government’s ability to meet its carbon reduction targets.
- 3.14 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. The Green Paper acknowledged that changes to the UK’s climate ambition were likely, stating that the Government would review the CCC’s revised aviation advice (due in spring 2019) and its advice on the implications of the Paris Agreement for the UK’s long term emissions reduction targets (due to be published at the same time). Furthermore, regular reviews would be needed

thereafter to align with the setting of carbon budgets, the Green Paper said, and the Government would “use CCC’s reviews to monitor the sector’s progress at the national and international level and to adjust its mix of policy measures and overall approach accordingly”. This sent a clear signal that the Government intended to be guided by CCC advice when determining future aviation policy.

- 3.15 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 Plan¹⁵ 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, and will propose how the Government plan for aviation to play its part in delivering our net zero ambitions.”*¹⁶
- 3.16 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. In relation to the DCO application to reopen Manston Airport as an air freight hub, the Examining Authority argued in its 2020 recommendations to the Secretary of State that the CCC’s advice should be treated as emerging policy and given due weight in considering whether emissions from the development would have a material impact on the ability of the Government to meet its carbon reduction targets, including carbon budgets.
- 3.17 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

¹⁵ CD 9.16 <https://www.gov.uk/government/publications/creating-the-transport-decarbonisation-plan>

¹⁶ CD9.112

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

Carbon Budget advice¹⁷ 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)¹⁸. The 2020 Progress Report also called on the Government to review the UK’s airport capacity strategy in light of COVID-19 and net zero, including undertaking a household and business survey of long-term travel expectations.

3.18 The ‘balanced pathway’ modelled by the CCC for the Sixth Carbon Budget suggests that attaining net zero aviation will be challenging. It anticipates residual annual aviation emissions of 23MtCO₂e by 2050 (compared to 38.5MtCO₂e in 2019), even allowing for:

- likely technology and operational improvements (CCC assumptions assume a 1.4% per annum efficiency improvement through to 2050, a significantly more optimistic estimate than the CCC’s 2009 prediction of 0.85% per annum);
- 25% of total fuel used in 2050 being ‘Sustainable Aviation Fuel’ (SAF), 17% from biofuels and 8% from synthetic fuels, both of which are assumed to deliver a 100% emission saving, again a more optimistic outlook than assumed in earlier CCC reports which estimated that SAF would account for just 10% of fuel use in 2050, reducing emissions by 5%;
- increases in passenger demand being limited to no more than 25% over 2018 levels (approximately 365mppa, significantly less than the 70% growth prediction made by Sustainable Aviation and the 50% increase predicted by the Department for Transport in its 2017 passenger forecasts constrained scenario).

¹⁷ CD 9.34 <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

¹⁸ CD 9.3

- 3.19 Residual aviation emissions in 2050 will need to be balanced by carbon removals to achieve net zero, CCC argues. The industry will need to lead the investment in this new technology that is currently unproven at scale.
- 3.20 The need to constrain future passenger growth to around 365mppa (compared to 296.8mppa in 2019) led the CCC to recommend to the Government 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.
- 3.21 CCC’s balanced pathway to net zero assumes that UK aviation emissions will be as follows:
- 2025 – 37 Mt CO₂e
 - 2030 – 33 Mt CO₂e
 - 2035 – 31 Mt CO₂e
 - 2040 – 30 Mt CO₂e
 - 2045 – 25 Mt CO₂e
 - 2050 – 23 Mt CO₂e
- 3.22 In summary, while existing aviation policy references keeping UK aviation emissions at or below 37.5MtCO₂ by 2050, following the introduction of net zero legislation and the subsequent commitment to include IAS in carbon budgets any assessment of greenhouse gas emissions should also take account of the likely increase in Government ambition for the sector in the near future. In the absence of updated policy and guidance from the Government, weight should be attached to the recommendations and modelling undertaken by CCC in terms of likely emission reduction pathways for the sector and the policy measures required.

