

Appendix 7-1 Greenhouse Gas and Climate Change Resilience Strategy

Future LuToN: Making best use of our runway

Preliminary Environmental Information Report
Volume 3: Appendices
Appendix 7-1 Greenhouse Gas and Climate Change
Resilience Strategy

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1 INTRODUCTION

1.1 Overview

1.1.1 London Luton Airport Limited (LLAL) is proposing to expand London Luton Airport (LTN) by submitting a Development Consent Order (DCO) application for works that will allow LTN to grow to accommodate 32 million passengers per annum (mppa). A current planning permission for works at LTN, called Project Curium (LBC ref: 12/01400/FUL), limits passenger throughput to 18mppa.

1.1.2 This report provides a commentary on the greenhouse gas (GHG) and climate change impacts expected to occur as a result the Proposed Development for which the DCO is being sought, and sets out the measures identified to manage these impacts. It forms part of the Preliminary Environmental Information required under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and forms part of the suite of Statutory Consultation material. The project design will continue to evolve to reflect the outcomes of the consultation, and the process of information gathering as the assessment progresses until the DCO submission. The information within this document is therefore preliminary and may be subject to change as assessment work continues.

1.1.3 This document will be the basis for the Greenhouse Gas and Climate Change Resilience Management Plan which will be submitted alongside the Environmental Statement (ES).

Climate change is widely regarded as one of the greatest global threats currently facing the planet and our societies, and actions taken over the next few decades will be pivotal in limiting the impacts.

The challenge we face is to reduce our GHG emissions (known as climate change mitigation) and design infrastructure that will withstand the impacts of climate change expected to potentially arise (known as climate change adaptation/resilience).

1.2 Structure

1.2.1 The document is laid out as follows:

- Section 2 – Relevant climate change legislation and policy
- Section 3 – LLAL's approach and progress to date
- Section 4 – Impacts expected as a result of the Proposed Development

- Section 5 – Measures to manage GHG emissions and increase the resilience of the Proposed Development
- Section 6 – Next steps

2 RELEVANT CLIMATE CHANGE LEGISLATION AND POLICY

2.1 International

2.1.1 This section outlines the international climate change legislation and policy relevant to the Proposed Development, highlighting the importance of minimising GHG emissions and planning for the impacts that climate change will have on our infrastructure and society.

Paris Agreement

2.1.2 The Paris Climate Agreement¹ is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) which sets out a global action plan to avoid dangerous climate change by limiting global warming to well below 2°C below pre-industrial levels and pursuing efforts to limit it to 1.5°C.

Since the Paris Agreement, the Intergovernmental Panel on Climate Change (IPCC) has published a report outlining the importance of limiting warming to 1.5 °C rather than 2 °C and states that global GHG emissions need to decline by 45% from 2010 levels by 2030 to achieve this.

2.1.3 The agreement was negotiated by representatives of 195 countries at the 21st Conference of the Parties (COP) of the UNFCCC in Paris and adopted by consensus on 12 December 2015.

2.1.4 The agreement came into effect on 4 November 2016, which is when the proportion of emissions covered by countries having ratified the treaty exceeded 55% of global greenhouse emissions. As of June 2019, 185 out of 197 Parties to the Convention have ratified the agreement.

EU Emissions Trading System (ETS)

2.1.5 The EU ETS is a system whereby a cap is set on the total amount of certain GHG emissions that can be emitted by companies covered by the system. Over time, this cap is reduced so that emissions reductions are achieved. Participation in the EU ETS is mandatory for companies in certain energy intensive industries, including aviation.

2.1.6 Within their cap, companies can trade emissions allowances with one another as required, or buy a limited number of these from emissions-saving projects around the world. Each year, a company must surrender enough allowances to cover their

¹ UNFCCC (2015) Paris Agreement

emissions or face heavy fines. Trading in this way allows flexibility, so that emissions reductions are made where it costs least to do so.

- 2.1.7 Progress to date shows a decrease in emissions as intended, with a decrease of just over 8% between 2013 and 2016. It is expected that by 2020, emissions from sectors covered by the system will be 21% lower than in 2005, while by 2030 they will be 43% lower.

