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**7.08 Green Controlled Growth Framework Appendix E -
Greenhouse Gases Monitoring Plan**

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The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

London Luton Airport Expansion Development Consent Order 202x

**7.08 GREEN CONTROLLED GROWTH FRAMEWORK APPENDIX E
- GREENHOUSE GASES MONITORING PLAN**

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Appendix E

E1 Introduction

E1.1 Overview of document

- E1.1.1 This Monitoring Plan for greenhouse gases (GHGs) has been submitted as part of the proposed **Green Controlled Growth (GCG) Framework [TR020001/APP/7.08]**.
- E1.1.2 It is intended that this Monitoring Plan will be approved as part of the application for development consent. Paragraph 21 of Schedule 2 to the **Draft Development Consent Order (DCO) [TR020001/APP/2.01]** will require the airport operator to undertake monitoring and reporting in accordance with this Monitoring Plan as part of their GCG responsibilities.
- E1.1.3 As such, this document will establish monitoring and reporting requirements for GHGs within the GCG Framework. Failure to carry out monitoring and reporting in line with this document will constitute a breach of the DCO and may result in enforcement action as detailed in Section 2.7 of the **GCG Framework Explanatory Note [TR020001/APP/7.07]**.
- E1.1.4 It is intended that this Monitoring Plan can be revised in future, for example in response to new monitoring technology or guidance. Any revisions would need to be agreed by both the airport operator and the Environmental Scrutiny Group (ESG), a new body established through the DCO to provide independent scrutiny of airport impacts. Paragraph 21 of Schedule 2 to the **Draft Development Consent Order [TR020001/APP/2.01]** sets out the mechanism for this.

E2 Monitoring Greenhouse Gases

E2.1 Airport Operations

Operations under the control of the airport

E2.1.1 The airport operator will monitor consumption of grid electricity and other fuels consumed within airport buildings, airfield operations and vehicles that are under the direct control of the airport.

Grid electricity

E2.1.2 Electricity consumption at each individual metering point will be recorded monthly, and an aggregate figure compiled for the airport as a whole. Electricity to Airport Electric Vehicle (EV) charging points (including any potential future charging facilities for electric aircraft) will be excluded, on the basis that emissions from EVs will be reported separately.

E2.1.3 GHG emissions from the consumption of grid electricity will be calculated annually by multiplying activity data (overall annual electricity consumption) in kWh by the appropriate emissions factor for that year as published by the UK Government in its annual conversion factors dataset (Ref 2.1).

E2.1.4 For each unit of electricity consumed, there are two separate emissions factors published annually:

- a. Emissions from generation of electricity¹ – Scope 2.
- b. Emissions from transmission and distribution losses – Scope 3.

Natural gas

E2.1.5 Consumption of natural gas at each metering point will be recorded monthly, and an aggregate figure compiled for the airport as a whole.

E2.1.6 GHG emissions from the consumption of natural gas will be calculated by multiplying activity data (overall annual natural gas consumption) by the appropriate emissions factor for that year from the dataset published by the UK Government.

E2.1.7 Activity data for natural gas may be recorded as a quantum of energy (i.e. in kWh) or by volume (m³). The appropriate emissions factor must be applied depending on the units of activity data recorded.

E2.1.8 For each unit of natural gas consumed, an emissions factor is published annually for the Scope 1 emissions from the combustion of natural gas.

Liquid fuels

E2.1.9 Consumption of liquid fuels consumed in stationary installations (e.g. generators, heating systems etc) will be recorded on an annual basis. This will also include any fuel use associated with fire training. The overall monitoring

¹ All emissions from the generation of electricity will be calculated using a location-based emissions factor for the UK for the reporting year.

methodology for liquid fuels may vary depending on the storage and delivery arrangements for each one.

