Manchester City Council
Report for Information

Report to: Environment and Climate Change Scrutiny Committee – 9 December 2021

Subject: Aviation and Carbon Emissions

Report of: Manchester Climate Change Agency and Manchester Airports Group (MAG)

Summary

This report provides an overview of the relationship between aviation and the city's carbon emissions. It sets out how, as previously agreed, aviation-related emissions need to form part of a nationally agreed carbon budget for aviation, which should be compatible with the Paris Agreement, rather than being accounted for directly in the city's own discrete carbon budget. The report contains information on the work that Manchester Airport have been doing to reduce the ground-based carbon impact of their activities and the work that the wider Group is doing to ensure that the UK aviation sector achieves net zero emissions by 2050.

Recommendations

To note and comment on the content of the report.

Wards Affected: All

Environmental Impact Assessment - the impact of the issues addressed in this report on achieving the zero-carbon target for the city
This report considers the relationship between aviation and carbon emissions. Aviation contributes 2-3%to global carbon emissions and the emissions that arise from flying need to be considered as part of global and national carbon budgets as part of global efforts to keep global temperature rise to 1.5 degrees C of pre-industrial levels. The report sets out how it is proposed that aviation related emissions are accounted for and also reports on the work that Manchester Airport are doing to both reduce ground-based emissions and to contribute to the wider aim of reducing aviation-based emissions.

Manchester Strategy outcomes	Summary of how this report aligns to the OMS
A thriving and sustainable city: supporting a diverse and distinctive economy that creates jobs and opportunities	Manchester Airport is a significant economic asset and pre-pandemic employed 25,000 people on site. Aviation is however also a significant contributor to global carbon emissions and this report sets out how it is proposed to work with Government and other cities to ensure that the economic benefits of having a major international airport in the city can co-exist with efforts to reduce the environmental impacts of aviation.
A highly skilled city: world class and home grown talent sustaining the city's economic success	The Climate Change Framework includes the objective: 'To ensure that Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit from playing an active role in decarbonising and adapting the city to the changing climate.' This report highlights both the challenges and opportunities of achieving this with respect to aviation-related emissions.
A progressive and equitable city: making a positive contribution by unlocking the potential of our communities	The Framework includes the objective: 'To improve the health and wellbeing of everyone in Manchester through actions that also contribute to our objectives for CO_2 reduction and adaption and resilience, with particular focus on those most in need.'
A liveable and low carbon city: a destination of choice to live, visit, work	The Framework includes the objective: 'To improve the health and wellbeing of everyone in Manchester through actions that also contribute to our objectives for CO_2 reduction and adaption and resilience, with particular focus on those most in need.'
A connected city: world class infrastructure and connectivity to drive growth	The Report sets out a proposed approach, working with Government and other cities, to address the need to reduce carbon emissions from flying in a way which is consistent with the wider carbon budget approach consistent to limiting global temperature rise to 1.5 degrees centigrade.

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Background documents (available for public inspection):

The following documents disclose important facts on which the report is based and have been relied upon in preparing the report. Copies of the background documents are available up to 4 years after the date of the meeting. If you would like a copy please contact one of the contact officers above.

Manchester Climate Change Framework 2020-25
www.manchesterclimate.com/framework-2020-25

Manchester Climate Change Annual Report 2020
www.manchesterclimate.com/progress

1.0 Introduction and Background

1.1 Manchester Airport is a core part of the city's and Greater Manchester's economy. Prior to the pandemic it employed 25,000 people directly on site and 76,000 indirectly, generating £4.5 billion for the local economy. Pre-pandemic, Manchester Airport had links to 210 destinations—more than any other UK airport. It is an international gateway for trade and travel, acting as a major draw for investment and development in Greater Manchester and the wider North, giving the region a competitive advantage over many other UK regions. For example, over two years its direct route to China helped to grow export values in the north by 41%, bringing with it £250 million to the visitor economy. The airport operates in a highly competitive market to attract airlines and worked hard over many years to develop its route network.

