COP27 and the flight path to Net Zero: progress made by the aviation industry since COP26

Following the conclusion of the 27th Conference of the Parties to the United Nations Framework Convention on Climate Change ("**COP27**") in Egypt last week, we examine the progress made by the aviation industry over the last year since the 26th Conference ("**COP26**"), with a particular focus on the United Kingdom.

COP26 – held in Glasgow in November 2021 – represented what could be seen as a crucial moment in the drive towards sustainability in the aviation industry. A number of commitments and initiatives were made by the industry following a dedicated Transport Day, with its agenda focussed on decarbonising transport.[1]

COP27 was billed as an opportunity to build on the outcomes of COP26 to take action and tackle the climate emergency. Sustainable transportation matters were not afforded a specific day this year but instead were discussed during both Solutions Day and Decarbonization Day. Little came out of these discussions to add to the number of UK-led COP26 aviation initiatives but one message was clear: there is a need for greater action. In the words of the UN Secretary-General, António Guterres, the world is "*on the highway to climate hell with our foot still on the accelerator*".

Achieving net zero by 2050

The long-term goal for the aviation industry that builds on the Paris Agreement is for international aviation to achieve net zero carbon emissions by 2050. Such sustainability objectives have been led by the International Civil Aviation Organization ("**ICAO**").

Participating at a round table of Heads of State, Prime Ministers and Chiefs of International Organisations during COP27, the President of the ICAO Council, Salvatore Sciacchitano, advocated for the realisation of ICAO's goal of reaching net zero emissions by 2050. He remarked that "*as aviation continues to explore and adopt the incredible new technological innovations arising today in aeronautics and renewable energy propulsion, ICAO also recognizes how imperative it is to start putting in place the right policies, legal frameworks and modernized infrastructure to enable this evolution to emissions-free flight*."

This followed ICAO's pledge in September at the 41st Session of the ICAO Assembly that it would support the "*aspirational*" net zero aviation goal by 2050. At the Assembly, ICAO set the baseline for airlines' carbon emissions under CORSIA – ICAO's global market-based mechanism to address carbon emissions from international aviation – as 85% of 2019 carbon emissions, with all emissions above that level needing to be offset.

[1] We examined the commitments made by the aviation industry surrounding COP26 in an article published in November 2021.

The International Aviation Climate Ambition Coalition ("**IACAC**"), the UK-led initiative launched at COP26, also met in Montreal in September and called for ambitious action to be taken by ICAO. During COP26, 23 nations signed the IACAC declaration setting out eight commitments with the objective of reducing aviation CO_2 emissions to meet global targets. One year on, the IACAC declaration has been given further teeth by the 36 nations that have subsequently signed up, including Germany which was one of the top ten countries contributing to passenger CO_2 emissions in 2019 according to a report published in October 2020 by the independent non-profit organisation International Council on Clean Transportation. Of the remaining top ten offenders, four have yet to sign the IACAC declaration; namely China, India, the United Arab Emirates and Australia. It remains to be seen what, if any, positive and legal actions will be taken by the IACAC declaration signatories at a national level.

On a European level, 44 Member States of the intergovernmental organisation, the European Civil Aviation Conference ("**ECAC**"), reaffirmed their commitments to reduce CO_2 emissions at a meeting in Sorrento in August. The Directors General of ECAC issued a statement at the meeting which:

i. urged ICAO to agree a suitably ambitious plan for international aviation and recognise the major role sustainable aviation fuels will have in delivering the reductions in CO_2 emissions needed to achieve their goal;
ii. committed to working with ICAO to contribute to capacity building activities and facilitate access to finance; and
iii. affirmed their support for the IACAC Declaration made at COP26.

Original Equipment Manufacturers ("OEMs") meet in panel discussion

In October, five OEM leaders met at the 2022 NBAA Business Aviation Convention and Exhibition in Florida to discuss the achievements, goals and challenges of achieving net zero by 2050. The panel – made up of Bombardier, Dassault, Embraer, Gulfstream and Textron eAviation executives – identified key areas of focus including education, communication and collaboration with regulators and other OEMs. All five panellists confirmed that their companies have already achieved energy-saving efficiencies by building this into their existing infrastructure, and integrating sustainable aviation fuel ("**SAF**") into developing engine products.