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

- 2.1.8 In 2016, the International Civil Aviation Organization (ICAO) adopted CORSIA to address rising carbon emissions from civil aviation, with the aim of limiting net carbon emissions from international aviation to 2020 levels.
- 2.1.9 Emissions offsetting is where a company or individual finances a reduction in emissions elsewhere in order to compensate for an equal amount of their own emissions.
- 2.1.10 Offsetting of emissions in this way is not intended to replace efforts to directly reduce emissions through adoption of new technologies, implementation of fuel efficiency measures and improvements to operations and infrastructure. However, CORSIA can help members of the sector achieve their emissions targets in the short- to medium-term while direct emissions reduction measures are developed and implemented.

World Bank Group's Action Plan on Climate Change Adaptation and Resilience

- 2.1.11 Current and projected global atmospheric GHG concentrations mean that the world is already locked into one degree Celsius of temperature increase and the associated impacts of this change. This means it is important that climate resilience is addressed in any long-term critical infrastructure assets and operations like LTN.
- 2.1.12 The World Bank Group's Action Plan on Climate Change Adaptation and Resilience² highlights the numerous global impacts faced as a result of climate change, and the importance of building resilience into projects as early as possible in the design process. It states that proactively building resilience into infrastructure is more cost-effective than reactively addressing impacts, such as damage to assets, as they occur.

² World Bank (2019) The World Bank Group Action Plan on Climate Change Adaptation and Resilience

2.2 United Kingdom

2.2.1 In addition to international legislation and policy, the UK has its own specific legislation, policy, targets and guidance on climate change. These are outlined below.

The Climate Change Act 2008/ Climate Change Act (2050 Target Amendment) Order 2019

2.2.2 The Climate Change Act 2008 set a legally binding target for the UK Government to reduce national GHG emissions from 1990 levels by at least 80% by 2050; supported by a series of five-year carbon budgets monitored by the Committee on Climate Change (the CCC), an independent, statutory body established under the Act.

2.2.3 In June 2019 Government laid before Parliament The Climate Change Act 2008 (2050 Target Amendment) Order 2019³, an amendment to the Climate Change Act 2008 to revise the current 2050 GHG target of an 80% reduction of GHG emissions compared to 1990 levels to a net zero carbon target.

2.2.4 In their latest report to parliament, the Committee on Climate Change stated that achieving net-zero emissions by 2050 will require a steeper reduction in emissions over the next three decades with more ambitious carbon budgets. The report acknowledged that the aviation sector will have a crucial role to play in reaching net zero emissions and stated that there is a need for international engagement to establish global emissions reduction frameworks through the International Civil Aviation Organization. Until this has been done, an allowance for carbon emissions from the aviation sector will be included in the UK's carbon budgets.

2.2.5 The Climate Change Act 2008 also requires infrastructure operators and public bodies to report on how they are addressing the impacts of climate change on their organisation under the Adaptation Reporting Power.

Aviation 2050

2.2.6 The UK aviation strategy, Aviation 2050, highlights the key role aviation must play if the UK is to achieve its carbon budgets and 2050 goal, estimating that aviation could account for 25% of total UK emissions by 2050. Aviation 2050 states that "The government will expect a strengthening of existing good practice and the development and adoption of new technologies and

³ UK Government, 2019 No 1056. The Climate Change Act 2008 (2050 Target Amendment) Order 2019

measures from industry to show demonstrable progress to reducing emissions.”

Road to Zero

- 2.2.7 In 2018, the UK Government announced its ‘Road to Zero’ strategy which sets out targets for at least 50% — and as many as 70% — of new car sales to be ultra-low emission by 2030, alongside up to 40% of new vans.
- 2.2.8 The Government has committed to taking steps to facilitate a massive roll-out of infrastructure to support the uptake of ultra-low emission vehicles (ULEVs), promising to invest £1.5 billion by 2020.
- 2.2.9 The government is also taking powers through the Automated and Electric Vehicles Bill to ensure charge points are easily accessed and used across the UK, available at motorway service areas and large fuel retailers.
- 2.2.10 This planned uptake of ULEVs will result in a reduction in emissions associated with surface access journeys at LTN.

Airports National Policy Statement (ANPS)

- 2.2.11 The inevitability of some degree of climate change and the importance of building climate change resilience into the design of new airport developments is addressed within the ANPS. The ANPS states that applicants for new airports infrastructure must consider the impacts of climate change at all lifecycle stages of the project, and that appropriate mitigation or adaptation measures should be identified through the Environmental Impact Assessment (EIA) process.

