



**Appeal by: Bristol Airport Limited**

**Appeal Reference: APP/D0121/W/20/3259234**

**North Somerset Council Application Reference: 18/P/5118/OUT**

**Proof of evidence of  
Dr Mark Hinnells PhD, MSc, MA, BA  
Carbon Emissions**

Reference: NSC/W6/1

**Ricardo Energy and Environment**





Ricardo  
Energy & Environment

## Proof of Evidence of Mark Hinnells on Carbon Emissions on behalf of N Somerset Council:

Bristol Airport Ltd Planning Appeal

PINS Appeal ref APP/D0121/W/20/3259234

Planning Application ref 18/P/5118/OUT

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Report ref ED14606101 for N Somerset Council

**Customer:**

N Somerset Council

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# Table of contents

<b>Glossary .....</b>	<b>iv</b>
<b>1 Name and qualifications .....</b>	<b>7</b>
<b>2 Instructions and scope of evidence.....</b>	<b>9</b>
2.1 Instructions .....	9
2.2 Scope of evidence .....	9
2.3 My experience of the site .....	10
<b>3 Aviation and Climate Change: Law and Policy.....</b>	<b>11</b>
3.1 Introduction.....	11
3.2 Policy up to submission of the application .....	11
3.2.1 The Climate Change Act .....	11
3.2.2 International aviation and shipping emissions and the UK's carbon budgets and 2050 target' .....	12
3.2.3 The Aviation Policy Framework.....	12
3.2.4 The Airports Commission .....	14
3.2.5 The Paris Agreement .....	16
3.2.6 CORSIA.....	17
3.2.7 DFT Forecasts 2017.....	18
3.2.8 Making best use of existing runways .....	18
3.2.9 The Airports National Policy Statement .....	20
3.3 Policy since the application was submitted .....	21
3.3.1 Aviation 2050.....	21
3.3.2 Declaration of Climate Emergency.....	22
3.3.3 North Somerset Climate Emergency.....	23
3.3.4 Adoption of Net-Zero as a Target for 2050 .....	23
3.3.5 CCC Letter September 2019.....	23
3.3.6 Key industry responses .....	24
3.4 Policy since the Decision but before appeal .....	25
3.4.1 Decarbonising Transport: Setting the Challenge .....	25
3.4.2 CCC Reducing UK emissions: 2020 Progress Report to Parliament .....	26
3.5 Emerging carbon and aviation policy .....	26
3.5.1 Sixth Carbon Budget advice.....	26
3.5.2 Government acceptance of the 6 <sup>th</sup> Carbon Budget Advice.....	29
3.5.3 The Implications for Policy Promulgated Prior to Net Zero .....	29
3.5.4 The 10-point plan .....	31

3.5.5	Sustainable Aviation Fuel.....	32
3.5.6	A new 'planning assumption' for aviation emissions.....	34
3.5.7	Implications of 6CB decisions: allowing greater use of existing runways.....	35
3.5.8	Cumulative decisions under MBU.....	36
3.5.9	Prematurity.....	37
<b>4</b>	<b>Planning policy .....</b>	<b>39</b>
4.1.1	The core strategy (2012) and Policy CS1 .....	39
4.1.2	The NPPF.....	40
<b>5</b>	<b>Assessment of the ESA and mitigation measures against national and local policy .....</b>	<b>42</b>
5.1	The ESA .....	42
5.2	Mitigations – the CCCAP.....	44
5.3	Significance .....	46
5.3.1	Benchmarks for significance .....	46
5.3.2	Future constraints.....	47
<b>6</b>	<b>Conditions .....</b>	<b>49</b>
<b>7</b>	<b>Summary and conclusions .....</b>	<b>50</b>
	<b>Appendix - Chronology .....</b>	<b>53</b>

## Glossary

Acronym / Term	Meaning / Definition
<b>A</b>	
A319 / A320/ A321	Airbus narrow body, short to medium range aircraft.
AC	Airports Commission
ACA	Airport Carbon Accreditation
ACAF	Airport Commission Appraisal Framework
ADMS	Atmospheric Dispersion Modelling System
Airside	The areas of the airport which require full security screening to gain access to.
AM	Aircraft Movement Any aircraft take-off or landing at an airport. These could be either commercial or non-commercial flights. For airport traffic purposes one arrival and one departure are counted as two movements.
Apron	A defined area on a land aerodrome provided for the stationing of aircraft for the embarkation and disembarkation of passengers, the loading and unloading of cargo, fuelling, and for parking.
ATC	Air Traffic Control
ATM	Air Transport Movement Landings or take offs of aircraft engaged in the transport of passenger or freight or mail on commercial terms. All scheduled movements, including those operated empty, loaded charter and air taxi movements are included.
<b>B</b>	
BAU	Business As Usual
<b>C</b>	
CAA	Civil Aviation Authority
CCC	Committee on Climate Change Independent body providing advice to the UK Government
CEMP	Construction Environmental Management Plan
Climate	Description of the long-term pattern of weather in a particular area, typically over a 30-year period.
Climate change	A change in climate conditions that can be statistically identified by changes in the mean and/or variability of its properties that persists for decades or longer.
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	CO <sub>2</sub> equivalent emissions
Carbon Equivalent/ Equivalent Warming	A definition is provided in S93 of the Climate Change Act (2008): A “tonne of carbon dioxide equivalent” means one metric tonne of carbon dioxide or an amount of any other greenhouse gas with an equivalent global warming potential.
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CSR	Corporate Social Responsibility
<b>D</b>	

Acronym / Term	Meaning / Definition
DC	Development Case Assessment in the ES of the impact of the proposed development.
DCO	Development Consent Order
DfT	Department of Transport
DM	Do Minimum Assessment in the ES of the impact without the proposed development
<b>E</b>	
EASA	European Aviation Safety Agency
EC	European Commission
EIA	Environmental Impact Assessment
ES	Environmental Statement The Environmental Statement, prepared by BAL and submitted February 2018. The ES and its supporting technical appendices present the findings of the EIA.
EU ETS	European Union Emission Trading Scheme
<b>G</b>	
GHG	Greenhouse Gases
<b>H</b>	
H <sub>2</sub> O	Water (vapour)
<b>I</b>	
ICAO	International Civil Aviation Organization
IEMA	Institute of Environmental Management and Assessment
IPCC	Intergovernmental Panel on Climate Change
<b>K</b>	
Km	Kilometres
<b>L</b>	
Landside	The areas of the airport which do not require full security screening to gain access to.
LPA	Local Planning Authority – N Somerset Council (NSC)
LTO	Landing and Take-Off
<b>M</b>	
MBU	'Making Best Use' Policy 2018 Beyond the horizon, the future of UK aviation: Making best use of existing runways.
mppa	Million passengers per annum
MtCO <sub>2</sub>	Million tonnes of carbon dioxide equivalent
<b>N</b>	
NO <sub>x</sub>	Nitrogen oxides Air quality pollutant.
NPS	National Policy Statement.



Acronym / Term	Meaning / Definition
	The Airports NPS was published June 2018.
<b>O</b>	
O <sub>3</sub>	Ozone
<b>P</b>	
PINS	Planning Inspectorate
<b>R</b>	
Resilience	The ability of a system to anticipate, withstand, adapt to and recover from shocks and stresses.
<b>S</b>	
S106	Section 106 Section 106 of the Town and Country Planning Act 1990 (as amended).
Site	Bristol Airport
<b>T</b>	
Taxiing	Movement of an aircraft on the surface of an aerodrome or an operating site under its own power, excluding take-off and landing.
<b>U</b>	
NSC	N Somerset Council
UK	United Kingdom
<b>W</b>	

# 1 Name and qualifications

1. My name is Dr Mark Hinnells. I have worked professionally in energy and environment policy since 1990.
2. I am a Senior Consultant with Ricardo Energy and Environment (Ricardo), a trading name of Ricardo-AEA Ltd. I have held this position since 2017. At Ricardo I lead work aiming at significant carbon emissions reductions for large sites including airports. Recently I have led on estimating future energy demand, and explored options for mitigating carbon emissions across several airports. This work supports a mix of airport DCO applications, applications to local planning authorities, and carbon management planning. I supported Uttlesford DC in the appeal at Stansted Airport.
3. Other recent projects have included work on a net zero carbon strategy for the water industry, and working with a number of local authorities to shape plans for local net zero carbon targets. I have supported a portfolio of solar farm developments to decarbonise the rail network, and explored a portfolio of measures to deliver major reductions in carbon emissions for public sector sites including prisons, hospitals and MOD sites. This wider view of carbon emissions allows me to put aviation in the context of carbon emissions across the economy.
4. My three decades in energy and environmental policy spans Government, academia and the private sector. Prior to joining Ricardo I spent time as a renewable energy developer and took wind and solar projects through the planning system.
5. Prior to that I was involved with Government policy development on secondment for three years to what was then DEFRA, and covering tax (including the Climate Change Levy) and regulatory frameworks (including redesigning and operating power station consents under section 36 of the Electricity Act 1989).
6. I spent 8 years advising on energy labelling and minimum efficiency standards for appliances at EU level, developing and interpreting technical economic and environmental findings for policy implementation. I spent 8 years in post-doctoral research at the Environmental Change Institute on developing low carbon scenarios for the UK building stock, and what Government can do to deliver change using a combination of information, economic instruments and regulation. I have spent several years teaching on the MSc programme at the Centre for Alternative Technology, Machynlleth.
7. I have an MA and PhD from the Manchester Metropolitan University (1996) and an MSc in Renewable Energy and Built Environment from the University of East London and Centre for Alternative Technology.
8. My expertise in relation to these proceedings covers matters relating to climate change policy and in particular the assessment and mitigation of carbon emission impacts due to airport operations.

9. The evidence which I have prepared and provide for this appeal Ref APP/D0121/W/20/3259234 in this proof of evidence is true and I confirm that the opinions expressed are my true and professional opinions. As such, I understand my duty to the Inspectors and I have complied with that duty. All of the opinions expressed in this Proof of Evidence are mine. This Proof of Evidence has been prepared on the basis of material that I have read myself. Where there is a range of opinion on an issue within this Proof of Evidence, I have indicated the range of opinions and set out my reasons for the opinion that I have expressed.

## 2 Instructions and scope of evidence

### 2.1 Instructions

10. I was instructed by North Somerset Council (NSC) in October 2020 to review the information on carbon emissions and climate change impacts submitted in connection with planning application 18/P/5118/OUT. The information I reviewed at that stage was primarily that contained within the Environmental Statement for the proposed development alongside relevant local planning policy and guidance. I also reviewed the NSC Report to the Planning and Regulatory Committee meeting held on 18 March 2021 (CD4.13), and I have listened to the recordings of the Planning and Regulatory Committee meetings held on 10 February and 18 March 2021. I have also reviewed relevant information contained in the subsequent addendum to the Environmental Statement that was submitted to NSC on 30 November 2020) (CD2.20.1).
11. Following meetings of its planning committee, one of the four reasons for refusal was based on the climate effects of the proposed development, as follows:
- “The scale of greenhouse gas emissions generated by the proposed increase in passenger numbers would not reduce carbon emissions and would not contribute to the transition to a low carbon future and would exacerbate climate change contrary to the National Planning Policy Framework, policy CS1 of the North Somerset Core Strategy 2017. and the duty in the Climate Change Act 2008 (as amended) to ensure that the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline .”***
12. Having reviewed that information, I was satisfied that there were grounds for objecting to the proposed development relating to the impact of its carbon emissions. This review informed the Statement of Case (CD2.18) on behalf of N Somerset Council.

### 2.2 Scope of evidence

13. This proof of evidence sets out the matters that remain of concern regarding carbon emissions and climate change related impacts, and to which I believe a decision maker needs to give consideration and weight when determining this appeal.
14. Climate Change policy has been changing rapidly and has evolved since the application and first Environmental Statement was submitted in December 2018, and the decision in March 2020. It has evolved since the submission of the appeal and it will continue to evolve after Proofs are submitted and prior to the presentation of evidence at the Inquiry into this appeal. Just two weeks before Proofs were due, BAL submitted a draft Carbon and Climate Change Action Plan (CD9.48). The Government has now included International Aviation and Shipping within the UK carbon targets, has promised promising a consultation on Net Zero Aviation for some months, and has now promised to publish a Transport Decarbonisation Plan.

15. Given the rapid and continuing change in this field, I reserve my right to change my advice to NSC, and NSC reserves the right to update its case in respect of the greenhouse gas implications of the Proposed Development in order to reflect any changes in the policy context as and when they arise.
16. Within this policy context I assess the proposal and consider the assessment presented in the Environmental Statement and the ES addendum, together with the recently provided draft Carbon and Climate Change Action Plan (CD9.48).
17. My evidence includes consideration of the potential effectiveness of proposed mitigation measures, specified via condition, and/or through a Section 106 Agreement, and/or through a Unilateral Undertaking. However, I am not providing evidence on planning policy or the planning balance as this evidence is provided on behalf of NSC by Mr Gurtler.

## 2.3 My experience of the site

18. I have not visited the site since commencing work on these issues. Carbon impacts are global in nature rather than local so the lack of a site visit does not affect my confidence in the conclusions set out in this Proof of Evidence.

## 3 Aviation and Climate Change: Law and Policy

### 3.1 Introduction

19. This proof shows the chronology of policy development covering both aviation and climate change policy, at local planning level, UK national level and international level. The rapidly changing policy is presented in sections against the timescale of the application at Bristol Airport, to show what has or has not been considered in the assessment of the proposed development at each stage. Appendix 1 summarises in table form developing policy against timeframe of the decision by the LPA to refuse to grant planning permission.
20. In summary the widespread expectation of airport development had been growth, in a period of a proposed 80% cut in UK carbon emissions. However consent decisions are now being made in a period where policy has moved to require net zero carbon emissions, including aviation. There is a clear collision of expectation of airports on the one hand and climate policy needs on the other. The headline conclusion of this proof is that there is not the evidence base for the appeal to be allowed.