4. Policy context for non-CO2 impacts from aviation

- 4.1 In the Green Paper, the Government states that it plans to negotiate for any long-term goal at ICAO to be set and reviewed in light of aviation's full climate impact, taking into account evolving evidence on non-CO2 effects.
- 4.2 The CCC's 2019 letter also notes that aviation has climate warming effects in addition to CO2, which will be important to monitor and consider within future policies. In the Sixth Carbon Budget advice, the CCC recommends that the Government should set both CO2 and non-CO2 targets. CCC argues *"For consistency with the Net Zero target, under which UK GHG emissions are reduced to Net Zero to stop contributing to further increases in global temperature by 2050, UK aviation non-CO2 effects should also target stopping contributing to further increases in global temperature by this same date. Without the development of mitigation options for these non-CO2 effects, this would require year-on-year demand growth to be reduced to essentially zero by or before 2050."*
- 4.3 Several areas of Government policy already acknowledge non-CO2 impacts. Despite the remaining scientific uncertainty associated with quantifying aviation's non-CO2 effects, current Government advice on GHG reporting¹⁹ for businesses is that *'Organisations should include the influence of radiative forcing RF in air travel emissions to capture the maximum climate impact of their travel habits'*. The 'Green Book Supplementary Guidance: valuation of energy use and greenhouse gas emissions for appraisal'²⁰ also advises that "where appropriate, proportionate and possible to identify the impact of the proposal on emissions overseas or that occur outside the target framework (e.g. radiative forcing from aviation), the change in emissions overseas should be valued at the Traded Price of Carbon over the 2010-2030 period."

¹⁹ CD 9.54 <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020>

²⁰CD9.113 <https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal>

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 CCC, Department for Transport and industry forecasts (for example Sustainable Aviation's carbon roadmap) rely heavily on assumptions about the scale of in-sector reductions, and these vary significantly on some issues. For example, while the CCC modelling assumes that a net zero target requires demand to be limited to no more than a 25% increase above 2018 levels, the industry coalition Sustainable Aviation claims²¹ that it will be possible to achieve net zero emissions in the sector through a combination of technical measures and carbon offsetting while still allowing for a 70% growth in passenger numbers.
- 5.3 All solutions are, however, 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. Biofuels are hard to produce sustainably at scale as the required land for crop-based feedstocks will be competing with both agriculture and with the need for increased forest cover to store carbon, while sources of sustainable waste will be limited. It is possible to produce a zero-carbon, drop-in fuel for aircraft by capturing carbon from the air and combining it with green hydrogen to make a liquid fuel. But this would require large amounts of surplus renewable electricity to produce, and none of this kind of fuel is yet commercially available. Government policy is expected to be clarified later this year. A consultation on mandating the use of 'sustainable aviation fuels' is expected over

²¹ CD 9.14 https://www.sustainableaviation.co.uk/wp-content/uploads/2020/02/SustainableAviation_CarbonReport_20200203.pdf

the summer, with questions relating to the eligibility criteria for biofuels, the level of a mandate and whether passengers should cover the cost (since most biofuels are currently at least two to three times more expensive than kerosene). Some of these questions will have implications for ticket prices and, consequently, future levels of demand. A similar discussion is also underway in Europe, with likely mandate thresholds being 2% by 2025 and 5% by 2030. There is a strong policy argument in favour of aligning UK and EU mandate levels.

- 5.4 The introduction of more fuel-efficient aircraft requires a long-term perspective (as aircraft in commercial passenger service have an average life cycle of 22 years) and is beyond BAL's direct control except through the possible use of differentiated landing charges to create incentives for operators. 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. Smaller all-electric aircraft may become viable for very short domestic or near-European journeys, but limitations posed by battery weight will make them unsuitable for replacing conventional aircraft for longer trips. In a report jointly commissioned by DfT and CCC on 'understanding the potential and costs for reducing UK aviation emissions'²² it was "judged unlikely that sufficient progress will be made by 2050 to enable electricity to be the sole source of propulsive power for any of the classes considered in this report."
- 5.5 The CCC's assumption that fleet efficiency could improve by 1.4% per annum is dependent on a range of external factors including future regulatory drivers and market forces. There are currently no plans for increasing the stringency of ICAO's aircraft CO₂ standard for manufacturers, and 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. Before the pandemic, there were over 14,000 aircraft on order but by the end of March 2021 this had slumped

²² CD 9.61

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785685/ata-potential-and-costs-reducing-emissions.pdf

to 12,844 with production having fallen to its lowest level for ten years²³. Depending on the speed of the recovery, this could delay the introduction of new technologies.