3 APPROACH AND PROGRESS TO DATE

3.1 Greenhouse Gases

- 3.1.1 LLAL, as the owner of LTN, is committed to continually improving the environmental performance of the airport, including reducing GHG emissions associated with airport operations. This section outlines the key areas of focus for LLAL, and the progress made to date.
- 3.1.2 Most GHG emissions in the aviation sector come from air traffic which LLAL does not have direct control over. London Luton Airport Operations Ltd (LLAOL) have direct control over the operation of the airport under a concession agreement with LLAL. Therefore, reducing GHG emissions associated with operating the airport is under the direct control of LLAOL.
- 3.1.3 LLAL recognise their roll in influencing how the airport operates, the design and operation of the Proposed Development, and how people travel to and from the airport and play a part in the road to a lower GHG impact from air travel.
- 3.1.4 To influence the future impact of LTN on the climate LLAL has developed a Sustainability Strategy which includes an action plan on how sustainability impacts including GHG emissions will be managed and reduced. The Strategy provides targets and commitments on reducing emissions from key emissions sources including a shift to the use of more sustainable transport for surface access journeys made by passengers and staff, a reduction in waste generated and water consumed, and targets for the installation and provision of low-carbon energy.

Energy use

- 3.1.5 In 2015, LLAOL became accredited with the Energy Management Standard ISO 50001⁴, and this accreditation has since been retained.
- 3.1.6 Energy saving initiatives such as the introduction of LED lighting and passive infrared sensor (PIR) motion sensors led to a reduction in the emissions associated with electricity use by 342 tCO₂ in the 2014-15 CRC Energy Efficiency Scheme⁵ reporting year, despite continued passenger growth. Since 2015, a further 1,500 lights have been upgraded to LEDs.

⁴ <https://www.iso.org/iso-50001-energy-management.html>

⁵ Formerly known as the 'Carbon Reduction Commitment'

Surface access journeys

- 3.1.7 As the fifth busiest airport in the UK, the mode of transportation within which people choose to travel to, from and around LTN can make a substantial difference to its overall GHG emissions.
- 3.1.8 Recognising this, LLAOL published its first Airport Surface Access Strategy (ASAS) in July 2000, with the most recent strategy covering the period 2018-2022.
- 3.1.9 As stated within the latest ASAS, more sustainable travel options are encouraged in the following ways:
- LTN has a great rail connection, with frequent services and direct access to London;
 - There are also bus and coach links to cities across the Midlands, East of England and South of England;
 - Walking and cycling is encouraged within the terminal area, with dropped kerbs, tactile paving, adequate lighting and zebra crossings at busier locations; and
 - LLAOL operates an airport-wide car share scheme which is open to all employees to reduce the number of single occupancy vehicle journeys.
- 3.1.10 In addition to the above, LLAL was granted planning permission in 2017 for construction of a Direct Air to Rail Transit (DART) system. The Luton DART, which is currently under construction and is scheduled to open in 2021, will increase the accessibility of the airport by reducing journey times, further encouraging the uptake of more sustainable travel options.

Air traffic movements

- 3.1.11 LLAOL has been working closely with airlines and air traffic control to optimise fuel use and reduce emissions from air traffic movements. A new departure route that was introduced in 2015 is estimated to reduce emissions by 885 tCO₂ annually.

Waste

- 3.1.12 LLAOL recognises the importance of reducing waste by maximising recycling, setting continuously tougher recycling targets.
- 3.1.13 All business partners, particularly cleaning and waste operators, are also encouraged to help reduce waste generation associated with LTN.

3.2 Climate Change Resilience

3.2.1 LLAOL published its first Climate Change Adaptation Report in May 2011⁶ in response to the Climate Change Act 2008 Adaptation Reporting Power. The report identified a range of climate change risks and opportunities for the airport. Key risks included:

- Increase in flight disruption as a result of increasing frequency of extreme weather events, such as storms;
- Disruption to airport and connecting surface access routes due to flooding;
- Damage to essential airfield and road surfaces as a result of increased summer temperatures; and
- Increased cooling demand due to increased summer temperatures.

3.2.2 From this, a number of actions were identified to manage risks and it noted that consideration was to be given to integrating potential risks and adaptive measures into the airport's policies and proposals.