### 3.2 Policy up to submission of the application

#### 3.2.1 The Climate Change Act

21. The Climate Change Act 2008 ("CCA 2008" **CD9.2**) passed into law on 26 November 2008. With effect from that date, a duty was imposed on the Secretary of State to ensure that the net UK carbon account for the year 2050 is at least 80% lower than the aggregate amount of net UK emissions of carbon dioxide for 1990.
22. It is important to understand that the adoption of an 80% target for reduction meant that there was scope for trade-offs between different sectors of the economy; a sector which could say only reduce to 70% could have its emissions off-set by another sector which could reduce to 90 or even 100%, depending on how easy or difficult, or expensive each sector was,
23. Section 32 of the CCA 2008 (CD9.2) established a Committee on Climate Change ("the CCC"), an independent public body to advise the UK and devolved Governments and Parliaments on tackling climate change, including on matters relating to the UK's statutory carbon reduction target for 2050 and the treatment of greenhouse gases from international aviation.
24. In addition to the carbon emissions target set by section 1 CCA 2008 - and to ensure compliance with it (see sections 5(1)(b) and 8 of the CCA 2008 ) - the Secretary of State is also required to set for each succeeding period of five years, at least 12 years in advance, an amount for the net UK carbon account ("the carbon budget"); and ensure that the net UK carbon account for any period does not exceed that budget (section 4 CAA 2008).

25. Thus, the CCA 2008 (**CD9.2**) creates a legal duty upon the Secretary of State to attain an endpoint target in 2050 and to attain interim targets for each five-year budget period up to that point.
26. Section 32 CCA 2008 established a Committee on Climate Change ("the CCC"), an independent public body to advise the UK and devolved Governments and Parliaments on tackling climate change, including on matters relating to the UK's statutory carbon reduction target for 2050 and the treatment of greenhouse gases from international aviation. CCC also advises on carbon budgets for the UK. The CCA 2008 also created the Committee on Climate Change to advise the Government on climate change issues and required the Government to establish carbon budgets for the UK (section 4 of the CCA 2008 **CD9.2**).

### 3.2.2 International aviation and shipping emissions and the UK's carbon budgets and 2050 target'

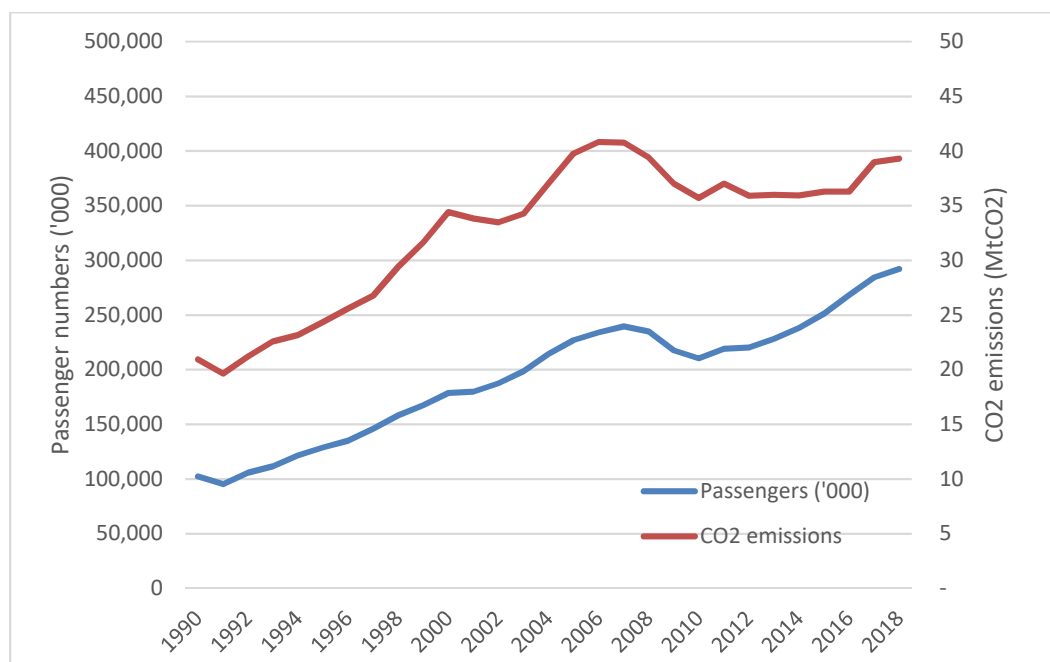
27. Section 10(2)(i) CCA 2008 requires international aviation and shipping emissions be taken into account when setting carbon budgets. In 2012 Government published '*International aviation and shipping emissions and the UK's carbon budgets and 2050 target*' (**CD9.39**)<sup>1</sup>. Para 12 says "*In setting the levels of existing carbon budgets, which go out to 2027, the Government took account of international aviation and shipping emissions, and the recommendations of the CCC.... In effect, the budgets for other sectors have been constrained so that, to 2027, the UK is on a trajectory that could be consistent with a 2050 target that includes emissions from international aviation and shipping.*" (my underline). At Part 2, para 3 says "*we are deferring a firm decision on whether to include international aviation and shipping emissions within the net carbon account at this time.*"

### 3.2.3 The Aviation Policy Framework

28. In numeric terms, UK aviation passenger numbers have tripled from 100m to 300million a year since 1990 (and 1990 was the year that climate change was recognised as an issue of international concern, following publication of the first IPCC report in 1990). Against that background, improvements in aircraft efficiency have meant emissions have doubled rather than tripled. This is important because whilst most other sectors have reduced emissions aviation has not.

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<sup>1</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/65686/7334-int-aviation-shipping-emissions-carb-budg.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/65686/7334-int-aviation-shipping-emissions-carb-budg.pdf) , published pursuant to section 30(3) of the Climate Change Act 2008

**Figure 1 UK Passenger number and emissions since 1990**

29. The Aviation Policy Framework (**CD6.1**)<sup>2</sup>, was published in March 2013 and updates the 2003 air transport white paper. As a result, it was formulated in a context of a duty to cut emissions to 80% of 1990 levels by 2050. It explained that the Government's objective is to ensure that the aviation sector makes a significant and cost-effective contribution towards reducing global emissions. The emphasis within the APF was on action at a global level as the best means of securing the significant and cost-effective reduction in global emissions. The Government also stated that it would take unilateral action at a national level where that is appropriate and justified in terms of the balance between benefits and costs.
30. The APF noted that (see paragraph 2.9) the international aviation industry had made progress in developing an agreed strategy to reduce its emissions. Airlines, represented by the International Air Transport Association (IATA), had set targets for a 1.5% average annual improvement in fuel efficiency to 2020, to deliver carbon -neutral growth through a cap on 'net' emissions (taking account of emissions trading) from 2020 onwards and to cut net emissions in half by 2050 compared with 2005 levels. Carbon neutral growth is a long way from meeting current requirements on carbon emissions.
31. The APF also explained the role of the EU Emissions Trading System (**CD9.1**). Aviation was included in the EU Emissions Trading System (EU ETS) with effect from 2012. The APF explained that: *"UK and international aviation gross emissions are forecast to increase out to 2050 without additional action. However, as part of the EU ETS, flights covered by the scheme*

<sup>2</sup> <https://www.gov.uk/government/publications/aviation-policy-framework>



*are subject to an emissions cap (limit) in 2012 of 97% of average annual emissions between 2004 and 2006. In 2013 this cap was reduced to 95%. This means that net emissions from flights arriving into and departing from European Economic Area (EEA) airports cannot increase above the level of the cap. 2.17 To stay within the EU ETS cap, airlines can either reduce their own emissions over time, or purchase allowances or credits from other sectors where options for reducing CO2 are easier and cheaper to deliver.”*

32. The APF (CD6.1) explained that (paragraph 2.19): *“Reducing emissions from within the aviation sector is anticipated to be more difficult and more costly than in other industries. Therefore, to achieve a given level of emissions savings, it is expected that aircraft operators would purchase allowances or credits from other sectors, at least in the short to medium term. This is, however, more difficult to achieve for international flights due to the risks of market distortions.”*
33. Thus again, it can be noted that the policy approach here (within the context of an 80% of 1990 emissions reduction target) is to rely upon the ability of other sectors who can achieve reductions beyond climate change targets to ‘offset’ emissions with the aviation sector.
34. The APF (CD6.1) explained that at the national level the decision on whether to include international aviation and shipping emissions in carbon budgets was deferred until June 2016, in advance of the setting of the 5th Carbon Budget. This would allow international negotiations relating to the aviation EU ETS to be resolved before this decision is taken.
35. Again the Government explained (paragraph 2.32) that existing carbon budgets out to 2027 had already been set to leave headroom for international aviation and shipping emissions, putting the UK on a trajectory which would be consistent with an 80% cut by 2050 target that includes a share of international aviation and international shipping emissions. The Government stated that it *“does not intend to alter the way in which international aviation and international shipping emissions have been taken into account in carbon budgets 1 to 4”*.
36. The APF (CD6.1) also deferred the decision on whether the UK should adopt a national emissions target for aviation, as the Government believed that it was important *“to have greater certainty over the future scope of the EU ETS and await the outcome of the ICAO negotiations towards a global deal on aviation emissions.”* (paragraph 2.35).
37. It is then important to understand that the “key priority” set out within the APF (CD6.1) for Government is to continue to work with the aviation industry and other stakeholders to make better use of existing runways at all UK airports in the short term (i.e. to around 2020) (see APF (CD6.1) paragraph 1.60) was a priority set within a context with a particular emissions target and with particular policy options (e.g. the ability for sectors to trade off with one another).

### 3.2.4 The Airports Commission

38. The Airports Commission (AC) was set up in 2012 to consider the UK’s future airport capacity needs. It was asked by Government to produce an Interim Report (CD11.23) by the end of 2013,

setting out the nature, scale, and timing of steps needed to maintain the UK's status as an international hub for aviation, alongside recommendations for making better use of the UK's existing runway capacity over the following five years (i.e. to 2018).

39. The CCC's recommendation to AC, that the target of constraining CO<sub>2</sub> emissions from UK aviation to 2005 levels by 2050, consistent with current plans to meet the economy-wide climate target, remains the most appropriate basis for planning future airport capacity (see AC Interim Report paragraph 4.39, **CD11.23**).
40. The work undertaken by the AC (see AC Interim Report December 2013 (CD11.23)) examined four core forecasts:
  - a. Carbon traded, capacity unconstrained. This represents total potential demand for UK aviation, in the absence of any constraints on airport capacity;
  - b. Carbon traded, capacity constrained. This is the same as the first forecast, except that it assumed that existing constraints on UK airport capacity persist throughout the forecast period. The difference between this forecast and the first allowed the Commission to estimate the scale of unmet demand at national, regional and airport level, and the rate at which airports would fill up in the absence of any limit on carbon emissions. This forecast is broadly equivalent to the DfT constrained forecast.
  - c. Carbon capped, capacity unconstrained. This represented the level of aviation demand consistent with the CCC's current assessment of how then then existing UK climate targets can be met. It included a higher modelled carbon price, to ensure that forecast emissions returned to 2005 levels by 2050, but it assumed no constraints on airport capacity. This was broadly equivalent to the CCC's 'likely' scenario, set out in its 2009 report "Meeting the UK aviation target – options for reducing emissions to 2050".
  - d. Carbon capped, capacity constrained. This forecast assumes both a higher modelled carbon price, as in (c), and the continuation of existing constraints on UK airport capacity, as in (b). It allowed the Commission to estimate how existing airport capacity would be used if further policies were introduced to return aviation emissions to 2005 levels by 2050.
41. It is to be noted that the AC did not examine reductions to attain anything beyond 2005 levels by 2050; rather the AC accepted the CCC recommendation that the target of constraining CO<sub>2</sub> emissions from UK aviation to 2005 levels by 2050 was the appropriate basis for planning future airport capacity.

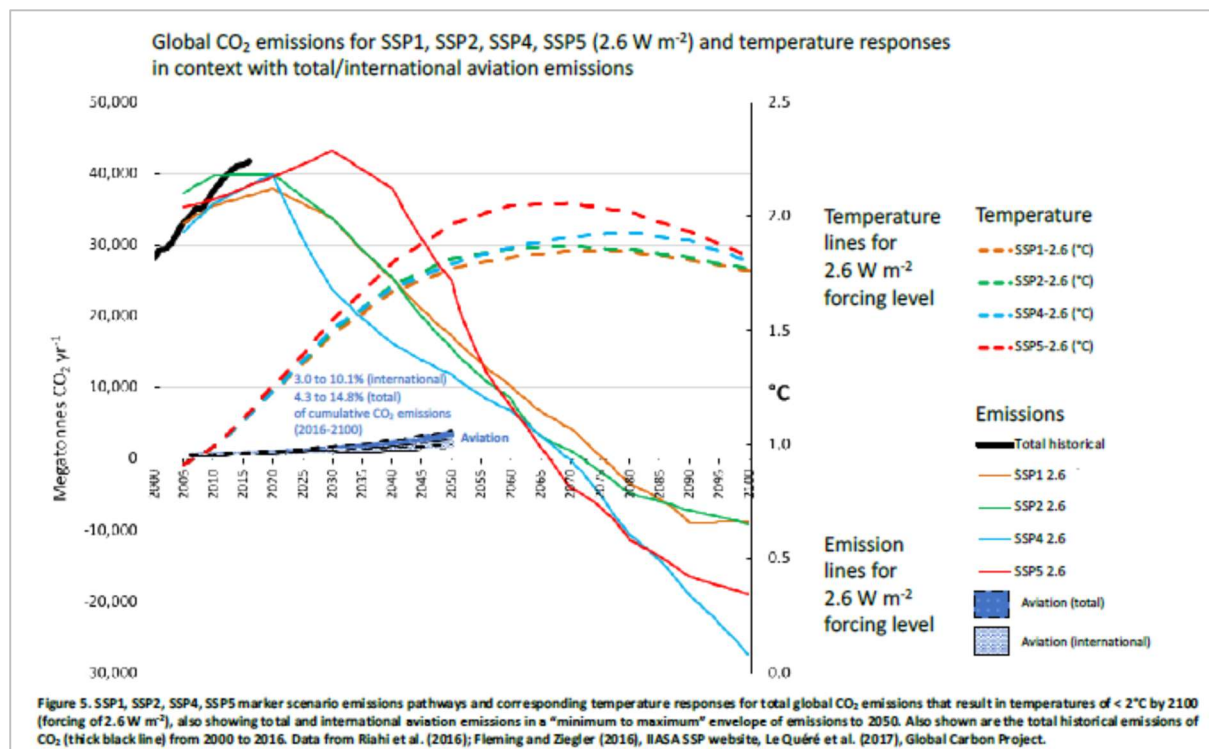
### 3.2.5 The Paris Agreement

42. The Paris Agreement (CD9.26) is a legally binding international treaty on climate change. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016.
43. It aims to keep the increase in global average temperature to well below 2°C (3.6°F) above pre-industrial levels; and to pursue efforts to limit the increase to 1.5°C. To achieve this is recognised as needing carbon neutrality.

#### The need for early action

44. It is clear from modelling to support Paris discussions that long term temperatures relate to cumulative emissions, and thus, early cuts (2025-2030 onwards, in blue below) are essential to meeting Paris goals – even scenarios that cut emissions to negative emissions, but not until the 2040s (red below) are not compatible with the objective of 1.5 degrees. The UK manages timing issues through successive 5 year carbon budgets under the CCA 2008.