- 5.6 CCC's policy recommendation for delivering net zero aviation includes limiting demand to no more than a 25% increase in passengers above 2018 levels (equivalent to an earlier recommendation that demand should be kept to a 60% increase above 2005 levels). CCC has not advanced detailed policy recommendations on how demand could be managed, but has suggested that in addition to the management of airport capacity, carbon pricing will be needed. In fact, up to 10% of the emission reduction assumed in the DfT's 2017 forecasts is attributable to carbon pricing (based on the BEIS published cost of carbon). At the time of its publication, 2017, this was assumed to be £77/tCO₂ in 2030 and £221/tCO₂ in 2050 (both in 2016 prices). In contrast, CORSIA is unlikely to result in any offsetting obligations before 2025 and even then, prices are likely to be £7-23/tCO₂ by 2030²⁴ ²⁵. The UK Emissions Trading System (UK ETS) auction regulations have set the minimum price for bids for allowances at £22, although as a guide to future prices in the UK ETS, the EU ETS allowance price in April 2021 was trading at over £39²⁶ (a record high). However, airlines are only required to pay the CORSIA (ICAO's Carbon Offsetting and Reduction Scheme for International Aviation) price for emissions above 2019 levels, meaning the vast majority of emissions on international routes covered by the scheme attract no carbon price at all, and airlines operating on UK domestic and UK-EEA routes receive a high proportion of their allowances for free. This means that the average price per tonne for all aviation emissions will be significantly lower than the market price for both schemes.
- 5.7 The UK ETS and CORSIA are the only carbon pricing mechanisms currently applied to UK aviation. It remains to be seen how the UK will treat routes that are subject to the requirements of both schemes. However, it is unlikely that the total carbon price, when averaged, will be equivalent to the BEIS costs assumed in the DfT's

²³ CD 9.62 <https://www.adsadvance.co.uk/pandemic-s-impact-on-global-aerospace-continues.html>

²⁴ CD 9.57 https://www.icao.int/environmental-protection/pages/a39_corsia_faq3.aspx

²⁵ \$10-33/tCO₂ based on an exchange rate of \$1 = £0.70 at 17 May 2021

²⁶ 45 Euros based on an exchange rate of 1 Euro = £0.86 at 17 May 2021

modelling. As the carbon price acts as a driver for innovation and efficiency, this will have a negative impact on forecast emissions reductions, suggesting that the Government will need to pursue additional policies to increase carbon pricing, either to encourage airlines to introduce measures with relatively high abatement costs or to encourage behavioural change amongst consumers. BAL's dependence on low-cost airlines makes it particularly vulnerable to passenger-related demand management such as carbon pricing, frequent flyer levies and changes to fuel duty, VAT and air passenger duty.

- 5.8 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. The UK ETS currently applies to domestic flights and departing international flights to EEA destinations. However, due to the fact that CORSIA applies to all international flights on eligible routes, some routes are covered by both schemes. The Government recently consulted on options to address this overlap, including applying the UK ETS or CORSIA requirements only on affected routes, various hybrid approaches, or maintaining the full provisions of both schemes in parallel. A further consultation on these options is expected in summer 2021.
- 5.9 CORSIA faces a number of limitations and challenges as a compliance mechanism for UK climate effort. CORSIA's goal, to keep emissions from international aviation at or below 2020 levels, is not aligned with a Paris-compatible trajectory. Although the UK is participating in its voluntary phases between 2021 and 2026, CORSIA will not be mandatory for all states until 2027. As a result, CORSIA will cover only 6% of projected CO₂ emissions from all international aviation between 2015 and 2050. The scheme is also currently scheduled to end in 2035, midway through the Sixth Carbon Budget. ICAO has held no discussions to date on whether market-based measures will be in place after this date.
- 5.10 More significantly, CCC advised the Government in its Sixth Carbon Budget report, that CORSIA should not be used for compliance with carbon budgets. While the CCC supports the principle of international action on aviation emissions and urges the UK

Government to continue negotiating at the UN level, the Committee notes that CORSIA is not currently aligned with the goals of the Paris Agreement and only requires emissions to be offset above a 2019 baseline (a level unlikely to be reached until around 2024 at the earliest following the pandemic). Compliance with the scheme should therefore, CCC argues, be additional to action to bring the sector's actual emissions into line with net zero; specifically, it advises that CORSIA offsets should not be used for compliance with domestic effort required under the Climate Change Act. For this reason, CORSIA is not included in the CCC's balanced pathway to net zero.

