

Airports Commission  
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By email only to [climatechange.paper@airports.gsi.gov.uk](mailto:climatechange.paper@airports.gsi.gov.uk)

C.C. Daniel Instone and Richard Plant, Defra.

Dear Sir

### **Response to the Aviation and Climate Change discussion paper.**

Thank you for providing the opportunity to respond to your discussion paper on Aviation and Climate Change. We consider having clear definitions of aviation's emissions and clear targets as essential to making progress in reducing greenhouse gas emissions and planning for adapting to climate change. We agree this is a complex issue and feel the publication of your discussion document is a valuable step forward.

As an environmental advisor to Government our response relates to our role in managing the EU Emissions Trading System and Adapting to Climate Change. We have had discussions with Natural England to ensure that we provide you with a consistent message on the environment.

### **Climate Change emissions**

#### **Our role:**

We are the Competent Authority for the EU Emissions Trading System in England making us responsible for ensuring its effective and efficient implementation. We also work closely with the Northern Ireland Environment Agency, the Scottish Environment Protection Agency and Natural Resources Wales to ensure it is implemented and enforced consistently across the United Kingdom.

We manage the Registry for the Emissions Trading System in the United Kingdom. Aviation emissions data will be reported to and be available from the Registry system on an annual basis from 2013. This will facilitate an evaluation of the effectiveness of the trading system in managing the climate impacts of aviation at both a UK and EU level.

#### **Comment on Section 3 Climate change policy framework.**

We note your comment within Section 3 that there are a number of overlapping national and multinational frameworks in operation that seek to address climate change that will have a bearing on your work.

As the Competent Authority on one of these frameworks – the EU Emission Trading System we feel it would be beneficial to share our views on its operation. Whilst we are confident

that the EU Emissions Trading System could produce significant reductions in greenhouse gas emissions, we note that it will not mitigate all of aviation's impact on the climate.

When the Airports Commission considers making its assessment of the nature, scale and timing of the UK's aviation capacity and connectivity it is worth considering these points that relate to the EU Emissions Trading System:

1. The Emissions Trading System does not cover the effects of non-CO<sub>2</sub> emissions on the climate, such as water vapour and nitrogen oxides at high altitude.
2. The Emissions Trading System cap for aviation implies only a modest curb on emissions at EU level. Emissions are capped at 97 per cent of the average annual emissions for the 2004-2006 period between 2008 and 2012 and 95 per cent between 2013 and 2020.
3. No cap has yet been determined for total emissions beyond 2020, so there is no carbon price signal for the longer term.

The above points are made in the context of the EU Emissions Trading System operating as set out by the European Commission based on flights arriving, or departing from airports in the European Economic Area. Due to some international opposition the European Commission is currently implementing '[stop the clock](#)' proposals on certain reporting and surrender aspects of EU ETS aviation pending the 2013 ICAO General Assembly. How this issue resolves will obviously impact on the ability of the EU Emissions Trading System (aviation) to deliver reductions in greenhouse gas emissions.

We are happy to engage in dialogue with the Airports Commission to share information on how EU Emissions Trading System operates and develops during this period.

In particular we would be able to provide data on UK flight emissions from the EU Emissions Trading System. Please note that the information needs to be interpreted with care, for example, we would have data for British Airways (flights London to New York included, Singapore to Sydney excluded), but not Ryanair which is regulated by Ireland, not the UK.

We also have access to the Eurocontrol support facility, which allows us to obtain data on flights, together with estimated CO<sub>2</sub> emissions. The Airports Commission may also find the Eurocontrol estimation tool, which allows estimations of CO<sub>2</sub> emissions based on route and aircraft type, useful when assessing the UKs' aviation capacity and connectivity needs.

As the Airports Commission is considering capacity and connectivity it is worth noting that it is not just flights that generate greenhouse gas emissions. Operations of the airport infrastructure (buildings and support vehicles) and the extra traffic movements generated by passengers and workers travelling to and from the airport generate greenhouse gas emissions. We recommend that the Airport Commission considers these associated emissions when evaluating proposals for capacity and connectivity.

