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London Luton Airport Expansion

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**8.171 Applicant's Response to Issue Specific Hearing 9 Action
27 - Note on GHG Limits**

Infrastructure Planning (Examination Procedure) Rules 2010

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The Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

**London Luton Airport Expansion Development Consent
Order 202x**

**8.171 APPLICANT'S RESPONSE TO ISSUE SPECIFIC HEARING 9
ACTION 27: GREEN CONTROLLED GROWTH GHG LIMITS**

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1 INTRODUCTION

1.1.1 This document has been prepared by Luton Rising (a trading name of London Luton Airport Limited) ('the Applicant') for submission to the Examining Authority ('ExA') following Issue Specific Hearing 9 (ISH9) which was held on 30 November 2023 covering the Green Controlled Growth (GCG) Framework. Agenda Item 4 of the hearing covered the greenhouse gas (GHG) emissions, and how GHG and climate change impacts will be controlled by the GCG Framework.

1.1.2 As part of the hearing (as described in Section 5.1 of the **Applicant's Post Hearing Submission - Issue Specific Hearing 9 (ISH9) [REP6-067]**), the Applicant was asked to contextualise the GHG Limits and Thresholds in Table 5.1 of the **Green Controlled Growth Framework [REP5-022]**. The table is reproduced below, and sets out Thresholds and Limits for each of the GHG categories. As per Paragraph 5.1.1 of the Green Controlled Growth Framework TR020001/APP/7.08, Scope 1 and 2 emissions have 'gross' Limits and Thresholds, whereas those for Scope 3 emissions are 'net', inclusive of any offsetting the airport operator chooses to implement.

Table 5.1 of the Green Controlled Growth Framework [REP5-022]

Limit	Limit Values (tCO _{2e} /yr)			
	Phase 1	Phase 2a	Phase 2b	Full Operating Capacity
Airport Operations CO _{2e} emissions (Scope 1 and Scope 2, no offsetting permitted)	<i>Note that as per Paragraph 5.4.2 of the GCG Framework, these Limits (and Thresholds) will be reviewed to align with the Jet Zero Strategy ambition of zero-emissions airport operations by 2040.</i>			
	Limit			
	7,644	4,969	280	280
	Level 2 Threshold			
	7,262	4,721	266	266
	Level 1 Threshold			
Airport Operations CO _{2e} emissions (Scope 3, offsetting allowable)	<i>Note that as per Paragraph 5.4.2 of the GCG Framework, these Limits (and Thresholds) will be reviewed to align with the Jet Zero Strategy ambition of zero-emissions airport operations by 2040.</i>			
	Limit			
	8,938	7,204	2,884	2,699
	Level 2 Threshold			
	8,492	6,844	2,739	2,564
Level 1 Threshold				

Limit	Limit Values (tCO _{2e} /yr)			
	Phase 1	Phase 2a	Phase 2b	Full Operating Capacity
	8,045	6,484	2,595	2,429
Surface Access CO _{2e} emissions (Scope 3, offsetting allowable)	<i>Note that from 2040 onwards, the Limit (and Thresholds) will be zero, irrespective of which Phase the airport is in.</i>			
	Limit			
	199,440	199,440	114,179	86,557
	Level 2 Threshold			
	189,468	189,468	108,470	82,229
	Level 1 Threshold			
179,496	179,496	102,761	77,901	

1.1.3 This paper is a response to the ExA’s Action Point 27 in **Action Points from Issue Specific Hearing 9 held on 30 November 2023 [EV16-009]:**

“Provide a note contextualising the limits in Table 5.1 of [REP5-022]. Provide an assessment of the likelihood of all the thresholds and limits being exceeded within a year.”

2 CONTEXTUALISING THE GCG GREENHOUSE GASES LIMITS

2.1 Airport Operations – Scope 1 and 2

2.1.1 As set out in Section 5.1 of the **Green Controlled Growth Framework [REP5-022]**, Scope 1 and 2 Airport Operations GCG Limits have been determined on the basis of the emissions sources shown in Table 2.1. The simplified emissions categories for these various sources are shown graphically in Figure 2.1 below.

Table 2.1: Airport Operations Scope 1 and 2 emissions sources and categorisation.