- 5.11 On the wider issue of offsets, the CCC's 2019 net zero recommendations advised against relying on the use of international carbon units (or 'credits')²⁷ for meeting UK 2050 climate obligations. Not only will other countries need to claim these emission reductions in order to meet their own net zero commitments, but there is also likely to be a scarcity of high-quality offsets available as the world gets closer to net zero in 2050. There is also a high risk that claimed emission reductions could be double counted. While the Government has not legislated to exclude these credits, ministers have said there is no intent to use international offsets for compliance with the CCA²⁸. The CCC also wrote to the Secretary of State in March 2021²⁹ stressing that the use of international offset credits should be regarded as additional to domestic action, noting their use in place of domestic action poses would detract from UK climate leadership and reduce clarity on the steps required in the UK to meet Net Zero. For these reasons, offsetting is likely to play a small and short-term role in decarbonising the UK aviation sector.
- 5.12 The CCC has argued that carbon removals will be needed to balance residual aviation emissions in 2050 to meet net zero (estimated in the balanced pathway to be approximately 23MtCO₂). However, while removals can take the form of offsets, not all offsets are removals. In fact, only a portion of the list of eligible offset

²⁷ CD 9.9 <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>

²⁸ CD9.115 <https://www.bbc.co.uk/news/science-environment-48596775>

²⁹ CD 9.63

programmes under CORSIA fall into this category, and most of these are nature-based solutions which may be limited in scale in the future. The CCC's reference in its 2019 letter to the Secretary of State for Transport to removals being delivered through a framework like CORSIA is dependent on that scheme being reformed to produce robust carbon removal measures.

- 5.13 Since there can be no certainty that sufficient removals will exist to compensate for the 23MtCO₂ of aviation emissions in 2050 currently allowed for by the CCC, further policy action may be required to ensure the aviation sector makes even deeper cuts. As identified by the Government in its December 2020 call for evidence on greenhouse gas removals (GGRs)³⁰, 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. "These include but are not limited to:
- Innovation and demonstration barriers: GGR options at early technology readiness levels will require innovation and demonstration support before they are ready for commercial deployment.
 - Financial barriers: Large initial costs, long payback periods, and a lack of price incentives for negative emissions can limit commercial viability and hamper investment in GGRs.
 - Non-financial deployment barriers: CO₂ transport and storage infrastructure will be required to enable rollout of BECCS and DACCS, as well as supply chain growth and the establishment of clear liability frameworks for the custody of captured and stored CO₂.
 - Accounting barriers: Accounting principles are not yet well established to measure robustly and transparently the quantity and permanence of CO₂ storage through GGRs.
 - Environmental barriers: The immaturity of some GGR techniques means that their local impacts on soil, water and air quality are not yet fully understood.

³⁰ CD9.114

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

Requirements for resources such as heat, water and biomass may also create trade-offs with other objectives and must be met sustainably.”

- 5.14 BAL’s Environmental Statement Addendum Volume 1: Main Report³¹ highlights the Government’s preference for action at an international level to address aviation’s international carbon emissions. ICAO’s existing aspirational goals are, however, to ensure emissions from international aviation remain at or below 2020 levels on a net basis, while supporting a 2% per annum improvement in fuel efficiency – not measures that are aligned with UK climate ambition.
- 5.15 International measures alone, which are focused almost exclusively on carbon offsetting and manufacturing standards, will not deliver the CCC’s recommended planning assumption for the UK aviation sector or the Government’s commitment to decarbonisation of all transport by 2050. The evidence suggests that ICAO is *not* on track to deliver a global approach that aligns with the Paris Agreement. Currently, ICAO has no long-term climate goal for international aviation and while its environment committee has an ongoing task to assess the feasibility of setting such a goal, the first opportunity to debate it will be at the next ICAO Assembly in 2022. Based on my first-hand experience of these negotiations, my view is that any political agreement is likely to fall short of the level of ambition being recommended as necessary by the CCC. Given the inclusion of international aviation and shipping in the sixth carbon budget, any additional effort required to meet net zero will need to be delivered through additional domestic or regional actions.
- 5.16 The uncertainties associated with the above mitigation options underpin the CCC’s recommendation that there should be no net increase in airport expansion. CCC states that further expansion should only be considered if and when the industry outperforms the expected emission reductions set out in its balanced approach pathway, creating the necessary headroom.

