



HEATHROW AIRPORT CARBON FOOTPRINT METHODOLOGY DOCUMENT

2022



Heathrow



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METHODOLOGY

Context

This document explains the approach taken by Heathrow Airport Limited (HAL) in collating and reporting our 2022 carbon footprint which is published in our 2022 Annual Report and Accounts (ARA). We monitor our carbon footprint and report on our greenhouse gas (GHG) emissions annually. This helps us to identify opportunities to reduce our emissions and assess our progress in delivering our carbon reduction goals.

Data is collected and reported in a way that is fully consistent with the GHG Protocol Corporate Reporting Standard (2015)¹ and Airport Carbon Accreditation (ACA) Standard². HAL comply with the requirements of the ACA Scheme Level 4+.

Bureau Veritas UK Limited have provided external verification for the GHG emissions data used in the carbon footprint, this is recorded in their verification statement.

Scope

The GHG Protocol¹ requires organisations to report their GHG emissions under 3 scopes:

1. **Scope 1** – all direct GHG emissions from activities at Heathrow Airport under our direct control, such as HAL’s own vehicles, fuel required to heat our terminals and non-carbon emissions including refrigerant gases.
2. **Scope 2** – all indirect GHG emissions from the electricity purchased for the organisation’s owned and operated activities.
3. **Scope 3** – all other indirect GHG emissions from activities in relation to Heathrow Airport, occurring from sources that we do not own or control.

Reporting Period

Data is reported as calendar year and covers the reporting year commencing 01 January 2022 and ending 31 December 2022. The carbon footprint is required to be reported annually to be delivered for the ARA.

Reporting Boundary

Reporting is based on operations over which HAL has operational control and is aligned with the GHG Protocol¹ ‘operational control’ approach, under which a company accounts for 100% of emissions from operations over which it, or one of its subsidiaries, has control

¹ Available at: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

² Available at: <https://www.airportcarbonaccreditation.org/>



to make operational decisions. This includes operational control both at the airport and offsite – including our business parking ‘Pod’ test track and Business Support Centre (BSC).

Emission Factors

Emissions factors are sourced from the Department for Business, Energy and Industrial Strategy (BEIS) UK Government GHG Conversion Factors for Company Reporting (2022)³. These factors are updated on an annual basis. Emissions are calculated in carbon dioxide equivalent (CO₂e) and include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and hydrofluorocarbons. There are other GHGs (perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride) that are not relevant for Heathrow Airport.

The footprint includes dual reporting using location-based and market-based approaches for Scope 2 grid electricity consumption to reflect our use of a renewable electricity contract.

An alternative source is used for the emissions factor for de-icer, which is sourced from the Airport Carbon and Emissions Reporting Tool (ACERT)⁴.

Calculation Methodology

Raw activity data are collected and used with emission factors to produce the annual carbon footprint in accordance with the methodology outlined by the GHG Protocol¹.

To represent the overall airport-wide impact, the reporting of Scope 2 emissions follows the ACA guidelines in that all electricity imported on to site is captured, with metered third-party usage included in the Scope 3 emissions. Scope 3 also includes aircraft landing and take-off (LTO) cycle and cruise emissions, and surface access.

The carbon footprint emission sources covered and the associated key performance indicators (KPIs), data sources and core assumptions, are detailed in the table overleaf.

³ Available at: <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

⁴ Available at: <https://aci.aero/about-aci/priorities/environment/acert/>

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Emission Source	KPIs	Data Sources and Core Assumptions
Scope 1		
Fuel consumption utilities	tonnes CO ₂ e MWh	<p>Natural gas – data supplied as kWh based on meter readings and invoice records.</p> <p>Gas oil – data supplied as litres of fuel used based on supplier invoice records.</p> <p>Biomass – data consisted of purchased tonnage of round timber (wood pellets) and wood chip based on supplier invoice records.</p> <p>BEIS emissions factors³ applied for natural gas (gross CV – kg CO₂e per kWh), gas oil (kg CO₂e per litre) and biomass (wood pellets and wood chips – kg CO₂e per tonne).</p>
Operational vehicles and equipment	tonnes CO ₂ e MWh	<p>Data for HAL supplied from live pump tracking system as litres of fuel used per fuel type – diesel, gas oil, hydrogenated vegetable oil (HVO) and unleaded petrol.</p> <p>BEIS emissions factors³ (kg CO₂e per litre) applied for diesel (average biofuel blend), gas oil, biodiesel HVO and petrol (average biofuel blend).</p>
Refrigerants	tonnes CO ₂ e	<p>Refrigerant leakage records (kg of refrigerant lost) provided for the large Johnson Chiller units which are managed directly by HAL.</p> <p>Refrigerant leakage has been estimated from the entire group of assets based on information held on refrigerant charge and type, with assumptions on annual leakage rate applied based on a monitoring sample.</p> <p>BEIS emissions factors³ (kg CO₂e per kg) applied for refrigerant types: R134A, R22, R290, R32, R407C and R410A.</p>