Emissions Category	Emissions Source
Natural gas	<ul style="list-style-type: none"> Emissions from the combustion of natural gas consumed at the airport by the airport operator¹.
Electricity	<ul style="list-style-type: none"> Emissions from generation of grid electricity consumed at the airport by the airport operator^{2,3}. Emissions from the generation of electricity used to charge electrically powered airport vehicles
Airport operations vehicles	<ul style="list-style-type: none"> Emissions from the combustion of fuel used in Internal Combustion Engine (ICE) airport vehicles
Other	<ul style="list-style-type: none"> Emissions from the combustion of liquid fuel consumed at the airport (including for on-airport fire training) On-airport fugitive refrigeration emissions. Emissions from airport usage de-icer.

2.1.2 The relative contribution of these different activities to the total emissions forecasts (and in turn the GCG Limits) changes over time due to the different rates at which it is possible to decarbonise these activities. This is shown in Figure 2.1, which shows the change in Scope 1 and 2 Airport Operations Emissions from the 2019 baseline to the Phase 1 and Phase 2b with DCO forecasts (assumed 2027 and 2043 respectively). As set out in **Chapter 12 of the Environmental Statement [REP3-007]** these forecasts include some residual emissions at 2040, which would be addressed via the commitment in

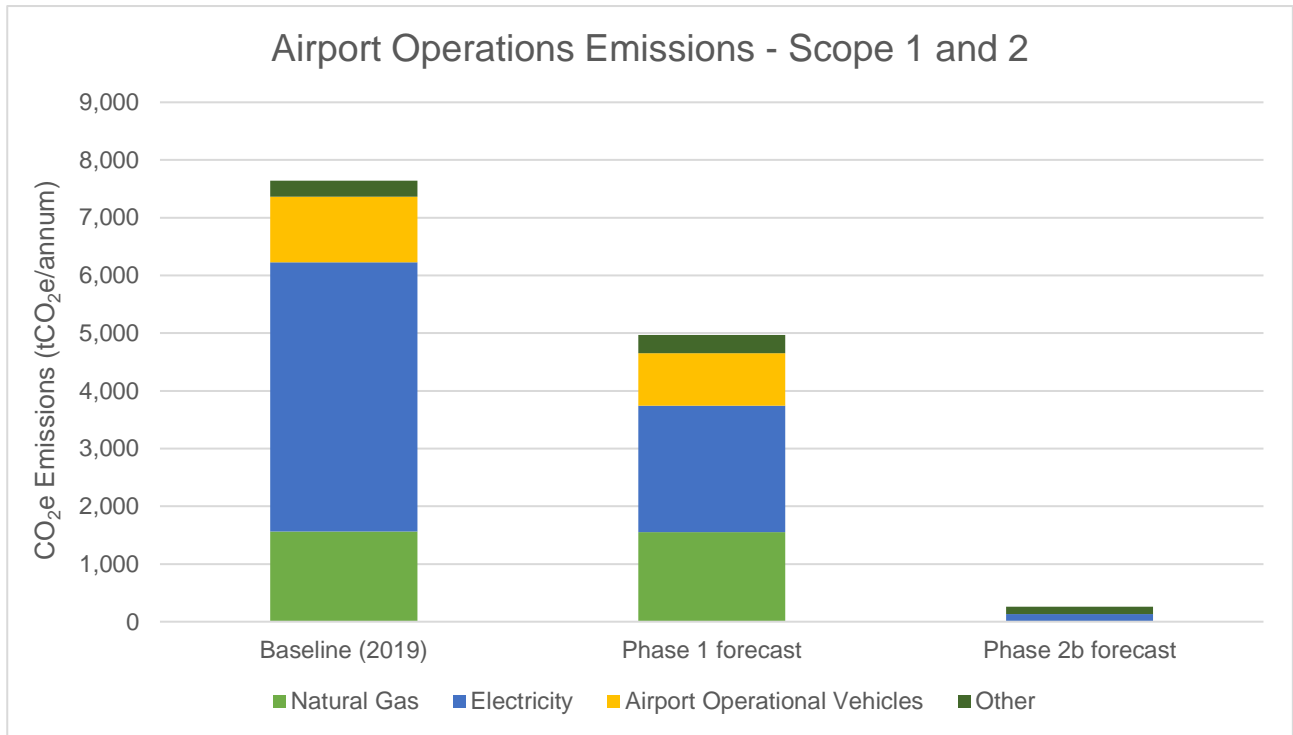
¹ These emissions are Scope 1 where emissions arise from activity under the direct control of the Airport operator, and Scope 3 where they arise from activity that is not under the Airport operator's direct control, for example the use of ICE vehicles by a third party with an operational presence at the airport.

