

Environmental Information Consultation Document (EICD)

Chapter 10: Carbon and other greenhouse gases

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10. Carbon

10.1 Introduction

- 10.1.1 As indicated within **Chapter 1: Setting the scene for consultation**, ‘carbon and other greenhouse gases’ is an environmental aspect for which information is presented to support the 2026 public consultation.
- 10.1.2 This chapter is supported by **Figure 10.1** to **Figure 10.7** and a glossary of terms.

10.2 What do we mean by carbon and greenhouse gases?

- 10.2.1 The terms ‘carbon’ and ‘carbon emissions’ are used as a shorthand way to refer to greenhouse gas (GHG) emissions. GHGs are a group of seven gases reported under international climate agreements due to their capacity to trap heat in the Earth’s atmosphere and (regardless of where they are released) contribute to global warming. These gases arise from human activities such as burning fossil fuels and so are the focus of efforts to reduce their release and thus minimise future consequences of a warming climate. The most common of these GHGs is carbon dioxide (CO₂).
- 10.2.2 Each of the GHGs has a different capacity to cause atmospheric warming, which is referred to as its global warming potential (GWP). To represent the total GWP of all seven GHGs, they are reported using a common unit, measuring their impact relative to CO₂. The common unit is therefore called carbon dioxide equivalent (CO₂e).
- 10.2.3 In reporting amounts of CO₂e, the unit of mass is used, most commonly metric tonnes of CO₂e (tCO₂e) or million tonnes (MtCO₂e).
- 10.2.4 By way of context, provisional GHG emissions reported by Government for the UK as a whole in 2025 amount to 407 MtCO₂e [1]. This total includes emissions from international aviation fuel use (36 MtCO₂e). Heathrow’s 2025 emissions, including flights were 19.4 MtCO₂e and therefore represent around 4.8% of UK GHG emissions.
- 10.2.5 Throughout this chapter, the terms carbon, carbon emissions and GHG emissions are all used interchangeably to refer to all GHG emissions. When amounts (such as tonnes, kilograms, million tonnes) of GHGs are being reported, then CO₂e is used to refer to them.

10.3 Why carbon emissions might change

- 10.3.1 The construction and operation of the Project would lead to an increase in carbon emissions. These occur across four emission categories that cover activities from the Project that directly or indirectly generate carbon emissions and therefore require assessment. The assessment considers each category individually, as well as total emissions from all categories in combination. Each category is described further below.

Construction

- 10.3.2 Construction works would require use of large quantities of construction materials such as concrete and steel. All materials and products used to construct the Project have embodied carbon, a term that refers to the release of carbon emissions during the extraction, processing and manufacture of materials and products. The materials used to construct the Project would therefore result in carbon emissions in the supply chain.
- 10.3.3 Construction works would also require use of vehicles and machinery to transport materials and workers and for construction activities on site. These vehicles (such as HGV deliveries) and plant (for example, concrete batching plant) would use fuels (like diesel or electricity) which result in the release of carbon emissions.

Airport buildings and ground operations (ABAGO)

- 10.3.4 For Heathrow to accommodate growth, the amount of energy consumed by terminals and other buildings would grow, as would the use of fuels and electricity for airport-related vehicles and equipment used to service the aircraft on the ground. Collectively, these sources of emissions are described as being from airport buildings and ground operations (ABAGO). This increase in activity may also result in an increase in carbon emissions.

Surface access

- 10.3.5 The number of passengers, workers (the latter known as colleagues) and freight movements accessing Heathrow would also rise with the Project. These would increase carbon emissions through use of fuels and power for transport, including cars, taxis and public transport. Electrification of surface transport would bring large reductions in carbon emissions, but residual emissions would remain in the short- and medium-term as the UK electricity grid decarbonises.

Air transport

- 10.3.6 The operation of the Project would result in an increase in the number of Heathrow flights which would increase carbon emissions from the use of aviation fuels, even as measures such as more efficient aircraft and lower carbon sustainable aviation fuel (SAF) are scaled up.
- 10.3.7 Changes in activity levels in all four of the categories described above all have the potential to increase carbon emissions; however, other factors would contribute to reducing emissions. The Government has committed to achieving net zero carbon emissions by 2050. As part of this commitment, efforts are being made across the economy to reduce the carbon emitted. These actions mean that, in the medium- to long-term, reductions in carbon emissions will be seen through measures such as electrification of industry and ground transport, increased development of renewable energy infrastructure, move to more efficient aircraft and a switch to sustainable fuels such as SAF. Since these actions need time to take effect, there may be short-term

increases in emissions associated with a greater number of passengers and flights at Heathrow (in comparison to emissions that would arise if Heathrow were not expanded).

10.4 Policy, legislation and guidance

- 10.4.1 The Government recently concluded its consultation on proposed amendments to the 2018 Airports National Policy Statement (ANPS), to be known once amended as the Heathrow Expansion National Policy Statement (HENPS). The Government is now considering consultation feedback, alongside the outcome of parliamentary scrutiny (once concluded), and – subject to parliamentary approval of the Government’s final form of the proposed amendments – is expected to publish the HENPS by the end of 2026. In preparing its consultation materials, Heathrow has reviewed the proposed amendments to the ANPS and is continuing to consider the potential implications of the Heathrow expansion and accompanying assessments. Where relevant, the requirements of the ANPS are referenced in this document together with any potential changes arising from the proposed ANPS amendments, recognising that current policy in the ANPS remains the starting point for the consideration of Heathrow expansion until the amendments to the ANPS have been finalised and the amended version published as the HENPS. Once this happens, Heathrow will engage with relevant stakeholders on the policy amendments as part of our ongoing programme of pre-application engagement.

Legislation and policy

- 10.4.2 In the UK, there is a wide variety of legislation, policy and guidance in place related to greenhouse gases (GHGs), as summarised in this chapter.
- 10.4.3 The primary legislation and policy that relate to the carbon assessment are the Climate Change Act [2], the national carbon budgets [3], the ANPS [4] the UK Emissions Trading Scheme (UK ETS) [5], and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) [6].
- 10.4.4 The ANPS sets the policy framework for the Project and requires that carbon emissions associated with expansion at Heathrow are assessed and mitigated to ensure that additional emissions resulting from construction and operation of the Project do not materially affect Government’s ability to meet its carbon reduction targets and carbon budgets.
- 10.4.5 The Government’s carbon reduction targets are defined by the Climate Change Act, which requires the UK to cut its carbon emissions to net zero by 2050 and ensures the UK is playing its part in responding to the Paris Agreement [7] – an international treaty that calls for global warming to be kept below 2 °C.
- 10.4.6 Carbon budgets, set every five years, limit the UK’s greenhouse gas (GHG) emissions and provide the pathway to net zero, decreasing as the UK approaches 2050. To date, seven carbon budgets have been legislated covering the period out to 2042.

- 10.4.7 The UK ETS is a cap-and-trade scheme that limits greenhouse gas emissions from covered sectors, including aviation. It applies to UK domestic flights and flights departing the UK to European Economic Area (EEA) states. The scheme requires aircraft operators to monitor, report and surrender allowances for their emissions.
- 10.4.8 CORSIA is a global scheme established by the International Civil Aviation Organization (ICAO) to address emissions from international aviation. The UK has participated in CORSIA since 2021, with qualifying aircraft operators required to monitor and report emissions and, where applicable, meet offsetting obligations. The UK has implemented CORSIA monitoring, reporting and verification requirements through UK legislation.
- 10.4.9 There are a number of other national laws, policies and strategies relevant to the Project, those that have been used within the assessment have been detailed in **Section 10.6**. The most relevant to this chapter is the Jet Zero Strategy [8]. Decarbonisation of aviation emissions is led by UK Government, and the Jet Zero Strategy is the Government's framework and plan for achieving net zero in the aviation sector by 2050. The strategy introduces a carbon emissions reduction trajectory for UK aviation, based on a 'High Ambition Scenario', with in-sector targets of 35.4 MtCO_{2e} in 2030, 28.4 MtCO_{2e} in 2040 and 19.3 MtCO_{2e} in 2050 (with residual emissions removed or offset).
- 10.4.10 The strategy proposes the introduction of the Sustainable Aviation Fuel (SAF) Mandate [9] in 2025, which has now come into force. It sets out a legal obligation for the proportion of SAF supplied to the aviation sector in the UK with a minimum of 2% in 2025. This rises to 10% in 2030 and 22% in 2040, in line with the Jet Zero High Ambition Scenario. Government is progressing the UK SAF Revenue Certainty Mechanism legislation¹ to support investment required to meet the SAF Mandate with the aim of having the full legislative framework in place by the end of 2026.
- 10.4.11 An important aspect of the Jet Zero Strategy is that the emissions trajectory for the aviation sector will be monitored on an annual basis, while the strategy itself will be reviewed every five years. This acknowledges that decarbonisation will rely on new technologies which require time to develop and test.

