



UK Research
and Innovation



Innovation Hub
**Towards Net Zero
Aviation**
UK Legislative Framework

Introduction

Net Zero technologies have become a core trend in aerospace and aviation, underpinned by ambitious Government targets and growing industry investment. Legislation and regulatory decision making plays a key role in enabling these.

This publication provides an overview of the current aviation legislative frameworks and associated regulation, against the context of emerging net zero propulsion technologies.

It demonstrates that many of the current frameworks in the UK can - and will - accommodate the continued development of industry-led solutions to create a greener and cleaner aviation sector for the future.

However, this publication also recognises that new technologies need to be reviewed against current regulatory processes. It starts to identify the much-needed work to ensure that the legislative framework is underpinned by new or modified policies and guidance that reflect the novel aspects of net zero technologies. This is particularly key as the technologies continue to evolve, with the aim of becoming safely integrated into the future aviation sector.

The CAA has a strong role to play in this process as the UK's safety regulator for aviation. However, Government and industry are equally important for enabling innovations to flourish safely over the next two decades and beyond.



What is Net Zero Aviation?

The Government intends to develop UK capabilities for net zero aviation, as part of its broader decarbonisation agenda for the UK and to reduce UK emissions in line with the Paris Climate Agreement.

To set the UK on its path towards net zero aviation, the Government has proposed a multi-track approach; looking to achieve the significant changes needed through multiple approaches, especially in terms of investing and supporting the development of a range of technologies in the aviation sector.

Taking an aircraft technologies focus, this means considering a range of changes to current aircraft propulsion technologies and fuels including: Sustainable Aviation Fuel (SAF); Lithium chemistry batteries; and Hydrogen.

These areas form the basis upon which this report has been created, and the case studies against which the current aviation legislative frameworks have been reviewed.

The 2015 Paris Agreement is an international commitment to limit global warming to below 2 degrees Celsius, preferably to 1.5, compared to pre-industrial levels. Achieving this will require countries to limit carbon emissions and reduce it to net-neutral by 2050.

This report is the first publication associated with the CAA Net Zero Propulsion Programme: established within the CAA Innovation Hub to coordinate and help develop work in this area. This research work was funded and supported through the Future Flight Challenge, and in association with the Jet Zero Council.



What does the legislation mean for Net Zero aims?

Compared to many other sectors in the UK, the legislative structure for aviation regulation is set at a high level; to enable a relatively large degree of flexibility in how it is applied. As a result, the legislative frameworks that exist are largely non-specific when it comes to individual technologies. They establish straightforward - but vital - principles to encourage improvement and development of new alternatives.

On this basis, concomitant with the right legislative structure, is the need for the right rules and regulation to sit underneath it. How regulatory requirements are imposed is a policy decision: made usually by the Government or in some cases (delegated to) the regulator.

Regulations may specify how a piece of technology is to be used or how a process is to be conducted, in order to ensure that the technology is used safely and appropriately. For aviation regulation in the UK, it can be affected by simple changes to legislation, the inclusion of special terms into licences, or by declaring certain standard licence conditions to be met.

Licences in aviation cover a wide range of operators and other stakeholders. We will touch on some of the regulation relating to this in this report (as well as focussing on the overall legislative structure).

Net zero aviation relates to a number of different areas under aviation regulation. For this report these principally fall into one of the following novel areas:

- SAF – production and use as an alternative fuel source in aviation;
- Design (or Certification) of engines and aircraft - creating a system or systems for a different power source, including hydrogen and electric propulsion;
- Aerodromes and ground infrastructure - to enable the above novel operations in a safe and integrated way, including safe storage and treatment of fuels.

We cover some of the key current questions but are not able to capture them all at this stage and we recognise the evolving nature of these topics means new questions should be expected to emerge as developments continue to evolve and change.

In focusing on the above three areas where significant discussion and industry-led development has already taken place, we aim to identify in this report questions for legislators and regulators to work on collaboratively with the private sector.

