**BAAN/W2/3**

**TOWN AND COUNTRY PLANNING ACT 1990**

**Appeal by Bristol Airport Limited concerning land at North Side Road, Felton, Bristol, BS48 3DY**

**DEVELOPMENT OF BRISTOL AIRPORT TO ACCOMMODATE 12 MILLION PASSENGERS PER ANNUM**

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

# SUMMARY OF

# PROOF OF EVIDENCE

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## Finlay Asher (MEng)

**Founder at Green Sky Thinking**

## 1. INTRODUCTION

1.1. This is a summary of my full proof of evidence ([BAAN/W2/1]), which sets out my relevant qualifications and experience.

## 2. SUMMARY AND CONCLUSIONS

2.1. There are a number of misconceptions relating to the potential for "sustainable aviation", all of which have been deployed by the Appellant in its justification for the proposal:

- Aviation contributes only a small % to global emissions and global warming
- Aircraft efficiency improvements are reducing emissions from the sector
- Electric aircraft will soon be a viable alternative to jet fuel powered flight
- Hydrogen aircraft will soon be a viable alternative to jet fuel powered flight
- Alternative jet fuels such as biofuel, or synfuel/electro-fuel can be scaled ecologically and economically – without affecting the price of air travel and undermining the business case for airline/airport expansion plans
- Existing carbon offset schemes will be effective in reducing emissions.

2.2. In my proof of evidence, I address each of these in detail.

2.3. **Environmental Impact**: The aviation industry is eager to highlight that flying only produces 2-3% of global CO2 emissions, but this is not small: if aviation was a country, it would rank amongst the top 10 emitters in the world, ahead of nations like Brazil, Mexico, and the UK. UK aviation already produces a significant amount of CO2 emissions (8% of total UK emissions) and the UK's per-capita aviation emissions are far higher than the global average. However, these are not evenly distributed across the population: surveys show that more than half the UK population do not fly in any given year, and only 15% of the population is responsible for 70% of all flights taken. Despite this, the UK's aviation emissions are projected to grow considerably, and are exacerbated by an even greater global warming effect from aviation's non-CO2 emissions.

2.4. **Aircraft Efficiency**: History has shown that efficiency improvements will not result in overall reduced total emissions or energy consumption because of increased number of flights. Over the period that aircraft have become more efficient and CO2 emissions **per passenger mile flown** have dropped significantly, air travel has grown rapidly and the total emissions produced by aviation has increased very steeply. Global aviation emissions have quadrupled since 1966; they have doubled since 1987 and have grown 4-5% a year since 2010 (i.e., after recovery from the global financial crisis). In 2018, the UK's aviation emissions were 88% above 1990 levels. In an industry like aviation, efficiency improvements grow the market and increase emissions, rather than reducing them. Efficiency gains will not result in **total** emissions or energy consumption reducing and cannot be relied upon in isolation, without measures to address demand, as the UK Climate Change Committee ("CCC") has emphasised.

2.5. **Electric Flight**: Hybrid-electric aircraft still burn jet fuel and should be treated simply as a potential efficiency improvement, with the problems just described. Fully-electric aircraft powered by batteries will not realistically be viable for anything but very short-haul commercial flights in small aircraft, even by 2050, and will not be available for the type of aircraft for which Bristol Airport is predominantly configured.

2.6. **Hydrogen Flight**: The associated costs and timescales required to develop and deploy hydrogen technology and infrastructure mean that it will not credibly support significant decarbonisation of Bristol Airport in the foreseeable future. Hydrogen flight is also as yet unproven, and its continued development is uncertain, meaning that it should not be relied on to meet airport sustainability targets.

2.7. **Alternative Jet Fuels**:

2.7.1. **Biofuels**: Aviation biofuel is not a sustainable or scalable solution without causing increased global food prices, water shortages, deforestation, drainage of peatland, loss of biodiversity, and land-use change emissions.

The use of large quantities of aviation biofuels will thus exacerbate the climate and ecological emergency. It will also transfer any sources of sustainable biomass away from other sectors. Without taking into account the political or economic barriers to alternative jet fuel production, it has been estimated that there are only sufficient global resources to support approximately 5.5% of projected EU jet fuel demand in 2030. Alternative fuels can only be scaled to a small fraction of existing aviation fuel consumption by 2035 or even 2040. Finally, aviation biofuel scale-up has been promised by the industry for more than a decade but has not materialised. Even optimistic targets from the industry show a low percentage uptake of biofuel over the coming decades and the industry has a history of missing these targets.