Guidance

- 10.4.12 A number of guidance documents and standards have been used to inform the carbon assessment. The Greenhouse Gas Protocol (GHG Protocol) [10] is an international standard followed by companies – including Heathrow Airport Limited (HAL) – in calculating and reporting their annual carbon emissions. The GHG Protocol is followed in the assessment of carbon emissions for the Project to ensure that it aligns well with our current and future carbon reporting.
- 10.4.13 The GHG Protocol categorises emissions into three 'scopes' (Scope 1, Scope 2 and Scope 3) based on whether carbon emission sources are in the control of the reporting company or not. These scopes can be summarised as follows:

¹ This legislation will set out guidance regarding guaranteed prices for the purchase of SAF from UK production facilities. This will help secure investment to build these new production plants.

- **Scope 1:** direct emissions of GHGs from plant, equipment, vehicles owned by the reporting corporate entity (for example, combustion of natural gas, vehicle fuels, and emissions of refrigerants).
- **Scope 2:** indirect emissions of GHGs associated with purchased electricity, steam, heating and cooling (purchased by the reporting corporate entity).
- **Scope 3:** other GHG emissions arising from the activities of the organisation including those associated with construction, air transport, surface access of passengers, colleagues and freight, waste, water, business travel, and energy use by tenants and third party organisations.

10.4.14 At Heathrow, we report GHG emissions by scope number as part of our annual sustainability reporting, and these will be presented in a consistent format as relevant in the Environmental Statement (ES). Our GHG reporting is also aligned to Airport Carbon Accreditation (ACA) [11] – a global carbon management standard specifically for airports. We hold Level 4+ ACA certification which requires full Scope 1, 2 and 3 emissions reporting and ACA provides guidance on emissions calculations and reporting to ensure consistency between airports.

10.4.15 Publicly Available Standard (PAS) 2080:2023 (PAS 2080) [12] provides an approach to reducing GHG emissions from buildings and infrastructure projects, including working with stakeholders, throughout the project lifecycle. It provides a common framework for managing whole life carbon when delivering infrastructure assets.

10.4.16 The approach set out in the standard will be adopted for the Project. It ensures that the whole impact of construction and operation is considered throughout the design process. This means that embedded environmental measures can be identified and tracked as we get further into the detailed design of the Project.

10.4.17 Whole life carbon assessment for the built environment 2nd edition [13] published by the Royal Institution of Chartered Surveyors (RICS) also provides guidance on a whole life approach to reducing carbon emissions within the built environment and includes reporting guidance relevant to this assessment.

10.4.18 Finally, the Institute of Sustainability and Environmental Professionals (ISEP) has published an environmental impact assessment (EIA) guide to assessing and evaluating GHG emissions [14] which provides guidance on GHG emissions assessment, environmental measures and reporting within an EIA context.

Carbon management at Heathrow

10.4.19 We consider reducing carbon emissions from our activities, and from the aviation sector as a whole, as a key priority. This is in relation to existing and proposed activities, with or without the Project. Our sustainability strategy, Connecting People and Planet [15] is based around two pillars, one of which is to work towards net zero aviation.

10.4.20 Our sustainability strategy is supported by a Net Zero Plan [16]. This is our evolving strategy for achieving net zero aviation by 2050 and sets out our targets for carbon

reductions and the measures we will implement to get there, including steps we are taking to influence our stakeholders.

- 10.4.21 Carbon emissions and progress towards Net Zero Plan targets are subject to annual monitoring and reporting and the latest 2025 sustainability report [17] reports progress on the Net Zero Plan targets. Progress is on track in terms of cutting aircraft emissions in the air. For example, approximately 191,000 tonnes of SAF were uplifted at Heathrow in 2025, saving more than 600,000 tonnes of carbon emissions from flights. SAF made up 3.1% of fuel uplifted from Heathrow in 2025, meeting its target of 3% with an aim to increase this to 11% by 2030, supported by our SAF incentive programme. By the end of 2025, our on-the-ground carbon emissions were 18% lower than 2019. However, supply chain emissions continued to rise year-on-year and are tracking 16% above 2019 levels, driven by increased capital expenditure. Ongoing improvements to data quality will better reflect the progress we are making in cutting the carbon intensity of surface access and construction activities in future.
- 10.4.22 Our Net Zero Plan includes a strategy for all of our carbon emissions, including emissions we have a large amount of control over, such as from our own buildings and assets (although these direct emissions account for less than 1% of our total carbon footprint in 2025). The plan also highlights emissions which we can influence, but which require collaboration and partnership with Government, airlines, investors and industry. We are in the process of updating this Net Zero Plan, alongside the Project, as part of its first major review and update since its publication in 2022 and further details of the Plan are provided in the Carbon Strategy Topic Paper.

10.5 Assessment summary

- 10.5.1 To assess the effect of carbon emissions resulting from the Project, carbon emissions are calculated by year from a baseline year of 2025 (the most recent year for which as emissions data exists) to 2060 (the year at which final expanded terminal capacity has been reached) for each of the four emissions categories defined in **Section 10.3**. The effect of the Project is the difference in carbon emissions between the scenario with the Project and the scenario without the Project. To establish the significance of this effect, the change in emissions is compared to carbon budgets [18] and judgments are made on the consistency of the effect with tests outlined in the Airports National Policy Statement (ANPS) [4].

Quantifying carbon emissions

- 10.5.2 To quantify carbon emissions, it is necessary to define certain activities and use pre-defined industry approaches and sources to attribute carbon emissions at annual increments (commonly referred to as greenhouse gas (GHG) factors) to these activities.
- 10.5.3 Greenhouse gas (GHG) emissions are calculated using the formula:

$$\text{Activity data} \times \text{GHG factor} = \text{GHG emissions}$$

where:

- **activity data** = a measure of the quantity of an activity, for example km travelled by a vehicle.
- **GHG factor** = a measure of the GHG emissions per unit of activity, for example kg CO₂e/km travelled.

10.5.4 Activity data depends on the specific activity being assessed and the way they are quantified, for example:

- Fuel consumption is typically quantified in litres or tonnes.
- Energy consumption is typically quantified in kilowatt hours (kWh).
- Transport activity is typically measured in kilometres travelled by vehicles or passengers.
- Construction materials and waste are quantified in cubic metres (m³) or tonnes.

10.5.5 Both activity data and GHG factors change over time. This is due to changes in demand (for example, changing numbers of passengers using Heathrow) and due to changes in the underlying policies and technologies that support an activity (such as decarbonisation of the electricity grid).

