NO 3RD RUNWAY COALITION

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No 3rd Runway Coalition Response to DfT Jet Zero Consultation

September 2021

Introduction

The No 3rd Runway Coalition is the largest organisation campaigning against the expansion of Heathrow. Our membership includes local communities, parliamentarians, local authorities, trade unions and environmental NGOs.

Our members believe the expansion of Heathrow is incompatible with the UK's net zero targets especially as Heathrow's own data show the massive increase in CO2 emissions resulting from a third runway.

Heathrow is the single largest polluter in the UK, and its emissions account for over half of all UK aviation emissions. It currently emits around 20MtCO2 of carbon annually. A 3rd runway would increase this by approximately 7MtCO2 to 27MtCO2.

The Government should initiate a review of the Airports National Policy Statement once its plans for Jet Zero emissions is announced in late 2021.

1. Do you agree or disagree that UK domestic aviation should be net zero by 2040? How do you propose this could be implemented?

Agree. However, domestic flights account for just 4% of UK aviation emissions so the target date of 2040 seems unambitious. This should be implemented by mandating that only electric aircraft can be used on domestic routes, using electricity from renewable energy.

There should be a ban on those domestic flights that can otherwise be completed by train, in under four hours; comparable to new laws passed in France in April 2021. The associated review will need to decide how the four hours is measured – airport to airport, train station to train station, or simply the centre of a city to another. But on Domestic Flights the UK should be taking the lead – they provide an exceptional opportunity to demonstrate the direction of travel, both to UK citizens and further afield.

The cost of flying remains far too cheap when compared to similar distances travelled by other public transport. This price imbalance could be addressed by introducing tax on aviation fuel for domestic flights and then using the revenue raised to reduce the cost of public transport on long distance train services (on which, through several projects, the UK is already investing). Such a move would help incentivise passengers to use less carbon intensive forms of travel. Train operators should be encouraged to compete more aggressively with the aviation

market where mode share is balanced towards flying, for example from London to the central belt of Scotland. The example of the new low-cost operator East Coast Trains, offering **all** fares lower than the average price of a plane ticket for the same route, should be encouraged.

2. **Do you agree or disagree with the range of illustrative scenarios that we have set out as possible trajectories to net zero in 2050? Are there any alternative evidence-based scenarios we should be considering?**

Disagree. There are significant issues with the scenarios outlined as to how those reductions are delivered.

The focus should be on what is possible; not what may happen in many decades to come. Currently the scenarios through which aviation might decarbonise are extremely optimistic and based on speculative technological breakthroughs that are at best in their infancy, or do not yet exist.

The consultation contains little evidence to address the uncertainty identified in the scenarios, particularly what additional policy measures will be required to deliver net zero aviation, should technological breakthrough not occur. For example, how would Heathrow expansion – an additional 260,000 flights per year – fit with these targets with minimal, let alone no, breakthroughs of new technology. With 2035 being the earliest entry-into-service year, there is little room for delay.

It is not clear why the recommendation of the Climate Change Committee for some form of demand management measures to reduce aviation emissions in the next decade has not been properly considered, or an alternative policy proposal put forward. The Government should present a fresh aviation strategy, taking all of these measures and the recent carbon legislation, and its binding targets, into account.

3. **Do you agree or disagree that we should set a CO2 emissions reduction trajectory to 2050?**

Agree. Although it is sensible to set an emissions reduction trajectory, there appears an absence of robust policy designed to ensure that the trajectory can be met.

There is insufficient clarity around the pace of aviation's recovery. The financial hit that the pandemic has delivered, in particular to large airports such as Heathrow, is likely to limit the capital available to invest in new aircraft or new technologies. Any delays to the introduction of less polluting aircraft is likely to

extend the operation of the existing fleet, thus reducing the capacity for such innovations to assist the decarbonisation effort.

a. Should the trajectory be set on an in-sector CO2 emissions basis (without offsets and removals) or a net CO2 emissions basis (including offsets and removals)?

The trajectory should be on an in-sector CO_2 emissions basis. Offsetting is not a credible policy mechanism as it does not stop aircraft from emitting greenhouse gasses into the atmosphere. Thus, it should not count towards reaching net zero, as advised by the CCC in the 6th Carbon Budget.