⁶ London Luton Airport Limited (2011) Climate Change Adaptation Report

4 IMPACTS EXPECTED AS A RESULT OF THE PROPOSED DEVELOPMENT

4.1.1 This section outlines the main impacts expected as a result of the Proposed Development in terms of increasing GHG emissions, as well as the impacts of future climate change on the Proposed Development.

4.2 Greenhouse Gases

4.2.1 Construction and operation of the Proposed Development will result in an increase in GHG emissions compared to the current level.

4.2.2 In order to identify measures to most effectively reduce these additional emissions, it is important to be able to identify the main emissions sources. A preliminary GHG assessment was conducted for the Proposed Development as part of the Preliminary Environmental Information Report (PEIR), which describes the main emissions sources. These are outlined in Table 4-1 and Table 4-2 respectively for construction and operation.

Table 4-1: Construction phase GHG emissions sources

PAS 2080 lifecycle stage ⁷	Activity	Emissions sources
Preconstruction stage	Fuel consumption during enabling works	GHG emissions from the fuel consumed during the enabling works to prepare the site for construction.
	Land use change	Loss of carbon sink i.e. the replacement of an area of land capable of absorbing GHG emissions with one less able to do so.
Product stage	Use of products/ materials required to build the scheme	Embodied GHG emissions within the construction materials i.e. emissions resulting from the extraction of raw materials, the manufacturing/ processing of materials into secondary/ final products for use, and the transportation of those materials.
Construction process stage	Water, energy and fuel consumption during construction	GHG emissions from grid electricity use for powering auxiliary facilities. GHG emissions from fuel consumed by construction vehicles and plant use. GHG emissions from the provision and treatment of water.

⁷ PAS 2080 Carbon Management in Infrastructure Verification was designed to address the management of carbon in infrastructure. It looks at the whole life cycle of the carbon used on projects and promotes reduced carbon, reduced cost infrastructure delivery and fostering innovation.

PAS 2080 lifecycle stage ⁷	Activity	Emissions sources
	Transportation of workers to and from site	GHG emissions arising from the fuel use for transportation of employees and/or contractors to and from the construction site.
	Transportation of materials and waste to and from site	GHG emissions arising from the fuel use for transportation of materials and waste to and from the construction site. Emissions arising from the treatment of waste.

4.2.3 The embodied carbon within construction materials and the associated transportation is estimated to be the largest source of emissions during the construction phase, with electricity consumption expected to be the second largest.

Table 4-2: Operation phase GHG emissions sources

PAS 2080 lifecycle stage	Activity	Emissions sources
Operation stage	Energy and fuel consumption for operation of the airport buildings, assets, infrastructure and airside/landside vehicles	GHG emissions from fuel/electricity use for buildings, assets and other infrastructure. GHG emissions from fuel/electricity use for landside/airside owned and third-party vehicles and equipment. GHG emissions from energy used for the transportation and disposal/treatment of waste. GHG emissions from energy used for the provision and treatment of water. Fugitive emissions from refrigeration and HVAC systems.
	Energy and fuel consumption for the maintenance of infrastructure/ assets	GHG emissions from the energy/fuel use for the replacement/ upgrade of certain assets. See construction phase GHG emissions in Table 4-1 above, with the exception of land use change, for a detailed breakdown of the emissions sources expected.
Use stage	Energy and fuel consumption for surface access journeys	GHG emissions from fuel/electricity use for the transportation of passengers and staff to, from and around the airport (private and public transport). GHG emissions arising from the fuel use for the transportation of freight to and from the airport.
	Fuel consumption for air traffic movements	GHG emissions from fuel used by aircraft during the landing take-off cycle (including decent/ascent up to 3000ft). GHG emissions from fuel used by aircraft during the cruise phase of flight.

4.2.4 Aircraft cruise emissions are expected to be by far the largest source of operational emissions, with surface access journeys

and power consumption for airport facilities expected to be the next largest sources.

4.2.5 In order to reduce the impact of the Proposed Development on GHG emissions and to help the UK Government meet its future carbon budgets, it is necessary to reduce such emissions where practical. However, it is important to note that LLAL has limited control over cruise emissions and industry wide action is required to reduce these.