² These emissions are Scope 2 where emissions arise from activity under the direct control of the airport operator, and Scope 3 where they arise from activity that is not under the airport operator's direct control, for example electricity consumed by a tenant that is subject to separate metering.

³ This excludes electricity use associated with the charging of electric vehicles, include any potential future electrically powered aircraft. This is to avoid double-counting emissions, given that emissions associated with EV charging are accounted for separately.

Section 5.4 of the Green Controlled Growth Framework TR020001/APP/7.08 to review Airport Operations Limits and Thresholds within three months of the government publishing updated policy or guidance that clarifies the scope and pathway to achieving zero emissions airport operations by 2040.

Figure 2.1: Emissions categories for Scope 1 and 2 Airport Operations Emissions



2.1.3 In both the baseline and Phase 1 forecast, consumption of electricity represents the largest single activity contributing to these emissions, although this is less in the Phase 1 forecast than in the baseline despite more electricity being consumed. This is because of the continuing decarbonisation of the national electricity grid, as reflected in future grid intensity projections, meaning that emissions associated with each MWh of electricity use decrease from 0.24 tonnes CO₂e in 2019 to 0.11 tonnes CO₂e in 2027 (Phase 1). By 2043 (Phase 2b) this has reduced further to 0.01 tonnes CO₂e/MWh, which in combination with use of on-site renewables means that electricity usage is responsible for a negligible amount of emissions.

2.1.4 Natural gas is the second largest source of Scope 1 and 2 emissions, and the emissions factor associated with its use remains constant through expansion at 0.18 tonnes CO₂e/MWh. However, consumption of natural gas is phased out over time, and it is not forecast to be the source of any emissions in the Phase 2b forecast.

2.2 Airport Operations – Scope 3

2.2.1 As set out in Section 5.1 of the **Green Controlled Growth Framework [REP5-022]**, Scope 3 Airport Operations GCG Limits have been determined on the basis of the emissions sources shown in Table 2.2. As for Scope 1 and 2

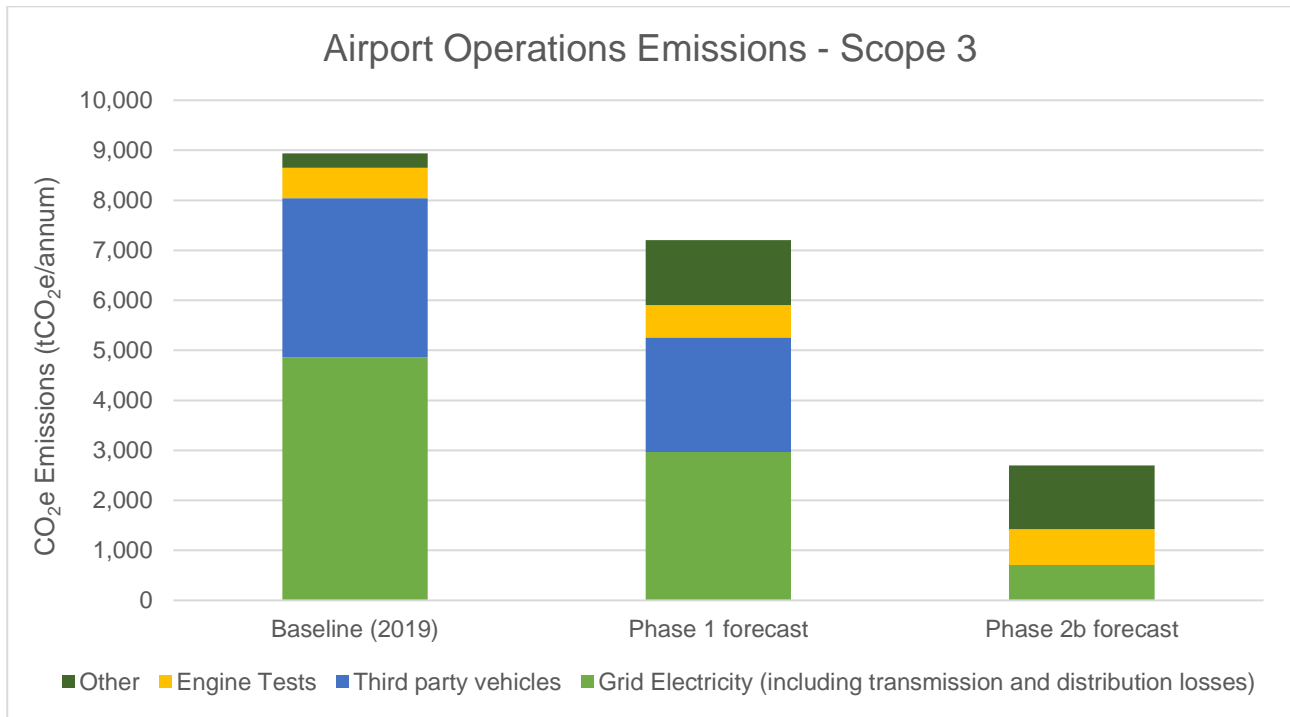
emissions, these have been categorised within the table and the categories then presented graphically in Figure 2.2.