Carbon removal such as direct air capture has not yet been developed and proven be operationally effective. There are also associated issues as to whether the carbon is stored or used.[1] Such initiatives may not increase carbon emissions, but they may not reduce them either.

b. Do you agree or disagree with the possible trajectories we have set out, based on our high ambition scenario, which have in-sector CO2 emissions of 39 Mt in 2030, and 31 Mt in 2040 and 21 Mt in 2050, or net CO2 emissions of 23-32 Mt in 2030, 12-19 Mt in 2040 and 0 Mt in 2050?

We disagree with the trajectory of allowing emissions to increase up to 2030. Reductions in emissions are required in aviation now, if Government are to meet their target of 78% reduction by 2035.

Heathrow expansion would add an additional 7MtCO2 per annum. In all the scenarios, the overall increase in emissions would be significantly lower were Heathrow not expanded.

4. Do you agree or disagree that we should review progress every five years and adapt our strategy in response to progress?

An annual review would appear more appropriate, as it is not obvious that a progress review every 5 years – just once per Parliament – will be sufficient to address the challenge of decarbonisation of the aviation sector.

Government policy will need to evolve far more quickly should the presumed investments and technological developments not occur at the pace hoped for – leaving emissions higher for longer.

[1] Transport & Environment (2021) What role for Direct Air Capture (DAC) in e-kerosene? https://www.transportenvironment.org/sites/te/files/publications/DAC%20briefing%20e4tech%20report.docx%20%283%29.pdf

5. Do you agree or disagree with the overall approach to improve the efficiency of our existing aviation system?

Disagree. The assumption of 2% efficiency gain per annum conflicts with the available evidence.

The International Civil Aviation Organisation (ICAO) in 2019 assumed long-term overall efficiency gains, even under the most optimistic scenario, of 1.37% per annum. This includes improvements associated with both technology and operations.[2] The United Nations Environment Programme UNEP similarly states that likely improvements in aircraft airframes and engines in the next 20 or so years will improve the burn-fuel metric by around 1.2% per year.[3]

These potential efficiency gains do not come close to matching the projected and desired growth (5% per annum) from the aviation industry and are simply insufficient to reduce emissions from the current level.

6. What more or differently could be done to ensure we maximise efficiency within the current aviation system?

Pidcock and Yeo (2016), show that carbon emissions from international aviation will still represent 12% of the 205Gt remaining global CO2 budget in 2050, even if technological and operational efficiencies are maximised and the total demand for conventional jet fuel is met with alternatives. This may rise to 20% should alternative jet fuels not become available in sufficient quantities. [4]

That is why the government should be considering robust demand management measures, including the introduction of a frequent flyer levy.

7. Do you agree or disagree with the overall approach for the development and uptake of SAF in the UK?

Disagree. The consultation provides no policy clarity or indication of the size of, if any, investment that Government believes is necessary to support the development of SAF.

Biofuels in general are a complex solution to manage as they can only be considered 'sustainable' if recruited from waste streams (which requires external

[2] ICAO (2019) Environmental Trends in Aviation to 2050 https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2019/ENVReport2019_pg17-23.pdf
[3] UNEP (2020) Emissions Gap Report. https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/34431/EGR20ch5.pdf?sequence=3
[4] Pidcock & Yeo (2016). *Analysis: aviation could consume a quarter of 1.5C carbon budget by 2050.* Retrieved from: https://www.carbonbrief.org/aviation-consume-quarter-carbon-budget

verification). This could discourage waste reduction strategies and encourage the deliberate creation of 'waste' oils. Biofuels directly sourced from crops would not qualify as sustainable.

Large-scale production of alternative jet fuels could also aggravate the environmental impacts linked with intensive agriculture of dedicated bioenergy feedstocks (Novelli, 2011)[5], and result in an absolute increase of carbon emissions from international aviation (Staples et al., 2018)[6]. The proposed approach does not appear to take this into account.

In 2010, the aviation industry pledged to source 10% of fuels from sustainable sources in 2020. Yet by 2018, the industry had managed to source a grand total of just0.002%. Sustainable Aviation Fuel (SAF) production today is still less than 1 percent of overall jet fuel supply – despite it being pitched by the industry as the panacea for decarbonisation.