1.2 The direct economic benefits of having a major international airport in the city are therefore considerable. The airport and aviation does however make a contribution to carbon emissions and, consistent with the city's ambition to be carbon neutral by 2038, it is important that ground emissions from the airport are considered in the overall strategy to limit overall carbon emissions. In the Climate Change Framework, which was developed by the Manchester Climate Change Agency and adopted by the City Council, on behalf of the city, emissions from flights from Manchester Airport are not included in the definition of net zero carbon for the city. This is because the analysis undertaken by the Tyndall Centre at Manchester University allocates aviation emissions to a UK-wide aviation carbon budget, rather than allocating emissions to specific local authority areas.

2.0 Aviation sub-objective

2.1 The Manchester Climate Change Framework includes a specific sub-objective for aviation which will be updated in the Framework refresh. MAG has worked with the Partnership to support its delivery and offer industry expertise.

2.2 The Manchester Climate Change Framework recognises the specific nature of aviation and the risk that regional policies which unilaterally impose costs in one region that are not shared nationally or internationally, can distort the aviation market and potentially displace flights and emissions without effecting any reduction in emissions. The Framework commits Manchester Climate Change Agency and MAG to work with Government to ensure that national aviation emissions are consistent with the temperature goals of the Paris Agreement. There has been significant progress in the last year, with the Government consulting on its Jet Zero Strategy and sustainable aviation fuel mandate. The Jet Zero Strategy sets out Government priorities for how the UK will achieve Net Zero including system efficiencies through airspace modernisation; advances in technology towards zero-emission flights; and investment in developing Sustainable Aviation Fuels.

2.3 In addition to transition to net zero, the Government is a leader in international policy. International aviation is regulated through the United Nations body, International Civil Aviation Organisation (ICAO). ICAO has already introduced

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) which caps net aviation emission at 2019 levels. In 2022, the ICAO General Assembly will meet and this will present an opportunity to adapt CORSIA to reduce emissions in line with the Paris Agreement.

2.4 The Framework also prioritises the information provided to passengers so that consumers can make informed choices about whether to fly and to influence their choice of airline. The Climate Change Partnership and MAG continue to work together in the development of the revised Climate Change Framework, which is due to be finalised in the New Year.

2.5 There is an opportunity for Manchester to take a lead in its work on creating a more sustainable aviation sector by building on the work already being undertaken here. Some of the pioneering work being undertaken by Manchester Airport is set out in more detail in the section below.

3.0 Manchester Airports Group – Introduction

3.1 Manchester Airports Group (MAG) owns and operates Manchester, London Stansted and East Midlands airports. Prior to the pandemic all three airports had experienced a sustained period of incremental growth so that by 2019 they handled just under 60 million passengers annually. Independent estimates suggest that this activity supported £8.2 billion in Gross Value Added to the national economy and that the airports and their supply chains supported 131,000 jobs. Operations at Manchester Airport directly supported 25,000 jobs on site, and this was estimated to contribute £1.4 billion in GVA to the regional economy.

3.2 Corporate Social Responsibility (CSR) has been a priority for MAG in both operating and developing its airports. With active programmes supporting education, skills and employment, MAG seek to ensure that the benefits of the airports' operations are shared with the communities within which the airports operate. MAG's CSR Strategy is available online[1].

3.3 COVID-19 and the resultant Government restrictions have had a devastating impact on the aviation sector. Passenger numbers were dramatically reduced so that in financial year 2020/21 passenger numbers fell to 6.3m, a reduction of 89% on 2019 levels. With the gradual relaxation of travel restrictions, operations are beginning to return to normal. Whilst the impact of the pandemic has been severe, MAG believes it is temporary, and do not anticipate any lasting impacts on the airports' long-term prospects for growth. Consistent with the Government's 'Making Best Use of Existing Runways' policy, MAG expect passenger numbers to recover and for policy to continue to support responsible and sustainable growth.

3.4 MAG is committed to playing a full part in the drive towards net zero emissions and it is important that the airports' operations and future growth takes place within acceptable environmental limits. This paper summarises the work

[1] www.magairports.com/responsible-business

undertaken by MAG to reduce the emissions that contribute to climate change and its work with partners to support the broader decarbonisation of aviation.

4.0 Carbon reporting

4.1 Internationally, aviation is estimated to account for 2-3%[2] of carbon emissions. Given the higher proportion of international travel passing through the UK, and the higher propensity to fly, aviation's estimated contribution to UK emissions is higher at 7%[3].