**Figure 2 Emissions scenarios and resulting temperatures**



Source: David Lee Paris agreement and aviation <sup>3</sup>

### The need for all warming impacts

45. It also follows that to address the Paris Agreement, all warming impacts, carbon and non carbon sources of warming need to be addressed. Section 93 CCA 2008 includes other sources of warming on a carbon equivalent basis. Thus dealing with both the Paris Agreement and the CCA 2008 requires consideration of non carbon warming.
46. The effect, and an approximation of the impact, has been acknowledged for more than two decades. In the January 2021 issue of the journal *Atmospheric Environment*, Lee et al (CD) present a “*new comprehensive and quantitative approach for evaluating aviation climate forcing terms*” and conclude that “*Whilst there is still uncertainty and some elements have medium and low confidence, aviation emissions are currently warming the climate at approximately three times the rate of that associated with aviation CO2 emissions alone*”. Further, the total Equivalent Warming effect has been rising as aircraft journeys increase.
47. For the sake of clarity there was no obligation on BAL to consider non carbon warming impacts at the time of its application. Government has just updated evidence on aviation aircraft contrails<sup>4</sup>, but for now, still holds to the line “*The government continues to keep non-CO2 emissions from aviation under review and will reassess its policy position as more evidence becomes available.*” If the total warming impact of aviation, including non carbon warming, is three times greater than currently accounted for by carbon emissions only, then understanding uncertainty, constraining emissions, and finding technical solutions is that much more urgent.
48. Unless and until the industry accounts properly for non-carbon warming impacts there is a significant risk of a misallocation of considerable financial resources in the wrong solutions to dealing with climate change. A solution that reduces carbon may exacerbate non carbon warming and vice versa. The right solutions reduce all warming, and for example, it is only when all warming impacts are considered that the true benefits of electric aviation (which avoid all combustion in the upper atmosphere) are appreciated.
49. Therefore if the appeal were to be allowed, and without prejudice to my evidence in this proof, NSC requests that a planning condition be included to require update of the proposed Carbon and Climate Change Action Plan (CCCAP) to account for non-carbon warming impacts, if (and more likely when) national policy changes (and I note from section 8.2 of the draft CCCAP just submitted, that BAL would not object to this).

### 3.2.6 CORSIA

50. CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) was developed by the International Civil Aviation Organization (ICAO) and adopted in October 2016 (CD9.4). Measures include primarily offsets and “alternative” fuels. Through CORSIA the aviation industry

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<sup>4</sup> vapour trails are line-shaped clouds produced by aircraft engine exhaust or changes in air pressure, and composed primarily of water, in the form of ice crystals

is aiming for a carbon neutral growth from 2020 (ie not to get aviation to net zero but to aim at aviation not growing its emissions beyond current levels).

51. On 15 February 2019, the ICAO announced an agreement on alternative fuels to reduce offsets. CORSIA (**CD9.4**) has three implementation phases, beginning 2021. Participation of countries until 2026 is voluntary. The programme runs until 2035 with a review in 2032.
52. CORSIA has been widely criticised as starting too late, finishing too early and aiming at net zero growth (ie no additional emissions beyond current levels) and not net zero emissions. It thus falls a long way short of being compatible with the Paris agreement and from a review of IPCC Assessment Report 6 (AR6) it seems likely that there will be significant pressure at COP26, and the next ICAO General Assembly in 2022, to amend this. The point for the current decision is that international agreements are not adequate to deal with binding national policy targets and thus other instruments, including capacity constraint through planning and land use policy are legitimate options.

### 3.2.7 DFT Forecasts 2017

53. In October 2017, the UK Aviation 2017 forecasts (**CD6.2**) were published by the DfT (building on historic data presented above). According to these forecasts, UK aviation emitted 37.3 MtCO<sub>2</sub> in 2016, with emissions projected to be between 35 and 42MtCO<sub>2</sub> by 2050. The projections included UK passenger demand growing from 267 mppa in 2016, to 395-437 mppa (or growth of 47% to 63%) under the low and high scenarios in 2050. According to these forecasts, UK aviation emitted 37.3 MtCO<sub>2</sub> in 2016, (though it rose sharply between 2016 and 2018), and with passenger numbers combined with projected improvements in aircraft efficiency, emissions were projected to be between 36.5 and 42MtCO<sub>2</sub> by 2050 (Table 70), with the variance explained by low, medium and high scenarios (based on macroeconomic assumptions), and on development at Gatwick (Northern Runway) and/or Heathrow (third runway), with the higher emissions caused by greater capacity and greater economic growth. These forecasts did not explore capacity or growth constraint.
54. These forecasts did not allow for any growth at Bristol Airport beyond 10 mppa, so growth beyond 10mppa (unless accompanied by reductions in passenger numbers elsewhere) would increase emissions towards 2050.

### 3.2.8 Making best use of existing runways

55. In June 2018, the Government published two key documents. The Airports National Policy Statement (ANPS) (**CD6.9**) applied to projects which sought to set a framework for development of an additional runway such as Heathrow. For smaller projects which wanted to increase capacity on existing runways, the parallel policy document was *Beyond the horizon: The future of UK aviation - Making best use of existing runways* (**CD6.4**). This is usually referred to as "MBU".

56. The Government examined the carbon emission implications of allowing airports to increase the use of existing runways in MBU. In doing so it recognised that there are some *“important environmental elements” associated with airport expansion which “should be considered at a national level”* (MBU paragraph 1.11).
57. In MBU (CD6.4) the Government recognised that airports making the best use of their existing runways could lead to increased air traffic which could increase carbon emissions (paragraph 1.11). It explained that it would be *“using the Aviation Strategy to progress our wider policy towards tackling aviation carbon.”*
58. Nevertheless, *“to ensure that our policy is compatible with the UK’s climate change commitments we have used the DfT aviation model to look at the impact of allowing all airports to make best use of their existing runway capacity.”* (paragraph 1.12)
59. The scale of expansion tested within MBU (as opposed to the ANPS), an against the climate change targets then applicable, was relatively modest. Tables 1-3 in MBU outlined various increases in passenger numbers, Air Traffic Movements (ATMs) and carbon emissions as a result of the policy. By 2050 MBU anticipated passenger numbers increasing from 409.5 to 421.3mppa as a result of the policy (or from 435 to 444mppa if the Heathrow North West Runway is consented under ANPS). In other words, the total amount of additional capacity tested was an additional 8.9-11.8mppa from the policy, or up to 67,000 additional ATMs. In carbon terms this represented an increase from 37 to 37.9 MtCO<sub>2</sub> as a result of the policy in 2050 (or from 39.9 to 40.8 in 2050 if the Heathrow North West Runway has been consented), though, in the case of Heathrow being consented, emissions were expected to peak in 2030 at around 43.4MtCO<sub>2</sub>). Thus, to keep within the 37.5MtCO<sub>2</sub> target, additional policy was needed.

#### Impact of MBU (CD6.4) by 2050 (as envisaged in 2018)

		Additional capacity Baseline+Best Use	Additional capacity LHR+Best Use
Table 1	Passenger numbers (mppa)	11.8	8.9
Table 2	ATMs ('000 p.a.)	30	67
Table 3	Carbon (MtCO <sub>2</sub> )	0.9	0.9

60. MBU (**CD6.4**) examined a carbon traded scenario in the context of a UK target of a reduction to 80% of 1990 levels. Under the carbon-traded scenario, UK aviation emissions could continue to grow provided that compensatory reductions are made elsewhere in the global economy. This could be facilitated by a carbon trading mechanism in which aviation emissions could be traded with other sectors. In this case, provided a global trading scheme is place, higher UK aviation activity would have no impact on global emissions as any increase in emissions would be offset elsewhere and therefore there is nothing to indicate that this policy would prevent the UK meeting its carbon obligations. Thus, this scenario assumes that UK aviation is not to form part of UK



climate reduction targets but to be addressed only on a global basis. MBU did not unpack the relationship between this scenario and ICAO, and the EU, now UK, Emissions Trading Scheme).

61. MBU (**CD6.4**) also examined a carbon capped scenario adopting a sector limit of the Committee on Climate Change's (CCC) planning assumption of 37.5Mt of CO<sub>2</sub> in 2050. That cap is the same cap of attaining 2005 emissions levels in 2050 examined by the AC. Under this scenario, the cap would be met using a combination of carbon pricing and specific measures e.g. more efficient aircraft ground movements (using single engine taxiing) and higher uptake of renewable fuels.
62. MBU (**CD6.4**) concluded that the implications of the increase in runway utilisation that it examined would be acceptable because on balance *"it is likely that these or other measures would be available to meet the planning assumption under this policy."*
63. MBU (**CD6.4**) concluded that "as a result of the consultation and further analysis to ensure future carbon emissions can be managed, government believes there is a case for airports making best of their existing runways across the whole of the UK" (MBU paragraph 1.25)
64. Thus, the acceptability of the policy approach contained in MBU (**CD6.4**) in carbon terms was thus very clearly and unambiguously:
  - a. Assessed on the basis of the then existing target of a reduction to 80% of 1990 levels by 2050;
  - b. Assessed on a basis which meant that there was scope for off-setting from other sectors within the UK economy (or potentially elsewhere) that might more easily reduce beyond the 80% target level;
  - c. Assessed on a basis that MBU would at most deliver between 8.9-11.8mppa and up to 67,000 additional ATMs.
  - d. Whilst MBU discussed additional policy to constrain emissions back to 37.5MtCO<sub>2</sub>, no additional policy (beyond the UK ETS, and CORSIA which has yet to take effect) has been implemented to constrain emissions. The 37.5MtCO<sub>2</sub> budget foreseen is thus very much at risk.

### 3.2.9 The Airports National Policy Statement

65. The Airports NPS (June 2018) (**CD6.9**) is a policy statement which applies principally in a DCO context and focusses on an application for additional runway capacity at Heathrow Airport. Nevertheless it contains useful and relevant information.
66. The ANPS explains that as at June 2018, UK domestic aviation emissions were included in the 2050 target, whilst international aviation emissions were not currently formally included within the UK's 'net carbon account' for greenhouse gas emissions and were therefore not included in the 2050 target as defined by the CCA 2008, nor within the first five carbon budgets.

67. The CCA 2008 (**CD9.2**) says that the Government must “take into account” the “estimated amount of reportable emissions from international aviation for the budgetary period or periods in question” when setting carbon budgets.
68. The Government accepted the CCC’s recommendations on the first five carbon budgets. The fifth carbon budget, for the period 2028-2032, was set in July 2016 in line with the CCC’s advice. In effect, this meant that carbon budgets for other sectors of the UK economy were set at a level which the CCC considered was consistent with meeting the overall 2050 target (i.e. a reduction to 80% of 1990 levels) when international aviation emissions are included.
69. It is instructive see within the ANPS (CD6.9) the sorts of measures that Government sees as relevant for an airport operator to consider in order to reduce carbon emissions. These include (paragraph 5.78):
- a. Zero or low-emission hybrid or electric vehicle use (ultra-low emission vehicles), charging and fuel facilities;
  - b. Reduced engine taxiing (improved taxiing efficiency);
  - c. Reducing emissions from aircraft at the gate;
  - d. Reduced emissions from airport buildings (for example from lower carbon heating);
  - e. Changes to the layout of surface access arrangements; and
  - f. Encouraging increased use of public transport by staff and passengers.
70. At paragraph 5.82 under the heading “Decision Making” the NPS (**CD6.9**) states: “*Any increase in carbon emissions alone is not a reason to refuse development consent, unless the increase in carbon emissions resulting from the project is so significant that it would have a material impact on the ability of Government to meet its carbon reduction targets, including carbon budgets.*”
71. That is a policy approach which I believe should be applied in the present case. As I shall explain below, at the present time, the appellant has failed to demonstrate that the proposed development will not have a material impact on the ability of the Government to meet the recently adopted 6<sup>th</sup> Carbon Budget, and the Net Zero target for 2050.

### 3.3 Policy since the application was submitted

#### 3.3.1 Aviation 2050

72. In December 2018, the Government announced a consultation exercise: “Aviation 2050 The future of UK aviation” (**CD9.29**). The foreword explains: “*the Government supports aviation industry growth. However growth must be coupled with steps to mitigate environmental damage such as carbon emissions, noise and air quality. We must also minimise the impact of growth on local areas and make journeys to and from airports cleaner, smarter and quicker....*”



73. Aviation 2050 (CD9.29) explains that as at December 2018 UK aviation accounted for around 7% of the UK's total greenhouse gas emissions (excluding non warming impacts of aviation) but its share of emissions is likely to continue to increase as other sectors, such as energy and manufacturing, decarbonise more quickly. Thus the Government recognised that this means that carbon emissions aviation could represent a 25% share of the UK's greenhouse gas emissions by 2050 (Aviation 20250 paragraph 1.24).
74. The Government explained that it agreed with the then CCC advice that international aviation emissions should continue to leave 'headroom' for international aviation when setting carbon budgets so that the economy as a whole is on a trajectory to meeting the 2050 target (including international aviation) in the CCA 2008. Aviation 2050 (CD9.29) explained that as at December 2018 in order to set a clear level of ambition for the sector, the government proposed to accept the CCC's recommendation that emissions from UK-departing flights should be at or below 2005 levels in 2050 (expected to allow a 25% growth in passenger numbers from current levels).
75. The Government also indicated that it would continue to engage at an international level via ICAO (the UN body responsible for tackling international aviation climate emissions) for a long term goal for international aviation that is consistent with the temperature goals of the Paris Agreement (CD9.26).
76. Aviation 2050 (CD9.29) also explained that the Government proposed to: "require planning applications for capacity growth to provide a full assessment of emissions, drawing on all feasible, cost-effective measures to limit their climate impact, and demonstrating that their project will not have a material impact on the government's ability to meet its carbon reduction targets"
77. In relation to sustainable journeys to and from airports, Aviation 2050 (CD9.29) explained that the Government's expectation is that airports, through their surface access strategies, set targets for sustainable passenger and staff travel to the airport which meet, where possible, the ambitions set by the government and for these to be monitored by their respective Airport Transport Forums. The Government expects airports to make the most of their regional influence to provide innovative solutions and incentives against ambitious targets which reduce carbon and congestion and improve air quality. (paragraphs 3.100-101).