2.7.2. **Synfuels**: Aviation synthetic fuels produced from electricity by synthesising hydrogen with carbon to create a liquid hydrocarbon, face problems of scale, cost, and use of renewable energy resources which mean they cannot contribute a significant percentage towards total aviation fuel consumption in a sustainable manner. Existing targets e.g., in Germany, for synfuel are even lower than those for biofuel. There are currently no UK targets.

2.7.3. **General**: Future air traffic and jet fuel consumption growth will in fact lower the potential contribution of alternative jet fuels, because of the small scale on which such fuels are capable of being produced. Even where they are used, they will be more expensive than conventional jet fuel and so will undermine the case for airport expansion, because they will drive up prices, resulting in reduced demand for flying. They also will not eradicate the climate impact of flying. This highlights the necessity of demand control, given the aviation emissions that cannot be mitigated with alternative jet fuels.

2.8. The UK CCC has given very clear advice on aviation. Its Sixth Carbon Budget Reports consider aircraft efficiency improvements, the potential for electric or hydrogen

aircraft and significant use of alternative jet fuels, but still conclude that air traffic demand management is crucial to achieving a "Balanced Net Zero Pathway". The CCC has recommended no net expansion of UK airports and stated: "*Airport expansion could still occur under the Balanced Pathway, but would require capacity restrictions elsewhere in the UK (i.e. effectively a reallocation of airport capacity).*"

2.9. **Carbon Offsetting and Emissions Pricing**: The only carbon pricing schemes currently proposed will not be effective in reducing emissions. The UK/EU ETS scheme is applicable only to domestic aviation emissions which only contribute 4% of total UK aviation emissions, while international aviation emissions are covered by the CORSIA scheme. The CORSIA terms are weak and the majority of emissions (pre-2019 levels of CO2 and all non-CO2) will not be offset. For the emissions that are offset, the offset credits are far too cheap. Airlines can also choose to purchase alternative fuel instead of offsets, which have very weak sustainability criteria and emissions reduction guarantees. Future higher pricing of aviation emissions is inevitable due to the economics of climate change and reliance on expensive negative emissions technologies. This will increase the cost of flying, which will undermine the expansion plans of the industry. The CCC has also advised that CORSIA is not currently compatible with the UK's Net Zero commitment and has thus advised that "CORSIA should not contribute to meeting the carbon budgets".

2.10. **The Appellant's Case**: In my proof I set out some of the main references in BAL's documents to sustainable aviation and give my responses.

2.11. The Appellant's Draft Carbon and Climate Change Action Plan ("CCCAP") relies predominantly on offsetting emissions, which for the reasons already given is not a credible approach. It also relies on efficiency improvements, which it claims expansion will deliver, however, as shown, efficiency improvements may be used to increase air traffic and increase emissions, not reduce them. Therefore, efficiency gains will not result in total emissions or energy consumption reducing, and cannot be relied upon in isolation, without measures to address demand. Such commitments present in the Draft CCCAP to enable "sustainable flight solutions" and

sustainable aviation fuel use are vague, lack quantified commitments and, in any event, do not address the difficulties I have evidenced on timescales, costs and adverse impacts. Very little weight can be placed on the Draft CCCAP.

2.12. BAL's ES Addendum relies on "Road-Maps" produced by UK aviation industry lobby group Sustainable Aviation, which in February 2020 also published a press release on UK aviation committing to Net Zero carbon emissions by 2050. I address some specific points on those documents in my proof. Importantly, the CCC was well aware of the proposals by Sustainable Aviation, which are referenced in the CCC's "The Sixth Carbon Budget: Aviation" report. The CCC did not consider the commitment announced by Sustainable Aviation or the Sustainable Aviation Decarbonisation Road-Map or the Fuel Road-Map meant that more weight should be given to hybrid-electric or fully electric aircraft. In full knowledge of these industry Road-Maps, the CCC's main recommendation was that air traffic demand management is crucial to achieving a Balanced Net Zero Pathway, through no net expansion of UK airport capacity.

2.13. **Overall conclusion**: Very little to no weight can safely be put on the Appellant's claims that they will deliver emissions reductions or that there are credible reasons why the climate change impact of expanding Bristol Airport will not be significant.

Finlay Asher