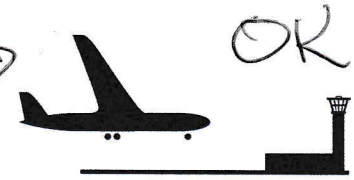
# Our policy measures



## System efficiencies

Improving the efficiency of our existing aviation system: **our aircraft, airports and airspace.**

Our ambition is for **all airport operations in England to be zero emission by 2040.**

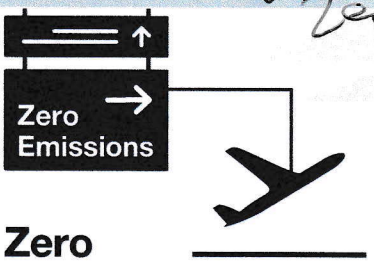
We are providing a further **£3.7m funding** in the years 2022/23 to support airports to complete stage 2 of their airspace change proposals.

## Sustainable aviation fuels

SAF are a key lever to accelerate the transition to Jet Zero, and represent an industrial leadership opportunity for the UK.

We will be supporting the development of the UK SAF industry with **£180m of new funding.**

By 2025 we are committing to having at least **five UK SAF plants** under construction and a SAF mandate in place with a target of at least **10% SAF in the UK aviation fuel mix by 2030.**




## Zero emission flight

There is the potential for new, zero emission aircraft to play a role in the decarbonisation of aviation.

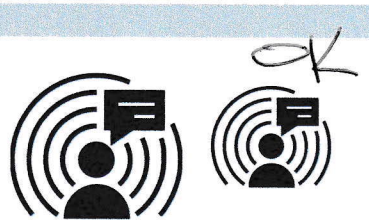
Our aspiration is to have **zero emission routes connecting different parts of the United Kingdom by 2030.**

We are supporting industrial R&D through the **ATI Programme** (£685m funding over the next 3 years) and have **invested £3m in the ZEFI project.**

## Markets and removals

The implementation of carbon markets and greenhouse gas removal technologies is vital to achieving Jet Zero.

We aim to have legislation for the **Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)** in force no later than 2024, and are working with the UK ETS Authority to **enhance the effectiveness of the UK Emissions Trading Scheme (UK ETS).**



## Influencing consumers

We want to **preserve the ability for people to fly** whilst supporting consumers to make sustainable aviation travel choices.

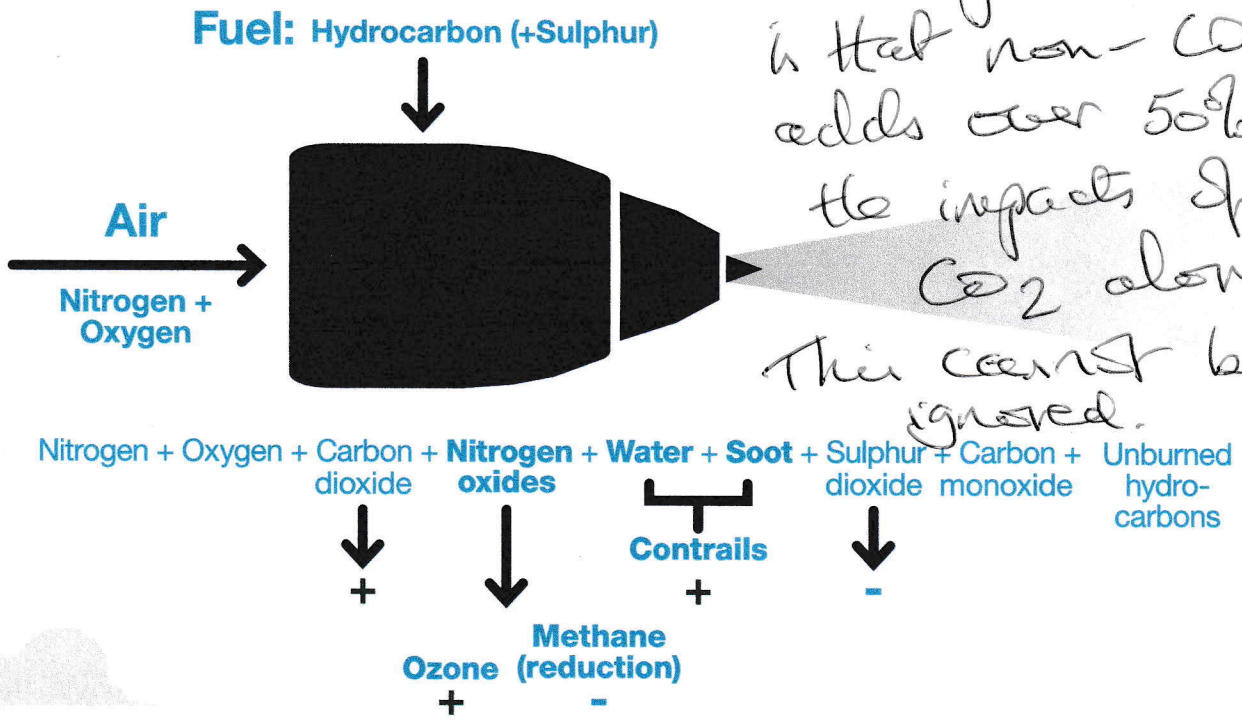
We will publish a Call for Evidence on our proposal to **provide consumers with environmental information at the time of booking in autumn 2022**, working with the Civil Aviation Authority.