### 3.3.2 Declaration of Climate Emergency

78. On the 1st May 2019 the UK Parliament declared a climate emergency. The full text of the resolution passed by the House of Commons reads: "*That this House declares an environment and climate emergency following the finding of the Inter-governmental Panel on Climate Change that to avoid a more than 1.5°C rise in global warming, global emissions would need to fall by around 45 per cent from 2010 levels by 2030, reaching net zero by around 2050; recognises the devastating impact that volatile and extreme weather will have on UK food production, water availability, public health and through flooding and wildfire damage; notes that the UK is currently missing almost all of its biodiversity targets, with an alarming trend in species decline, and that*

*cuts of 50 per cent to the funding of Natural England are counterproductive to tackling those problems; calls on the Government to increase the ambition of the UK's climate change targets under the Climate Change Act 2008 to achieve net zero emissions before 2050, to increase support for and set ambitious, short-term targets for the roll-out of renewable and low carbon energy and transport, and to move swiftly to capture economic opportunities and green jobs in the low carbon economy while managing risks for workers and communities currently reliant on carbon intensive sectors; and further calls on the Government to lay before the House within the next six months urgent proposals to restore the UK's natural environment and to deliver a circular, zero waste economy."*

### 3.3.3 North Somerset Climate Emergency

79. North Somerset Council has adopted a target of being carbon neutral by 2030<sup>5</sup>.

### 3.3.4 Adoption of Net-Zero as a Target for 2050

80. As a result of art.2(2) of the Climate Change Act 2008 (2050 Target Amendment) Order 2019/1056 the statutory duty in section 1 CCA 2008 was amended with effect from 27th June 2019 (**CD9.7**). The target which the Secretary of State has a duty to achieve is that the net UK carbon account for the year 2050 is at least 100% lower than the net UK emissions of carbon dioxide for 1990. This referred to as "Net-Zero".
81. This marked a very significant and important shift with significant implications in policy terms. The adoption of a net zero target in place of an 80% of 1990 emission target means that across the economic sectors, whilst in the next few decades there is still some scope for one sector to offset the emissions of another sector, as the economy approaches net zero this becomes very much harder. There remains, however, the opportunity for either offsets in other economies, or, increasingly, (because of the problem of certifying such offsets, and also that as other economies decarbonise those savings would happen anyway) there is a need for carbon removal (eg by forestry, land management, or by direct capture from the air, a process at technical demonstration level and still pre-commercialisation, with uncertain costs).
82. The adoption of net-zero has profound and significant consequences for the weight that can be attributed to the APF and MBU as I shall explain below.

### 3.3.5 CCC Letter September 2019

83. In September 2019 the CCC wrote a formal letter to the Secretary of State for Transport (**CD9.11**). In that letter the CCC recommended that international aviation and shipping carbon emissions should now be included in the net zero target for 2050. The letter sets out the rationale for this advice. There are a number of points to note from it:

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<sup>5</sup> <https://www.n-somerset.gov.uk/sites/default/files/2020-02/North%20Somerset%20climate%20emergency%20strategy%202019.pdf>

- a. Aviation is likely to be the largest emitting sector in the UK by 2050, even with strong progress on technology and limiting demand. Aviation also has climate warming effects beyond CO<sub>2</sub>, which it will be important to monitor and consider within future policies.
- b. The planning assumption for IAS should be to achieve net-zero emissions by 2050. This should be reflected in the forthcoming Aviation Strategy and as the Clean Maritime Plan is taken forward. It means reducing actual emissions in these sectors and is likely to require some use of greenhouse gas removals (GGRs<sup>6</sup>) to offset remaining emissions:
- c. Aviation. Zero-carbon aviation is highly unlikely to be feasible by 2050.
  - i. Aviation emissions could be reduced by around 20% from today to 2050 through improvements to fuel efficiency, some use of sustainable biofuels, and by limiting demand growth to at most 25% above current levels. This is likely to be cost-saving. There is potential to reduce emissions further with lower levels of demand.
  - ii. Novel fuels (e.g. synthetic carbon-neutral kerosene, algal biofuels) could allow greater reductions, but their development is highly speculative and should not be relied upon.
  - iii. The Government should assess its airport capacity strategy in this context. Specifically, investments will need to be demonstrated to make economic sense in a net-zero world and the transition towards
- d. For aviation, and to the extent that shipping emissions cannot be eliminated, measures to remove CO<sub>2</sub> from the atmosphere will be required to offset remaining emissions. They cannot be a substitute for genuine emissions reductions.

### 3.3.6 Key industry responses

#### **Airports Council International (ACI) Commit To 'Net Zero' by 2050 (CD9.90)**

84. More than 200 European airports under the umbrella of the ACI (Airports Council International) have committed to reaching net zero carbon emissions by 2050. The pledge has so far been signed by 203 airports, who account for 64% of European air traffic. Bristol Airport is a signatory. The accounting method used for this target is the Airports Carbon Accreditation Scheme (CD9.44) and more on this method is discussed further below.

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<sup>6</sup> GGR in the context of CCC means Engineered Greenhouse Gas Removals. It is an option to remove emissions that cannot be removed by other measures, including improved efficiency, Sustainable Aviation Fuel, Hydrogen, Electrification

**Sustainable Aviation Decarbonisation Roadmap (Feb 2020, CD9.14)**

85. Bristol Airport is a member of “Sustainable Aviation” which describes itself as *“an established UK industry group which sets out the collective approach of UK aviation to tackling the challenge of ensuring a cleaner, quieter, smarter future for our industry”*.
86. On 4th February 2020 the Group published a document entitled *“Decarbonisation Roadmap: a path to net zero” (CD9.14)*. This examines a potential route to net zero for UK aviation. But it should be noted that the roadmap only identifies net zero as being attainable via a very significant increase in the use of Sustainable Aviation Fuels and via the use of “market-based measures” (MBMs) developed internationally *“to obligate airlines to also invest in carbon reductions from outside of the aviation sector. In 2050 this will require around 26 million tonnes of CO2 to be offset or removed outside of aviation.”* In other words, Sustainable Aviation and its members accept that UK aviation will not achieve net zero at 2050 and that the sector is reliant upon unidentified and uncoded greenhouse gas removal measures to offset remaining emissions.

**Destination 2050**

87. Destination 2050<sup>7</sup> – is an EU industry perspective (similar to the Sustainable Aviation Group) which shows a different mix of measures to deliver similar ends, with more emphasis on electric and hydrogen aircraft.

## 3.4 Policy since the Decision but before appeal

### 3.4.1 Decarbonising Transport: Setting the Challenge

88. In March 2020 the DfT published a consultation paper entitled *‘Decarbonising Transport: Setting the Challenge’ (CD9.16)*. The Government identified in this document that International aviation emissions, at 37MtCO<sub>2</sub> in 2018, have more than doubled since 1990. The majority of the increase came in the 1990s and early 2000s, however emissions have also been increasing since 2012. There has been an increase of 1% since 2017 (paragraph 2.46). The Government also explained that it *“takes seriously its commitments on the environment and the expansion of any airport must always be within the UK’s environmental obligations.”* (paragraph 2.49). Figure 12 of that document forecasts the change in domestic and international aviation greenhouse gas emissions over time. It essentially shows no material decrease in emissions between now and 2050.
89. The consultation paper also announced: *“Later this year a consultation on net zero aviation will be published. This 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.”*

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<sup>7</sup> <https://www.destination2050.eu/>

90. That consultation has not been published as at the date of finalising this proof of evidence, but is expected before the end of this month.

### 3.4.2 CCC Reducing UK emissions: 2020 Progress Report to Parliament

91. In June 2020 the CCC published its 2020 progress report (**CD9.17**). This included advice to Government that international aviation and shipping should now be formally included in UK climate targets when the 6CB is set, and net-zero plans should be developed. It identified Aviation as representing 8% of 2019 emissions. It advised that a policy framework is needed to achieve net-zero emissions by 2050, including demand-side measures, efficiency and low-carbon fuels, with residual emissions offset by verifiable removals. It advised that the UK's airport capacity strategy should be reviewed in light of the net-zero target.
92. The Government responded in October 2020 (**CD9.23**) largely replicating the position as set out in the March 2020 consultation paper.

## 3.5 Emerging carbon and aviation policy

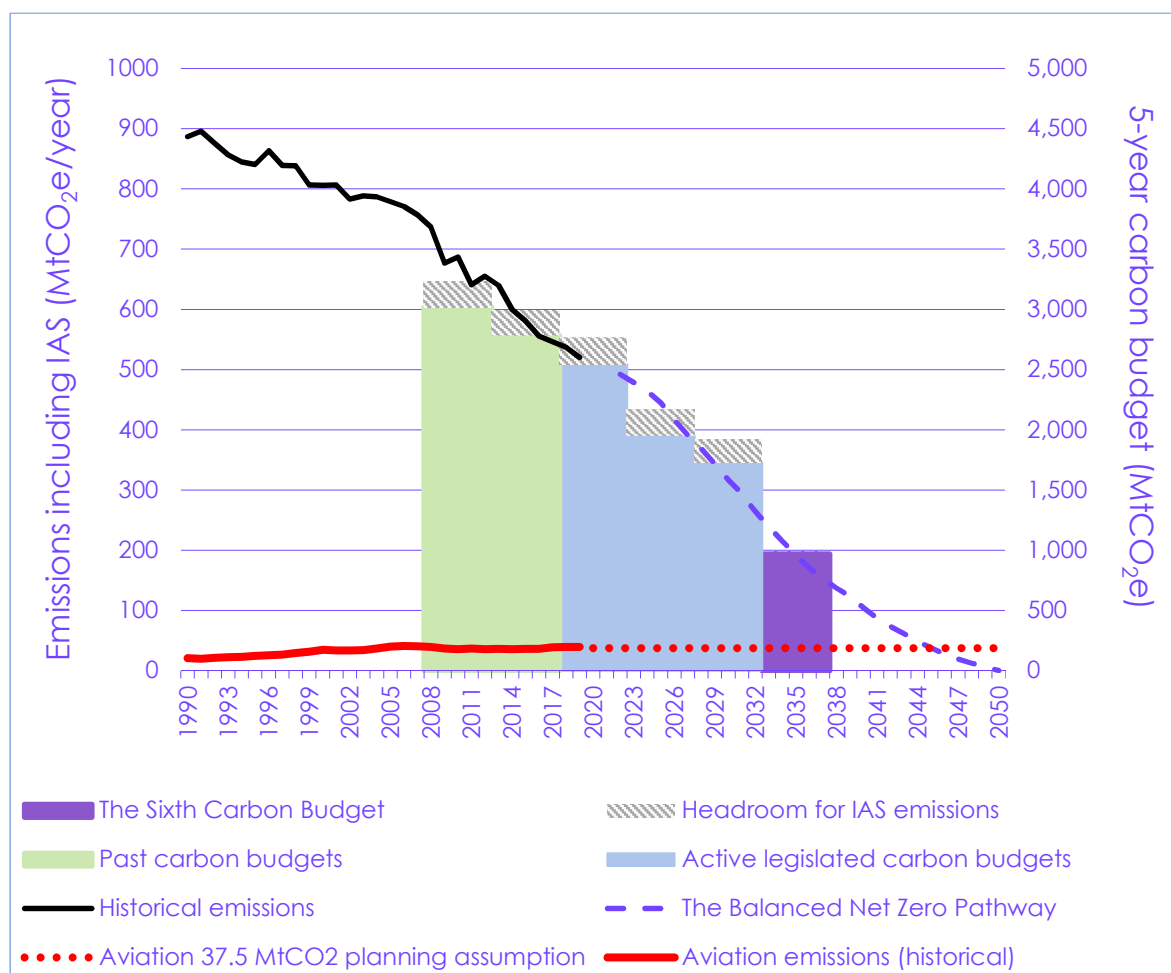
93. Emerging policy development includes policy announced since the ESA and before the conclusion of this inquiry. Because policy is in flux I must reserve the right to change my advice to NSC, and NSC's position should be considered to be reserved accordingly.
94. In making the announcement the Government indicated it would bring forward a Heating and Building Strategy, and Transport Decarbonisation Plan, and as I have touched on above, the Government intends to begin a consultation on achieving "net zero aviation" (expected in late June).
95. As I explain below, in my view, to determine the present appeal in advance of the adoption of the policy which will flow out of the aviation net zero consultation would be premature.

### 3.5.1 Sixth Carbon Budget advice

96. In December 2020, the CCC published its recommendations for the 6<sup>th</sup> Carbon Budget addressing the period from 2033-2037. It is the first carbon budget to be prepared following the adoption of the net zero target.
97. Until two years ago the UK was aiming at an 80% cut in CO<sub>2</sub> by 2050, excluding International Aviation and Shipping (IAS). Now the UK target is a 78% reduction (so almost the same number), by 2035 *including* IAS. Because the target is to be achieved in less than half the time, 14 years instead of 32, IAS cannot rely on the rest of the economy making additional reductions to avoid reductions in aviation.
98. Successive Carbon budgets are shown in Figure 1, based on CCC recommendations, with the Planning Assumption to date assumed for Aviation. The 37.5MtCO<sub>2</sub> planning assumption for aviation becomes an ever higher proportion of UK emissions, becoming a quarter of UK

emissions by the end of the sixth carbon budget period, and exceeding the entire UK carbon budget by 2045.

**Figure 3 UK Carbon Budgets 1-6 and aviation**



**Source: CCC data in Core Document CD9.104**

99. This recommendation was based upon an identified series of policy measures which the CCC termed the “Balanced Net Zero Pathway”. The CCC pathway examined each sector of the economy including aviation.

100. The CCC’s formal policy recommendations included that:

- a. the Government should Formally include International Aviation emissions within UK climate targets when setting the Sixth Carbon Budget;
- b. Demand management policy should be implemented, as given expected developments in efficiency and SAF deployment, demand growth will need to be lower than baseline assumptions, and likely constrained to 25% growth by 2050 from 2018 levels for the sector to contribute to UK Net-Zero.

- c. 25% use of Sustainable Aviation fuel (SAF) bio-derived fuels (and in some scenarios up to 50% SAF);
- d. A target of 23 MtCO<sub>2</sub> by 2050 (not the 37.5 in MBU), and with the remaining emissions offset or removed to net zero. Thus the only post net-zero assessment of the aviation sector target identifies a figure which is significantly different from MBU (which of course was not an assessment conducted in a net-zero target or in the context of the policy implications of Net-Zero);
- e. The Government should assess its airport capacity strategy in the context of Net Zero and any lasting impacts on demand from COVID-19. Investments will need to be demonstrated to make economic sense in a Net Zero world and the transition towards it.
- f. Unless faster than expected progress is made on aircraft technology and SAF deployment, such that the sector is outperforming its trajectory to Net-Zero, current planned additional airport capacity would require capacity restrictions placed on other airports.
- g. Going forwards, there should be no net expansion of UK airport capacity unless the sector is assessed as being on track to sufficiently outperform a net emissions trajectory that is compatible with achieving Net Zero alongside the rest of the economy, and is able to accommodate the additional demand and still stay on track.