The panellists discussed the need for OEMs to balance their engineering capabilities with the demands of the market. Carlos Brana of Dassault suggested OEMs could, for example, do "*something which is very different, which is an airplane with a very long [wingspan] and then you could consume 30% less fuel but the speed would not be the same*". He observed that "*most probably the users would not accept that speed. We are dealing with a market and the market accepts, or does not accept*".

Other market leaders have been progressing their sustainability initiatives. In August, Boeing announced its plan to establish a research and development facility in Japan to further develop SAF and to advance electric and hydrogen aircraft technology.

Airports announce significant progress whilst governments introduce ground-breaking policies

The European airport industry has announced notable progress in its steps taken to achieve net zero CO_2 emissions by 2050. Airports Council International Europe ("**ACI Europe**") held their 32nd annual Assembly in Rome in June to reaffirm and expand its leading role in decarbonisation. At the Assembly, ACI Europe announced that 128 European airports run by 23 operators, which account for 23.8% of European air traffic, had gone one step further and were aiming to reach net zero CO_2 emissions by 2030 or earlier.

Furthermore, ten Swedish airports and the 20 airports run by Finavia have already achieved net zero, whilst Toulon, Athens and Lyon airports are set to reach net zero by 2026. ACI Europe also published further guidance for airports on their contribution to Net Zero European aviation, which includes practical solutions to reduce Scope 3 emissions (particularly aircraft emissions) in support of Destination 2050, the flagship sustainability initiative of Europe's aviation sector.

In July, the Dutch government made an historic announcement to limit the number of flights arriving at Schiphol – the third largest airport in Europe – in order to reduce emissions. The number of flights arriving at the airport will be capped to 440,000 flights a year from 2023, which is a reduction of 11% compared with pre-pandemic numbers in 2019.

The French government also took drastic measures in April by announcing a ban on short-haul flights where the journey could be made by train in under 2.5 hours, which could eradicate 12% of domestic flights in France. A similar call to reduce domestic flights was made in October by UK think tank The Intergenerational Foundation, following its report outlining the shortcomings of the aviation sector in hitting its environmental targets, but such a move is unlikely to garner the support of the UK government.

Commercial aircraft make use of SAF

SAF has been labelled as the only realistic solution for medium and long-haul flights, with aircraft being tested to run on 100% SAF. In October 2021, Rolls-Royce conducted its first test flight with its Trent 1000 engine that is aimed at running on 100% SAF by 2023. Shortly after, in November 2021, Airbus flew the first 100% SAF aircraft using its A319neo.

Meanwhile, in October 2021, easyJet demonstrated its first ever 30% blended SAF flight out of London Gatwick, and the airline aims to renew its fleet with 16 NEO aircraft as well as arranging long-term agreements with SAF suppliers. At the '*Cutting Aviation's Climate Change Impact*' conference held by the Royal Aeronautical Society in the same month, Jonathon Counsell, head of sustainability at International Airlines Group, said "*we are on the cusp of seeing SAF take-off*". He added that we could see some improvements in flights using SAF, "*10% by 2030 and at least 60% of flights by 2050*".

Moreover, to demonstrate to businesses how to implement the use of SAF in their corporate strategies, the Sustainable Markets Initiative ("**SMI**") launched a SAF pocket guide at COP27, with a toolkit on how to incorporate SAF and where to purchase SAF. The guide was highlighted at the COP27 SMI Aviation panel.

Progress conclusions and looking ahead

COP27 was somewhat of a damp squib when it came to aviation matters, with nothing of substance arising out of the conference, at least compared to the initiatives discussed at COP26. Of the proposals that arose out of COP26, further weight has been given to the IACAC declaration and its commitments following a considerable number of additional nations signing the declaration over the last year. Whether these commitments translate into legal obligations and actions that have a positive effect in reducing aviation CO_2 emissions to meet global targets remains to be seen. We consider this further in the context of the UK below.