We acknowledge the work the Airports Commission has done to understand the greenhouse gas emissions from the aviation sector in the discussion document, it is essential to have this understanding to enable the Airports Commission to deliver recommendations on UK

aviation capacity and connectivity that allow compliance with Government's climate change commitments.

## Climate Change adaptation

### Our role:

We have a new role to provide advice and support to businesses, public sector and other organisations to help them adapt to a changing climate. Our aim is to help key sectors increase their resilience to climate risks. This role complements our existing roles and responsibilities. It is for England only but the products generated will be available across the UK. We work closely with Defra as part of [Climate Ready](#) - the Government's national programme for adaptation.

**Discussion question: What do you consider to be the main climate risks and adaptation challenges that the Commission will need to consider (a) in making its assessment of the UK's overall aviation capacity and connectivity needs, and (b) in considering site specific options to meet those needs?**

We note that you have identified some of the main climate risks in paragraphs 6.6 – 6.8 of the discussion paper as; increased frequency of extreme weather events, increased temperature/heat waves, increased rainfall and flood risk, sea level rise, coastal erosion and changes in wind patterns. We would further suggest that consideration needs to be given to changes in soil/groundwater levels which could have impacts on infrastructure such as subsidence.

For each of these climate risks we would expect the assessment process to consider the adaptation challenges for each airport and new development. Of particular interest for our role would be how impacts on water quality, water resources, flood risk, air quality, land quality and biodiversity are mitigated and managed. In annexe A we have provided some examples of the climate risks and adaption challenges (that relate to our role) to illustrate the importance of developing mitigation measures.

We are supportive of your findings (in paragraph 6.7) that there is benefit in considering risks associated with airports' dependencies such surface transport, water, energy and telecoms to gain a full assessment of the risks and adaptation needs of the aviation sector.

In making an assessment of the UK's overall aviation capacity and connectivity needs it would be beneficial to make sure the assessment process considers and mitigates the risks of climate change to current capacity as well as any new developments. This is to make sure the current and planned operational capacity has been safeguarded against the risks related to the predicted changes to weather and sea level as a result of a changing climate.

We agree that the issue of assessing adaption is more relevant to the second phase of your work to identify future aviation capacity and connectivity needs.

In terms of site specific options, we would consider it the role of the operators and developers to determine their own risks and adaption plans due to a changing climate. We acknowledge that 11 airports have already produced adaptation reports under the Government's Climate Change Act reporting power. Advice is available from [Defra](#) and the [Climate Ready programme](#).

## Next steps

We are happy to work with the Airports Commission to explain our role and provide more detail on the operation of the EU Emissions Trading System and the support we have for planning for adapting to Climate Change.

Thank you for your co-operation and support in this matter and we look forward to receiving your response. In the meantime, please contact -[stephen.hemingway@environment-agency.gov.uk](mailto:stephen.hemingway@environment-agency.gov.uk) (01772 714164) if you would like further information.

Yours faithfully



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## **Annexe A:** examples of the climate risks and adaption challenges.

### **Increased frequency of extreme weather events:**

**Scenario:** more frequent frosts and snow falls due to a changing climate lead to greater use of de-icers to keep runways and aircraft free from ice.

De-icers used at airfields generally aren't conventional de-icers such as granular salt because they're corrosive. Alternative materials such as glycols or calcium magnesium acetate are substituted.

Many independent carriers at commercial sites will de-ice their own aircraft. This normally happens just before take-off and may involve up to 1,000 litres of solution to de-ice a large aircraft. Fluid remaining on the aircraft will normally be deposited on the runway during take-off and can run into local water courses and groundwater.

#### **Risk: failure to meet water quality standards.**

The increased frequency and quantities of de-icer applied at airports increases the risk that de-icers enter local water courses and groundwater. This could lead to failure of EU Water Framework Directive objectives and standards for water quality, which could lead to infraction proceedings for the UK Government.

As an example, the recent severe winter weather experienced at Heathrow airport has led to a number of glycol related pollution incidents in the River Crane.