- E2.1.10 This could be delivery based, whereby overall consumption is deemed to be the quantity ordered and delivered in the reporting year. Or, the monitoring could use a mass balance arrangement under which changes in stocks stored are also taken into account alongside deliveries to calculate annual consumption. Activity data will be recorded in litres.
- E2.1.11 GHG emissions from the consumption of liquid fuels will be calculated by multiplying activity data (overall annual fuel consumption in litres) by the appropriate emissions factor for that year from the dataset published by the UK Government.
- E2.1.12 For each unit of liquid fuel consumed, an emissions factor is published annually for the Scope 1 emissions from the combustion of fuel.
- E2.1.13 Care will be taken to ensure that the correct emissions factors are applied to different fuel types as applicable (gas oil, kerosene, fuel oil etc.)

Internal Combustion Engine (ICE) Airport vehicles

- E2.1.14 Activity data for the operation of ICE airport vehicles will be monitored and recorded, where possible, in litres of fuel consumed. This data will be taken from fuel purchase records or fuel consumption records.
- E2.1.15 GHG emissions from the consumption of fuels for ICE airport vehicles will be calculated by multiplying activity data (overall annual consumption for each fuel in litres) by the appropriate emissions factor for that fuel and year from the dataset published by the UK Government.
- E2.1.16 For each unit of liquid fuel consumed, an emissions factor is published annually for the Scope 1 emissions from the combustion of fuel.
- E2.1.17 Care will be taken to ensure that the correct emissions factors are applied to different fuel types as applicable (diesel, petrol etc.)

Electric Airport vehicles

- E2.1.18 Activity data for the operation of EV airport vehicles will be monitored and recorded in kWh of electricity consumed, on the basis of EV charging records.
- E2.1.19 For each unit of electricity consumed, there are two separate emissions factors published annually.
 - a. Emissions from generation of electricity – Scope 2
 - b. Emissions from transmission and distribution losses – Scope 3

Refrigerants

- E2.1.20 Data on refrigerant losses will be collected when refrigerant is refilled. This will then be converted to GHG emissions through the use of the appropriate emissions factor for that year from the dataset published by the UK Government.

De-icer

E2.1.21 Data on quantities of de-icer utilised by the airport operator per annum (litres) will be collected. This will then be converted to GHG emissions through the use of an appropriate emissions factor for that year.

Operations under the influence of the airport

E2.1.22 The airport operator will monitor consumption of grid electricity and other fuels consumed within airport buildings, airfield operations and vehicles that are not under the direct control of the airport, but where the airport has some influence. This would include the consumption of electricity and fuels by tenants and other third parties with an operational presence within the airport.

E2.1.23 The overall methodology closely follows the section above, with the only change being that all emissions will fall under Scope 3.

Grid electricity

E2.1.24 Electricity consumption at each individual tenanted metering point will be recorded monthly, and an aggregate figure compiled for the airport as a whole. Electricity to Tenant and Third-party EV charging points will be excluded, on the basis that emissions from EVs will be reported separately. Similarly, electricity usage associated with the operation of the Luton DART will be reported separately as part of the surface access emissions.

E2.1.25 GHG emissions from the consumption of grid electricity will be calculated annually by multiplying activity data (overall annual electricity consumption) in kWh by the appropriate emissions factor for that year as published by the UK Government in its annual conversion factors dataset (Ref 2.2).

E2.1.26 For each unit of electricity consumed, there are two separate emissions factors published annually. Each of these falls within Scope 3.

- a. Emissions from generation of electricity
- b. Emissions from transmission and distribution losses

Liquid fuels

E2.1.27 Consumption of liquid fuels consumed in stationary installations (e.g. generators, heating systems etc) will be recorded on an annual basis. This will include the use of any fuel associated with on-airport aircraft engine testing. The overall monitoring methodology for liquid fuels may vary depending on the storage and delivery arrangements for each one.

E2.1.28 This could be delivery based, whereby overall consumption is deemed to be the quantity ordered and delivered in the reporting year. Or the monitoring could use a mass balance arrangement under which changes in stocks stored are also taken into account alongside deliveries to calculate annual consumption. Activity data will be recorded in litres.

E2.1.29 GHG emissions from the consumption of liquid fuels will be calculated by multiplying activity data (overall annual fuel consumption in litres) by the

appropriate emissions factor for that year from the dataset published by the UK Government.