Table 2.2: Airport Operations Scope 3 emissions sources and categorisation

Emissions Category	Emissions Source
Grid electricity (including transmission and distribution losses)	<ul style="list-style-type: none"> • Emissions from generation of grid electricity consumed at the airport by third parties • Emissions from transmission and distribution losses associated with grid electricity (including that used to charge electrically powered airport vehicles) • Emissions from the generation of electricity used to charge electrically powered third party vehicles
Third party vehicles	<ul style="list-style-type: none"> • Emissions from the combustion of fuel used in Internal Combustion Engine (ICE) third party vehicles
Engine tests	<ul style="list-style-type: none"> • Emissions from aircraft engine tests.
Other	<ul style="list-style-type: none"> • Emissions from the combustion of liquid fuel consumed at the airport by third parties • Emissions from business travel by employees of the airport operator. • Emissions from the processing of on-airport waste. • Emissions from the processing of on-airport wastewater. • Emissions from third party usage of de-icer.

2.2.2 As with Scope 1 and 2 Airport Operations emissions, the relative contribution of these different activities to the total emissions forecasts (and in turn the GCG Limits) changes over time due to the different rates at which it is possible to decarbonise these activities. This is shown in Figure 2.2.

Figure 2.2: Emissions sources for Scope 3 Airport Operations Emissions



2.2.3 There is a similar pattern to Scope 1 and 2 emissions, with the greatest proportion of Scope 3 emissions in the short to medium term being third party use of grid electricity and the use of third party vehicles. As the electricity grid continues to decarbonise, and more vehicles are ultra-low or zero emissions, the relative contribution of these sources decreases.

2.3 Surface Access – Scope 3

2.3.1 As set out in Section 5.1 of the **Green Controlled Growth Framework [REP5-022]**, Scope 3 Surface Access GCG Limits have been determined on the basis of the following emissions sources:

- a. emissions from the transportation of passengers to/from the airport;
- b. emissions from the transportation of staff to/from the airport; and
- c. emissions from the electricity usage for the operation of the Luton DART.