³¹ CD2.20.1 https://planning.n-somerset.gov.uk/online-applications/files/7A149BB796B80EEE51CED34DB2DDD01F/pdf/20_P_2896_APPCON-ENVIRONMENTAL_STATEMENT_ADDENDUM_VOLUME_1__MAIN_REPORT-2988071.pdf

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

- 6.1 BAL's Environmental Statement Addendum Volume 1 and Appendices³² show total GHG emissions in 2017 to be 670kTCO₂e, comprising emissions from aviation activity, surface access, airport buildings and operations, and construction (including embodied carbon). Under the central emissions scenario, these emissions rise to 680.64KtCO₂e in 2024, before falling to 632.54KtCO₂e in 2030, 532.83KtCO₂e in 2040 and 405.44KtCO₂e in 2050 without further development. With the proposed development, these figures increase from the 2017 baseline to 731.41KtCO₂e in 2024 and 763.03KtCO₂e in 2030, before falling to 636.53KtCO₂e in 2040 and 483.63KtCO₂e in 2050.
- 6.2 Specifically for domestic and international aviation, emissions associated with the development are expected to rise from 472.45KtCO₂e in the 2017 baseline, to 509.16KtCO₂e in 2024 and 544KtCO₂e in 2030, before falling to 528.52KtCO₂e in 2040 and 443.01KtCO₂e in 2050. For comparison, emissions in 2050 would be 18.9% higher than without development (372.57KtCO₂e).
- 6.3 BAL also provides an upper emissions scenario based on the DfT's 2017 aviation forecast assumptions³³. This shows the emissions with development to be 488.29KtCO₂e in 2050, and 410.65KtCO₂e without development. The 'without development' figure is surprisingly low given that the DfT's 2017 forecast of emissions, using the same assumptions, estimated that Bristol 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).

³² CD 2.20.6

³³ CD 6.2 <https://www.gov.uk/government/publications/uk-aviation-forecasts-2017>

- 6.4 Non-CO2 impacts have not been included in the airport's assessment of the climate implications of expansion on the basis of uncertainty. Alternative emissions figures for the development, including a non-CO2 factor, have been calculated by New Economics Forecasting (NEF) in its report *Turbulence Expected*³⁴ and show emissions that are six times higher than those forecast by BAL (noting that this is also attributable to the inclusion of arriving flight flights in addition to departures).
- 6.5 BAL's Environmental Statement Addendum Volume 1: Main Report states that "international aviation emissions from Bristol Airport are considered against the planning assumption for aviation emissions as indicated by DfT in the Aviation Strategy", namely 37.5MtCO₂, although the assessment methodology defines this planning assumption, incorrectly, as applying to UK international aviation emissions only and assuming, also incorrectly, that this is the level of headroom allowed for in the third fourth and fifth carbon budgets. In fact, CCC's definition of headroom for net emissions from international aviation in these budgets is 31MtCO₂e³⁵ per year on the basis of the UK's share of emissions from all departing flights under the EU Emissions Trading System cap for aviation in 2020, with the Government subsequently revising this number to 32.6MtCO₂e³⁶ in its IAS statement to Parliament.
- 6.6 The letter of 5 May 2021 from Womble Bond Dickinson on behalf of the airport also argued that international aviation's inclusion in climate targets set by the Sixth Carbon Budget will no longer require the industry to meet the 'planning assumption' of 37.5Mt CO₂ since domestic and international aviation will operate within the 'cap and trade' mechanism set by the UK ETS, as supplemented by CORSIA. While the Sixth Carbon Budget will no longer leave headroom for aviation, it is wrong to imply that there is no benchmark for these emissions during the period 2033-2037. As noted in the aviation policy section above, CCC's previous advice has been

³⁴ CD 9.85 <https://neweconomics.org/2021/05/turbulence-expected>

³⁵ CD 9. 51 https://www.theccc.org.uk/wp-content/uploads/2012/04/CCC_IAS_Core-ScopeOfBudgets_Interactive.pdf

³⁶ CD 9.39

superseded by a new recommended 'planning assumption' that aviation emissions should be net zero by 2050, and the CCC's modelled balanced pathway to net zero provides figures for the levels of UK aviation emissions in interim years. This downward trajectory for UK aviation emissions could be used as a benchmark for assessing whether or not the emissions associated with airport expansion are compatible with anticipated levels for the sector. For the purposes of the Sixth Carbon Budget, the UK aviation sector should be expected to demonstrate how it can keep its emissions at or below 31MtCO₂e by 2035 (the 2035 level of aviation emissions modelled by the CCC in its balanced pathway to net zero).