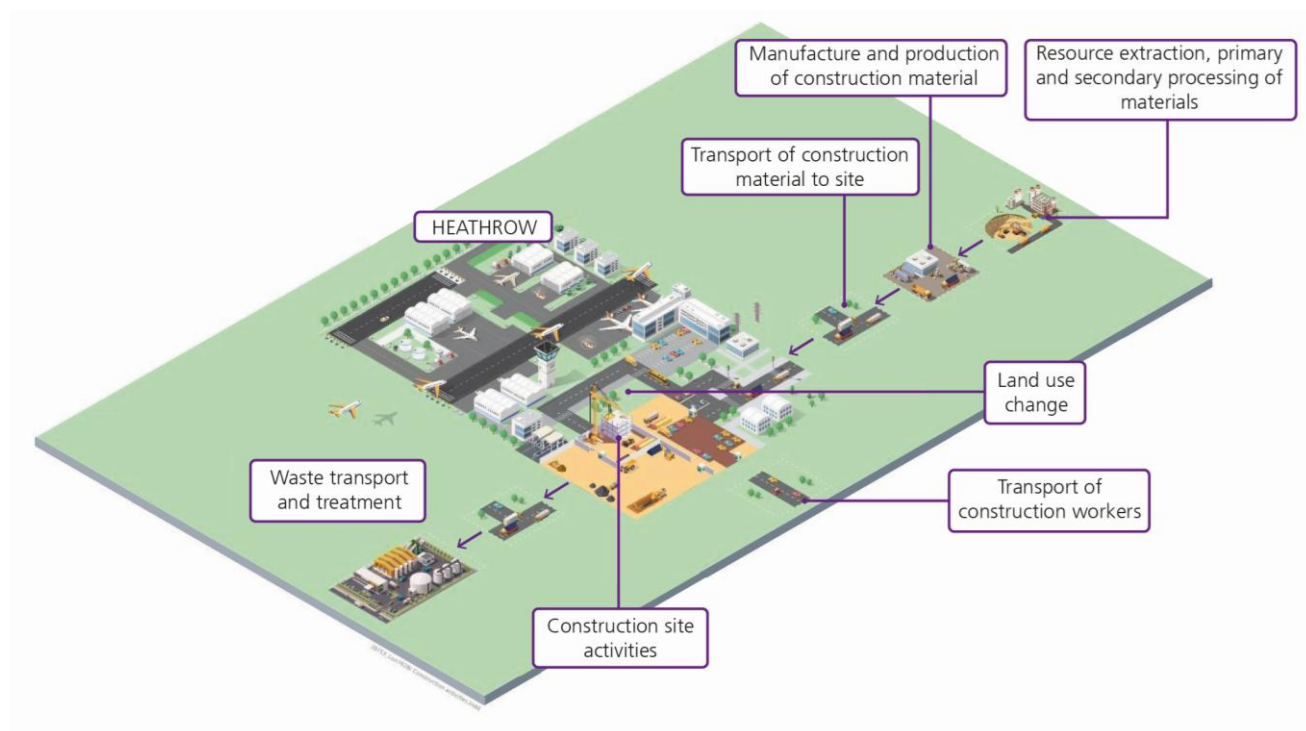
10.5.6 GHG factors are drawn from a range of national and international sources, but where available focus on forecast data and trajectories published by the Government and linked to its climate change policies, including:

- Electricity grid decarbonisation is assumed in line with HM Treasury's Green Book guidance [19].
- Surface transport decarbonisation is assumed in line with data in Department for Transport's (DfT) transport analysis guidance datasets [20].
- Air transport decarbonisation is assessed using the scenarios and assumptions set out in the DfT's 2026 UK Aviation Forecast [21].

10.5.7 As discussed in **Section 10.3**, carbon emissions are assessed in four categories. Within each category there are a number of activities which result in GHG emissions. The assessment in this chapter focuses on total emissions in each category, but details of the specific carbon emissions activities (often referred to as emissions sources) are defined in the following sections.

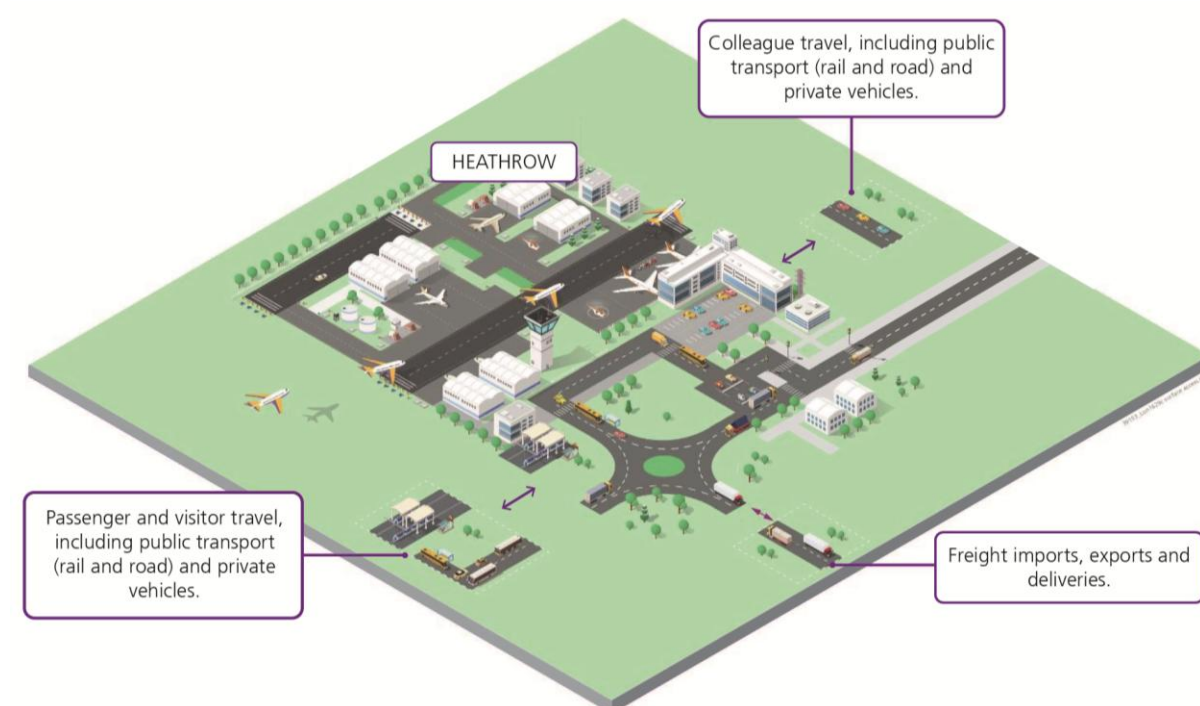
10.5.8 Construction – the emissions arising from the construction of the Project, including embodied carbon in materials, construction transport and fuel and energy use on the construction sites, as illustrated in **Figure 10.1**.