- E2.1.30 For each unit of liquid fuel consumed, an emissions factor is published annually for the Scope 3 emissions from the combustion of fuel.
- E2.1.31 Care will be taken to ensure that the correct emissions factors are applied to different fuel types as applicable (gas oil, kerosene, fuel oil etc.)

ICE Third party vehicles

- E2.1.32 Activity data for the operation of ICE third party vehicles will be monitored and recorded, where possible, in litres of fuel consumed.
- E2.1.33 GHG emissions from the consumption of fuels for ICE airport vehicles will be calculated by multiplying activity data (overall annual consumption for each fuel in litres) by the appropriate emissions factor for that fuel and year from the dataset published by the UK Government.
- E2.1.34 For each unit of liquid fuel consumed, an emissions factor is published annually for the Scope 3 emissions from the combustion of fuel.
- E2.1.35 Care will be taken to ensure that the correct emissions factors are applied to different fuel types as applicable (diesel, petrol etc.)

Electric Third party vehicles

- E2.1.36 Activity data for the operation of EV third party vehicles will be monitored and recorded in kWh of electricity consumed, on the basis of EV charging records.
- E2.1.37 For each unit of electricity consumed, there are two separate emissions factors published annually.
 - a. Emissions from generation of electricity – Scope 2
 - b. Emissions from transmission and distribution losses – Scope 3

Disposal and treatment of operational waste

- E2.1.38 Activity data for the disposal and treatment of operational waste will be monitored according to existing methodologies for waste reporting. Where possible, this data will be broken down by waste type. Activity data will be recorded in terms of mass in kg or tonnes for each waste type for the reporting year.
- E2.1.39 Activity data will be converted to emissions data for each waste type by multiplying by the appropriate emissions factors taken from the conversion factor dataset published by the UK Government for the reporting year.
- E2.1.40 All emissions from the treatment and disposal of waste will be reported under Scope 3.

Provision of water and treatment of wastewater

- E2.1.41 Activity data for the volume of water supplied to the airport will be taken from existing metering and billing data for the reporting year. Activity data will be recorded in m³ per year.
- E2.1.42 Activity data will be converted to emissions data for by multiplying by the emissions factor for water supply taken from the conversion factor dataset published by the UK Government for the reporting year.
- E2.1.43 Activity data for the volume of wastewater treated will be taken as the volume of water supplied to the airport, on the assumption that all potable water supplied will enter the wastewater network for final treatment.
- E2.1.44 Activity data will be converted to emissions data by multiplying by the emissions factor for wastewater treatment taken from the conversion factor dataset published by the UK Government for the reporting year.
- E2.1.45 All emissions from the supply of water and treatment of wastewater will be reported under Scope 3.

Third party de-icer

- E2.1.46 Data on quantities of de-icer utilised by third parties per annum (litres) will be collected. This will then be converted to GHG emissions through the use of an appropriate emissions factor for that year.

Business Travel

- E2.1.47 Data on expenses claims associated with business travel by employees of the airport operator in vehicles owned or operated by third parties will be collected by the airport operator. This will be converted from a cost to a kilometre distance using standard factors.
- E2.1.48 Activity data will be converted to emissions data for each travel mode by multiplying it by the appropriate emissions factor taken from the conversion factor dataset published by the UK Government for the reporting year.
- E2.1.49 Emissions factors will be applied as follows:
 - a. Cars – Average car of unknown fuel, data in vehicle km
 - b. Taxi – Regular taxi, data in vehicle km
 - c. Bus – Average local bus, data in passenger km
 - d. Rail – National rail, data in passenger km
 - e. Flights – Standard factors, data in passenger km
- E2.1.50 All emissions calculated are reportable under Scope 3.