4.2 MAG has been calculating and reporting its carbon footprint for many years. The detail of the information published has changed over time consistent with evolving regulatory requirements and developments in best practice. MAG's full carbon account is published online[4].

5.0 Carbon neutral airports

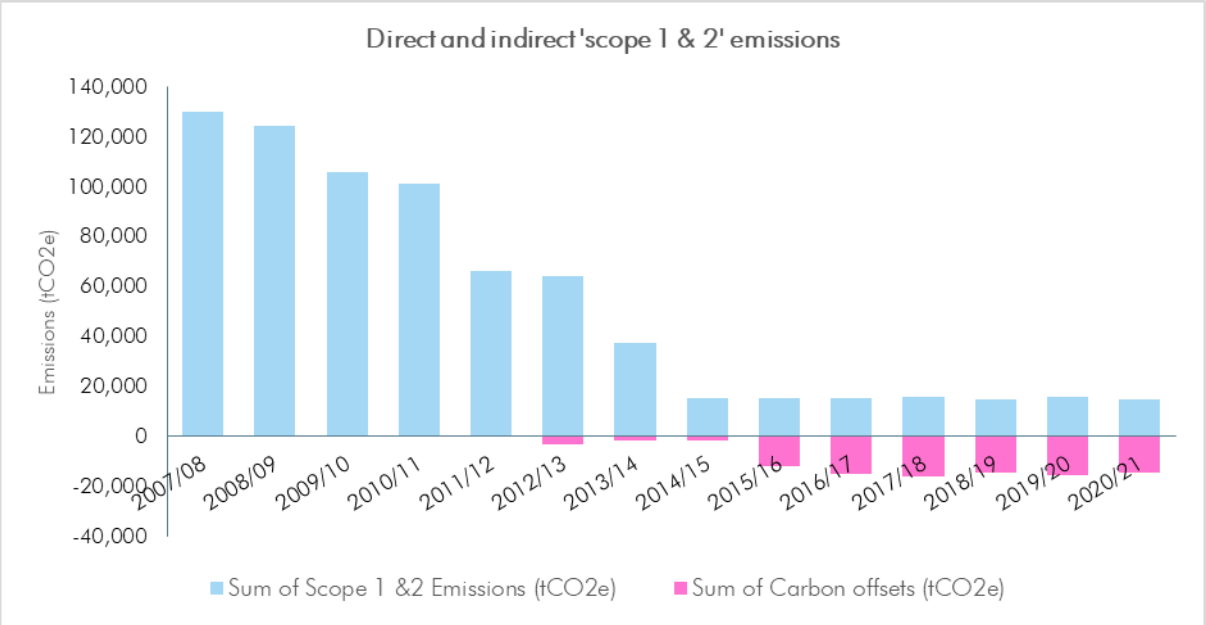
5.1 In 2006/7 MAG made the ground-breaking commitment to make its airport operations carbon neutral by 2015. Consistent with this target, Manchester Airport became the first in the UK to be certified as carbon neutral in 2015, with East Midlands and London Stansted certified shortly after.

5.2 Consistent with international accounting practice, the commitment to carbon neutrality includes all of MAG's direct emissions (Scopes 1 and 2). These emissions are either eliminated, or where they cannot yet be mitigated, are compensated for by purchasing high quality carbon off-sets (Figure 1).

5.3 Figure 1 below shows a graph of MAG's emissions. Over the course of the last decade, emissions have reduced by approximately 89%. This reduction has been achieved by a strong focus on energy efficiency, the generation of energy from renewable sources and the purchase of all remaining electricity from renewable sources.

[2] Source: Jet Zero Strategy (2021), Department for Transport
[3] Source: Sixth Carbon Budget (2020), Committee on Climate Change
[4] https://www.magairports.com/responsible-business/csr-reports/

Figure 1



5.4 By way of illustration, innovating and investing in energy efficiency, means that the electricity and gas consumed at Manchester Airport has reduced by 55% since 2007/08. During the same period passenger numbers at the airport increased by 28%, resulting in a reduction in energy use per passenger of 71%. The newly opened facilities in Terminal 2 at Manchester have embedded this learning and gone further, with the new facilities 15% more efficient than the previous generation of facilities.