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Emission Source	KPIs	Data Sources and Core Assumptions
De-icer	tonnes CO ₂ e	<p>Data supplied as total litres of de-icer taken from the automatic tank level monitoring system validated against duty reports. This therefore represents the amount removed from the tank and not what was eventually laid down. From September onwards, this figure is now generated from the on-board telematics system on HAL's spreading vehicles.</p> <p>ACERT emissions factor⁴ applied for airport surface de-icing glycol – pure undiluted.</p>
Scope 2		
Grid electricity consumption	tonnes CO ₂ e MWh	<p>Data supplied as kWh based on meter readings and invoice records, with third-party (Scope 3) consumption subtracted from the total grid electricity consumption.</p> <p>Location-based reporting – BEIS emissions factor³ for UK grid electricity generated (kg CO₂e per kWh) applied.</p> <p>Market-based reporting – supplier emissions factor used: HAL's supplier, Engie, have an emissions factor of 0 backed by their Renewable Energy Guarantee of Origin (REGO) electricity contract.</p>
Scope 1 and 2 carbon intensity		
Passenger numbers	kg CO ₂ e / passenger	<p>The intensity metric used is kg CO₂e per passenger for Scope 1 and 2 emissions.</p> <p>Passenger numbers are collated by HAL and sourced from airline records. The passenger numbers are the sum of all arriving, connecting, and departing passengers.</p>

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Emission Source	KPIs	Data Sources and Core Assumptions
Scope 3		
Passenger surface access	tonnes CO ₂ e	<p>Passenger travel data is collected through interviews of a sample of passengers – data is weighted by the total number of departing passengers to give an estimate of the total number of passengers by start point and mode across the year.</p> <p>Distances travelled were estimated using the Google Maps Distance Matrix API⁵.</p> <p>BEIS emissions factors³ (kg CO₂e per passenger km) applied for average car unknown (per km), local London bus, coach, national rail and London Underground.</p>
Colleague surface access	tonnes CO ₂ e	<p>Colleague travel data is sourced from the 2021 colleague travel survey which determined the onsite staff numbers, typical number of working days, and the start points and modes of travel. Data is scaled based on the number of active pass holders.</p> <p>Distances travelled were estimated using the Google Maps Distance Matrix API⁵.</p> <p>BEIS emissions factors³ (kg CO₂e per passenger km) applied for average car unknown fuel (per km), average motorbike (per km), local London bus, coach, national rail and London Underground.</p>
Business travel	tonnes CO ₂ e	<p>Mileage report – records of personal car miles travelled.</p> <p>Expenses report – records of employee expense claims for travel payments for public transport and taxis. Assumptions applied on cost (£) per km for each mode.</p>

⁵ Available at: <https://developers.google.com/maps/documentation/distance-matrix/overview>

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Emission Source	KPIs	Data Sources and Core Assumptions
Business travel (cont.)	tonnes CO ₂ e	<p>ClickTravel – HAL’s pre-booking system for business travel, including distance of flights (short and long haul) and train travel. Pre-paid travel cards for local public transport are also included based on assumptions on cost (£) per km for each mode.</p> <p>BEIS emissions factors³ (kg CO₂e per passenger km) applied for average car unknown fuel (per km), regular taxi, local London bus, national rail, domestic air and long-haul.</p>
Waste	tonnes CO ₂ e	<p>Waste is split between operational airport waste and construction contractor waste.</p> <p>Waste data is based on waste transfer notes and provided in tonnes of waste, by waste type and disposal destination.</p> <p>BEIS emissions factors³ (kg CO₂e per tonne) applied for waste disposal of the various waste types and disposal methods.</p>
Water	tonnes CO ₂ e	<p>Data includes the volume (m³) of water consumption and wastewater treatment based on meter readings and supplier invoice records.</p> <p>BEIS emissions factors³ (kg CO₂e per m³) applied for water supply and water treatment.</p>
De-icer	tonnes CO ₂ e	<p>Data supplied by airlines as total litres of de-icer (type I) and anti-icer (type IV) used.</p> <p>ACERT emissions factor⁴ applied for aircraft de-icing glycol – pure undiluted glycol for type IV and accounting for 35% dilution for type I de-icer.</p>

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Emission Source	KPIs	Data Sources and Core Assumptions
Operational vehicles and equipment	tonnes CO ₂ e	Data for third parties supplied from live pump tracking system as litres of fuel used per fuel type – diesel, gas oil, HVO and unleaded petrol. BEIS emissions factors ³ (kg CO ₂ e per litre) applied for diesel (average biofuel blend), gas oil, biodiesel HVO and petrol (average biofuel blend).
Construction vehicle fuels	tonnes CO ₂ e	Data was provided as total litres of diesel used per construction company. BEIS emissions factors ³ (kg CO ₂ e per litre) applied for diesel (average biofuel blend).
Third-party grid electricity consumption	tonnes CO ₂ e	Data supplied as kWh based on meter readings and invoice records for third parties. Location-based reporting – BEIS emissions factor ³ for UK grid electricity generated (kg CO ₂ e per kWh) applied. For Scope 3 reporting, market-based reporting is not included as it is not a factor that HAL can control therefore only location-based reporting is used.
Fuel consumption utilities	tonnes CO ₂ e	2021 data has been used as a proxy for 2022 due to data being unavailable. Data supplied as kWh based on meter readings and invoice records. BEIS emissions factors ³ applied for natural gas (gross CV – kg CO ₂ e per kWh).
Aircraft in the LTO cycle	tonnes CO ₂ e	Emissions are calculated using the Carbon Emissions software provided by Envirosuite which uses actual radar aircraft movement data. Auxiliary Power Unit (APU) emissions are not included in Carbon Emissions, so an uplift based on HAL's emissions inventory is applied to account for APU emissions on stand.

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Emission Source	KPIs	Data Sources and Core Assumptions
Cruise emissions from all departure flights	tonnes CO ₂ e	Emissions are calculated using the Carbon Emissions software provided by Envirosuite which uses actual radar aircraft movement data.