Figure 10.1: Typical construction activities



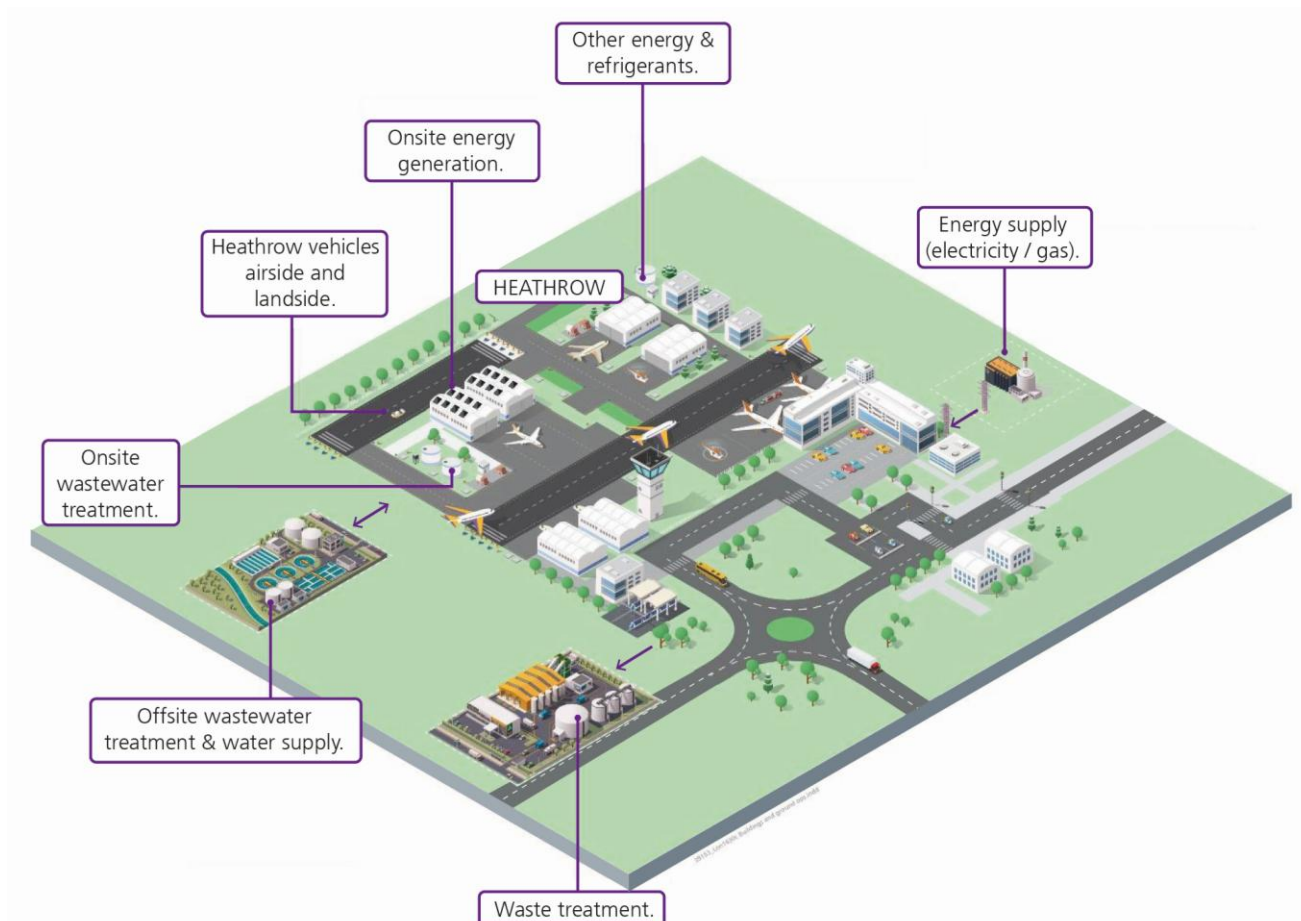
10.5.9 Airport buildings and ground operations (ABAGO) – the emissions arising from fuel and energy use for buildings (including terminals, offices, hangars and other ancillary structures), infrastructure and operations by Heathrow and third parties as illustrated in **Figure 10.2**.

Figure 10.2: Airport buildings and ground operations (ABAGO) activities



10.5.10 **Surface access** – the emissions arising from the movement of passengers and colleagues to and from Heathrow. This also includes the movement of cargo to and from the freight forwarding sites local to Heathrow, as shown in **Figure 10.3**.

Figure 10.3: Surface access activities



10.5.11 Surface access emissions were calculated for passengers and colleagues using data from a suite of detailed surface access transport models described in **TICD Part 2: How we have appraised the surface access implications of Heathrow expansion** which provides the transport modelling used to estimate surface access emissions. These provide data on the number of passenger and colleague movements to and from the airport from a comprehensive range of national locations. Road freight movement forecasts have informed the freight calculations, based on projected volumes of cargo handled at Heathrow.

10.5.12 **Air transport** – the emissions arising from aircraft at the airport, including the landing and take-off (LTO) cycle and climb, cruise and descent (CCD) phases of flight, as well as emissions from aircraft on stand (which includes auxiliary power unit (APU) use), as shown in **Figure 10.4** and **Figure 10.5**.

Figure 10.4: Air transport landing and take-off activities

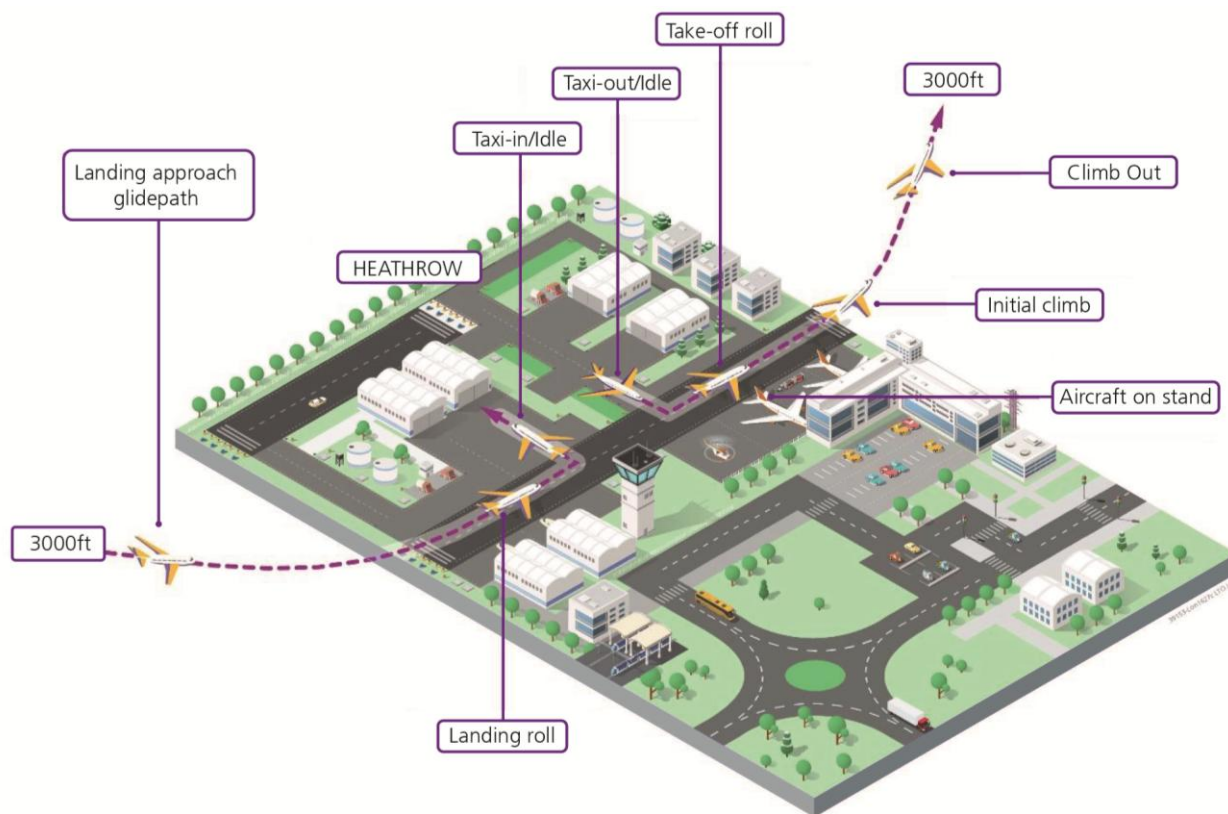
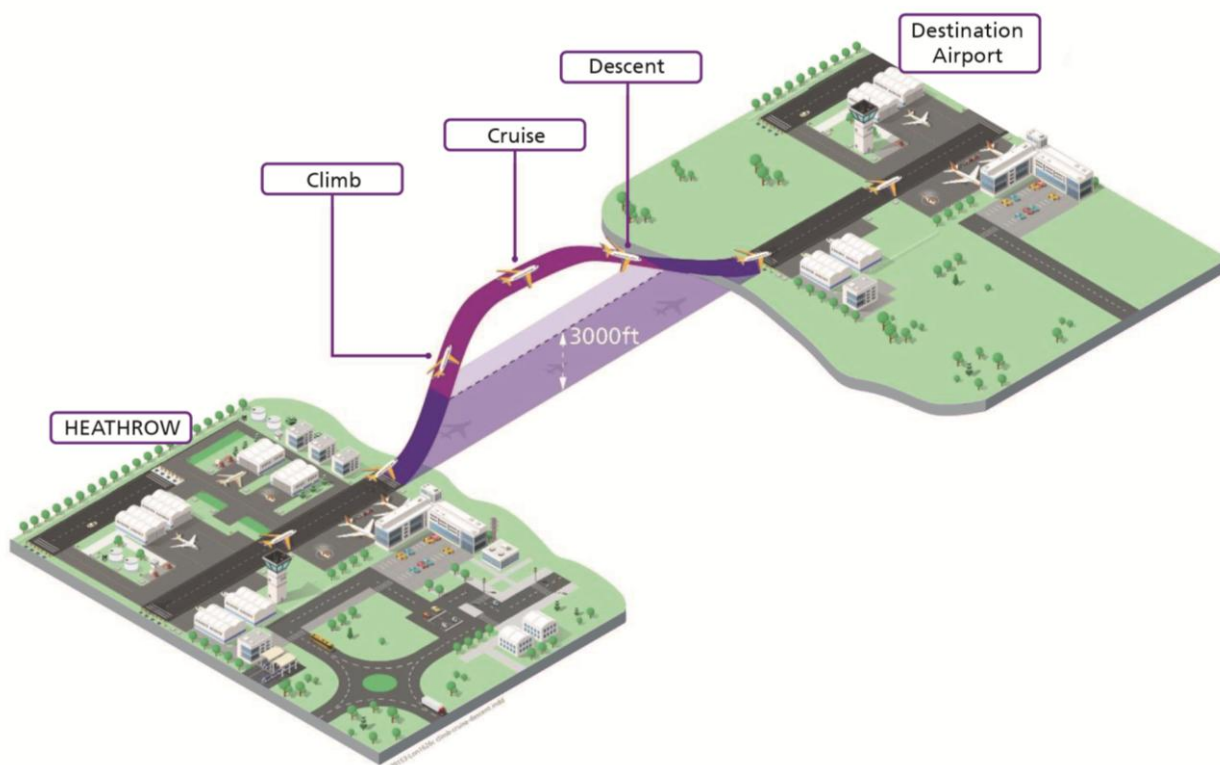