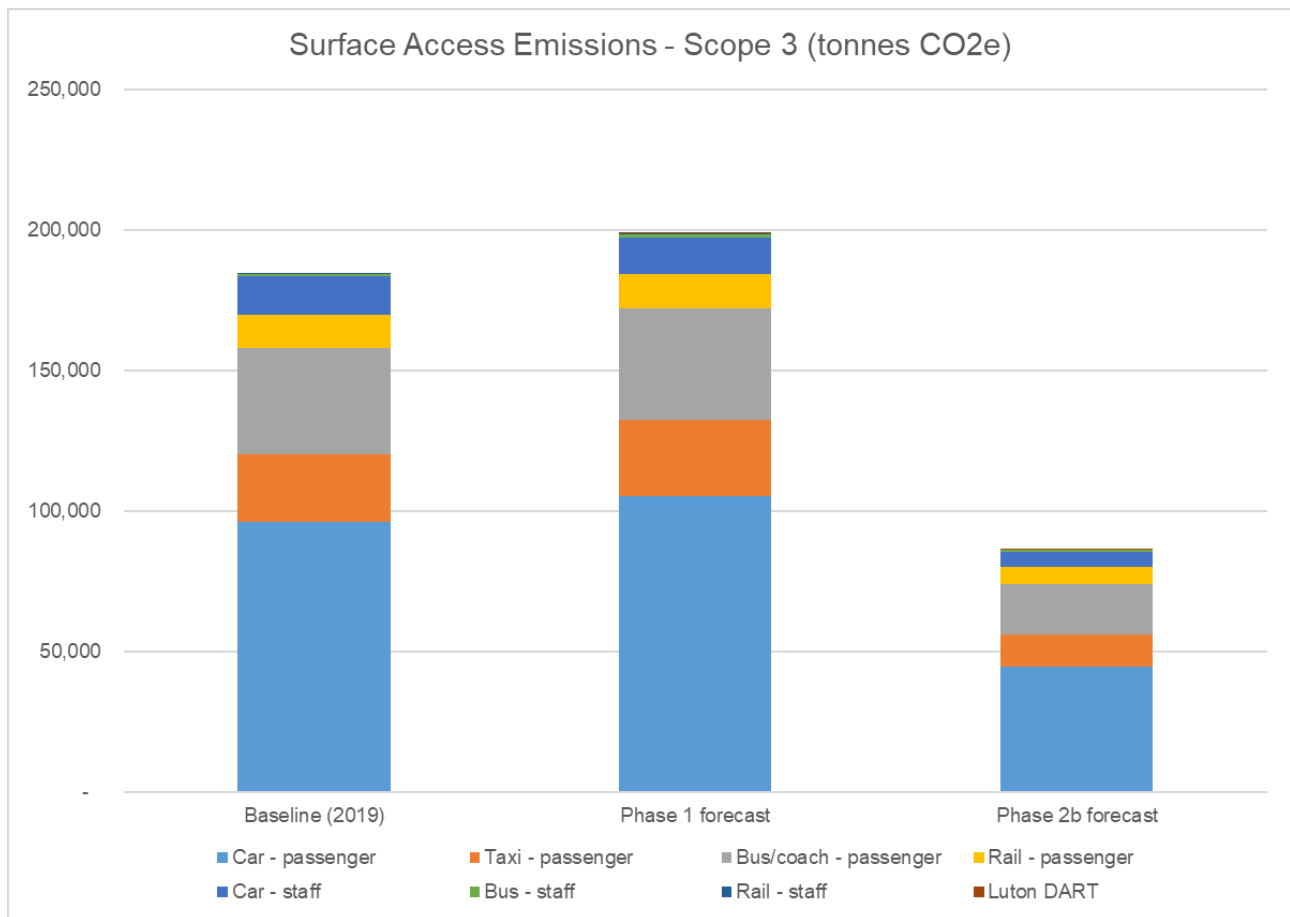
2.3.2 Emissions for passenger and staff travel were derived by mode of transport (car, bus/coach and rail), based on the forecast travel patterns utilised in the transport modelling. Emissions factors were used to convert surface access activity data, in terms of total vehicle km travelled (by mode, and per year) into emissions. Further detail on the methodology for surface access has been provided in the **ES Appendix 12.1 – GHG Methodology and Data [APP-081]**.

2.3.3 Figure 2.3 sets out the change in Scope 3 Surface Access Emissions from the 2019 baseline to the Phase 1 and Phase 2b with DCO forecasts (assumed 2027 and 2043 respectively), for passenger and staff travel, broken down by mode.

2.3.4 The proportion of total emissions for passengers compared to staff remains almost constant over time, with passenger travel accounting for 92-93% of emissions, and staff travel around 7-8%. Emissions from Luton DART were calculated separately but are negligible overall (~0.3%).

2.3.5 Travel by car (including taxis) for both passengers and staff represents the vast majority of total emissions, and this remains so even following the modal shift from car to public transport and active travel assumed within the **Transport Assessment [APP-203]**. However, by Phase 2b, the emissions factors for car trips have decreased significantly as a result of the predicted decarbonisation of the vehicle fleet. This results in emissions from car trips more than halving between Phase 1 and Phase 2b, despite total vehicle mileage increasing as a result of the increased number of passengers.