- 6.7 Given the policy gap that exists since the UK legislated for net zero, the CCC's balanced pathway to net zero for the sector, which accompanied the CCC's 2020 Sixth Carbon Budget as set out in section 3.20 above, is an appropriate benchmark for assessing the application. This assumes that aviation emissions in 2050 should be 23MtCO₂, significantly lower than BAL's sensitivity analysis which uses 30MtCO₂ in 2050 (as assumed previously by CCC in its 2019 net zero modelling). This approach can be used in addition to assessing the application's impacts against the old planning assumption of 37.5MtCO which is acknowledged in current, but pre-net zero, aviation policy. However, for accuracy, this old advice from the CCC should be defined as applying to both UK domestic and international flights and not to international flights only (which would be approximately 36MtCO₂).
- 6.8 Both approaches require an assessment of total UK aviation emissions, factoring in possible increases from other airport expansions. DfT's latest forecasts (2017) are based primarily on a constrained demand scenario which allows for growth within existing planning permissions but does not allow for any significant new infrastructure (Bristol Airport is assumed to reach 10.2mppa in 2050 in this scenario). Forecast UK CO₂ emissions associated with this scenario are 37MtCO₂ by 2050, leaving almost no headroom for further expansion at any airport even assessed against the old 37.5 Mt benchmark. Despite support for airports making best use of their capacity, the assumptions used in the Government's MBU (where DfT modelled increases beyond passenger caps where airports were more than 95%

full, but not including infrastructure expansion) applied only modest increases nationally for both air traffic movements and passenger numbers: the increase in passengers compared to the baseline in 2050 is just 11.8mppa (a total of 421.3mppa in 2050 compared to 409.5mppa in the baseline without Heathrow expansion). This would result in 37.9MtCO₂ in 2050 (a figure that rises to 40.8MtCO₂ if a third runway at Heathrow is included), although MBU included an assessment of additional mitigation that could, it was argued, keep emissions within the planning assumption. 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.

- 6.9 The CCC's balanced approach pathway to deliver net zero, despite using more optimistic assumptions regarding technology and SAF than DfT's latest forecast, concludes that any increase in capacity (and the associated emissions) can only be compatible with the UK's net zero target if corresponding reductions in capacity are made at other airports.
- 6.10 BAL's analysis does not take account of likely expansion elsewhere in the UK. Although it maintains that such an assessment of cumulative emissions from airport expansions is neither appropriate nor necessary, Appendix 1 of Womble Bond Dickinson's letter of 5 May 2021 provides estimates of carbon emissions associated with planned expansions at London Stansted Airport, Southampton International Airport, Leeds-Bradford Airport, Luton Airport and Manston Airport. Emission forecasts for Heathrow and Gatwick were not provided as part of this assessment as the letter states that there is no publicly available information for these airports. This fails to acknowledge the information provided by the Department for Transport

in its 2017 demand forecasts³⁷, which included analysis showing the carbon emissions associated with a third runway at Heathrow and a second runway at Gatwick. By 2050, Heathrow's carbon emissions with a third runway were forecast to be 20.3MtCO₂ compared to 15.9MtCO₂ without expansion, while Gatwick's 2050 emissions were forecast to be 6.8MtCO₂ with a second runway compared to 3.0MtCO₂ without expansion.

- 6.11 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 AEF³⁸, 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 (including plans for bringing Gatwick's emergency runway into regular use).

7. BAL's proposed mitigation

- 7.1 With regard to the airport's mitigation of GHG impacts, BAL's Carbon Roadmap³⁹ commits to net zero by 2050, as well as aiming to be carbon neutral for its Scope 1 and 2 emissions by 2025, largely through investment in electric vehicles and solar energy. Based on the inventory provided in the Carbon Roadmap, BAL's Scope 1 and 2 emissions account for just 0.67% of the total emissions associated with the airport's operations (including Scope 3 emissions). BAL commits to carbon neutral journeys to and from the airport (staff and passenger car use accounts for 20.2% of the emissions inventory) using offsetting. The Carbon Roadmap does not specify the projects that will be used to offset journeys to and from the airport, but it is assumed that any offsetting of Scope 1 and 2 emissions, plus Scope 3 emissions from ground transportation, would be in line with the Airports Council International's

³⁷ CD 6.2

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/878705/uk-aviation-forecasts-2017.pdf (table 39)

³⁸ CD 9.59 <https://www.aef.org.uk/uploads/2021/05/Cumulative-airport-emissions.pdf>

³⁹ CD 9.10 <https://www.bristolairport.co.uk/about-us/environment/carbon-roadmap>

guidance issued through is Airports Carbon Accreditation scheme. As noted in section 5 above, however, the CCC has recommended that the net zero target should be met through UK domestic action without relying on international carbon credits⁴⁰. While the Act still retains the ability to use international offset credits, Ministers have said⁴¹ the government does not intend to use them. Therefore, this measure, while additional, should not be regarded as appropriate mitigation for the purposes of assessing surface access emissions.