E2.2 Surface Access

Surface access - passengers

- E2.2.1 Passenger travel to the airport will be monitored according to the approach set out in the **Surface Access Monitoring Plan** in **Appendix F** of the **GCG Framework [TR020001/APP/7.08]**.
- E2.2.2 Data will be recorded in terms of origin location, overall vehicle kilometres for private cars and taxis, and passenger kilometres for buses and rail travel.
- E2.2.3 Where car and taxi data is monitored in terms of passenger kilometres, this data will be converted to vehicle kilometres, by dividing by an occupancy factor derived from the average group size reported in the given year's CAA dataset. For the 2019 ES baseline year, a factor of 1.87 was assumed, equivalent to the occupancy factor used in the 2016 base year strategic traffic model.
- E2.2.4 Activity data will be aggregated for the reporting year for each travel mode and scaled to present kilometres travelled by total passengers throughout the year.
- E2.2.5 Activity data will be converted to emissions data for each travel mode by multiplying it by the appropriate emissions factor taken from the conversion factor dataset published by the UK Government for the reporting year.
- E2.2.6 Emissions factors will be applied as follows:
- a. Cars – Average car of unknown fuel, data in vehicle km.
 - b. Taxi – Regular taxi, data in vehicle km.
 - c. Bus – Average local bus, data in passenger km.
 - d. Rail – National rail, data in passenger km.
- E2.2.7 All emissions calculated are reportable under Scope 3.

Surface access - staff

- E2.2.8 Staff travel to the airport will be monitored according to the approach set out in the Surface Access Monitoring Plan.
- E2.2.9 Data will be recorded in terms of days commuted each week, overall vehicle kilometres (as a two-way journey) for private cars and passenger kilometres for buses and rail travel.
- E2.2.10 Where car data is monitored in terms of passenger kilometres, this data will be converted to vehicle kilometres by dividing by an occupancy factor derived by dividing the total number of staff arriving by car (drivers and passengers) by the number of car drivers (for the baseline year this is 1.1).
- E2.2.11 Activity data will be aggregated for the reporting year for each travel mode and scaled to present kilometres travelled by total staff throughout the reporting year.

E2.2.12 Activity data will be converted to emissions data for each travel mode by multiplying it by the appropriate emissions factor taken from the conversion factor dataset published by the UK Government for the reporting year.

E2.2.13 Emissions factors will be applied as follows:

- a. Cars – Average car of unknown fuel, data in vehicle km.
- b. Taxis – Average car of unknown fuel, data in passenger km.
- c. Motorcycles – Average petrol motorcycle, data in passenger km.
- d. Bus – Average local bus, data in passenger km.
- e. Rail – National rail, data in passenger km.

E2.2.14 All emissions calculated are reportable under Scope 3.

Surface Access – Luton DART

E2.2.15 Electricity consumption associated with the operation of the Luton DART will be recorded monthly, and an aggregate figure compiled for the year as a whole.

E2.2.16 GHG emissions from the consumption of grid electricity will be calculated annually by multiplying activity data (overall annual electricity consumption) in kWh by the appropriate emissions factor for that year as published by the UK Government in its annual conversion factors dataset (Ref 2.3).

E2.2.17 For each unit of electricity consumed, there are two separate emissions factors published annually. Each of these falls within Scope 3.

- a. Emissions from generation of electricity.
- b. Emissions from transmission and distribution losses.

E2.3 Validation of Data and Calculations

E2.3.1 All emissions data produced according to the above procedure will be subject to, as a minimum, demonstrable internal peer review and validation. It is desirable for all emissions data to be subject to independent third party verification, carried out to ISO 14064-3.

E2.3.2 Any validation will cover the following areas:

- a. the process for gathering, handling and recording activity data, including data cleansing where necessary;
- b. the selection of correct emissions factors for the activity and/or fuel, and reporting year; and
- c. the algorithms used to convert activity data and emissions factor to final emissions figures, with reference to the correct use of units.