One area of the aviation industry that has made considerable progress towards net zero is airports, although it could be said that this is the 'easy' part of the industry given that it is not faced with the unenviable task of revolutionising the jet engine.

UK initiatives and actions

Building on its commitments from COP26, including as a signatory and the initiator of the IACAC declaration, the UK has, over the last year, implemented several strategies aimed at reducing the country's aviation carbon footprint. These are explored in further detail below.

1. Jet Zero Strategy

In July, the UK government announced its aviation Jet Zero Strategy[2], to support its vision to be a global leader in the development, production and use of SAF, to enable the achievement of net zero flying, and to create thousands of green jobs, as well as meeting the concerns of passengers by enabling them to fly guilt-free in the future. Through a number of ambitious targets, the strategy lays down a timeline for reaching net zero in UK domestic aviation by 2040, with all UK airports reaching zero-emission levels in the same year. Launched at the Farnborough International Airshow 2022, the Jet Zero Strategy includes a plan for the aviation industry to not exceed the pre-pandemic levels of carbon emissions, through measures such as new technologies.

The then Secretary of State for Transport, Grant Shapps, stated that the whole economy would benefit from the development of new, cutting-edge industries and infrastructure, with 2019 being remembered as the peak year for aviation emissions. As a supporter of ICAO's long-term, ambitious goal for CO_2 emissions, the UK aims to set an example of tackling climate change throughout the aviation industry.

To achieve its objectives, the UK government will work through the newly established Jet Zero Council, a partnership between industry and government, to deliver new technologies to cut aviation emissions. The Council includes two Delivery Groups on SAF and zero emission flight ("**ZEF**"), created to provide advice on how the industry can work together to establish the UK as a leader in the race to net zero. Both groups will build on the network of the ATI's FlyZero Project and the Zero Emission Flight Infrastructure ("**ZEFI**") project.

By 2025, the UK is committed to having at least five SAF plants under construction, as well as a SAF mandate in place, targeting at least 10% SAF being blended in the UK jet fuel mix by 2030[3]. To be

[2] The UK government's Jet Zero strategy can be found at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1095952/jet-zero-strategy.pdf

[3] Based on the sustainable aviation fuels mandate, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1100050/sustainable-aviation-fuels-mandate-summary-of-consultation-responses-and-government-response.pdf

acceptable to aviation regulators, such fuel blends must meet strict physical and chemical criteria; however, once certified, these may be regarded as equivalent to conventional jet fuel. While the UK government recognises that this is an ambitious target given the nascent status of the SAF industry in the UK, the number of plants expected to be established globally is believed to be sufficient to supplement any shortcomings of domestic production.

Furthermore, since these consultations have been published, the UK government has provided further support to the SAF industry, through initiatives such as financing the Advanced Fuel Fund.[4]

2. FlyZero project

In 2021, the UK's Aerospace Technology Institute ("**ATI**"), funded by the Department for Business, Energy and Industrial Strategy, launched its FlyZero project, setting out a 'revolutionary' vision for the future of aviation. FlyZero aims to realize zero carbon emission commercial aviation by 2030. The project builds on the UK's leading initiatives, which have already seen small battery electric aircraft in use in the UK's general aviation sector.

As an independent research project employing experts from across the UK, FlyZero will assess the design challenges, manufacturing demands, operational requirements, and market opportunities to develop zero-carbon aircraft. The experts are comparing energy sources including batteries, hydrogen, and ammonia. In March, the researchers concluded that liquid hydrogen is the most viable energy source, and therefore, in order to implement the UK's Jet Zero strategy by 2050, the UK government needs to invest in both SAF and green liquid hydrogen technologies.

This ATI project has supported technology development of hydrogen aircraft such as GKN's H2Gear and ZeroAvia's HyFlyer. Moreover, with ATI's backing, Rolls Royce broke the world all-electric air speed record with their 'Spirit of Innovation' aircraft in late 2021, further demonstrating the UK's leadership in sustainable aviation.