Figure 2.3: Emissions sources for Scope 3 Surface Access Emissions



3 THE POTENTIAL FOR THRESHOLDS AND LIMITS TO BE EXCEEDED WITHIN A YEAR

- 3.1.1 As set out in Section 2 of this note, GHG emissions associated with airport operations and surface access are forecast to reduce over time, notwithstanding the increase in passenger throughput. This is due to the decarbonisation of sources of GHG emissions such as the national electricity grid and the phasing out of other activity such as the use of natural gas and the use of petrol and diesel powered vehicles for access to and from the airport.
- 3.1.2 Figure 3.1, Figure 3.2 and Figure 3.3 show an indicative trajectory of emissions associated with the expansion of the airport over time, plotted against the proposed GCG Limits and Thresholds. The indicative trajectory has been developed using a range of assumptions for the non-modelled years between the Assessment Phases that were modelled and reported in **Chapter 5 of the Environmental Statement [AS-075]**, including linear interpolation of key parameters. Actual emissions over time may vary as a result of a range of factors, such as fluctuations in passenger growth, and the impact of significant interventions, leading to more significant step-changes in emissions reduction followed by a flatter trajectory (e.g. new on-site renewables being installed). This concept was illustrated previously in Figure 3.1 of the **Green Controlled Growth Explanatory Note [REP5-020]**.
- 3.1.3 The Figures also provide a simplified view of Limits to contextualise them against indicative forecast emissions, and as such do not take into account either the review mechanism set out in Section 5.4 of the **Green Controlled Growth Framework [REP5-022]** to align GCG Limits with the Jet Zero commitment for zero emissions airport operations by 2040, or the commitment made by the Applicant to secure carbon neutral surface access from 2040 through changes to the Limits.

Figure 3.1: Indicative trajectory of Scope 1 and 2 Airport Operations GHG Emissions