The current global targets for approximately 50% alternative jet fuel use in 2050 would require three new bio-jet fuel refineries to be built every month for the next 30 years. Today there are just two facilities – the market is not delivering at the pace required.

There are unresolved issues around the definition of 'sustainable' for Sustainable Aviation Fuels (SAF) as there is not a single internationally agreed definition of SAF, nor is it clear how emissions in production are accounted for. There is an assumption of benefit of waste being turned into fuel as opposed to being left to rot (thus generating methane), however jet fuel from waste could still generate similar levels of carbon emissions as kerosene. In order to achieve net zero both the methane and carbon emissions need to be avoided.

The Climate Change Committee (CCC) advises that we shouldn't plan for aviation biofuel to exceed 10% of total aviation fuel use by 2050.[7] The International Energy Association (IEA) Sustainable Development Scenario (SDS), anticipates biofuels reaching around 10% of aviation fuel demand by 2030, and close to 20% by 2040.[8]

However, the price of biofuel is again crucial. Lu (2018) discovered a cost benefit ratio of more than five has been shown for biofuel usage, suggesting that this is not economical, compared with traditional fuel. The results show that it is not until the biofuel price is just around 8-11% higher than the traditional fuel that the use

[5] Novelli, P. (2011) Sustainable way for alternative fuels and energy in aviation (SWAFEA), report prepared for the European Commission's directorate general for mobility and transport. https://www.icao.int/environmental-protection/GFAAF/Documents/SW_WP9_D.9.1%20Final%20report_released %20July2011.pdf

[6] Staples, M.D., Malina, R., Suresh, P., Hileman, J.I., Barrett, S.R.H., 2018. Aviation CO_2 emissions reductions from the use of alternative jet fuels. Energy Pol. 114 (C), 342-354. https://doi.org/10.1016/j.enpol.2017.12.007

[7] https://www.theccc.org.uk/wp-content/uploads/2013/04/Aviation-factsheet.pdf

[8] https://www.iea.org/commentaries/are-aviation-biofuels-ready-for-take-off

of biofuel becomes more economical than traditional fuel.[9] Thus, whilst alternative jet fuels may play a role it is not yet clear how significant this role might be in terms of decarbonisation.

In our view 2030 is too late before a SAF-specific review is undertaken. An initial review should be taken by 2025 at the latest and then on an annual basis thereafter to ensure that both the proposed policy framework and the industry is delivering as required.

8. What further measures are needed to support the development of a globally competitive UK SAF industry and increase SAF usage?

A report commissioned by the Department for Transport to investigate the feasibility of commercial SAF plants in the UK found that there is a pool of UK and international developers that could build such plants. However, there is significant technology risk, high capital costs and uncertainty on the monetary value of policy support, meaning that this industry needs to overcome a number of key barriers before it can even take off. The study concludes that first-of-a-kind commercial plants could cost between £600m - £700m.[10]

It is not clear how much investment industry or Government is willing to commit to enable alternative aviation fuels generation to be scaled up and sold at a price that is competitive with kerosene.

It is difficult to make a strong case for public investment in such risky initiatives that benefit one sector when there are many pressing demands for public capital that could more effectively address the decarbonisation challenge.

9. Do you agree or disagree with the overall approach for developing zero emission flight in the UK?

The industry's own assessment suggests that even if a technological breakthrough does become commercially available before 2050, new technological developments in the aviation sector usually take up to a couple of decades before reaching maturity (IATA, 2013).[11]

Additionally, new lower emission aircraft may not be operational by the date predicted in the even the least ambitious scenarios and might not be viable for long haul or even longer short haul flights until a date much later than this.

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[9] Lu, C. (2018) When will biofuels be economically feasible for commercial flights? Considering the difference between environmental benefits and fuel purchase costs. Journal of Cleaner Production Volume 181, 20 April 2018, Pages 365-373. https://doi.org/10.1016/j.jclepro.2018.01.227

[10] https://www.e4tech.com/uploads/files/final-report-aviation-abdc-feasibility-study-issue-v1-0.pdf

[11] IATA, 2013. Technology Roadmap, fourth ed. Retrieved from: https://www.iata.org/whatwedo/environment/Documents/technology-roadmap-2013.pdf

Electric Aircraft

Analysis by Fellow Travellers[12] reveals that electric aircraft in development today have the technical potential to cut 13% of UK aviation's greenhouse gas emissions. Delivering this level of emissions reduction before 2050 would require regulation and major market intervention to accelerate product development and fleet turnover cycles.