Figure 10.5: Air transport climb, cruise and descent activities



- 10.5.13 While we continue to develop and test our own flight forecasts and future operational scenarios in detail in preparation for the Project DCO application and supporting EIA, air transport emissions have been assessed using the 2026 DfT forecasts [21]. The DfT forecasts provide the latest evaluation of the assessment of future air transport emissions in the UK.
- 10.5.14 In the recently published draft HENPS the government has indicated a requirement to assess the carbon emissions of Heathrow expansion at a UK aviation system level (in addition to the effect of Heathrow alone). Assessing emissions at a UK aviation system level allows the assessment to take account of displacement. Displacement means flights which, if Heathrow were not to expand, would occur at other airports instead. While we work to develop the forecasts and approaches necessary to evaluate the system-wide carbon impacts, we have used DfT's assessment to inform this consultation chapter.
- 10.5.15 All reporting in this chapter has followed best practice guidance as set out in the GHG Protocol and related guidance. This ensures it is consistent with the existing reporting that we undertake, and with national reporting of carbon budgets that has been used in the assessment of significance of effects of the Project. This approach is detailed in **Section 10.7.36**, and will also be adopted for the Environmental Statement (ES).

10.6 Baseline

- 10.6.1 We report our carbon emissions annually by tracking progress against our own net zero targets and identifying opportunities for improvement. Our latest (2025) carbon emissions are presented in our sustainability report [17].
- 10.6.2 Our reporting follows the Greenhouse Gas (GHG) Protocol discussed in **Section 10.4**. Heathrow's total carbon emissions for 2025 were 19.4 MtCO_{2e}, and these emissions provide a baseline from which effects of the Project can be understood. Almost 96% of these emissions relate to Air Traffic Movements, as shown in **Table 10.1**.

Table 10.1: Heathrow's 2025 carbon emissions by assessment category

Assessment category	Emissions sources	Carbon emissions (MtCO _{2e})	% of total emissions
Air transport	Figures 12-1 and 12-2	18.6	95.6%
Surface access	Figure 12-3	0.5	2.6%
ABAGO	Figure 12-4	0.05	0.3%
Construction	Figure 12-5	0.3	1.5%
Total		19.4	100%

Environmental measures

- 10.6.3 The Airports National Policy Statement (ANPS) [4] expects Heathrow to take measures to avoid and reduce carbon emissions associated with the construction and operation of the Project and acknowledges that implementation of measures to do so may require working with partners.
- 10.6.4 As indicated in **Chapter 1: Setting the scene for consultation – environmental information**, there are robust measures for management of carbon emissions, including:
- Project design embeds measures to enable efficient airfield operations, deliver energy efficient buildings and assets and low carbon heating strategy.
 - Environmentally managed growth (EMG) framework: the EMG framework includes four key environmental topics – noise, air quality, surface access and carbon – and is designed as a control mechanism to limit the environmental impacts of expansion. EMG proposes to include our carbon emissions on the ground. Further details are included in the Environmentally managed growth topic paper.
 - Draft Code of Construction Practice (CoCP): details of how construction activities would be managed to avoid and reduce carbon emissions are included in the draft CoCP.
 - In addition, this consultation document (EICD) is supported by a Carbon strategy topic paper which describes the overarching strategy for carbon management of the Project and explains how carbon management measures, including the Environmentally managed growth topic paper and the draft CoCP, are integrated.

Assessment approach

- 10.6.5 There is no statutory guidance for the assessment of significance of carbon and GHG effects. It is generally adopted practice to follow guidance published by the Institute of Sustainability and Environmental Professionals (ISEP) to help define significance of effects. This is the approach that will be undertaken in the Environmental Statement (ES).
- 10.6.6 The ISEP guidance [14] advises that the carbon impact of any project which contributes more than 5% to any of the UK's national carbon budgets [3] is likely to be significant. Below this threshold, the effects of a project's GHG emissions are not automatically considered to be not significant, but an assessment must be made of the ability of the project's emissions to align with net zero, taking account of the compliance of the project with current and emerging policy and the measures introduced by the project to avoid and reduce its carbon emissions (including alignment with ANPS requirements).
- 10.6.7 In this chapter, an assessment of the significance of carbon and GHG effects has been undertaken using the following three-step approach:
- **Step 1:** assess whether the change in carbon emissions from the project contributes more than 5% to a national carbon budget. If so, then the effect is likely to be significant, where Steps 2 and 3 are still undertaken for completeness.

- **Step 2:** Contextualise the carbon emissions using a relevant net zero compatible decarbonisation pathways (see **Table 10.2**).
- **Step 3:** Apply an evidence-based assessment, taking account of the significance of any change in emissions considering the contextualisation (Step 2) and the measures adopted by the Project to reasonably reduce any increase in emissions. For example, if the measures adopted to minimise carbon emissions are considered to be best practice, then this would influence the assessment of significance.

10.6.8 The net zero compatible pathways used in the assessment (see **Table 10.2**) in this chapter draw from the DfT and the Climate Change Committee (CCC). The CCC is an independent advisor to the Government on climate change and provides recommendations on carbon budgets and an assessment of viable pathways by which UK emissions can meet the carbon budgets and achieve net zero by 2050. It is important to note that while the Government has adopted the carbon budgets (that is, the amount of GHG emissions in each five-year period) via legislation, it does not formally adopt the CCC's recommended pathway, which remains the CCC's recommendation rather than policy.