3. Generation Aviation Group

To further facilitate the collaboration between the UK government and the aviation industry, the Generation Aviation Group was established to work with the UK's Department for Transport ("**DfT**") in order to consider both the short and long-term skills gaps and recruitment barriers that exist within the aviation workforce. The Group has several programmes in place, such as its Reach for the Sky program and the Aviation Skills Recruitment platform, intended to raise awareness of aviation roles and early career opportunities.

4. Sixth Carbon Budget

The UK's Sixth Carbon Budget, published on 20 April 2021, will run from 2033 to 2037 and will incorporate the UK's share of international aviation and shipping emissions reduction. Pursuant to the UK Climate Change Act 2008, the Climate Change Committee published its Sixth Carbon Budget report in December 2020, setting out the methods and policies, with supporting evidence, recommended to enable the UK to reduce its carbon footprint and reach its targets.

The recommended pathway requires a 78% reduction in the UK's territorial emissions between 1990 and 2035 and meets the stipulation of the "*highest possible ambition*" of the Paris Agreement. The four key steps recommended to meet the Sixth Carbon Budget are (1) take up of low-carbon solutions; (2) expansion of low-carbon energy supplies; (3) reducing demand for carbon-intensive activities; and (4) land and greenhouse gas removals.

This Carbon Budget, adopting the Committee's recommendations, is legally binding and a historic milestone on the path to net zero UK by 2050.

5. Flightpath to the Future

Building upon its 2018 Consultation Paper, the DfT outlined a ten-point plan to deliver the UK government's commitment to greater sustainability in the aviation sector. The ten-point plan draws on the lessons learned from the pandemic, which can be used to grow a resilient and connected sector and aims to put the sector on course to achieve Jet Zero by 2050.

To successfully deliver this plan, the DfT will also be launching the Aviation Council, jointly chaired by the Minister for Aviation and a sector representative. This will bring together representatives from across the aviation industry, to meet regularly to monitor the progress on the delivery of the ten-point plan.

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[4] These initiatives include: (i) the £165 million Advanced Fuel Fund to support the development of advanced fuels plants in the UK for financial years 2022-25; (ii) £12 million to support fuel testing, including funding to establish a SAF clearing house for financial years 2022-25 and up to £1 million to support the delivery of the first net zero transatlantic flight fuelled on 100% SAF; and (iii) the £400 million partnership with Breakthrough Energy Catalyst to drive investment into the next generation of clean energy technologies, including SAF.

The Aviation Council will also be able to establish smaller working groups, in order to consider specific issues in more detail.

6. The net zero ambitions of London City, Leeds Bradford and Luton airports

In addition to the UK government's efforts, individual airports in the UK are taking action to reduce the country's aviation carbon footprint. On 18 May, London City outlined its plan to become the first net zero airport in the UK, aiming to reach this goal by 2030. Its sustainability roadmap sets out the steps it will take between now and 2030 to achieve this goal. These include measures to phase out gas heating in its buildings, to ensure that all airport vehicles become electric, as well as to transform into a zero single-use plastics business. In addition, the airport plans that by 2030, 80% of all journeys to and from the airport will be made by sustainable transport modes.

Similarly, Leeds Bradford published its 'net zero by 2030' plan. Over the last six years, the airport has reduced its CO_2 emissions by 48% through taking steps such as installing LED lights in the terminals, retrofitting speed drives on escalators to reduce power usage and upgrading the airfield signage light boxes to LEDs.

Luton also committed to achieving carbon neutrality by 2026, and net zero by 2040 for its airport operations. As part of ACI Europe's Airport Carbon Accreditation scheme, the airport has already achieved Level 3 Accreditation. It also developed an energy policy, to improve energy efficiency, further reducing its carbon footprint.

Commentary on the UK's initiatives

The UK has developed a number of strategies, projects, groups and plans designed to assist it in its mission to achieve net zero for the UK's aviation industry. However, of these initiatives, only the Carbon Budget is legally binding. There is therefore little certainty at this stage – a criticism levied by many climate activists against governments and industries across the globe – as to whether any positive action can be achieved by the UK in order for it to live up to its ambitious self-styled title as a global leader in tackling climate change across the aviation industry.

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