5.5 Whilst the generation of energy at an airport can be challenging, due to safety and space constraints, on-site wind turbines, solar PV and ground source heat pumps have been installed in a series of developments across all three MAG airports. Recently, MAG announced the intention to install large-scale solar power generation at Stansted Airport.

5.6 MAG began to buy a proportion of electricity from renewable sources in 2004. The proportion of power sourced from renewable generation was progressively increased to 100% by 2011/12.

5.7 To date, some residual emissions have proven disproportionately difficult or expensive to mitigate. Most of these emissions arise from the operation of ground support vehicles, the use of gas to provide heating and hot water, and fugitive emissions from air conditioning plant. To compensate for these remaining issues, MAG buy independently verified Gold Standard carbon off-sets. The projects MAG has supported include the purchase of more efficient cook stoves, used by families in Africa. These stoves reduce fuel use and have the additional benefit of improving indoor air quality and generating local employment.

5.8 With advances in vehicle technology and the progressive replacement and enhancement of key assets, including the remaining gas fired boilers, MAG is

now in a position to reduce the remaining emissions from MAG airports. Over the next decade MAG will transition to a fleet of ultra-low emission vehicles and will also tackle remaining emissions from heating and cooling. This will take MAG as close as possible to zero emissions, with any remaining emissions compensated for by the purchase of permanent carbon removals. Consistent with the commitment made by Manchester City Council and across Greater Manchester, MAG has committed to achieving net zero emissions no later than 2038.

5.9 MAG's work in this area has been widely recognised as industry leading. In 2021 MAG was rated by the Financial Times as one of 300 climate leaders and the highest rated transport business in Europe.

6.0 Indirect (scope 3) emissions

6.1 In addition to emissions from the airports, MAG's reported carbon footprint highlights indirect emissions which are associated with its airport operations. The two most important emission sources are aircraft operations and surface access journeys made by passengers and staff accessing the airport. Given the scale of these emission sources, which are both much greater than airport emissions, MAG is closely engaged with their mitigation and working closely with others to ensure they too are consistent with the national objective to achieve net zero emissions.

6.2 Emissions from surface access

6.3 To minimise emissions from surface access journeys to and from its airports, MAG work closely with local partners. At Manchester Airport, this includes Transport for Greater Manchester (TfGM) and other providers of public transport services. Stakeholders meet regularly through the Airport's Transport Forum and, to accompany the recent investment in the Manchester Transformation Project, Manchester Airport have reviewed, updated and published the new Airport Travel Plan. The Airport Travel Plan commits the airport to reducing the proportion of staff travelling in single occupancy cars and encouraging active travel and public transport.

6.4 In recent years infrastructure supporting public transport at Manchester Airport has been substantially improved with the addition, in 2015, of another two platforms to the railway station. This has doubled rail capacity, providing connectivity across the North and North Wales. The resulting growth in recorded passenger entries and exits of 23% was the highest amongst the UK's large city centre stations and airport stations between 2018/19 and 2017/18, only London Bridge saw higher growth.

6.5 In 2016, Manchester Airport welcomed the Metrolink extension, after a £50m investment, and by 2019 passenger numbers had grown to 200,000. To make rail travel more affordable for staff, people working at the airport qualify for a 25% discount (subject to the purchase of a railcard at a cost of £20).

6.6 Despite the 2015 expansion and 2016 Metrolink extension, between the May 2018 timetable change and the onset of the COVID 19 pandemic, the rail system was completely unable to cope with the levels of passenger demand, let alone further growth. The root cause of these issues has been the failure to complete the Northern Hub programme of investment. This has exacerbated existing issues and resulted in major reductions in reliability. Manchester Airport in its position as a spur was particularly badly affected, with some of the worst levels of cancellations and delays across the North of England rail network, with significant impacts on passengers and staff.

6.7 MAG recognise the vital role that bus services provide, particularly to support staff travel. With the introduction of a levy on parking charges for 'drop off', Manchester Airport have been able to provide greater support to local bus services, including working with Stagecoach to extend existing services so that they better serve the airport campus. MAG also provide all new starters at the airport with four weeks' free travel and have launched a car share scheme, funded new cycle parking and cycle maps and, with the support of TfGM, trialled the use of demand response travel in target areas, including Wythenshawe.