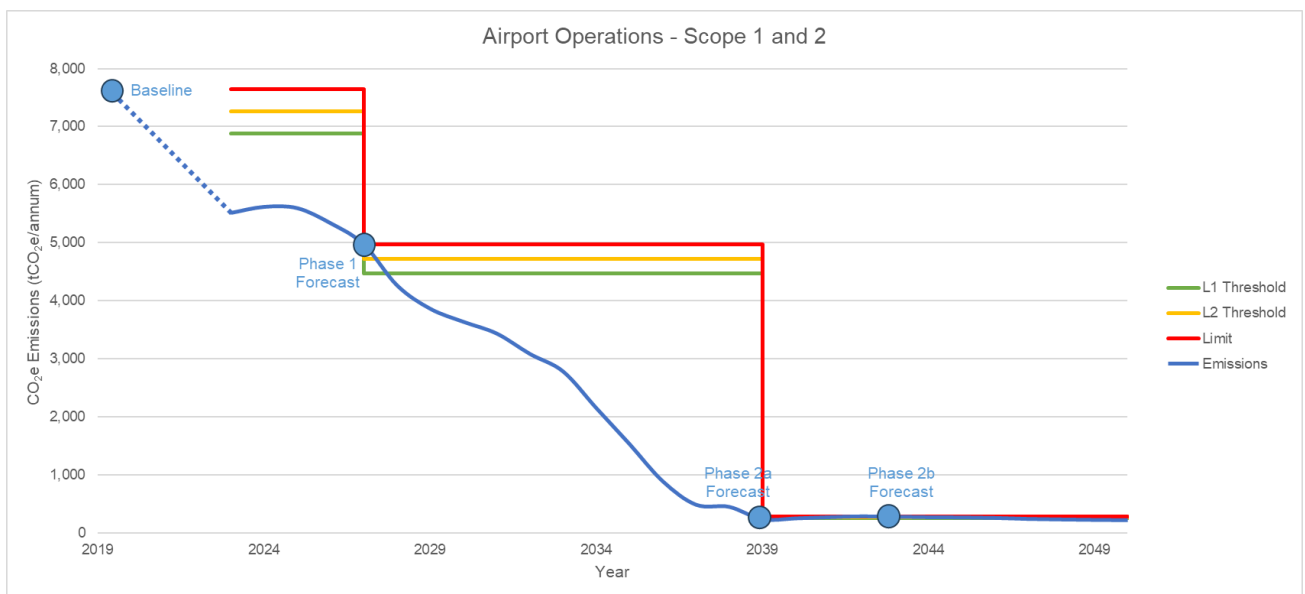


Figure 3.2: Indicative trajectory of Scope 3 Airport Operations GHG Emissions

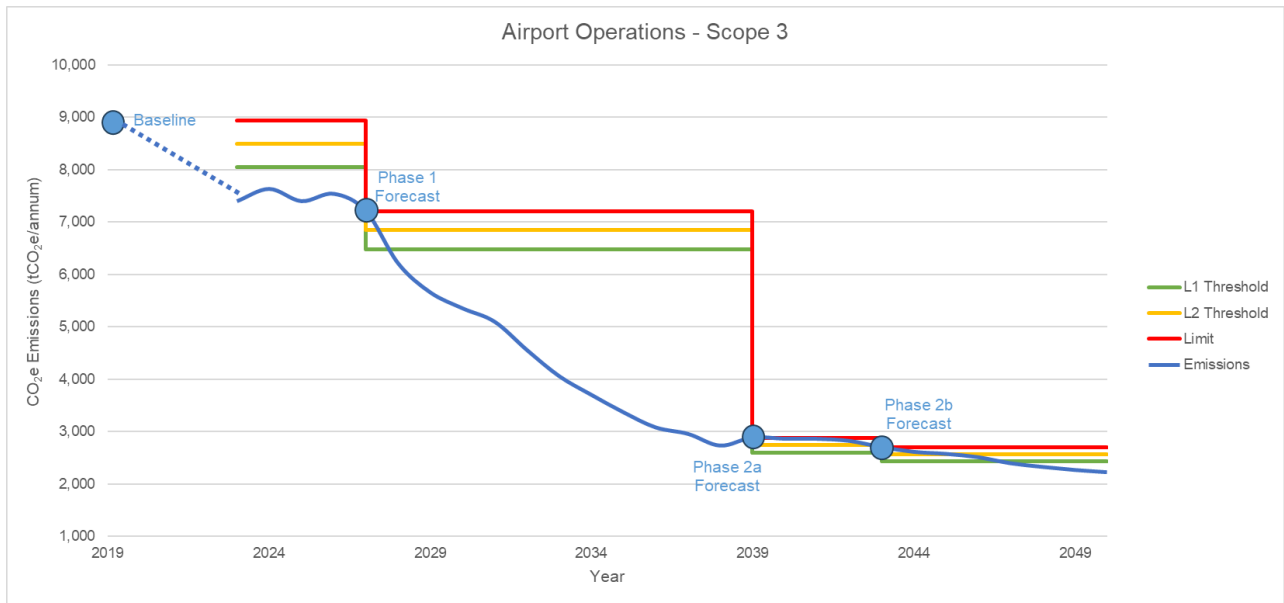
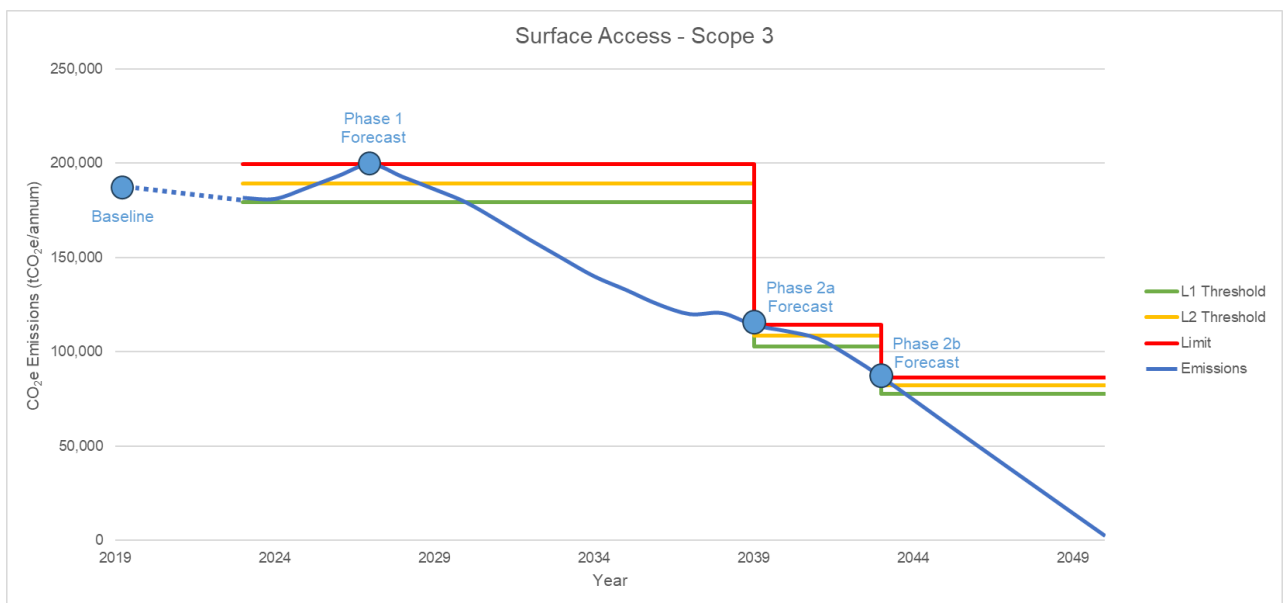


