GLASGOW AIRPORT
PROUD TO SERVE SCOTLAND

Climate Change Adaptation Progress Report for Glasgow Airport

Contents

1 Amendments, Distribution, Replacements & Endorsement

1.2 Amendments

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1.2 Distribution

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2. Background

Under the Climate Change Act 2008, section 63(5) the Secretary of State may direct certain Reporting Authorities to produce reports on the current and future predicted effects of climate change on their organisation and on their proposals for adapting to climate change.

The first round of reporting in 2011 focused upon major public infrastructure providers from the energy, transport and water sectors. For the second round of the reporting cycle DEFRA has adopted a voluntary approach and Glasgow Airport Limited (GLAL) has agreed to produce a report detailing progress made since production of its original report in 2011. This document has been prepared in accordance with the guidelines set out in the document 'Climate Change Adaptation Reporting Power: How to report your progress in planning for climate change: December 2013 (Published by DEFRA).

2.1 Structure of this Report

The section headings used in this report broadly follow those set out in the guidance document outlined above; where sections have been omitted or modified this is because they have been deemed not applicable.

2.2 Glasgow Airport Limited

Glasgow Airport Limited (GLAL) is owned by AGS Airports Limited. AGS Airports is a partnership between Ferrovial and Macquarie Infrastructure and Real Assets (MIRA) established in 2014 to invest in Aberdeen, Glasgow and Southampton airports. With 30 airlines serving more than 120 destinations worldwide, including Canada, the US, the Caribbean, Europe and the Gulf, Glasgow Airport is Scotland's principal long-haul airport.

In addition to being Scotland's largest charter hub, GLAL serves more Scottish destinations than any other airport and is a key component of Scotland's transport infrastructure. The airport supports over 7,300 jobs across Scotland and makes the largest contribution of any airport to Scotland's economy, generating hundreds of millions of pounds.

In 2015, more than 8.7 million people travelled through GLAL representing an annual increase of 13% - the largest ever increase in the airport's annual passenger numbers. In 2015 Glasgow Airport secured three major industry accolades – UK Airport of the Year, Scottish Airport of the Year and the Best Airport in the UK with 3 - 10 million passengers. It was also confirmed as one of the fastest growing airports in its category by industry trade body ACI Europe.

3. Understanding Climate Risk

3.1 Changes to the Understanding of Climate Risks, Impacts and their Effects on Glasgow Airport and its Stakeholders

In the original Climate Change Adaptation Report (CCAR) published in 2011, a total of 30 risks across the airport's activities were identified for short (to 2020) and medium/long-term (20202 – 2050) timeframes. Risks in the short term were, and continue to be, almost exclusively low (green).

In the medium to longer term as climate change is predicted to accelerate, and assuming no changes to existing airport controls, risk levels are shown generally to rise in significance.

For GLAL the most significant climate change risks arise from projected longer term changes to temperature and precipitation extremes. The biggest uncertainties surround future prevailing wind conditions. This is significant since Glasgow has one runway and master planning for a second runway shows the addition of a parallel and not cross-wind runway.

The long term nature of climate change and the fact that no new UKCIP climate projections are currently available means that underlying climate assumptions remain unaltered and the medium/long-term climate change risk ratings identified initially have not changed.

The recently published Technical Guidance Note 'Is UKCP09 still an appropriate tool for adaptation planning?' (April 2016) confirmed that UKCP09 "continues to provide a valid assessment of future UK climate over land." Glasgow Airport is aware that a new project (UKCP 18) has been initiated to update the UK's climate projections and will take the findings of this study into account in future updates of its current climate change risk assessment when it is published. Until that time we have, and will continue to use, UKCP09 as our principal adaptation planning tool.

3.2 Climate Change Evidence and Research used to improve Understanding of the Implications for Organisational Functions

As detailed above, GLAL continues to use UKCP09 as its main adaptation planning tool. At a more local level we continue to use Flood Maps produced by the Scottish Environment Protection Agency (SEPA) (www.sepa.org.uk/environment/water/flooding/flood-maps) to understand flood-related risks.

As an active member of the West of Scotland Regional Resilience Partnership and in our capacity as a Category 2 responder we are also able to benefit from knowledge sharing with local authorities and other agencies represented on the group; the Airport's Head of Assurance is also the current Chair of the Transport Functional Group.

3.3 Understanding Organisational Vulnerability

Organisational vulnerability related to potential climate change impacts is continually tracked via the risk register.

As detailed in section 3.1 above, the medium/longer-term risk profile established in our original CCAR has not changed.

The dynamic process utilised by GLAL for reviewing and updating organisational risks has certainly seen some changes to short-term climate-related risks, notably those associated with flooding. Specifically, the potential for loss of critical infrastructure due to flooding of the airfield or other critical areas is a standing entry on the main Glasgow Airport Risk Register and is continually tracked.

3.4 Development of Quantified Assessment and Analysis of Risk Likelihood and Impacts

GLAL continues to risk ratings based on consequence and likelihood scores as used in the production of the original CCAR.