4.2.6 Measures to minimise GHG emissions are outlined in Section 5.1.

4.3 Climate Change Resilience

4.3.1 A preliminary climate change resilience assessment was conducted for the Proposed Development as part of the Preliminary Environmental Information Report (PEIR). The climate change impacts identified to date include:

- Damage to buildings and infrastructure due to flooding, extreme weather events (such as storms), or increased summer temperatures;
- Disruption to airfield operations and Luton DART services due to wind speeds creating or distributing debris onto aprons, taxiways and tracks;
- Disruption to airport and connecting surface access routes due to flooding;
- Increase in flight disruption as a result of increasing frequency of extreme weather events, such as storms;
- Increased heat stress for passengers, staff, and outdoor maintenance workers as a result of increased summer temperatures and occurrence of heatwaves;
- Flood water management infrastructure stress due to more frequent, intense rainfall events;
- Reduced potable water availability required for airport operations due to prolonged periods of dry spells leading to drought;
- Aircraft accident or loss of telecommunications due to lightning striking the airport;
- Increase in fire risk during hot days, and increased risk in damage to fuel operations due to lightning strikes; and
- Potential damage to open space and habitats if not resilient to climate change.

4.3.2 However, not all climate change impacts are adverse and warmer winter temperatures may result in less need for aircraft de-icing in the future.

5 MEASURES TO MANAGE GHG EMISSIONS AND INCREASE THE RESILIENCE OF THE PROPOSED DEVELOPMENT

5.1 Greenhouse Gases

5.1.1 This section outlines the measures identified to date to manage GHG emissions from the Proposed Development, through design, construction and during operation.

5.1.2 The approach to identify measures to manage GHG emissions has followed several principles. These are aligned with information provided in other documents being developed to be submitted with the DCO application.

- Mainstreaming and embedding – measures to reduce GHG emissions have informed early stage strategy and design for the Proposed Development. This will continue as the design progresses and will also be built into operational processes.
- Collaboration – work with third parties, including airlines to encourage measures to reduce GHG emissions from aviation that are outwith LLAL’s direct control (Sustainability Strategy).
- Targeting long term efficiencies – measures have been identified to make productive investments to allow for longer term energy efficiencies and reduce GHG emissions across the design-life of the Proposed Development.
- Low carbon energy generation – options for on-site generation of energy from low-carbon technology and renewable sources are being explored and are to be presented in the Luton Airport Expansion Project Energy and Carbon Strategy.

Reducing GHG emissions through design

5.1.3 Buildings and assets are to be designed to be low carbon during operation, including:

- A requirement for energy efficient, low carbon design in buildings/new assets proposed as part of the Proposed Development (including building envelope and building services i.e. HVAC, lighting etc.).
- Building services to be designed to minimise the release of fugitive emissions.

5.1.4 Specification of materials with lower embodied GHG emissions within contractor contracts (where practical, materials with a higher recycled content, and locally sourced materials etc) will be used. Where feasible, assets will be designed for end of component reuse and offsite manufacture of design elements.

- 5.1.5 The contractor will be required to demonstrate to LLAL that materials with lower embodied carbon emissions have been specified where feasible.

Reducing GHG emissions during construction

- 5.1.6 Measures to reduce waste generated and resource use during construction including:

- Designing out waste workshops to identify opportunities to reduce waste and resources and to identify opportunities to achieve a cut/fill balance during construction;
- Recycling of demolition waste on site;
- Recycling and use on site of existing landfill material;
- Balancing the cut (excavation) and fill (material placement) – Earthworks excluding landfill material; and
- Setting waste targets in line with the ANPS.

- 5.1.7 Contractors will adopt good practice in sustainable procurement and construction waste management to reduce the quantity of waste produced and increase the recycled content of materials. This will include:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- Attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- Reuse of materials onsite wherever feasible;
- Recycling of waste onsite wherever feasible, e.g. recycling of demolition material;
- Reuse and recycling of materials off-site where reuse on-site is not practical (e.g. through use of off-site waste management infrastructure and resale for direct reuse or reprocessing);
- Setting construction and demolition waste recovery targets in line with the APNS;
- Establishment of a project specific recycled content target e.g. for aggregates;
- Contractual requirements for contractors to procure and use recycled and more sustainable materials; and
- Contractor to prepare a sustainable procurement policy to include waste and resources aims and objectives.