7.2 The officer's report to North Somerset Council's Planning and Regulatory Committee contained a proposed planning condition that would, in the event that planning permission is granted, require BAL to submit a Carbon and Climate Change Action Plan (CCCAP) within 12 months of the date of approval (draft planning condition 15). The CCCAP is expected to set out a plan of deliverable measures, with a timetable and implementation programme, to reduce and offset greenhouse gas emissions from airport activities and ensure the airport's resilience to the effects of climate change. On 28th May 2021, BAL circulated a Draft CCCAP⁴² in accordance with draft Condition 15. The Draft CCCAP is conditional upon planning approval being granted.

7.3 The Draft CCCAP commits to ensure that:

- BAL's operations and activities (scope 1 and 2 emissions) will be carbon neutral by 2021, by offsetting its emissions
- all its operations and activities (associated with 12mppa) will be carbon net zero by 2030 with any residual emissions being removed, and
- Bristol Airport as a whole will be carbon net zero by 2050, including its Scope 1, 2 and 3 emissions. In relation to scope 3 emissions, the Draft CCCAP acknowledges that BAL can only guide and influence outcomes, and much will depend on technological innovation.

⁴⁰ CD 9.9

⁴¹ CD9.115 <https://www.bbc.co.uk/news/science-environment-48596775>

⁴² CD 9.48

- 7.4 The Draft CCCAP retains many elements of the Carbon Roadmap but the significant changes are bringing forward the date by which BAL's scope 1 and 2 emissions will be net zero from 2025 to 2021, transitioning by 2030 to the use of carbon removals (rather than offsetting generally) to balance 'minimal' residual emissions. BAL also hopes to attain Airport Carbon Accreditation (ACA) Level 4+ by 2030. ACA Level 4+ requires accredited airports to offset their remaining Scope 1 and 2 carbon emissions as well as emissions from staff business travel, using internationally recognised offsets (although not necessarily by using carbon removals).
- 7.5 The Draft CCCAP identifies four key focus areas for action, namely 'Carbon Net Zero Airport' covering its scope 1 and 2 emissions, 'Reducing Emissions from Vehicles and Sustainable Flights', relating to its scope 3 emissions, and 'Low Carbon Design and Construction'. The timeframe to tackle each focus area is split between short-term measures (2021-2024), medium-term measures (which are dependent on obtaining planning permission and would run from approval through to 2030), and long-term (beyond 2031-2050, which are "dependent on wider developments within the UK economy, government policy and technological developments in the aviation sector").
- 7.6 For the mitigation of Scope 1 and 2 emissions, the Draft CCCAP highlights a range of measures that have been implemented to date and have led to a significant decrease in Scope 1 and 2 emissions between 2015 and 2019, both in terms of CO₂ per passenger and total CO₂ emissions. As noted in relation to the Carbon Roadmap however (the Draft CCCAP uses the same data as BAL's Environmental Assessment Addendum), these emissions accounted for just 5.77tCO₂e in 2019, less than 1% of the total emissions associated with the airport.
- 7.7 Attaining the goal of carbon neutrality by 2021 will still require offsetting, the Draft CCCAP says. To date, BAL has used offset projects that meet either the Verified Carbon Standard or the Gold Standard. These projects are international, mainly in India. As with the Carbon Roadmap, these international credits may be compliant with the ACA scheme but the CCC has recommended that they should not be used to

meet the UK's net zero commitment, and therefore should not be regarded as appropriate mitigation. If sufficient supply exists, BAL intends to use up to 10% of offsets from sources that benefit the south-west region by 2030. These projects may be eligible to be used in UK carbon accounting, but the majority of offsets will continue to be sourced from international projects.

7.8 The commitment to use carbon removals instead of offsets is welcome and in line with CCC recommendations, recognising the differences between being carbon neutral and attaining net zero. In fact, BAL explains that “carbon offsets help reduce or avoid emissions, but they have no effect on the current CO₂ levels in the atmosphere.” This is also an acknowledgment of the limitations of offsetting (and helps to explain why the CCC recommended that, without reform, the CORSIA offsetting scheme should not be relevant to meeting the UK's carbon budgets and wider net zero commitments). The Draft CCCAP does not offer further detail relating to carbon removals, perhaps because the technology and markets are in their infancy. Whether they can deliver at the scale required nationally by 2050 remains to be seen given the likely cost and competition to use captured carbon in fuels such as e-kerosene, but it is likely that any projects in 2030 will be small scale.