Table 10.2: Net zero compatible emissions pathways used for assessment (Step 2)

Emissions Category	Pathway used for assessment	Rationale
Construction	CCC Seventh Carbon Budget: industry balanced net zero pathway (industry).	The industry sector balanced pathway provides a net zero compatible trajectory consistent with the production of construction materials and non-road mobile machinery used in construction.
Air transport	DfT 2026 UK Aviation Forecast Technology Development scenario	Provides the latest DfT forecasts for UK aviation activity and emissions and reflects the assumptions used in the DfT aviation modelling
Surface access	CCC Seventh Carbon Budget Balanced Pathway, surface transport sector	Represents a net zero-compatible trajectory for total UK surface transport emissions, to which Heathrow's surface access emissions contribute.
ABAGO	CCC Seventh Carbon Budget: Non-Residential Buildings Balanced Net Zero Pathway (airport buildings); CCC Seventh Carbon Budget: Surface Transport Balanced Net Zero Pathway (ground operations)	The non-residential buildings net zero pathway is relevant to the new terminal facilities and related buildings. The surface transport balanced pathway provides a net zero compatible trajectory consistent with ground support equipment.
Whole Project emissions	CCC Seventh Carbon Budget Balanced Pathway [18]	Provides an up-to-date net zero-compatible trajectory for all UK terrestrial GHG emissions.

10.6.9 The assessment of significance is binary. The effects are therefore either judged to be significant or not significant.

Airports National Policy Statement (ANPS) test

10.6.10 In addition to the assessment of likely significant effects, this chapter also includes an assessment of the compliance with the key test set by the ANPS [4] relevant to carbon and GHG emissions. The test is described at paragraph 5.82 of the ANPS:

“Any increase in carbon emissions alone is not a reason to refuse development consent, unless the increase in carbon emissions resulting from the project is so significant that it would have a material impact on the ability of Government to meet its carbon reduction targets, including carbon budgets.”

10.6.11 This chapter therefore considers the emissions in relation to the Government’s carbon reduction targets, which include the currently legislated carbon budgets and the 2050 net zero target set by the Climate Change Act. The assessment considers whether additional carbon and GHG emissions from the project would materially affect these targets.

10.7 Assessment results

10.7.1 The assessment presented in this chapter is based on the assumption that 2035 is the earliest possible date for runway opening. This reflected the Government’s stated ambitions at the time the assessment modelling commenced.

10.7.2 Since commencing our assessment, further work has indicated that a later runway opening date in the late 2030s is more achievable. This would affect the timing and profile of emissions across the assessment period. For aircraft emissions, undertaking the assessment using an earlier runway opening date is considered to capture the reasonable worst-case effects that can be predicted at this stage, particularly given the precautionary approach taken for the EICD, although the effects would arise later if the runway opens later.

10.7.3 The Environmental Statement supporting the DCO application will present an assessment based on the updated delivery programme.

Construction

10.7.4 An initial assessment of carbon emissions from construction has been completed. This takes into account the current design information available for consultation as described in **Chapter 2: Description of the project**.

10.7.5 The Project would be constructed over a period of approximately 25 years. Emissions from construction materials, transport and site works would vary during this time depending on the amount of construction activity being undertaken as well as the effect of the economy and construction sector decarbonising as the UK progresses to the net zero target date of 2050.

10.7.6 Given the length of the overall construction programme not all years of activity fit within the UK carbon budgets currently set in law (since the Seventh Carbon Budget period ends in 2042).

- 10.7.7 A guide as to the scale of construction emissions at this initial stage considers the period of highest construction activity in the works programme within legislated UK carbon budgets.
- 10.7.8 The peak for construction activities is associated with construction of the Northwest Runway. This is forecast to be within the Sixth Carbon Budget period (from 2033 to 2037) and is also in the early stages of the Project when emissions from the industry and transport sectors are expected to be higher than they will be in the late 2030s and beyond.
- 10.7.9 At this stage, the assessment has focused on establishing the peak construction emissions which are predicted to occur in 2033. These are provided in **Table 10.3**.

Table 10.3: Construction emissions (2033 peak year activity)

Assessment category	Greenhouse gas emissions (MtCO ₂ e)
Construction material	0.35
Construction plant and equipment activities	0.18
Transport of materials and workers to site	0.10
Transport of soil, demolition and construction waste	0.01
Total	0.64

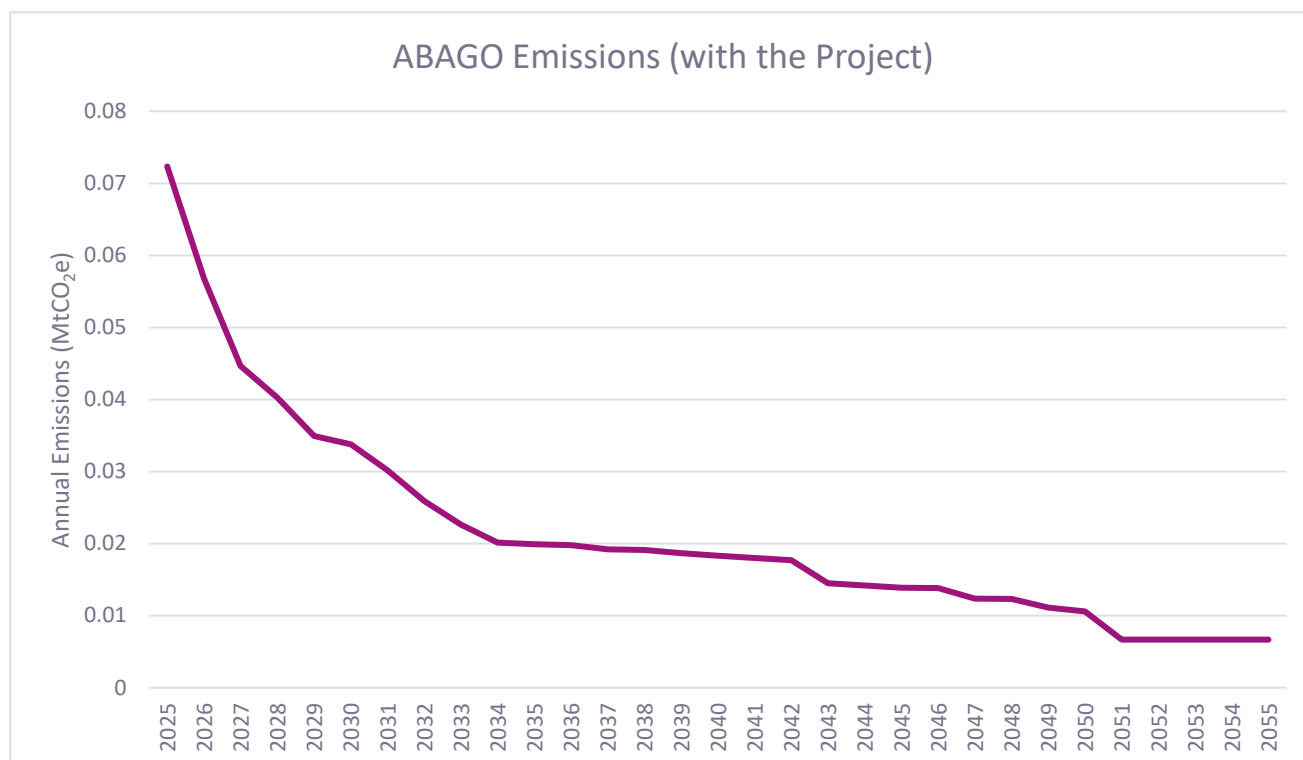
- 10.7.10 The peak construction year is forecast to be within the Sixth Carbon Budget period from 2033 to 2037. The total budget for the five-year period is 965 MtCO₂e, which is an annualised average of 193 MtCO₂e. This would mean that peak construction activity emissions would make up around 0.3% of the annualised Sixth Carbon Budget, well below 5%. Using the peak construction emissions for the purposes of comparison provides a means of understanding the largest impact across the entire construction period.
- 10.7.11 The CCC Seventh Carbon Budget Balanced Pathway shows how UK industry sector emissions can fall in line with a net-zero compliant trajectory to net zero by 2050. This pathway directly relates to the production of construction materials and emissions from construction plant and machinery (the main contributions to construction emissions as shown in **Table 10.3**) and provides a net zero compatible route to reducing the carbon associated with construction of the Project.
- 10.7.12 To align with national decarbonisation of industry and construction sectors, the draft Code of Construction Practice (CoCP) sets out a framework of measures to manage carbon emissions during the construction programme. This would include a requirement for individual contractors to develop carbon management plans specific to each scope of works being undertaken. In addition, Heathrow are aligned to the Publicly Available Standard (PAS) 2080:2023 (PAS 2080) carbon management standard which ensures carbon emissions are managed from design to completion and operation of all buildings and infrastructure.