Engineering constraints mean larger gains are unlikely in this timeframe, and it is probably not possible for transatlantic-range battery powered craft to be economically viable. There are no electric aircraft currently in development, whatsoever, which could compete with much of the current global civil aviation fleet on range or capacity.

Electric aircraft will not reduce their weight due to fuel combustion over the duration of a flight. This means that, on a like for like basis, electric aircraft may be heavier on arrival leading to an increase of airframe noise.

Hydrogen

In June 2021, Airbus told the EU that most airliners will rely on traditional jet engines until at least 2050. They plan to develop the world's first zero-emission commercial aircraft by 2035, but assert that, *"Zero-emission hydrogen aircraft will be primarily focused on regional and shorter-range aircraft from 2035. Which means that current and future iterations of highly efficient gas turbines will still be required as we move towards 2050, especially for long-haul operations."*[13]

If hydrogen is to form part of the Government's alternative aviation fuels strategy then it will need to set goals that are realistic and achievable, and focus on creating a secure market for green hydrogen with high sustainability standards so that industry can make the long-term investments that are required to scale up sustainably. As stated above only hydrogen currently produced by electrolysis could hope to meet this standard depending on where the electricity needed is generated from.

The cost of hydrogen aircraft is a significant concern. For the technology to become competitive, the cost will need to fall in order to increase its competitiveness in the industry. This is unlikely to happen while the concept is relatively fresh, and companies face start-up costs of new infrastructure. Therefore, the government cannot simply rely on hydrogen as a means to achieve Jet Zero emissions quickly.

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[12] Fellow Travellers (2018) *Electric Dreams: the carbon mitigation potential of electric aviation in the UK air travel market.* https://s3-eu-west-1.amazonaws.com/media.afreeride.org/documents/Electric+Dreams.pdf

[13] https://www.reuters.com/business/aerospace-defense/airbus-tells-eu-hydrogen-wont-be-widely-used-planes-before-2050-2021-06-10/

10. What further measures are needed to support the transition towards zero emission aviation?

The introduction of effective demand management measures and the promotion of alternatives to air travel should be accompanied by a tougher regulatory framework for aviation emissions.

11. Do you agree or disagree with the overall approach for using carbon markets and greenhouse gas removal methods to drive down CO2 emissions?

Disagree. The carbon price in the UK ETS remains too low and airlines should not be being given free allowances. The CCC has advised the Government not to use CORSIA as a way to meet our 2050 net zero target.

The cost of SAF will need to fall significantly in order to become competitive enough to challenge kerosene.

12. What could be done further or differently to ensure carbon markets and greenhouse gas removal methods are used most effectively?

Increasing the price of carbon to reflect the true environmental cost. The non-CO2 impacts of aviation should also be monetised and reflected in ticket prices, given the significant impact they have on climate warming.

As identified in the Evidence and Analysis, a key challenge could be to overcome the inability of airlines to effectively modernise their fleets, due to financial or other constraints. This, in turn could impact the deliverability of the Jet Zero aviation.

13. Do you agree or disagree with the overall focus on influencing consumers?

Agree that this is an important first step to providing environmental information.

14. What more can government do to support consumers to make informed, sustainable aviation travel choices?

Aviation taxes should increase in line with those paid by motorists to help generate additional revenue (around £10bn per annum) for the Treasury. It is clear from the advice of the CCC and the International Energy Association that aviation policy needs to include demand management.

A frequent flyer (or air miles) levy could be an effective, social, just and morally defensible way to reduce UK aviation emissions - but allowing those who take just one return flight per year to do so at no extra cost.

15. What could be done further or differently to ensure we tackle non-CO2 impacts from aviation?

It is likely that including non-CO2 emissions would result in a doubling of the overall climate impact of aviation. [14] The government should follow the recommendation of the CCC, that it is vital that further research is commissioned to guide policy and regulations for non-CO2 emissions.

Stop expansion at Heathrow with immediate effect.

[14] Lee et al (2021) The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018. Atmospheric Environment, Volume 244, 117834. https://doi.org/10.1016/j.atmosenv.2020.117834