4. Understanding Uncertainties

4.1 Uncertainties in Monitoring and Evaluating Climate Change Risks to Glasgow Airport's Functions

The key uncertainties identified in the original plan remain unchanged following this review; these relate to the modelling of future climate change, future long-term development of assets at Glasgow, indirect risks from 3rd parties, as well as critical threshold levels for specific assets.

GLAL, like all businesses, acts within financial constraints. The airport has to balance the need to invest in climate change mitigation measures with other business investment priorities. Currently there is enough uncertainty surrounding longer-term climate impacts generated via UKCP09 to make the production of a sound business case for capital investment in infrastructure/technology designed specifically to address negative climate impacts difficult to achieve.

The Airport's Master Plan (2011) predicted passenger numbers of 10.4 million by 2020 and 16.39 million by 2040; the current growth trajectory suggests that these forecasts are achievable and potentially could be exceeded. The Plan indicates that it is difficult to pinpoint specific developments associated with growth post 2020, but that it is envisaged that substantial alterations will be required to the terminal building and additional airport stands will be required. Up to 2040 only a limited amount of additional land outwith the current boundary is forecast to be needed and there is no forecast requirement for land which hasn't already been identified in the Renfrewshire Local Plan in terms of land use.

One of the biggest challenges facing the airport is understanding how longer term climate change impacts together with local infrastructure developments outwith the airport boundary may impact on the longer term flood risk for airport land.

4.2 Implications of Uncertainties on Actions for Glasgow Airport

Whilst the UKCP09 model continues to be the main tool for evaluating climate change impacts it has limitations with respect to its application to the aviation sector. Specifically, there is very limited detail relating to the prediction of extreme weather events and in particular, the potential for increased wind events and directional variation. Runway movements are highly influenced by wind speed and direction and consequently a sound understanding of impacts in this area is vitally important to long term planning.

As part of its ongoing risk review of potential climate change impacts GLAL will consider in greater detail the above limitation and attempt to identify if any other information is available to support its longer term evaluation in this area.

5. Details of Actions: implemented and new

5.1 Original Actions

The risk matrix generated as part of the original CCAR identified four areas where actions were deemed necessary in the short term. Progress against these is summarised in the table below:

Action	Progress	Additional Comments
Ensure appropriate design standards are applied to new buildings to address risks from water ingress/flooding.	No new construction in areas identified as 'at risk' from Flood Risk Assessment; all building construction has been compliant with building standards with respect to design requirements.	Internal guidance currently under preparation with respect to sustainability criteria related to construction and asset replacement. Where new construction is planned for areas identified as being at risk from flooding this would be addressed as part of the Capital approvals process.
Investigate and address risks of groundwater flooding to existing critical assets	Assessment carried out and linked to flood risk assessment. One potentially vulnerable asset was identified (05B Electrical Centre) where some flooding occurred in 2013; new field drainage was put in place in the area and new pumps were installed in the existing sump area: no further flooding issues have been observed. In addition a project was undertaken to improve surface drainage in grassed areas of the airfield; this involved removal of thatch build-up and has been effective in reducing localised ponding.	As a further mitigation measure consideration will be given to raising the level of the switchgear in this area as part of the next upgrade of this asset.
Sensitivity test airport drainage infrastructure to ensure as robust as practicable to future climate extremes. Investigate and address risks of flooding to existing critical assets.	Camera survey carried out of the full landside drainage network serving interceptor/outfall system. Substantial silt accumulation which was reducing drainage capacity and creating problems with water back-up and localised flooding at some drains on Sanderling Road was identified. Drains cleaned as a result. In addition to this action, site interceptors continue to be cleaned on a regular basis as part of the PPM programme and in line with a regulatory requirement as part of the airport's CAR Licence (governing discharge into the local watercourse).	As part of the capital approvals process the airport's Sustainability Assurance Manager is listed as a mandatory internal consultee. This process ensures that activities that may have potentially adverse environmental impacts are identified at an early stage and appropriate mitigation measures factored into the design process and/or addressed via the introduction of new operating procedures. Any new development works which may result in an increase in hardstanding must also take into account CAR Licence conditions which specify maximum areas serving surface water outfalls.

Review winter operations plans taking into account learnings from 2009/10 winters and ensure contingencies consider future climate change.	Historically, winter operations were resourced via external contractors. In winter 2014 this was brought in-house. This decision has enabled a faster and better coordinated response to poor weather events in addition to upskilling internal staff members and helping to raise awareness of the issues associated with winter weather.	

5.2 New Proposed Actions

Since production of the last report the following areas have been identified as important with respect to ensuring that the airport is positioned to deal with predicted climate change impacts.

Energy Security

In light of the recent announcement by the Scottish Government that its 42% CO_2 reduction target for 2020 has been met early it is expected that there will be a revision to future interim targets to ensure that the correct trajectory is maintained towards the second major target of an 80% reduction in CO_2 (from 1990 levels) by 2050. Should this revision be confirmed it is expected that measures may be introduced which will either mandate low carbon energy use by the private sector, or alternatively, the existing tax framework relating to energy consumption will become increasingly weighted against non-renewable forms of energy. As a consequence of this the airport will look at reducing reliance on grid electricity and gas by sourcing a percentage of its energy from renewable sources; the precise figures are yet to be determined and will be informed by feasibility studies already carried out into the viability of solar PV as well as additional independent studies being carried out at the time of writing. These studies are being overseen by the Sustainability Assurance Manager and the findings will be communicated to the airport's Sustainability Board which meets every 2 months.