## Addressing non-$CO_2$

Tackling the climate impact of aviation is not just about reducing $CO_2$ emissions, there are other non-$CO_2$ impacts that also affect the climate and local air quality.

Our focus is to **increase our understanding** of non-$CO_2$ impacts as the exact scale of their effect remains uncertain.

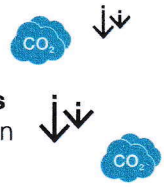
# Addressing non-$CO_2$



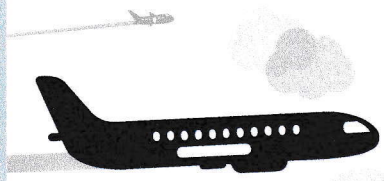

The general view is that non-$CO_2$ adds over 50% to the impacts of $CO_2$ alone. This cannot be ignored.

## What are non-$CO_2$ impacts?


**$CO_2$ is the principal greenhouse gas** emitted by aviation but important **non-$CO_2$ effects can cause additional warming**

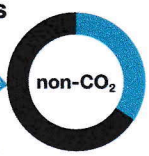



Major forcings from aviation come from **contrail cirrus clouds, $CO_2$ and the 'net NOx' effect,** with minor contributions from water vapour, soot and sulphur aerosol-radiation interactions



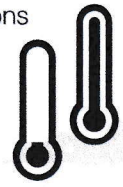
## What effect do non-$CO_2$ impacts have?

**Non-$CO_2$ impacts currently represent around 66%** of the net effective radiative forcing (ERF): **this is not a fixed number** and is scenario dependent. Cumulative $CO_2$ emissions currently represent around **34% of the net ERF**[64]




Non-$CO_2$ effects contributed **8x more than $CO_2$ to the uncertainties** of net global aviation warming **in 2018**[65]

Non-$CO_2$ emissions can have both **warming cooling effects** &

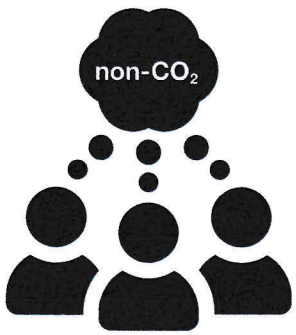


MINIMISES SIZE OF ISSUE

## What can we do to tackle non-$CO_2$ impacts?

Research indicates SAF can produce **50%–70% fewer** soot particles, which could reduce the overall warming effect of contrails[66]