101. In respect of aviation, even after the above sectoral changes, the CCC advised: *“Aviation is one of the sectors in which we expect there to be significant remaining positive emissions by 2050, given the limited set of options for decarbonisation. Remaining residual emissions will need to be offset by greenhouse gas removals for the sector to reach Net Zero.”* However, the CCC also identified in its policy recommendations (page 199) that:

- a. Removals are essential for meeting Net Zero in the UK, but are currently not available at scale in the UK, outside of the land sector.
- b. The annual costs of removing emissions from the atmosphere are potentially large (e.g. of the order of £6 billion/year by 2050, from an initial scale of around £1 billion/year in 2030).
- c. Thus even the CCC's 6<sup>th</sup> Carbon budget approach to aviation is dependent upon a significant upscaling of Greenhouse Gas Reduction (GGR) infrastructure which does not exist at scale at present.
- d. The CCC's balanced pathway only allows for a 25% increase in growth to 2050 compared to 2018 levels. However it also assumes that this growth occurs without any net increase in airport capacity – the CCC assumed that *“any expansion is balanced by reductions in capacity elsewhere in the UK.”*



102. Thus, the situation is sufficiently constrained that the CCC is of the view that if an airport is allowed to expand now then this should only occur by reducing the capacity at other airport(s).

### 3.5.2 Government acceptance of the 6<sup>th</sup> Carbon Budget Advice

103. On the 20<sup>th</sup> April 2021, the Government announced its decision to accept the overall emission reduction target recommended by the CCC ie a 78% cut in carbon emissions compared to 1990 levels, by 2035. It also announced that it accepted that IAS should be included within this target (CD9.100)<sup>8</sup>. In doing so, the Government said: *“The sixth Carbon Budget will commit us in law to the fastest fall in greenhouse gas emissions of any major economy between 1990 and 2035, making it one of the most ambitious climate targets in the world... CB6 includes emissions from International Aviation and Shipping (IAS) for the first time. Previous carbon budgets have formally excluded these emissions, instead leaving ‘headroom’ for them. However, IAS emissions were included in the CCC’s advice, and are included in our 2050 net zero target, which was set on a whole economy basis.”*

104. Importantly, however, the Government stated: *“Following the CCC’s recommended budget level does not mean we are following their specific policy recommendations. Our published analysis is based on the government’s own assumptions and does not, for example, assume the CCC’s change in people’s diet. Ahead of COP26, we will be setting out our own vision for net zero, and ambitious plans across key sectors of the economy to meet carbon budgets.”*

105. It follows that, whilst the Government has accepted the overall reduction target for the period 2033-2037 and has accepted that international aviation is included within that budget, it cannot be taken to have accepted the policy approach recommended by the CCC. On the other hand in not accepting (for example) diet change recommendations, policy does need to go further and faster in another sector.

106. That means that at present, there is a target of net zero and an interim target for the period 2033-37 but no adopted policy framework to deliver those targets.

### 3.5.3 The Implications for Policy Promulgated Prior to Net Zero

107. As I have explained above, APF, MBU and ANPS were adopted in a climate change policy context which did not have a statutory target of net zero by 2050 and which did not include international aviation within that statutory target.

108. The position is now *fundamentally different* with the adoption of net zero in 2019, the 78% reduction by sixth carbon budget period and the inclusion of International Aviation, announced 21 April 2021.

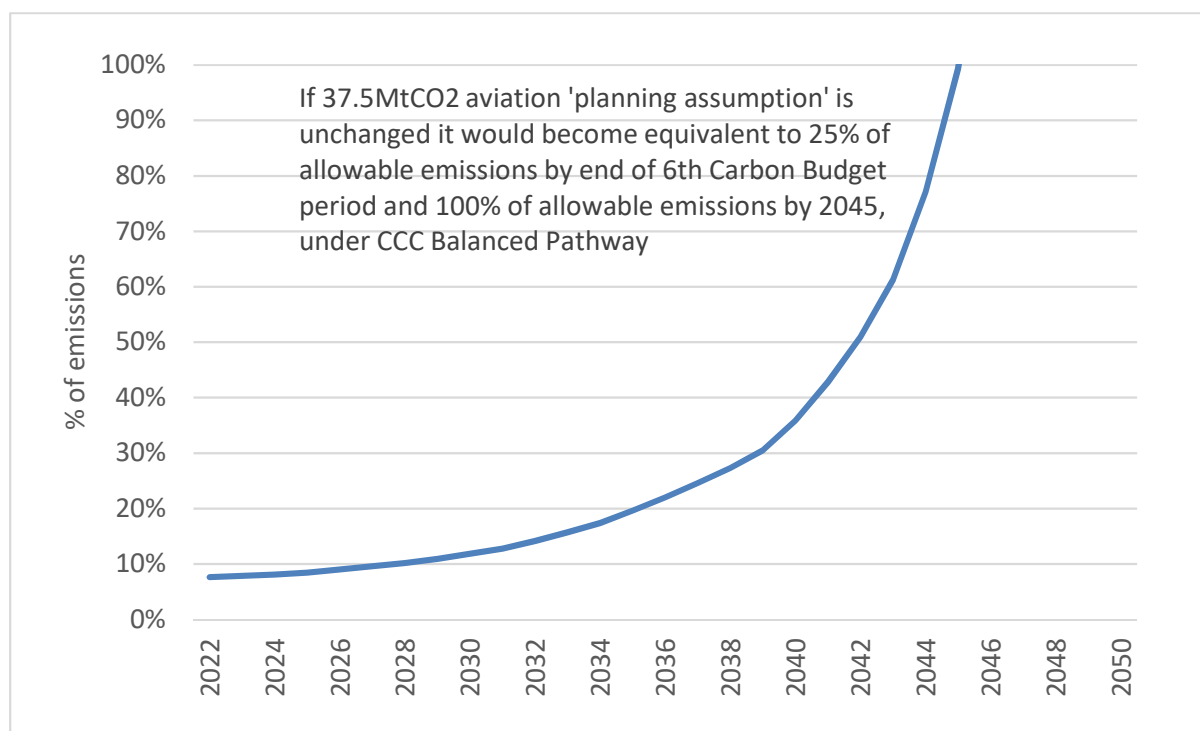
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<sup>8</sup> [www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035](https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035)



109. In relation to MBU, as I have explained above, its conclusion, that the scale of growth it envisages via increased use of existing runways is consistent with the UK's climate change obligations, was a conclusion reached in a context where:
- a. The assessment assumed that there was scope for other sectors to cross-subsidise the aviation sector. With a net zero approach however that ability is removed. Since all other sectors have to meet net zero, there are no "spare" emissions for the sectors to provide to the aviation sector;
  - b. The headroom figure of 37.5MtCO<sub>2</sub> per annum was a figure provided by the CCC in the context of a planning objective of reducing aviation emissions to those of 2005. In essence, in a net zero context aviation must make carbon reductions in line with the rest of the economy. To underline this the 37.5MtCO<sub>2</sub> 'planning assumption' has been compared below to projected UK carbon emissions under the Balanced Pathway in CCC 6CB Recommendations (now accepted). A fixed 37.5MtCO<sub>2</sub> budget would have results in aviation emissions forming a greater and greater proportion of UK emissions over time, being 7.6% of UK emissions in 2022; 12% in 2030; 36% in 2040, 100% in 2045. With this assumption in place the net zero target in 2050 cannot be attained.
110. MBU did not assess and does not demonstrate that the increased use of existing runways envisaged in that document is consistent with either the 6<sup>th</sup> Carbon budget (which included IAS for the first time) or Net-Zero.
111. Thus whilst I recognise that MBU and ANPS represents current government policy, the policy approach in so far as it depends upon matters relating to climate change is now out of date, and should be of little weight. **A 37.5 MtCO<sub>2</sub> planning assumption is wholly inconsistent with Net-Zero, as shown below.**

**Figure 4 The aviation 'planning assumption' of 37.5 MtCO<sub>2</sub> as a percentage of allowable net emissions under CCC Balanced Pathway of 6th Carbon Budget**



Sources: Balanced Pathway carbon budget is CCC data in Core Document **CD 9.104** on tab "6CB Advice report Ch1&2" at line 46, with the 37.5MtCO<sub>2</sub> Planning assumption.

### 3.5.4 The 10-point plan

112. There are a number of initiatives that have begun to signal investment in low carbon aviation particularly as part of the Prime Ministers '10-point plan for a Green Industrial Revolution'<sup>9</sup>

- a. Establishing a "Jet Zero Council" to accelerate the development and adoption of new technologies to reach net zero aviation<sup>10</sup>.
- b. Driving the growth of hydrogen and continued investment in R&D and into infrastructure upgrades required to move to battery and hydrogen aircraft.
- c. Supporting commercialisation of Sustainable Aviation Fuel, explored more below.
- d. Investing in carbon capture, usage and storage

113. However these technologies are at a very early technical and commercial stage and ability to reduce emissions is still highly uncertain. There is nothing in these actions that can show that the airport can attain current carbon targets whilst increasing passenger numbers.

<sup>9</sup> <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution/title>

<sup>10</sup> <https://www.gov.uk/government/groups/jet-zero-council>

### 3.5.5 Sustainable Aviation Fuel

114. The industry group Sustainable Aviation have published a Roadmap on Sustainable Aviation Fuel, has been updated several times, the latest at the end of January 2020 (**CD9.15**)<sup>11</sup>. This foresaw 32% of UK demand for kerosene could be met by domestically produced SAF in 2050. However, uptake is exponential from a low base, so the vast majority of uptake and saving is from 2040-2050, far enough off for there to be significant uncertainty as to the timing, and to leave significant cumulative emissions in the meantime.
115. Further, the Roadmap states that this market development is estimated to need £500m of Government investment over five years, matched by industry and commencing in 2020 (totalling £1bn), to support flagship commercial SAF plants across the UK (**CD9.15** p.5).

#### Government support for advanced biofuels

116. In September 2020, colleagues in Ricardo and E4Tech published a report on Advanced Biofuels for Aviation (9.94)<sup>12</sup>. in summary:
- a. Since the UK currently has no production of SAF, the report agreed with others that Government support would be needed to develop First of a Kind (FOAK) UK-based production and then bridge the gap between new technologies and commercially demonstrated plants.
  - b. Technology risk: There is a high degree of technology risk for FOAK commercial plants, which private investors are not willing to take on, or would require a high premium for capital.
  - c. High capital costs of FOAK plants: Costs for a FOAK plant are significantly higher compared to further plants based on the same technology.
  - d. Market mechanism uncertainty: While the DfT has set a target for development fuels as part of the RTFO scheme as incentivisation for SAF production, the scheme is not yet mature enough for investors to estimate long-term income.
117. It is also important to be aware that the Greenhouse Gas (GHG) saving from SAF varies by source. The European Union Aviation Safety (EASA) European Aviation Environmental Report (**CD9.95**) contains a Table 3.4 which indicates carbon savings from SAF can be less than 30% to more than 90% for different fuel options compared to kerosene. The EU Renewable Energy Directive requires a minimum 65% saving of GHG emissions for bio-based fuels, and a minimum of 70% saving for fuels of non-biological origin compared to fossil fuels, for plants beginning operations after 1 January 2021. This means that the Sustainable Aviation Fuel

<sup>11</sup> [www.sustainableaviation.co.uk/wp-content/uploads/2020/02/SustainableAviation\\_FuelReport\\_20200231.pdf](http://www.sustainableaviation.co.uk/wp-content/uploads/2020/02/SustainableAviation_FuelReport_20200231.pdf)

<sup>12</sup> Targeted Aviation Advanced Biofuels Demonstration Competition – Feasibility Study Final Report for Department for Transport, UK. <https://ee.ricardo.com/downloads/transport/targeted-aviation-advanced-biofuels-demonstration-competition-%E2%80%93-feasibility-study>

Roadmap's projected take-up of 32% SAF by 2050 could only provide between 20.8%-29% reduction in carbon emissions depending on the mix of fuels.

118. EASA also notes that the use of sustainable aviation fuel (SAF) is currently minimal and is likely to remain limited in the short term, whilst agreeing that SAF has the potential to make an important contribution to mitigating the current and expected future environmental impacts of aviation.

### **GFGS Green Fuels, Green Skies Competition (CD9.97)**

119. The first tranche of £15m Government support has been launched (with programme support from Ricardo)<sup>13</sup>, although this is unfortunately small compared to the £500m Sustainable Aviation foresaw.

### **Renewable Transport Fuels Obligation**

120. DfT published *Targeting net zero Next steps for the Renewable Transport Fuels Obligation* in March 2021 (CD9.98)<sup>14</sup>. Biofuels for transport (primarily road transport) have been supported in the UK for over a decade, principally by the Renewable Transport Fuel Obligation (RTFO). The RTFO commenced on 15 April 2008 and delivers reductions in GHG emissions from fuel used for transport purposes by mandating the supply of renewable fuels. The scheme works by setting an annual obligation on suppliers to supply renewable fuels -increasing from 9.75% of total transport fuel in 2020 to 12.4% in 2032. In subsequent years suppliers' obligation levels will remain at the 2032 level.
121. In 2018, a new category of fuels called 'development fuels' was introduced into the RTFO. Development fuel certificates provides additional support to fuels of high strategic importance, to address the difficulty and cost of delivering the technological advances needed to produce fuels for hard to decarbonise sectors, such as aviation and freight. Currently all renewable hydrogen is considered a development fuel, as long as it complies with the RTFO sustainability requirements.
122. Government proposes:
- a. To increase the RTFO main obligation to supply renewable fuel by 2.5%: 1.5% in 2022 followed by an additional 1% spread over the period 2023 to 2032. The target will remain at the 2032 level in subsequent years but will be kept under review going forwards.
  - b. As cars are increasingly electrified, *"we will need to consider the best use of low carbon fuels in the decades to come. This is likely to mean a transition so that in the*

<sup>13</sup> <https://ee.ricardo.com/gfgs>

<sup>14</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/974822/targeting-net-zero-rtfo.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/974822/targeting-net-zero-rtfo.pdf)

*longer term these fuels are primarily used in sectors with limited alternatives - especially aviation and maritime”*

- c. ways of supporting a more diverse range of fuels in transport for the longer term, especially to support the uptake of renewable hydrogen and recycled carbon fuels (RCFs<sup>15</sup>) – which turn household rubbish into fuel.