Infrastructure Capability (Asset Management)

The airport's asset management objectives include 'reducing the energy consumption of non-property related assets by monitoring and improved planned maintenance'. Underpinning this objective are a number of Asset Management Plans relating to HVAC, LTHW Systems, Chiller performance and the BMS which are designed to improve the resilience of the airport's current building stock in terms of heating and cooling capacity. Performance against the established objectives is reported at the monthly Asset Assurance Group meeting.

Infrastructure Capability (Procurement)

A Sustainable and Ethical Procurement Policy has recently been produced for the AGS Airport Group. This policy identifies 5 focus areas where detailed procurement guidelines and standards will be produced to help minimise the environmental impact associated with purchased goods and services. One of the focus areas identified was 'Construction and Asset Replacement' and climate resilience factors will be taken into account when developing the guidelines and standards in this area.

6. Addressing Barriers and Understanding Interdependencies

6.1 Impact of identified Interdependencies on Climate Risk Actions

The original CCAR highlighted a key interdependency around its relationship with tenants and the issues identified then remain valid. Specifically, in its role as a landlord, GLAL is limited in how directly it can shape adaptation measures implemented by other organisations. Not all adaptation decisions will be taken in-house by GLAL and the airport operator will be affected by the degree to which other bodies at the airport choose to adapt to climate change. In addition, GLAL relies on external, offsite third party organisations for some of its essential services such as fuel, staff transport, power and potable water. Should climate change negatively impact these services then the adaptive capacity at Glasgow could be impaired.

GLAL maintains excellent relationships with a host of key stakeholders associated with the airport. In particular, we acknowledge the importance of engagement with the Local Authority to understand potential impacts of local planning decisions on airport operations.

6.2 Main Barriers to Implementing Possible Climate Change Adaptation Improvement Measures

There are a number of potential barriers which require to be addressed in delivering certain climate change adaptation improvement measures; these can be summarised as follows:

- **Environmental Fiscal Taxes**: the complex and often unconnected nature of the environmental tax framework within the UK creates an uncertain background for medium to long-term planning with respect to investment in renewable technologies. The recently completed HM Treasury review led to an announcement in the March 2016 Budget Statement of an intention to abolish the current CRC scheme: this provided a degree of longer term clarity regarding the future tax regime; however, the lack of clarity with respect to the long-term funding/support for renewable technologies remains a potential barrier to the implementation of potential climate change adaptation solutions;

- **Financial investment:** securing internal investment for measures to mitigate potential long-term climate change impacts, like any other investment, requires the presentation of a robust business case; one of the key (although not sole) determinants will relate to the projected IRR. Uncertainty surrounding the potential fiscal returns associated with ‘green investments’ (see point above) is a barrier to potential investment; furthermore, at this stage, the lack of certainty regarding some potential long-term adverse climate impacts being realised provides a weak basis for making investment decisions; and

- **Regulatory constraints**: the aviation sector is subject to close scrutiny with respect to its environmental impacts and specifically its contribution to climate change; the evolution of new/tighter financial controls may potentially restrict the Airport’s ability to invest in additional measures/infrastructure that are not integral to meeting compliance requirements;

7. Monitoring and Evaluating

GLAL operates an integrated management system, the Managing Responsibly System (MRS), and currently holds certification to ISO 14001:2004 (environmental management), ISO 22301:2012 (business continuity), ISO 55001:2014 (asset management) and OHSAS 18001 (health and safety). The MRS is a mature system which has been effective in driving continual improvement across the business for over 10 years; evidenced by the fact that in 2015 there were no non-conformities raised by any of the third party surveillance audits which were carried out.

A key element of the MRS is the risk register which tracks departmental risks and provides an overall view of the most significant business risks. Impacts arising from climate-related events such as flooding, high wind and high/extended periods of snowfall are continually tracked on the system. In addition to ongoing monitoring of risks, specific actions arising from internal or external audits or those generated from internal committees are tracked via the organisation's Corrective Action Required Tracker (CART). The CART is a highly effective tool for ensuring that key actions underpinning each of the areas covered by the MRS are tracked and closed out within an agreed timescale; actions are tracked on a weekly basis by Senior Management.

7.1 Effectiveness of Embedding Consideration of Climate Change Risks within Organisation

The process for embedding measures to deal with identified climate change risks and/or audit-related issues has been outlined above. In addition to these measures Glasgow has comprehensive contingency plans in place which are regularly reviewed and tested and an integral element of GLAL's risk management function. This suite of contingency plans cover a wide range of meteorological events and other natural 'disasters' including snowfall, flooding, high winds, fog, offsite problems at destination airports (for example the Boxing Day Tsunami in 2004), disruption to surface access (including contingencies for the closure of M8 motorway) and extended flight bans such as that resulting from the Eyjafjallajökull volcano.