5.1.8 A Carbon Efficiency Plan will be developed and implemented to manage/reduce carbon emissions and promote good practice, including:

- Monitoring of fuel use and compressed air leaks;
- Machinery and plant operatives fuel efficiency training;
- Avoidance of oversizing of generators for plant and temporary buildings;
- Separate generators for peak time versus low time demand;
- Nominated individuals with responsibility for site energy management;
- Use of hybrid or electric plant;
- Early energy grid connection to minimise use of diesel; and
- Construction workers will be encouraged to use public transportation to/from site

5.1.9 A target will be set to reduce water use and disposal during construction in order to reduce associated emissions.

5.1.10 A landscape strategy will also be developed to offset any loss of vegetation that would result in a net loss of carbon sink.

Reducing GHG emissions during operation

5.1.11 A range of measures to reduce GHG emissions during the operation of the airport have been identified, and covers energy use, surface access journeys, air traffic movements, and waste and water.

Energy use

5.1.12 Options for low carbon renewable energy generation/ or procurement, and options to incentivise the future uptake of low and zero carbon fuels for vehicles using the airport e.g. inclusion of EV charging points in car parks would be implemented where feasible.

5.1.13 Uptake of sustainable aviation fuels would be encouraged through the inclusion of infrastructure for sustainable aviation fuels where practical.

5.1.14 Buildings would be designed to 2013 BREEAM 'Good Status' to be energy efficient with appropriate installations and equipment together with thermally efficient materials and shading.

5.1.15 Energy use would be primarily electricity supplemented by:

- Solar voltaic cells built where practical over car parking and on roofs over the construction period to 2038;

- Ground source heat pumps; and
- Battery storage for back-up power rather than relying on diesel generators.

5.1.16 The new terminal building would utilise efficient building design to reduce operational GHG emissions including:

- Electric reverse heat pumps for heating and cooling supported with ground source heat pump technology; and
- Storage of heat using water storage facilities.

Surface access journeys

5.1.17 A Surface Access Strategy will be developed to provide the medium to long term direction for a shift away from private car use to public transport. Where private cars are used measures will incentivise low/zero carbon private transport options e.g. electric vehicles.

5.1.18 The strategy will seek to promote and encourage the use of sustainable transport options for employees and passengers including:

- 45% of passengers using public transport, and an increase in staff using sustainable transport;
- Promotion of the use of car sharing scheme to decrease the use single occupancy vehicles;
- Increasing awareness of the cycle to work scheme;
- Increasing the total number of vehicle electrical charging points in staff and passenger car parks; and
- Install dedicated electric charging points for taxis.

Airside vehicles

5.1.19 Encourage the use of zero or low emission vehicles and seek to provide appropriate fuelling infrastructure based on a cost-benefit approach.

5.1.20 Provide staff with training materials such as eco-driving guidance.

5.1.21 All purchased airside vehicles are to meet the latest emission standards, as a minimum. No Airside Vehicle Permits (AVPs) should be provided to vehicles which do not comply unless there is a specific technical reason for the non-compliance. Keep a register of all non-compliant and older vehicles (pre Euro 4) and work with operators to develop plans to reduce the emissions from airside vehicles (e.g. plans to update vehicle fleets and increase the use of low emission alternatives).

5.1.22 Minimise idling of vehicles on-site.

Air traffic movements

5.1.23 Measures that will be considered to help reduce GHG emissions from aircrafts when on the ground include:

- Fitting all stands with fixed electrical ground power (FEGP). Currently, designs include FEGP at all Terminal 2 stands;
- Reviewing auxiliary power unit (APU) running time allowances and reduce to the minimum level possible;
- Shutting down all engines as soon as possible following arrival;
- If a delay occurs subsequent to engine start-up, shutting down engines whenever possible;
- Recommending single/reduced engine taxiing;
- Working with the National Air Traffic Service and airlines to reduce hold times in the air and on the ground; and
- Developing a best practice operational guide for ground operations and departures to reduce emissions due to aircraft idling and hold.

5.1.24 An Operational Strategy will be developed by LLAOL to:

- Reduce emissions from air traffic movements; and
- Encourage the uptake of sustainable aviation fuels and new aircrafts.

Waste

5.1.25 Measures incorporated into the design to reduce waste include:

- Design of adequate provision for internal and external waste segregation and storage; and
- Setting of municipal waste recycling targets as per the ANPS and development of a waste and resources plan by LLAOL.

Additional mitigation measures

5.1.26 Any potential additional mitigation measures will be identified as the GHG assessment is completed and will be included in the ES.