123. This relatively limited support, through GFSG and RTO is important, but the addition of a few percentage points to a fuels obligation does not suggest that SAF can be transformational to aviation.

124. There is thus nothing in these policy actions that can show that the airport can attain current carbon targets whilst increasing passenger numbers. If emissions cannot be managed by technical means, then to meet net zero, emissions need to be managed by demand management.

### 3.5.6 A new ‘planning assumption’ for aviation emissions

125. The MBU (**CD6.4**) ‘planning assumption’ of 37.5MtCO<sub>2</sub> cannot continue into the future for reasons I have explained above. What is also clear from the work I have outline above is that there is no pathway in which aviation emissions can attain net zero without offsets or removals. Both the CCC and SA appraisal, rely upon greenhouse gas reduction measures to off-set or remove the remaining carbon emissions.

126. The CCC (**CD9.105**) and SA (**CD9.89**) reports (compared in the figure below) indicate a requirement to identify carbon emissions reductions to address direct aviation carbon emissions of between 23 and 25MtCO<sub>2</sub>, by 2050. The differences between them lie in some of the detailed assumptions. SA allows a 70% growth in passenger numbers, such that its baseline projection is 70MtCO<sub>2</sub>, whereas CCC allows a 25% growth in passenger numbers (no new net capacity with any increases in capacity offset by reductions elsewhere) and the baseline emissions before technical measures in 50MtCO<sub>2</sub>.

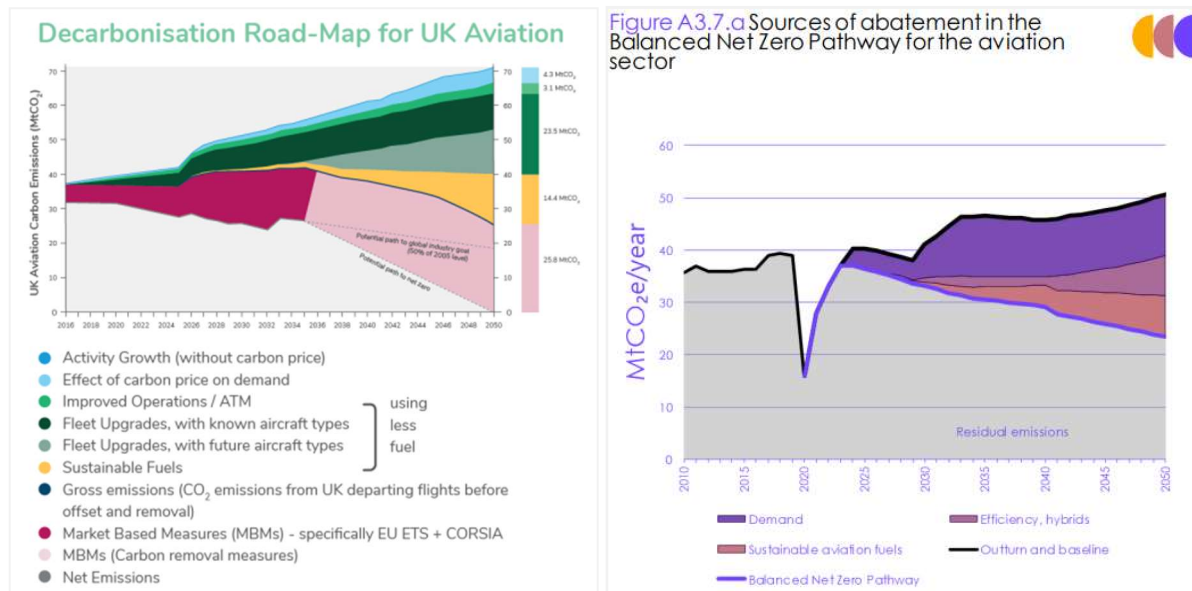
127. The two analyses include the effect of successive reductions in carbon from demand management through pricing (much bigger impact in CCC work), improved air traffic management and operating procedures, introduction of known and new, more efficient aircraft, sustainable aviation fuels (25% in CCC work but a 50% or more take-up in SA making a 32% saving in carbon). Both analyses include electric and hybrid aircraft.

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<sup>15</sup> Recycled carbon fuels (RCFs) are fuels produced from fossil wastes that cannot be avoided, reused or recycled. Examples of feedstocks include industrial waste gases and the fossil fraction of municipal solid waste (MSW) such as non-recyclable plastic.

128. The SA work (CD9.89) shows actual emissions at about 25MtCO<sub>2</sub> then offset to Net Zero. The CCC work shows actual emissions of 23MtCO<sub>2</sub> but the CCC further assumed ALL remaining UK emissions across the economy would be offset or removed to Net Zero carbon emissions.

**Figure 5 A comparison of SA and CCC 6CB aviation emissions projections**



NB the SA Roadmap shows emissions reduced to net zero, CCC work assumes it but does not show it on this graph.

129. The ability for sufficient measures to come forward at scale on a timetable to assist in achieving the 6th Carbon Budget levels, and then net zero as at 2050, has not been proven in my view. Further, the aviation sector is not the only sector which needs to rely upon GGR measures. There will be a competitive market in which aviation will need to compete, and the relationship between demand and supply in this market is very poorly understood .
130. In summary, there is a good degree of consistency about potential outcomes, but not pathways. SA (CD9.89) is more optimistic about technical solutions (which are yet to be proven either technically or commercially and where uptake may not be significant until after 2040) whereas CCC includes some technical change, but also relies more on capacity constraint. But both still require significant use of GGR measures.

### 3.5.7 Implications of 6CB decisions: allowing greater use of existing runways

131. At the present time, I am not aware of any assessment which demonstrates that a policy of allowing greater use to be made of existing runways is consistent with the net zero 2050 target nor the 6<sup>th</sup> carbon budget target.
132. It is also the case that even without any expansion in capacity the aviation sector cannot achieve net zero in 2050. That means that aviation emissions will have to managed carefully to

ensure that they fall within the scope of available GGR measures as at 2050 even without any further increases in UK aviation capacity.

133. The CCC 6<sup>th</sup> Carbon Budget work (**CD9.104**) indicates that there is scope for just 25% growth in the whole aviation sector to 2050, given technical mitigations, and requiring no additional capacity. It still depends on Engineered Greenhouse Gas Removal projects (GGR).
134. To allow any expansion of capacity a decision maker will therefore need to be satisfied that the increase in carbon emissions which that expansion will cause will be capable (after improvements in efficiency, SAF, hydrogen, and electrification) of being off-set via the available GGR measures as at 2050.
135. Schemes which can demonstrate that they will not cause any net addition to UK carbon emissions compared to the position if they were not permitted, will not have any material impact upon the UK's ability to meet its climate change targets. The ES and ESA demonstrated that the proposed development would cause a net addition to UK carbon emissions.
136. Where a net addition to UK carbon emissions will arise then the question arises whether there is evidence that GGR measures will be available in 2050 to enable an increase in capacity whilst still achieving net zero. In this situation, unless it is demonstrated that all of the proposed airport expansion schemes can be accommodated by GGR measures, there will be insufficient carbon capacity to enable all schemes to come forward. Thus a decision maker will have to consider which expansion schemes should come forward and which should not.

### 3.5.8 Cumulative decisions under MBU

137. As explained above, MBU (**CD6.4**) envisaged, in Table 1, an additional 11 mppa in 2050 as a result of the MBU policy (or 9mppa in 2050 as a result of MBU over and above Heathrow North West Runway). If 8mppa is confirmed at Stansted (subject to any possible Judicial Review), and taking into account the proposed developments at Southampton, and Leeds Bradford, and the likelihood that Luton will go to committee in September for an additional 1mppa, decisions to consent the additional capacity going beyond MBU have already been made. If all five airports, including Bristol, are consented following conclusion of the relevant planning processes, this would imply an additional 13mppa by 2030 under MBU, yet MBU only foresaw an extra 1m by 2030, and an extra 11.8 by 2050. Thus Government needs urgently to review the policy in the light of 6<sup>th</sup> carbon budget decisions as well as net zero in 2050.
138. But as I have already explained, the adoption of a net zero approach results in a reduced ability to expand consistent with climate change obligations compared to that envisaged and assessed in MBU.. The result is that decisions have already been made which suggest that there may be insufficient technology change within aviation, or GGR measures, to accommodate the expansion of capacity already permitted.



139. In my view, it has not been demonstrated that all proposed airport expansion schemes can be accommodated within the targets set in law in the Sixth carbon budget period and Net-Zero target. As a consequence, even if it were accepted that carbon emissions mitigation, offset and removal measures may mean that there is some scope for the expansion of capacity (which has not been established by BAL to date) the decision maker in this case will have to consider which expansion scheme should come forward and which should not.

140. A “first come first serve” approach on capacity, whilst inherent in MBU, is not one which is rational under the carbon constraints we now face. For example, the policy approach within the NPPF (**CD5.8**) seeks to encourage sustainable development. If a choice has to be made between schemes because there is a finite capacity available for growth then the most sustainable schemes should be identified. Any other approach would be inconsistent with a central objective of NPPF. Also relevant will be the Government’s levelling up agenda. It may be that the public interest is better served by expanding an airport in one region compared to another.

141. For these reasons, a first come first serve approach would not allocate the available capacity on a basis which would be rationally consistent with carbon emissions policy; rather what is required is for the decision maker to undertake a comparison of the relative merits of each expansion scheme and to identify those which should be permitted to come forward to take up the finite capacity that is available (if any).

### 3.5.9 Prematurity

142. BAL has not undertaken that exercise. It has not demonstrated that the Greenhouse Gas Reduction GGR measures available in 2050 will be sufficient to allow for any net airport expansion in the UK. Further, BAL has not demonstrated that GGR measures will be available in the 6<sup>th</sup> carbon budget period (2033-37) and for net zero in 2050 will be sufficient to accommodate all the airport expansion schemes. BAL has not demonstrated that of all the proposed airport expansion schemes its expansion proposal is the most sustainable and best meets the public interest such that any mitigation measures which can accommodate expansion should be utilised to enable its scheme to come forward (as opposed to any of the other airport expansions schemes).

143. But, of course, BAL has not done this. BAL is not in a position to be able to undertake that exercise any more than North Somerset Council is. It is not BAL’s job to do this. Equally it is not a task that a planning inspector in a section 78 appeal can undertake either. Rather, this is an exercise which is a matter for national government to undertake at the national level. Only Government has the ability to choose between airport expansion plans – the outcome of the runway expansion process in the South East of England is an example of Government doing just this.



144. In advance of the government undertaking the comparative exercise I have identified above, I consider that it would be premature to grant planning permission for the proposed development unless the Panel are satisfied that either:

- a. The proposed development will not result in any net change in the UK carbon emissions compared to the position if planning permission were refused; or
- b. sufficient carbon reduction measures will be available in the sixth carbon budget period 2033-37 and to net zero in 2050 to address the cumulative increase in carbon emissions resulting from all of the proposed airport expansion schemes.

145. Since neither of these has been established, to grant planning permission for the proposed development would be premature since it prejudices the outcome of the required comparative assessment exercise.

## 4 Planning policy

146. Alongside evolving policy on airports and on carbon at national level, planning policy is clearly relevant including the Core Strategy and the National Planning Policy Framework.

### 4.1.1 The core strategy (2012) and Policy CS1

147. In carbon terms, relevant sections of The North Somerset Core Strategy (**CD5.20**) Policy CS1 state: *“**Addressing climate change and carbon reduction:** North Somerset Council is committed to reducing carbon emissions and tackling climate change, mitigating further impacts and supporting adaptation to its effects, and to support this, the following principles will guide development:*

*1) development should demonstrate a commitment to reducing carbon emissions, including reducing energy demand through good design, and utilising renewable energy where feasible and viable in line with standards set out in Policy CS2;*

*2) developers are encouraged to incorporate site-wide renewable energy solutions to be delivered in a phased and co-ordinated way with the proposed development;*

*and*

*4) ...Opportunities for walking, cycling and use of public transport should be maximised through new development and in existing areas emphasising the aim to provide opportunities that encourage and facilitate modal shift towards more sustainable transport modes;”*

148. In explaining CS1, para 3.15 of the core strategy *“Development proposals should demonstrate how they contribute to addressing climate change by putting in place the necessary measures to make their development as sustainable as possible.”* Para 3.17 continues *“The wide scope of this policy translates to the variety of interests responsible for delivering action on climate change and meeting the strategic objectives and realising the visions set out in this strategy and the need to co-ordinate action, towards comprehensive place-making. Developers and other bodies with development interests should work closely with local communities, specialist groups and the council in order to bring development forward that meets the challenges climate change brings”*. Thus it would be wholly consistent with local policy, for the LPA to insist the airport to work with the airlines to meet carbon targets.

149. Policy CS2: **Delivering sustainable design and construction** notes that *“In moving towards zero carbon development, applicants will ensure that sustainable principles are established in the new proposals from the outset.”*

150. In my view it is difficult indeed to see how a development which has not been demonstrated to be consistent with the 6<sup>th</sup> carbon budget target nor the net zero 2050 target can be seen to accord with the policy objectives of Policies CS1 or CS2.

#### 4.1.2 The NPPF

151. The NPPF (**CD5.8**) is clear on Sustainable development and the need to consider “radical reductions” in carbon emissions:

- a. Paragraph 7: The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- b. Paragraph 8 - Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives)... c) an environmental objective – ... mitigating and adapting to climate change, including moving to a low carbon economy.
- c. Para 148: “The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure. “It cannot be seen to be a scheme which supports the transition to a low carbon future and as such must be contrary to paragraphs 8 and 148 of the NPPF.
- d. Para 150: New development should be planned for in ways that:
  - i. can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government’s policy for national technical standards.
  - ii. In determining planning applications, local planning authorities should expect new development to: a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

152. To my mind a development which cannot be demonstrated to be consistent with the achievement of the 6<sup>th</sup> carbon budget or the net zero 2050 legal duty cannot be seen to be a development which accords with the NPPF objective of achieving sustainable development. As such, the proposed development must be in conflict with the NPPF paragraph 7. It cannot be

seen to be a scheme which supports the transition to a low carbon future and as such must be contrary to paragraphs 8 and 148 of the NPPF.