E3 Reporting Greenhouse Gases

E3.1.1 Greenhouse gases assessed according to the procedures detailed above will be reported in the annual Monitoring Report for GCG secured under paragraph 21 of **Schedule 2** to the **Draft Development Consent Order [TR020001/APP/2.01]** according to the following categories:

- a. Scope 1 and 2 Airport Operations:
 - i. Scope 2 emissions from generation of grid electricity consumed at the airport;
 - ii. Scope 1 emissions from the combustion of natural gas consumed at the airport;
 - iii. Scope 1 emissions from the combustion of liquid fuel consumed at the airport (including for on-airport fire training);
 - iv. Scope 1 emissions from the combustion of fuel used in Internal Combustion Engine (ICE) airport vehicles;
 - v. Scope 2 emissions from the generation of electricity used to charge electrically powered airport vehicles;
 - vi. Scope 1 on-airport fugitive refrigeration emissions; and
 - vii. Scope 1 emissions from usage of de-icer.

- b. Scope 3 Airport Operations:
 - i. Scope 3 emissions from generation of grid electricity consumed at the airport by tenants;
 - ii. Scope 3 emissions from transmission and distribution losses associated with grid electricity (including that used to charge electrically powered airport vehicles);
 - iii. Scope 3 emissions from the combustion of natural gas consumed at the airport;
 - iv. Scope 3 emissions from the combustion of liquid fuel consumed at the airport;
 - v. Scope 3 emissions from the combustion of fuel used in Internal Combustion Engine (ICE) airport vehicles;
 - vi. Scope 3 emissions from the generation of electricity used to charge electrically powered airport vehicles;
 - vii. Scope 3 emissions from business travel by employees of the airport operator;
 - viii. Scope 3 emissions from the processing of on-airport waste;
 - ix. Scope 3 emissions from the processing of on-airport wastewater; and
 - x. Scope 3 emissions from third party usage of de-icer.

- c. Surface Access
 - i. Passenger surface access;
 - ii. Staff surface access;
 - iii. Scope 3 emissions from generation of grid electricity consumed for the operation of the Luton DART; and

- iv. Scope 3 emissions from transmission and distribution losses associated with grid electricity consumed for the operation of the Luton DART.

- E3.1.2 Reporting will take place annually and the Monitoring Report will be submitted to the ESG.
- E3.1.3 Where offsets have been used, the following information should be provided at a minimum:
- a. Offset programme used.
 - b. Offset project type.
 - c. Project name.
 - d. Project identification number.
- E3.1.4 The airport operator should make underlying GHG data (e.g. emissions data) available on a confidential basis at the reasonable request of the Environmental Scrutiny Group or Greenhouse Gases Technical Panel.
- E3.1.5 The Monitoring Report must also include the total number of Air Traffic Movements (ATMs), the total commercial passenger throughput for the preceding calendar year (corresponding to the period covered by the Monitoring Report), and the Limits and Thresholds used for that year (i.e. Phase 1 Limit, Phase 2a Limit etc).

GLOSSARY

Term	Definition
CAA	Civil Aviation Authority
DCO	Development Consent Order
ESG	Environmental Scrutiny Group. The ESG will be established through the DCO to independently oversee operation of the GCG framework. Its membership will include an independent chair, an independent aviation expert, representatives of local authorities and an airline industry body. The ESG will have a range of powers enshrined in its Terms of Reference, that can be utilised at its discretion.
GHG	Greenhouse Gas
GCG	Green Controlled Growth
EV	Electric Vehicle
ICE	Internal Combustion Engine
ISO	International Organisation for Standardisation
LLAOL	London Luton Airport Operations Limited
Monitoring Plan	Individual plans secured through the DCO for each of the four environmental topics of the GCG Framework, setting out the monitoring and reporting requirements associated with the relevant Limits of that topic.
Technical Panel	Technical Panels will be established through the DCO for each of the four environmental topics within the GCG Framework. They will be staffed by a combination of independent experts and representatives of local authorities, in order to review information submitted by the airport operator (Monitoring Reports, Level 2 Plans, Mitigation Plans) and providing comment and recommendations to the ESG.

REFERENCES

Ref 2.1 UK Government (2022). Greenhouse gas reporting: conversion factors 2022. Online.

Ref 2.2 Ibid.

Ref 2.3 Ibid.