- 10.7.13 Design work continues to refine the quantities of materials required for the construction works, but also the detail of the programme of works to seek efficiency in site activities and associated movement of materials, staff and equipment. A full emissions profile for the construction programme will be presented in the Environmental Statement (ES).
- 10.7.14 The greatest effects arising from the construction works relate to the embodied carbon of materials used and the energy used by plant equipment in construction activities. The initial analysis here has focused on the forecast largest single-year impacts. While the contribution to total carbon budgets in the peak year would be small, the construction programme would be spread over approximately 25 years and the cumulative emissions and contribution to industrial sector emissions are large. Construction emissions are therefore assessed as **significant**.

Airport buildings and ground operations (ABAGO)

- 10.7.15 In the scenario without the Project there will be decarbonisation of energy use in buildings and the airside vehicle fleet across Heathrow aligned with our Net Zero Plan. In practice, this means phasing out of fossil fuel use with increased use of electricity.
- 10.7.16 In the scenario with the Project, there would be an increase in airport energy demand, airside vehicle fleet, water consumption and waste generation, but airport buildings and ground operations (ABAGO) emissions can still decarbonise and reach net zero in the same timeframes as without the Project.
- 10.7.17 All new buildings within the Project would be free of fossil fuel use. This means that future energy demand would be for electricity, and associated carbon emissions are therefore tied to wider targets to achieve an operational net zero national electricity grid.
- 10.7.18 Fuel use by airside vehicle fleets is reducing as the fleet electrifies and much of the non-electric fleet uses biofuels. The introduction of an airside ultra-low emission zone helps increase the proportions of electric vehicles and the Project allows deployment of additional electric vehicle infrastructure to further progress towards full electrification. A residual portion of ground support equipment is more specialist in nature and therefore likely to be difficult to decarbonise in the short- to medium-term.
- 10.7.19 Water demand within the Project would rise to meet increasing demand from passengers. Given the energy use in the supply and treatment of water is predominantly electricity, future emissions are tied to the wider national decarbonisation of the electricity grid.
- 10.7.20 Waste management on site will continue to look to minimise the scale of waste arising from activities at Heathrow and increase the amount of waste which is recycled.
- 10.7.21 Future ABAGO emissions (with the Project) are summarised in **Figure 10.6**.

Figure 10.6: With the Project ABAGO emissions



10.7.22 The additional ABAGO emissions from the Project contribute less than 0.1% of any of the UK carbon budgets. The contribution of the Project to currently legislated carbon budgets is therefore well below 5%.

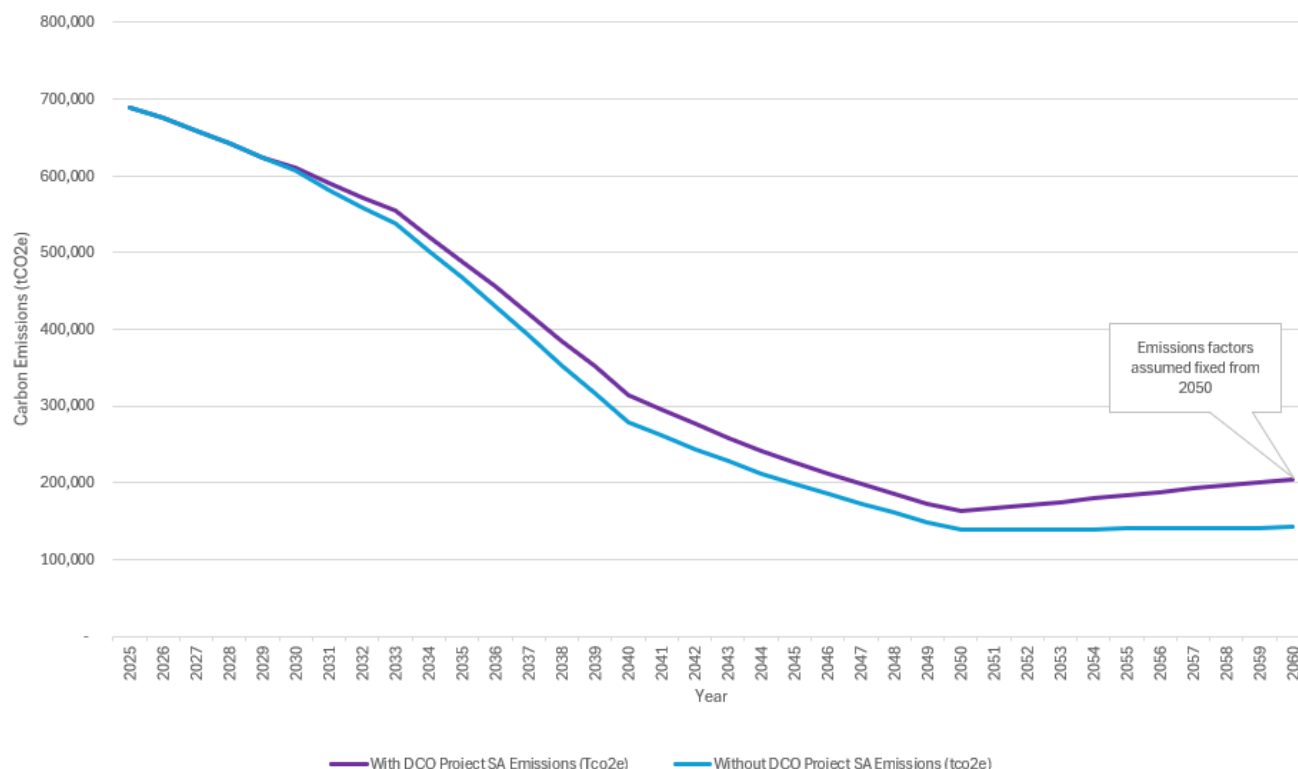
10.7.23 The Net Zero Plan applies with or without the Project and is in the process of being updated in line with current Project plans. Measures delivered as part of the Project and within the Net Zero Plan can support ABAGO emissions (with the Project) reaching net zero by at least 2050.

10.7.24 On this basis, taking account of the Project's small contribution to the UK carbon budgets, alignment with the relevant net zero pathway and the measures set out in the Net Zero Plan, the effect of ABAGO carbon emissions is **not significant**.

Surface access

10.7.25 The results of the assessment of carbon and greenhouse gas (GHG) emissions from surface access are presented in **Figure 10.7**. The results for both situations (with and without the Project) include emissions from passenger and colleague travel, and freight.

Figure 10.7: With and without the project surface access emissions



- 10.7.26 The emissions with the Project (purple line) rise above the emissions without the Project (grey line) from the early-2030s resulting from additional passenger, colleague and freight movements. There is a steady rate of passenger and freight growth expected from modelled runway opening in the mid-2050s, which means there are no large step changes in surface access emissions. Overall, total carbon emissions in both the with and without the Project scenarios see a steady reduction over time due to decarbonisation of surface transport.
- 10.7.27 The modelling takes account of measures set out in the Transport Information Consultation Document (TICD) **Part 3: Our emerging surface access strategy for Heathrow expansion** to increase the proportion of passengers and colleagues using sustainable transport (walking, wheeling, cycling, bus and rail) to access Heathrow. This reduces carbon emissions as sustainable transport typically has lower carbon emissions per person than private road vehicles.
- 10.7.28 In addition, the modelling accounts for national and regional level transport decarbonisation measures, including the progressive electrification of road vehicles, and decarbonisation of rail travel through increased use of renewable energy to power rail services. These are not specific to the Project.
- 10.7.29 The additional surface access emissions from the Project contribute less than 0.04% of any of the UK carbon budgets. The contribution of the Project to currently legislated carbon budgets is therefore well below 5%.
- 10.7.30 Surface access emissions with the Project are seen to grow relative to the without the Project scenario but are still capable of decarbonising in line with the net zero

pathway, driven by national and transport-sector efforts to decarbonise surface transport. The contribution of the Project to the CCC's surface transport pathway is small (around 2% by 2050) and remain a minor contribution to the overall surface transport sector emissions with or without the Project.