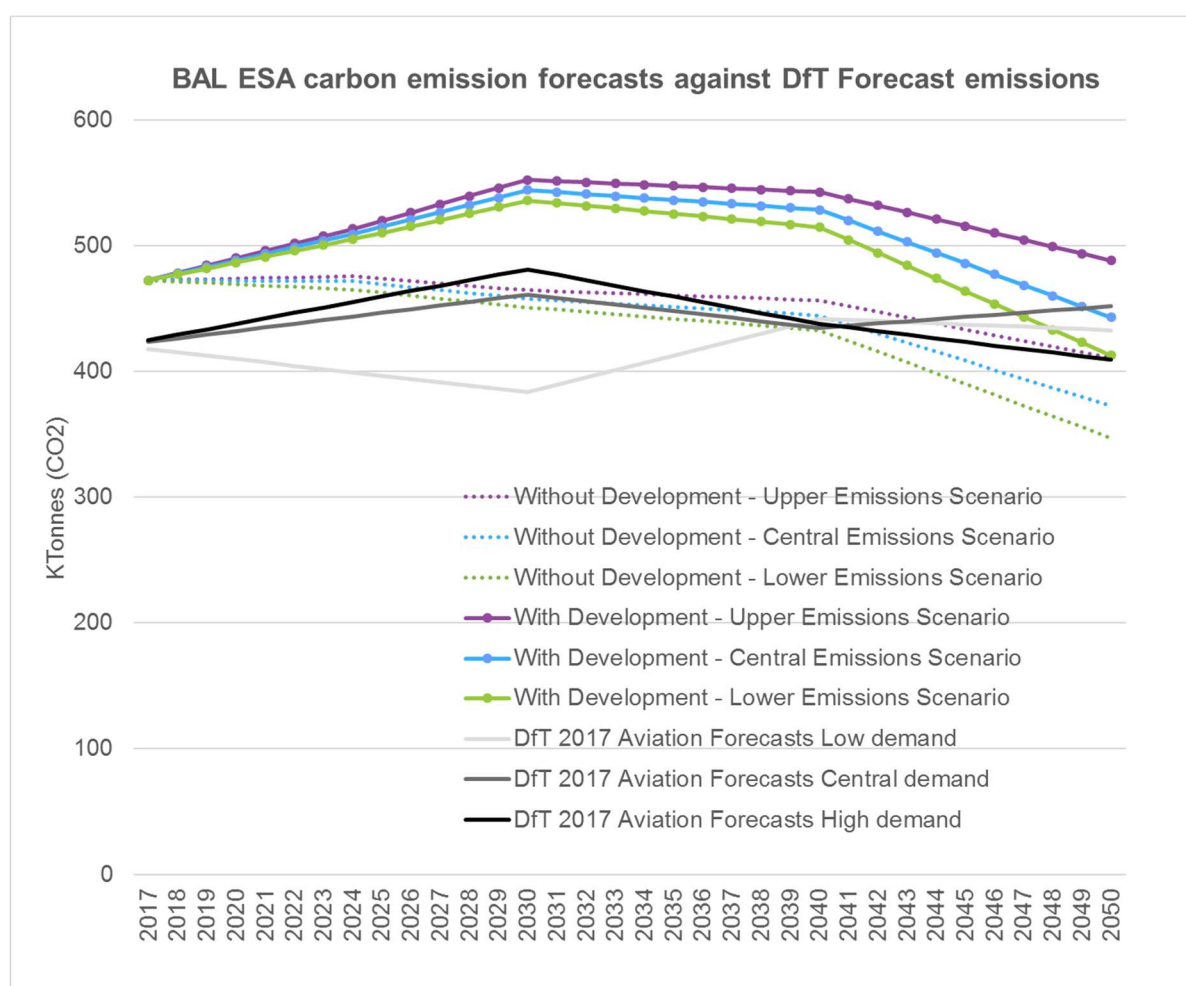
153. Further, the proposed development cannot be demonstrated to have been planned in a way which helps reduce greenhouse gas emissions, its location does not encourage public transport, and its design does not enable decarbonisation of aviation, resulting in an increase in carbon emissions as at 2050, which at the very least would have to be off-set via appropriate GGR measures if they were available. It is accordingly contrary to the first part of paragraph 150 of the NPPF.

## 5 Assessment of the ESA and mitigation measures against national and local policy

### 5.1 The ESA

154. I have reviewed the ESA (CD2.20.1) and its expectation of carbon emissions as a result of the development. In particular, in order to assess the impact of increased emissions on the UK carbon target I have assessed the emissions projections in the Environmental Statement against DfT 2017 Aviation Forecasts (see chart below).

**Figure 6 BAL Estimates of carbon emissions against DfT (2017) Aviation Forecasts**



155. As discussed above DfT forecasts assess the 29 largest airports in the UK using a range of drivers including the effect of economic conditions on demand, improvements in aircraft technology etc. and add up passenger number, Air Traffic Movements, and thus calculate carbon emissions by airport. Although DfT forecasts are often criticised by individual airports as

underestimating potential growth, they are the best benchmark we have as to whether a given proposal will affect the ability of the UK to meet carbon targets. The DfT (CD6.2 Table 70) estimated aviation emissions in 2050 to be between 36.5 and 44.1 MtCO<sub>2</sub> across all UK airports.

156. As discussed above, in DfT (2017) Aviation Forecasts (and in MBU), Bristol was at projected to be 10mppa. Thus 12mppa is additional to any forecast in DfT, and any carbon emissions from the development are additional to DfT (2017) and MBU projections for the UK as a whole.
157. The graph above shows an envelope of DfT forecast carbon emissions in grey, with Do Minimum (DM) Case in dotted colours and Development Case (DC) in solid colours. The analysis shows:
  - a. Carbon emissions were higher in 2019 than DfT forecast because of more rapid growth (within existing consented envelope) than DfT forecast in 2017.
  - b. There is inherent uncertainty in forecasts. Neither DfT (2017) or Environmental Statement forecasts show the impact of COVID (which is unsurprising for DfT since it was well before COVID but is a little surprising for the ESA because it was after COVID). The effect of COVID is a short term deep suppression in demand, expected to recover in 2024-25. Economic growth will also affect passenger growth and there is clear forward economic uncertainty. Finally, in the very long term, the uncertainty of different assumptions over future aircraft efficiency is as big as the difference between the DC and DM.
  - c. Emissions rise with passenger numbers and peak at the end of the fifth carbon budget period (2028-32) and remain close to peak in the sixth carbon budget period (2033-37) and are then projected to decline because (even with capacity growth) the improvement in aircraft efficiency is forecast to outweigh the increase in passenger numbers. The point of inflexion on emissions depends on the timescale of investment and fleet choices by airlines. The graphs indicate likely fleet changes in the 2040s, though the trajectory in the 2040s will not in practice be a straight downward trendline, it will be closer to a step change for each airline or route, but both the extent and the timing of the step is uncertain, hence the usual modelling practice is to represent it (however approximate) with an annual percentage change.
  - d. Since the ES Addendum Jet2 announced in November 2020 that they are starting to fly out of Bristol<sup>16</sup>. A sensitivity analysis exploring the potential effects of increased flights by Jet2 is set out in evidence elsewhere. Because of the typically older aircraft fleet used by Jet2, preliminary calculations indicate that this would result in an

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<sup>16</sup> [www.jet2.com/News/Announcing\\_our\\_tenth\\_UK\\_base\\_%E2%80%93\\_Bristol\\_Airport/](https://www.jet2.com/News/Announcing_our_tenth_UK_base_%E2%80%93_Bristol_Airport/)

increase in fuel consumed during LTO cycle (we assume for now CCD phase is similar) of 6.2% compared to the forecasts in the ES Addendum.

- e. The graph shows typically 100 kT CO<sub>2</sub> additional emissions per annum over the DfT basecase, compared to a 37.5MtCO<sub>2</sub> target.
  - f. The assessment should have separated out impacts and mitigations separately for UK aviation / EEA Aviation / and international aviation, since, at the time the assessment was undertaken, domestic aviation was already within the UK target of net zero.
  - g. However, as discussed above, the 37.5MtCO<sub>2</sub> target is out of date and none of these projections are compatible with the inclusion of international aviation in the UK net zero target. Assessment against sixth carbon budget is difficult without knowing sectoral policies the Government wishes to pursue, but the graphs do not show aviation at Bristol taking an equal burden of a 78% cut for the 6<sup>th</sup> carbon budget period (2033-37).
158. In practice, therefore, to meet targets would require those options analysed in in the CCC 6CB recommendations, and in the work by Sustainable Aviation Group (including Sustainable Aviation Fuel, electric, hydrogen and hybrid solutions, as well as changed airframes and modes of operation), would be needed, and then remaining emissions offset, or better removed (eg through Direct Air Capture or similar), to net zero.
159. There is thus no evidence in the ES or the ES Addendum (**CD2.20.1**), that the expanded airport can meet the Sixth Carbon Budget announcement or Net Zero in 2050, or that the economy can achieve Net Zero with the development as proposed in the ES Addendum, not least because the ES and mitigations were never designed for this circumstance.

## 5.2 Mitigations – the CCCAP

160. NSC and BAL have been discussing potential conditions/planning obligations. These include a Carbon and Climate Change Action Plan, or CCCAP (CD9.48) to be agreed with North Somerset Council.
161. Two weeks before Proofs were due BAL published a draft Carbon and Climate Change Action plan produced under these Heads of Terms
- a. ***“By 2030 and with 12 mppa, all operations and activities will be carbon net zero. This means all Scope 1 and 2 emissions will be minimised as far as practicable with any residual emissions being removed.***
  - b. ***By 2050 the Airport as a whole will be carbon net zero. This includes Scope 1, 2 and 3 emissions, and means all of the companies that operate from or provide services to***

*the airport, including the airport and the airlines, will be contributing to the UK's carbon net zero economy.*

- c. A commitment to continuing to **guide and influence** the companies and passengers that use the Airport to help them to reduce their GHG emissions in line with the UK's net zero 2050 target.*
- d. Progress towards achievement of these KPIs will be reviewed and reported on every year in an Annual Monitoring Report that will be accessible from our public website. The CCCAP will be reviewed every five years in line with UK carbon budgets and adaptation cycles."*

162. In other words, compared to earlier proposals, the targets have been set later for airport based emissions (perhaps because of COVID), but the scope has increased from Scope 1 and 2 (airport onsite emissions) to include scope 3 (travel to the airport and aircraft emissions). This recognises the inclusion of aviation emissions in the net zero target. There is an important change in tone too, so that not only are they aiming to "influence" the airlines, as third parties that use the airport, the aim is to "*guide and influence*".

163. This document does not demonstrate how or indeed whether those objectives will be achieved. For example, we are told that the full version of the CCCAP, to be developed following planning approval, will include a trajectory to carbon net zero 2030 to indicate how and when Scope 1 and 2 emissions will be reduced (page 15). As figure 4.1 demonstrates these are only very small parts of the total emissions associated with the airport.

164. The far larger proportion relates to emissions associated with airlines and surface access. The measures to be adopted to reduce emissions associated with aircraft and surface transport (referred to a scope 3 emissions) are "qualitatively described". Thus again, the document does not demonstrate a trajectory compatible with 6<sup>th</sup> Carbon Budget and net zero.

165. Indeed, Figure 4.4 demonstrates that the grant of planning permission would result in almost an addition 100 KtCo2 per year at 2050 would have to be off-set compared to the position if permission is refused.

166. The section in relation to sustainable transport identifies that aviation emission constitute around 70% of carbon emissions associated with the airport. However, the measures proposed to reduce emissions are weak. There is no commitment to the provision of sustainable aviation fuel at any point in time. The proposed basis for encouraging the use of cleaner and quieter aircraft is simply the publication of a league table. The remaining proposals are to attend meetings.

167. In addition, the CCCAP does not contain any sanction or consequence if its objectives are not achieved. That is not acceptable to the Council.

168. In my view the draft CCCAP is a step in the right direction but it does not go far enough to set out ambitious targets and how they will be achieved. The position adopted in relation to



sustainable aviation fuel is particularly disappointing given that such fuel is an essential part of the CCC and Sustainable Aviation paths to net zero. My understanding is that the Council will continue to discuss this document however with a view to securing further improvement and clear reductions in carbon emissions should permission be granted for the proposed development.

## 5.3 Significance

### 5.3.1 Benchmarks for significance

169. IEMA published 'Environmental Impact Assessment Guide to Greenhouse Gas Emissions and Assessing their Significance' in 2017<sup>17</sup>. The Guide clarifies: "*in the absence of any significance criteria or a defined threshold, it might be considered that all GHG emissions are significant and an EIA should ensure the project addresses their occurrence by taking mitigating action*". (my underline). Whilst action is proposed in CCCAP, that goes beyond what is assessed in the ESA, and is not guaranteed.
170. The ANPS (**CD6.9**) states at para. 12.57; "*Any increase in carbon emissions alone is not a reason to refuse development consent, unless the increase in carbon emissions resulting from the project is so significant that it would have a material impact on the ability of Government to meet its carbon reduction targets, including carbon budgets.*" This is similar to Aviation 2050 which states planning applications should demonstrate "*that their project will not have a material impact on the Government's ability to meet its carbon reduction targets*".
171. BAL claim in the ESA that carbon emissions are negligible, and that the development "*is unlikely to materially impact the UK's ability to meet its 2050 aviation target of 37.5MtCO<sub>2</sub>*", I cannot share this conclusion. In my view the development will almost certainly adversely impact on the UK's ability to meet its 2050 net zero target, for several reasons:
- a. As above, I cannot share the conclusion that 37.5MtCO<sub>2</sub> can be retained as the 'planning assumption'.
  - b. It is no answer to the above to contend as BAL appears to that the increase in carbon emissions for its scheme represent a small part of total aviation emissions. As I have explained, as time progresses even small parts of the aviation emissions sector will become larger parts of the total UK carbon emissions. Significance should be assessed against net zero, not against an out of date 'planning assumption', or even the CCC target of 23MtCO<sub>2</sub> because CCC assume all remaining emissions are offset to net zero.
  - c. What matters is not the scale of any increase in emissions but whether or not there is scope for that increase in emissions to be reduced or off-set, and following changes

<sup>17</sup>[https://www.iaia.org/pdf/wab/EIA%20Guide\\_GHG%20Assessment%20and%20Significance\\_IEMA\\_16May17.pdf](https://www.iaia.org/pdf/wab/EIA%20Guide_GHG%20Assessment%20and%20Significance_IEMA_16May17.pdf)

in policy, to 78% reduction in the 6<sup>th</sup> carbon budget period (2033-37) and to net zero in 2050.

- d. In the absence of evidence that there will be appropriate measures available to reduce or off-set aviation emissions, including the increase in emissions associated with the proposed development, then it cannot be said that the scale of that increase means those emissions are insignificant in terms of compliance with the UKs climate change obligations. This is not a matter which BAL has addressed in the ES or ESA.