7.9 The Draft CCCAP identifies that Scope 3 emissions (which include emissions from flights, and surface access journeys by passengers and staff) account for more than 99% of the total emissions associated with the airport's operation. The Draft CCCAP acknowledges that it can only guide and influence Scope 3 emissions, and as such it relies primarily on the Government's “fundamental role in controlling Scope 3 emission sources through the setting of policy, national carbon budgets and emission cap and trading schemes”, including the Transport Decarbonisation Plan to be published later in 2021, the end of sales of new petrol and diesel cars by 2030, and aviation's inclusion in the UK ETS. As the policy content of the Transport Decarbonisation Plan is not yet known and the UK ETS and CORSIA are limited in scope (as explained in paragraphs 5.8 and 5.9 above), these measures and policies alone cannot, however, be relied upon to deliver net zero emissions.

- 7.10 Emissions from travel to and from the airport account for 29% of the total emissions associated with the airport's operation. The airport's own initiatives aim to encourage and support modal shifts to public transport modes, aiming for 15% public transport share by 2030 rising to 17% if permission is granted for 12mppa. To support this, BAL plans to review 'kiss and fly' charges, while providing a Public Transport Improvement Fund to improve ticketing, reduce fares, improve real-time information provision and add capacity. Increasing the airport's capacity by 2mppa while increasing the public transport modal share goal by only 2% will, however, still result in an additional 1,460,000 passengers trips per annum arriving at or departing from the airport by road. Even with the uptake of electric vehicles, this target is insufficient to align the airport with the Government's interim target of reducing emissions by 78% below 1990 levels by 2035.
- 7.11 With regard to reducing the Scope 3 emissions from flights (which account for 70% of the airport's total emissions), the Draft CCCAP commits to supporting industry initiatives by creating a low carbon innovation hub at the airport to work with aerospace companies in the region. BAL's proposed Aviation Carbon Transition is aimed primarily at enabling SAF at the airport, together with a commitment to a SAF feasibility study. It is questionable, however, whether these should be regarded as additional climate mitigation measures. With the Government about to consult on a UK SAF mandate, BAL will need to determine as part of its core business whether SAF is best delivered to an aircraft via tankers or a pipeline.
- 7.12 Planned efforts to publish a league table of operators' noise and emissions performance mirror initiatives at other airports, but the usefulness of such a measure will be dependent on the metrics and the data disclosed. For example, using aircraft manufacturers' data for carbon emissions will lead to the same ranking for every operator using a particular aircraft type irrespective of an operator's seating configuration, load factors and other operational practices. To have an impact, the league table would need to use actual emissions data for each operator that factor in these specific operational characteristics, but such moves have been resisted strongly by airlines in the past on grounds of commercial confidentiality. The

airport's ability to use financial incentives and penalties to encourage more efficient operations, perhaps using differential landing charges, could have a more significant impact but the Draft CCCAP suggests that such measures may not be put in place until 2030.

- 7.13 From 2027, the Draft CCCAP states, BAL plans to work with NATS on airspace modernisation to reduce the track miles flown by aircraft, which it claims will reduce GHG emissions and noise impacts. While this is a worthwhile aim, in advance of any detailed plans to change arrival and departure routes it is not possible to predict whether both goals can be delivered simultaneously. In cases where trade-offs will need to be made, the Draft CCCAP does not state whether it will prioritise noise or emissions.
- 7.14 In summary, the Draft CCCAP describes actions and processes, but BAL can only be held to account to deliver its Scope 1 and 2 emission goals, and these may not be fully aligned with the UK's climate targets given the reliance on international offset credits. While a switch to local projects and removals may help to address this, the likely scale of uptake is likely to be limited due to the cost and availability of removals. However, with over 99% of the airport's emissions related to Scope 3 emissions that are dependent on industry-wide progress and Government policy, the Draft CCCAP is likely to have a marginal impact. As a planning condition it 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 aviation⁴³, continuing a trend which has seen annual increases in most years since 2012.

⁴³ CD 9.34 <https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Aviation.pdf>

- 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".⁴⁴
- 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.

⁴⁴ CD 9.52 <https://www.ft.com/content/6c112691-fa2f-491a-85b2-b03fc2e38a30>