We will carefully consider any need for **additional research and development activity on non-$CO_2$ effects, including working with UK Research and Innovation (UKRI)**




UNCERTAIN[56]

SAVINGS AND MOVE QUESTIONABLE CARBON INTO AIR

## The importance of SAF:

Aviation fuel usage reached **12.4Mt in 2019**[28]

SAF are a 'drop in' option which can be used in existing aircraft without modification and are already available for commercial use[29]

When fully replacing kerosene, SAF use achieves, on average, **over 70% GHG emissions savings** on a lifecycle basis

SAF will be essential to achieve **net zero aviation** for medium and long-haul flights, which account for around **80% of the $CO_2$ emissions from aviation**[30]

Our "High Ambition" scenario projects approximately **5m tonnes of SAF are required by 2050 to meet our net zero target**

## Key actions:

NONE SO FAR?

We have committed to having **at least five commercial-scale UK plants under construction by 2025**

We will support the delivery of the first net zero transatlantic flight running on **100% SAF** with up to £1m of funding

Our previous advanced fuels competitions have supported the development and commercialisation of SAF pathways since 2014:

**£25m** Advanced Biofuels Demonstration Competition (ABDC) – launched in 2014

**£22m** Future Fuels for Flight and Freight Competition (F4C) – launched in 2017

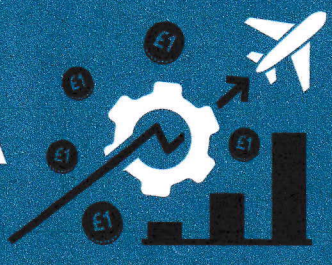
**£15m** Green Fuels Green Skies Competition (GFGS) – launched in 2021

We will provide → **£180m new funding between 2022-2025** to support the commercialisation of SAF plants and fuel testing in the UK

We will have a SAF mandate in place by 2025, **reducing greenhouse gas emissions through the uptake of aviation fuel by the equivalent of at least 10% SAF use by 2030**

## The co-benefits of a UK SAF industry:

**By 2035,** the development of a SAF industry could generate up to **£2.7bn GVA for the UK from UK production and global exports**



**By 2035,** the development of a domestic industry for the production of sustainable aviation fuels is expected to **support up to 5,200 UK jobs**[31]

AIRBUS MAY HAVE ABANDONED THIS CONCEPT. $H_2$ NEEDS TO REACH POWER TO PRODUCE.


## Case Study: Airbus ZEROe Demonstrator

Airbus aim to bring a zero emission commercial aircraft to market by 2035 and in April 2022 announced the launch of a Zero Emission Flight Development Centre in Filton, Bristol.

In 2022, Airbus launched their ZEROe Demonstrator with the aim to test hydrogen combustion propulsion technology on an A380 multimodal platform. Three concept hybrid-hydrogen aircraft have been designed to enable the exploration of a variety of configurations and hydrogen technologies that will shape the development of future zero emission aircraft. They are powered by hydrogen combustion through modified gas turbine engines, where liquid hydrogen is used as a fuel for combustion with oxygen. In addition, the onboard hydrogen fuel cells create electrical power that complements the gas turbine, resulting in a highly efficient hybrid-electric propulsion system.

Airbus ZEROe concept aircraft powered using liquid hydrogen. Image courtesy of Airbus.

## Strategic objectives

- Grow UK share of the global aerospace manufacturing market as new forms of aircraft emerge.
- Facilitate collaboration between aviation, other transport modes and sectors of the economy on the adoption of hydrogen.
- Ensure parallel development of aircraft with the energy and ground infrastructure required for their operation.
- Ensure the aviation sector workforce is prepared for the introduction of new aircraft.
- Stimulate future innovation by promoting diversity and accessibility in the sector.
- Put in place the policy and regulatory system to enable zero emission aircraft to enter commercial service and deliver our aspiration of zero emission routes connecting different parts of the United Kingdom to be realised by 2030.