### 5.3.2 Future constraints

172. It is no answer to the difficulties that the carbon impacts present in the current case, to suggest that government can take steps to restrict carbon emissions in the future, either by imposing controls at Bristol, or at other airports, or in other sectors. Whilst this is no doubt possible, such action would itself give rise to adverse impacts, e.g. if action were taken at Bristol airport to restrict capacity then it is likely to mean that the full economic benefit would not be realised. If action were taken at other airports to restrict capacity as a result of the grant of permission at Bristol then the adverse economic impacts of that would also need to be taken into account in the determination of the present appeal. Equally, if action is taken in another sector then the adverse impacts of that would also need to be taken into account. Such impacts would be a consequence of the grant of planning permission and would thus be material to the determination. However, the extent of these impacts is unknown.

173. Planning decisions have to be taken on the basis of a balance of the impacts and benefits that will arise if planning permission is granted. If it is the case that once built the use of a scheme would be inhibited in order to meet climate change targets, then the benefits of the scheme that were used to justify the grant of planning permission would not be realised.

174. If in reality a proportion of the benefits of a scheme will not be capable of realisation, or there is a substantial risk that it will not, then that proportion must not be taken into account by a planning decision maker or at the very least it should be given limited if any weight.

175. It follows that the extent to which Government is likely to allow an airport to use any increase capacity must be determined at the decision making stage in order for a decision maker to weigh the degree of benefit that would actually be realised against the adverse impacts that would arise.

176. BAL has chosen to present its case in the present appeal on the basis of an assessment of benefits and impacts that assumes a growth of 2 mppa. It has not demonstrated that Central Government will or can allow this level of growth to occur consistent with the U.K. climate change obligations. Further, it has not sought to demonstrate that its scheme remains justified if only a lower level of growth or indeed no growth is permitted by Central Government.

177. My view is that it has not been demonstrated that the proposed development would not have a material impact on the ability of Government to meet its legally binding carbon reduction targets

in 2050. Further, there is no evidence which demonstrates that the proposed development is compatible with the Sixth Carbon Budget announcement objectives for 2035.

## 6 Conditions

178. The LPA continues in its view that the proposal is unacceptable in carbon terms, but without prejudice to that position, if in the planning balance the proposal is consented, the LPA considers that it is necessary to impose conditions which include

- a. A carbon roadmap updated every 5 years, in line with carbon budget periods (or as significant changes in policy require):
- b. The roadmap would need to show how BAL intended to implement national policy locally. This includes showing how BAL is taking its share of national policy targets, including specific carbon budget periods.
- c. The roadmap would need to cover carbon emissions from surface access; carbon emissions from ground based assets; how the airport will work with airlines to deliver aviation emissions reductions including provision of alternative fuels; and if national policy requires it, to manage non-carbon warming impacts.
- d. If the CCCAP objectives were not met (ie projected carbon emissions were not met) there would need to be a mechanism for enforcement, just as there might be for a development which breaches air quality or noise policy. This may include asking for revised carbon plans to bring emissions within an agreed limit. But ultimately a breach of the plan should be considered a breach of the consent with the usual remedies.

179. The reason for this would be the need for compliance with NPPF paras 8 and 148, and to ensure compliance with UK Carbon budgets.

## 7 Summary and conclusions

### Summary

180. This proof shows the chronology of policy development covering both aviation and climate change policy, at UK national level and international level. The rapidly changing policy is presented in sections against the timescale of the application for planning permission at Bristol Airport and this appeal, to show what has or has not been considered at each stage of the planning process. Appendix 1 summarises in table form developing policy against timeframe of the decision at Bristol
181. The Proof covers planning policy both at local level (CS1 and 2) and national level (NPPF)
182. In summary the widespread expectation of airport development had been growth, in a period of a proposed 80% cut in UK carbon emissions. However consent decisions are now being made in a period where policy has changed and the adoption of the net zero target for 2050 and the 6<sup>th</sup> carbon budget 6CB of a 78% reduction for the period 2033-37, including aviation, have significant implications for the determination of the carbon related issues arising in this appeal.
183. There is a clear collision of expectation of airports on the one hand and climate policy needs on the other. The headline conclusion of this proof is that there is not the evidence base for the application to be approved.
184. Trading emissions in another sector off against aviation is no longer possible because all sectors are required to attain net zero. Unlike the position when the target was 80% reduction, the net zero target means that there are no “spare” emissions in other sectors to offset between now and 2050.

### MBU

185. MBU includes (CD6.4) include policy approaches which are out of date based and assessed as they were in the context of a statutory obligation to achieve 80% carbon reductions compared to 1990 levels and not net zero. The conclusion in MBU that greater use can be made of existing runway capacity without impinging upon climate change targets is no longer correct. The result is that MBU cannot be relied upon in this regard and should be given little weight.
186. In addition to that, even if MBU had any validity, its target additions in Tables 1, 2, and 3, have been or are likely to be met by decisions made before the conclusion of this appeal. The ‘first come first served’ nature of MBU has been used.

### Current policy

187. Whilst the Government has adopted net zero, the overall 6CB and determined that international aviation should be included in the UKs targets, it has not yet identified how these

targets will be achieved generally nor specifically within the aviation sector, though such policy may be announced shortly and I reserve the right to change my recommendation to the LPA.

### **Mitigations**

188. Whilst the CCCAP is welcome, it does nothing to guarantee an emissions trajectory that is consistent with sixth carbon budget (2033-37) and net zero in 2050 including aviation.

189. It is no answer to suggest that there are mitigations such as Sustainable Aviation Fuel, or other technologies, since these are in their technical and commercial infancy and no guarantee can be placed on them, and thus little weight should be placed on them in the planning balance.

### **Significance**

190. The work by the CCC to support its path to net zero in the 6CB demonstrates that the achievement of net zero by the aviation sector will not be possible even with growth restricted to just 25% to 2050 and with no additional airport capacity provided. The aviation sector will be reliant upon greenhouse gas reduction measures in order for the UK to achieve net zero.

191. If all five airports ((Stansted, Leeds, Southampton, Luton and Bristol)) are consented following conclusion of the relevant planning processes this would imply an additional 13mppa by 2030 because of MBU (CD6.4), and MBU (CD6.4) only foresaw an extra 1m by 2030, and an extra 11.8 by 2050 and thus Government needs urgently to review it in the light of 6CB decisions as well as net zero in 2050

192. As time progresses the aviation sector will form a larger and larger proportion of UK carbon emissions, indeed the old 37.5MtCO<sub>2</sub> 'planning assumption' would become more than 100% of UK emissions by 2045. Thus, the importance of net additions to carbon emissions will increase over time.

193. The significance of the development in carbon terms should be weighed against net zero, not against 37.5MtCO<sub>2</sub> or 23MtCO<sub>2</sub>

194. BAL has not demonstrated that carbon emissions with the proposed development will be the same or less as those if planning permission is refused. Indeed, quite the reverse is the case – granting planning permission will result in an increase in carbon emissions associated with the airport.

195. BAL has not demonstrated that in the sixth carbon budget period (2033-37) and forwards to 2050 there will be mitigation measures available to address the net addition to the UK's carbon emissions which the operation of the airport will represent.

**Prematurity**

196. BAL has not demonstrated that all of the expansion plans of all of the airports in the UK can be accommodated with the available mitigation measures in the sixth carbon budget period and forward to 2050. Indeed, it has not carried out any kind of cumulative impact assessment.
197. It is no answer to contend that airport expansion schemes should be permitted since their use can be subsequently regulated by central Government introducing controls to inhibit the use of any increase in capacity.
198. If in reality a proportion of the benefits of a scheme will not be capable of coming forward, or there is a substantial risk that it will not, then that proportion of the benefits must not be taken into account by a planning decision maker or it should be given limited, if any, weight in the planning balance.
199. A choice has to be made as to which airport expansion plans should come forward and which should not. That choice can only be made at a national level by Government via a comparative exercise which examines all of the competing potential airport expansion proposals against a wide range of considerations relevant to the achievement of sustainable development (i.e. the economic social and environmental objectives of sustainable development). In such an exercise, all of the competing expansion proposals, including the Proposed Development, would need to be considered and compared, with only the highest ranked being selected to come forward and to utilise the carbon budget available and which can be offset. The decision as to which airports can expand and which cannot is a matter of central Government and not for determination in a Section 78 appeal. That comparative exercise has not been undertaken.
200. Since the grant of planning permission would prejudice the outcome of that exercise, to grant planning permission for appeal scheme now would be premature.

**Conclusion**

201. It has not been demonstrated that the Proposed Development will not have a material impact on the Government's ability to meet its carbon reduction targets or the interim carbon budgets.
202. The Council's position is that the BAL proposal is inconsistent with the attainment of sixth carbon budget reductions of 78% by 2033-37 and Net Zero target in 2050, and is contrary to the NPPF (in particular paras. 7 and 148) (CD5.8), policy CS1 of the CS and the duty in the CCA 2008 (as amended) (CD9.7) to ensure that the net UK carbon account for the year 2050 is at least 100% lower than the 1990 baseline. This remains largely as stated in the reasons for refusal, though updated by sixth carbon budgets and inclusion of aviation in UK targets.

## Appendix - Chronology

**Table 1 Changes to legislation, policy, and guidance since 2008 and planning application timelines**

Date	Changes	Planning application timeline
2008	Climate Change Act 2008 ( <b>CD9.2</b> ). Though emissions from international aviation and shipping (IAS) were excluded, the Act placed an obligation on CCC to provide advice and on the secretary of state to include IAS by 2012	
Sept 2009	CCC advice on a framework for reducing global aviation emissions including constraining global emissions to 2005 levels and addressing the need to incorporate the non-CO2 warming effects of aviation.	
2010-2011		Permission to expand from 7 million to 10 million passengers a year, approved after surviving court challenge in 2011 on carbon grounds, <sup>18</sup>
Dec 2012	Government published 'International aviation and shipping emissions and the UK's carbon budgets and 2050 target'. ( <b>CD9.39</b> ) (This decision allowed aviation to continue to increase by offsetting their emissions elsewhere in the economy).	
March 2013	Aviation Policy Framework factsheet ( <b>CD9.88</b> )	
Dec 2015	Paris agreement (countries who are signatories should return all emissions to net zero) ( <b>CD9.26</b> )	
October 2016	CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) sets a framework for carbon neutral growth (ie no new and additional emissions from growth), from 2020 onwards, until 2035 at the present time ( <b>CD9.4</b> )	
Dec 2016	Sustainable Aviation CO2 Road-Map provides an update to the Road-Map published by Sustainable Aviation in 2012. This report explored the potential for the UK to accommodate growth in aviation to 2050 without significantly increasing CO2 emissions,	

<sup>18</sup> <https://www.bbc.co.uk/news/uk-england-bristol-15469445>



	through improvements in carbon efficiency (CD9.89).	
October 2017	The DfT published the UK Aviation Forecasts, noting that the forecasts include Bristol at 10 mppa in 2050 (CD6.2)	
June 2018	The DfT published 'Beyond the Horizon: The future of UK aviation, making the best use of existing runways' (MBU). (CD6.4)	
June 2018	The DfT published 'Airports National Policy Statement: new runway capacity and infrastructure at airports in the south east of England' (CD9.28)	
Dec 2018	The DfT published 'Aviation 2050 — the future of UK aviation Consultation and supporting documents' (CD9.29)	Planning application 18/P/5118/OUT submitted to increase capacity from 10 to 12mppa
Feb 2019	Latest revision of NPPF, replacing previous versions from March 2012, and July 2018, though all versions of the NPPF include a statement similar to para 7 (purpose of the planning system is sustainable development, i.e. <i>"meeting the needs of the present without compromising the ability of future generations to meet their own needs"</i> ) and to para 148, that <i>"The planning system should support the transition to a low carbon future"</i> and <i>"shape places in ways that contribute to radical reductions in greenhouse gas emissions"</i> (CD5.8)	
Feb 2019	CCC published advice on aviation warning that stronger action may be needed beyond constraining aviation emissions to 2005 levels (CD9.50)	N Somerset Council declare climate emergency and commit to making N Somerset carbon neutral by 2030 (CD XXCD9.12)
April 2019		Further information under Reg 25 in response to comments received from Jacobs on climate change
May 2019	CCC published 'Net Zero – The UK's contribution to stopping global warming' which explores emissions across all sectors of the UK economy including aviation(CD9.31)	
June 2019	The Climate Change Act 2008 (2050 Target Amendment) Order 26 June 2019 (CD9.7), which changed the UK carbon emissions	

	reduction target from an 80% to a 100% reduction	
Sept 2019	CCC letter: Net-zero and the approach to international aviation (CD9.11)	
Oct 2019	Airports Council International (ACI) Commit To 'Net Zero' by 2050 (CD9.90)	Further information under Reg 25 on transport
January 2020		Officers report to Planning Committee published recommending approval ( <b>CD4.11</b> )
Feb 2020	Sustainable Aviation Group publish the Decarbonisation Road-Map: A Path to Net Zero (CD9.14)	Report to Committee (CD4.12 and CD 4.13)
Feb 2020	ANPS declared illegal in R (Friends Of The Earth) v Secretary Of State For Transport And Others (CD9.91)	
March 2020	DfT published 'Decarbonising Transport: Setting the Challenge A consultation paper' ( <b>CD9.16</b> )	Committee Update 18 March (CD4.14). Application refused by Committee
June 2020	CCC Reducing UK emissions: 2020 Progress Report to Parliament (CD9.17)	
October 2020	Government response to the CCC Progress Report to Parliament ( <b>CD9.112</b> ). This report provides an update to the Government's approach to reaching net zero in 2050 and impact of Government policy, focussing on five key areas, including: Building Back Greener, Sector-specific action, climate change adaptation and resilience, action in devolved administrations, and international leadership.	
October 2020	Establishment of the UK Connectivity review	
December 2020	A letter from the CCC to the Secretary of State advising on the UK's 2030 Nationally Determined Contribution to the Paris Agreement <sup>19</sup>	
Jan 2021		Start of appeal on 18/P/5118/OUT. Appeal Ref: APP/D0121/W/20/3259234

<sup>19</sup> [www.theccc.org.uk/publication/letter-advice-on-the-uks-2030-nationally-determined-contribution-ndc/](https://www.theccc.org.uk/publication/letter-advice-on-the-uks-2030-nationally-determined-contribution-ndc/)

20 April 2021	High level recommendations of the CCC on the 6th Carbon Budget (6CB) accepted, ie a 78% cut in carbon emissions compared to 1990 levels, by 2035, including International Aviation and Shipping (IAS) ( <b>CD9.109</b> ) .	
<b><i>Expected June 2021</i></b>	<b><i>Heating and Building Strategy and Transport Decarbonisation Plan</i></b>	



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