5.1.27 Initiatives and policies that will be considered under additional mitigation will include for example the introduction of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA)⁸ adopted by the International Civil Aviation

⁸ICAO, 108, CORSA <https://www.icao.int/environmental-protection/CORSA/Pages/default.aspx>

Organisation (ICAO) in 2016. The pilot phase of CORSIA runs from 2021 while from 2027 all international; flights will be subject to offsetting requirements. It is anticipated that a substantial proportion of international aviation emissions from the Proposed Development will be offset. CORSIA aims to stabilize net CO₂ emissions from international civil aviation at 2020 levels.

5.1.28 A further measure for consideration is the target set by the International Air Transport Association (IATA) target to reduce net aviation CO₂ emissions by 50% by 2050, relative to 2005 levels. IATA is a representative body for the airline industry.

5.1.29 Other additional measures to reduce aviation emissions to be considered will include:

- LLAL and LLAOL will consider green slot strategies to incentivise the most efficient aircraft;
- Infrastructure to enable the uptake of sustainable aviation fuels.

5.1.30 To minimise GHG emissions from the operation of airport buildings and assets additional mitigation to be considered within the ES will include:

- The setting of targets to:
 - Reduce operational energy demand;
 - Purchase a percentage of energy from low carbon and renewable energy sources;
 - Generate a percentage of low carbon/renewable energy on-site; and
 - Reduce operation water consumption.

5.1.31 Additional measures to reduce emissions from surface access will include the incentivisation of uptake of low emission transportation for freight entering/leaving the airport for example HGV using low carbon technologies.

5.2 Climate Change Resilience

5.2.1 This section outlines the measures being implemented to increase the resilience of the Proposed Development to climate change.

5.2.2 The approach taken to identify measures to increase the resilience of the Proposed Development are aligned with several of the principles outlined in ISO 14090: Adaptation to climate change – Principles, requirements and guidelines, including:

- Mainstreaming and embedding – climate change consideration has informed early stage strategy and design for the Proposed Development. It will continue to as the

design progresses and will be built into operational processes.

- Robustness – the latest climate change projections from UK Climate Projections 2018 (UKCP18) have been used to inform climate change resilience assessment. Measures identified so far to increase the resilience of the Proposed Development are tolerant of uncertainty in climate change projections.
- Systems thinking – the Proposed Development and its operations, and its dependencies on other infrastructure systems (such as power, road transport, telecommunications, water etc.) are considered in the climate change resilience assessment.
- Transparency – this Strategy, and final Plan to be submitted with the ES, will be a publicly available document, as well as any other reporting on climate change risk and resilience throughout the operational lifetime of the Proposed Development, such as reporting against the Climate Change Act 2008.

5.2.3 As mentioned above, climate change resilience assessment has informed early stage strategy and design and is continuing as the design progresses. Measures identified to date include:

- All new and replacement assets, including buildings, surface access routes, taxiways and aprons will be designed for the climatic conditions projected for the end of their design life, using appropriate design guidance where available or adaptive capacity will be built into the designs;
- Concepts within ‘CEN-CENELEC (2016) Guide 32: Guide for addressing climate change adaptation in standards’ will be embedded within the design of all assets;
- All surface water drainage systems will be designed to Environment Agency guidance and will be able to accommodate for surface water flows during 1 in 100 years storm event, accounting for an increase in precipitation of 40% due to climate change;
- Requirements for consideration of climate change impacts on groundwater levels, soil moisture content and precipitation are included in the construction and design of earthworks and structures in-line with BS EN1997-1⁹ and BS6031 Code of Practice for Earthworks¹⁰.
- Landscape planting will take into consideration climate change in the selection of appropriate species for planting

⁹ European Committee for Standardization (2004) BS EN1997-1: Geotechnical design

¹⁰ British Standard (2009) BS6031: Code of Practice for Earthworks

and habitat creation and provide adequate monitoring post-planting;

- Water efficiencies to increase resilience to drought events will be built into the Proposed Development through, for example rain water harvesting from the roofs to allow greywater storage and re-use where practicable and appropriate; and
- Assets will be maintained regularly to detect deterioration and damage caused by extreme weather events such as storms through maintenance and monitoring in contracts.

6 NEXT STEPS

- 6.1.1 Assessments are ongoing and the measures identified above to manage GHG emissions and increase the resilience of the Proposed Development to climate change will continue to be refined throughout the assessment process. These will be reported in the Greenhouse Gas & Climate Change Resilience Management Plan as part of the ES.