6.8 MAG's CSR Strategy commits to extending a parking levy to other areas, so that greater financial support can be provided for public transport services. In recognition of the progress Manchester Airport has made, in 2020 TfGM awarded the Airport a Gold Award for staff travel.

7.0 Aircraft emissions

7.1 In 2013, all major companies in the UK aviation and aerospace sectors came together to work in coalition to address the sustainability challenges the industry face. The Sustainable Aviation coalition recognises that no single company or sector can deliver the radical change that will be necessary to make net zero aviation a reality.

7.2 Drawing on the best expertise from across the sector, Sustainable Aviation has set out a pathway by which UK aviation emissions can reach net zero by 2050. This thorough evidence base is included in the Sustainable Aviation Decarbonisation Road-Map[5].

7.3 The Road-Map has provided confidence to the industry that net zero aviation, whilst challenging to achieve, is a practical reality. In 2020 the CEOs of all major UK aviation and aerospace companies came together to pledge to achieve net zero emissions by 2050. This pledge was jointly signed by the Secretary of State for Transport. The work undertaken in the UK has catalysed international efforts to establish a similar long-term plan. Recently the International Air Transport Association (IATA), which represents the world's major airlines, joined the pledge to reach net zero by 2050.

[5] https://www.sustainableaviation.co.uk/wp-content/uploads/2020/02/SustainableAviation_CarbonReport_20200203.pdf

7.5 MAG has been at the heart of this work, chairing the Sustainable Aviation coalition throughout the development of the Decarbonisation Road-Map and bringing companies together to support the pledge.

7.6 Delivering the decarbonisation pathway set out by Sustainable Aviation requires a close partnership with Government, to provide the right long-term policy framework. In 2020, the Government formed the Jet Zero Council, chaired jointly by Secretaries of State for Business, Energy and Industrial Strategy and Transport. The Council brings together the most senior level of government with the industry's senior leaders. MAG's CEO is one of two airport representatives on the Council. MAG was fundamental to the establishment of Jet Zero Council, which was later backed by industry.

7.7 The Road-Map requires the modernisation of airspace arrangements. Better utilising the technology that is already onboard aircraft can significantly improve efficiency and reduce emissions. Importantly these emission savings can be realised in the short term. At MAG's airports the process of modernising airspace arrangements has already begun, and initial engagement is underway with stakeholders on the design for new flight paths.

7.8 The manufacture of kerosene from sustainable sources is critical to the delivery of the Road-Map. It is assumed that the first commercial scale production facilities in the UK will be completed by the middle of the decade and that by 2050, more than 30% of fuel used will be sustainable aviation fuel (SAF). MAG recently announced an agreement with Fulcrum Bio-Energy, who are developing a SAF production facility at Stanlow, which would be directly connected by an existing pipeline to Manchester Airport. This facility aims to begin production by 2026 and to reach a production level of approximately 100 million litres of sustainable fuel per annum.

7.9 New aircraft entering service at MAG's airports are delivering significant fuel savings, they are in the region of 14-20% more efficient than the aircraft they replace. The Road-Map assumes that new aircraft types will continue to incrementally improve fuel efficiency and that by the mid-2030s the first new, radically changed, aircraft will begin to enter service. These aircraft which are in development now, are likely to have electric or hydrogen propulsion systems. To signal support, in 2020 MAG announced a competition to provide five years' free landing charges, worth over £1 million, to the first airline that is able to bring a zero-emission aircraft to one of the three airports.

7.10 The Road-Map is realistic that the rate at which aviation decarbonisation will progress will mean that aviation is unlikely to reach zero emissions by 2050, and therefore, in order to reach net zero-emissions it is likely that the industry will need to pay for permanent carbon removals. The favoured route is to build on international agreements to ensure that the whole of the global aviation industry develops a market-based mechanism that allows it to pay for permanent carbon removals to compensate for any residual emissions. Pricing carbon in this way will stimulate innovation and, by setting legally binding emission limits, will ensure the environment is safeguarded.