#### **Potential mitigation measures:**

Heathrow airport are investing approximately £20m in water treatment, the creation of reed beds and lagoons to treat runway run-off before it enters local watercourses, and are also investigating glycol recovery.

### **Increased temperatures/heat waves**

**Scenario:** more frequent droughts due to hotter drier summers lead to lack of water for use at airports.

Airport operations are large users of drinking water and also surface and groundwater for various other activities. For example, Heathrow's annual consumption is approximately 2,265,000 m<sup>3</sup> per annum. To give a context of scale, this is equivalent to the annual average water consumption of around 41,000 people, (41,000 people is the size of the population of a small city such as Canterbury).

#### **Risk: Lack of water for people and environment:**

Lack of water, for example during drought could pose risks to efficiencies of airport operations, public health issues for passengers and workers and any water based pollution event or even routine discharges may have a greater impact on water quality (due to the lack of any 'dilution effect' as water courses would already have reduced flows).

Water use by airports needs to be set in the wider context of water resources management. It is worth considering that the south east will face a potential increase in population by the

2050s of more than 40%. Using a scenario based approach the Environment Agency has looked at the current and future availability of water resources and in order to meet this growth, individual daily demand needs to decline by approximately 17%. The combined impacts of climate change and population indicate there could be less water available for people, businesses, agriculture and the environment. Just to highlight this, it is worth considering that the Thames Corridor Catchment Abstraction Management Strategy identifies that much of the catchment is already classed as being over abstracted.

**Potential mitigation measures:**

Individual airports would benefit from developing and implementing long term water resources strategies and adaption plans to make sure future water requirements are catered for.

The future water needs of any new airport development would need to be built into regional/local water supply strategies and a sustainable source agreed before the development goes ahead.

### **Increased rainfall and flood risk**

An important aspect of assessing airports ability to deliver capacity and connectivity is to ensure that flood risk has been considered and managed. It is a major issue for airports as operations may be vulnerable to flooding, particularly temporary inundation of runways and roads, which would affect their ability to deliver capacity and connectivity.

Airports also have large areas of hard surfacing that can contribute to local flooding downstream of storm discharges and this has implications for the local community and environment.

Some examples of flood risk management issues at airports include:

**Gatwick airport** is at the highest fluvial flood risk and the planned Upper Mole Flood Alleviation Scheme will reduce that risk. It's being done in partnership with Gatwick Airport Ltd who are contributing to it financially.

We are currently part way through the construction phase of a project (Upper Mole Flood Alleviation Scheme) to reduce flood risk to Crawley and Gatwick Airport. At present the Gatwick Airport (South Terminal) is vulnerable to a flood event from the Gatwick Stream, a tributary of the River Mole, having an annual occurrence of 5% (1 in 20 year return). With the full scheme in place Gatwick Airport will be protected to an event having a 2% annual occurrence (1 in 50 year return). Assuming planning permission is granted shortly for construction of one of the key flood detention reservoirs, we anticipate that the scheme should be complete by the end of 2014.

We have also been informed by Gatwick Airport that they are introducing additional flood storage within their site, to reduce flood risk further.

**The City of London Airport** is located entirely within the tidal floodplain of the River Thames. However the site is protected to more than a 1:1000 year standard of protection from the Thames Barrier and the Thames tidal defences. The Thames Estuary 2100 plan provides a strategy for maintaining this very high standard of defence for the rest of the century.

## **Flood risk and Thames Estuary**

For any estuarine airport a flood risk assessment would need to identify the current and future likelihood and consequences of flooding, along with how the island would manage the risk of flooding from tidal storm surges.

To add some context a surge tide entering the Thames estuary can increase water levels by 1 to 3 m and can be a major flood threat especially if this happens during a 'spring' tide when normal tide levels are higher. Sea level rise in the Thames over the next century due to thermal expansion of the oceans, melting glaciers and polar ice is likely to be between 20 cm and 90 cm.

The assessment would also need to consider the support infrastructure located on the nearby mainland, much of which is in the tidal floodplain, and any impact on local flood risk. The assessment should take into account the proposed positions in our [Thames Estuary 2100 Flood Risk Management Plan](#).