Figure 3.3: Indicative trajectory of Scope 3 Surface Access GHG Emissions



3.1.4 Figure 3.1, Figure 3.2 and Figure 3.3 show that in order for GHG emissions to exceed Thresholds and Limits in a single year, emissions would generally need to increase to an extent that reversed the downward trajectory and resulted in emissions increasing year on year. This is considered unlikely given the commitments made by the Applicant to decarbonising airport operations, and wider Government commitments to decarbonisation such as those set out in the Transport Decarbonisation Plan [Ref 3.1] for surface access.

3.1.5 The points at which the airport would be most at risk of exceeding a Limit would be where passenger throughput increases to a point where Limits change (and generally step down) in that year. This would need to be taken into account by the airport operator in planning that growth and were a Limit to be exceeded at that point the airport operator would be required to stop the release of new slots

(stopping airport growth) until mitigation pursuant to an approved Mitigation Plan has been effective at reducing GHG emissions below the Limit. This is in essence the purpose of GCG – to ensure that the reasonable worst case forecast emissions reduction over time associated with the Faster Growth case does occur, or else further airport growth cannot take place.

- 3.1.6 It is also acknowledged that once a passenger throughput of 27 mppa is reached, Limits and Thresholds for airport operations (both Scope 1 and 2, and Scope 3) reduce very significantly, to an extent that there is not a significant difference between the Limit and either of the Thresholds. It is not considered that revising the value of the Thresholds would address this, as this is fundamentally a function of the extensive decarbonisation of airport operations forecast by the late 2030s, which results in the forecast GHG emissions (and in turn the Limit) being very low.
- 3.1.7 Notwithstanding this, however, it should be noted that the Jet Zero strategy [Ref 3.2] published by the UK government includes an ambition to achieve zero emissions airport operations by 2040. The **GCG Framework [REP5-022]** includes a commitment to review and align Limits and Thresholds with this ambition once the scope and pathway to achieving this policy objective are known. On this basis, it is considered that the Limits and Thresholds beyond 27 mppa are likely to change in future to reflect wider government requirements.
- 3.1.8 Considering surface access emissions, the primary driver for the reduction in emissions over time is the decarbonisation of the vehicle fleet, reflecting the Government's policy position as set out in the Transport Decarbonisation Plan. Whilst modal shift from private car to public transport and active travel does also realise emissions reductions, this has a lower impact than the reduction in emissions factors for each mode of transport over time. It is for this reason that offsetting of Scope 3 surface access emissions has been allowed for, on the basis that the Applicant can only influence this wider decarbonisation (e.g. by providing EV charging points), but cannot directly control it.
- 3.1.9 As an example, in Assessment Phase 1 (2027) passenger mode share is assumed to include 40% of passengers travelling by public transport (bus, coach and rail), with the remaining 60% travelling by car based modes (drop-off/pick-up, parking, hire car, or taxi). Whilst public transport is more efficient in terms of emissions per passenger compared to car-based modes, representing 29% of total passenger surface access emissions in Assessment Phase 1, it still contributes significantly to overall GHG emissions.

Were car-based modes to be reduced from 60% to 55% of passengers in Assessment Phase 1, GHG emissions from those modes would be reduced by around 6,600 tCO₂e (assuming the reduction was evenly distributed across the different car-based modes). Such a reduction would only equate to 3.3% of the Phase 1 GCG Limit value for surface access emissions. However, this does not account for the additional public transport emissions that would be created, and so the overall net reduction would be lower. This demonstrates that significant changes in mode share would be required to reduce surface access emissions further, assuming the decrease in emissions factors over time follows the trajectory utilised with the GHG assessment and reported in the ES.

REFERENCES

Ref 3.1 Decarbonising transport: a better, greener Britain, Department for Transport, January 2023

Ref 3.2 Jet Zero strategy: delivering net zero aviation by 2050, Department for Transport, August 2022