- 10.7.31 In summary, the Project's surface access carbon emissions represent a small contribution and can decarbonise in line with a net zero compliant trajectory. The effect of surface access carbon emissions is therefore **not significant**.

Air transport

- 10.7.32 The DfT has recently published updated air transport carbon emissions forecasts [21]. These include projections for air transport emissions at a UK system level with and without Heathrow out to 2050 and beyond.
- 10.7.33 The DfT's assessment of the net system impact of Heathrow expansion over different carbon budget periods is summarised in **Table 10.4**. The DfT has considered a number of scenarios, of which two core scenarios are presented in **Table 10.4**; the Current Trends scenario which is aligned to UK aviation sector carbon policies currently in place, and the Technology Development scenario, which is aligned to government's strategic aviation carbon policy ambition.

Table 10.4: DfT Assessment of net system impact of Heathrow Expansion on carbon budgets

UK Carbon Budget period	Million tonnes CO ₂ e		Percentage impact on Carbon Budget	
	Current Trends scenario	Technology development scenario	Current Trends scenario	Technology development scenario
Carbon Budget 6 (2033-2037)	-0.6	-0.3	-0.06%	-0.03%
Carbon Budget 7 (2038-2042)	2.2	2.1	0.41%	0.39%
Carbon Budget 8 (2043-2047)	4.6	2.5	N/A	N/A

Note: It is not possible to calculate the % impact on Carbon Budget 8 as this carbon budget has not yet been defined.

- 10.7.34 Reference to **Table 10.4** shows that the net system impact of the Project would be a small net benefit during the 6th Carbon Budget. This means that it is forecast that UK aviation emissions would grow at a slightly slower rate at a UK level while the third runway is being constructed than if the Project was not to come forward at all. After this time, in the 7th and 8th Carbon Budget periods (and beyond), the impact of the Project is an increase in overall emissions, reflecting the additional flights serving Heathrow as a result of expansion.

10.7.35 While the impacts in the 6th, 7th and 8th Carbon Budget periods are shown in **Table 10.4**, Heathrow is forecast to continue its growth beyond the 8th Carbon Budget and into the 2050s. There are no carbon budgets or other benchmarks against which to assess emissions beyond 2050, but additional carbon emissions will occur as a result of the Project in this period. Total air transport emissions resulting from the Project are large and as such, it is anticipated that the effect of air transport carbon emissions will be **significant**.

Arrival flight emissions

10.7.36 The air transport emissions presented in **Table 10.4** include the impact of domestic flights and international flight departures only. In other words, the emissions from flights departing Heathrow and other UK airports for other international airports is included, but the emissions from flights arriving at Heathrow and other UK airports from other international airports is not. This is because it is agreed internationally that each nation/state should account only for outbound emissions from aviation and shipping to avoid double counting in the sector. Only outbound flight emissions are included in UK carbon budgets.

10.7.37 Arrival flight emissions will be fully quantified and presented in the final Environmental Statement (ES) for completeness.

Whole Project

10.7.38 Air transport and construction carbon emissions are assessed as significant. The effect of the whole Project carbon emissions is therefore also **significant** in environmental impact assessment (EIA) terms.

Airports National Policy Statement (ANPS) test

10.7.39 The Airports National Policy Statement (ANPS) makes clear that an increase in carbon emissions is not a reason to refuse development consent, provided the emissions do not materially affect the Government's climate targets and carbon budgets (see **Section 12.5(h)**).

10.7.40 Emissions from ABAGO will be reduced to net zero by 2050 as part of our Net Zero Plan, with or without the Project, and embedded measures in the Project design assist on this journey.

10.7.41 Emissions from construction will peak early in the Project and are forecast to decarbonise in line with the UK industry sector and managed via measures adopted through the draft CoCP.

10.7.42 Emissions from surface access can decarbonise in line with the UK surface transport sector and measures implemented through the Environmentally Managed Growth topic paper and T1CD **Part 3: Our emerging surface access strategy for Heathrow expansion** will support this.

10.7.43 Air transport emissions are the predominant contributor to Heathrow's overall carbon emissions. The UK Government has a number of policy levers it can use in

managing emissions in the aviation sector so they do not exceed the sectoral pathway set out in the Jet Zero Strategy, enabling it to meet its carbon budgets and 2050 net zero commitments. This is the case with or without the Project.

10.7.44 These levers include the Sustainable Aviation Fuel (SAF) Mandate, the carbon cap set within the UK Emissions Trading Scheme, as well as policies to incentivise development of markets for GHG removals and increase UK SAF supply. Any policy changes required would be identified through the Jet Zero Strategy's five-year review cycle and ensure that the UK's aviation emissions remain consistent with the trajectory.

10.7.45 Our assessment has concluded that from an EIA perspective, and based on ISEP guidance, the effect is significant. However, this does not imply the Project would result in an increase in carbon emissions that would materially affect the Government's ability to meet its carbon budgets. The carbon budgets apply to the whole economy, not to specific sectors within it and in this respect government has policy levers available, such as the UK ETS to it to ensure its carbon budgets are met.

10.7.46 Therefore, it is concluded that the increase in emissions will not materially affect the ability of UK Government to meet its climate targets.

10.8 Summary of likely significant carbon effects

10.8.1 The initial assessment of significance is summarised in **Table 10.5**.

Table 10.5: Assessing significance of effects

Emissions Category	Significance	Rationale
Construction	Likely significant	Peak emissions <0.4% of carbon budget. However, length of programme of works means likely significant cumulative emissions.
Air transport	Likely significant	Additional air transport emissions as a result of the Project are expected out to and beyond 2050, which in aggregate are likely to be significant.
Surface access	Not significant	Project emissions small in context of sectoral emissions (circa 0.5-1%) and align to net zero pathway.
Airport buildings and ground operations	Not significant	Additional emissions small (<0.1% of carbon budget).
Whole Project	Likely significant	Air transport and construction effects significant.

10.9 Next steps and preparation of the Environmental Statement (ES)

Greenhouse gas (carbon) emissions

- 10.9.1 In developing the Environmental Statement (ES), Heathrow will calculate air transport emissions for the Project on both a gross (Heathrow only) and net (UK aviation system) basis using our own forecasting methodology including refining the environmental measures. The assessment approach will evolve and be guided by the emerging Heathrow Expansion National Policy Statement (HENPS) as it moves from consultation to publication. The Department for Transport (DfT) is also anticipated to publish an update to its Jet Zero Strategy early in 2027 and this will be taken into account in the assessment within the final ES.
- 10.9.2 The input data to the carbon assessment is all subject to revision as the design development evolves working towards Development Consent Order (DCO) submission. The final ES will present data from the final suite of input information, models and forecasts.
- 10.9.3 The assessment will also evolve to align with a detailed update to our Net Zero Plan, which is being developed alongside the Project, as described in the Carbon Strategy topic paper.
- 10.9.4 The carbon emissions reported in this Environmental Information Consultation Document (EICD) exclude Scope 3 well-to-tank emissions. These are the emissions associated with the extraction and refining of diesel and petrol fuels used for surface access of passengers, colleagues and freight. Further assessment and analysis of Scope 3 well-to-tank emissions will be included in the ES, including the proportion of these which contribute to UK carbon budgets.
- 10.9.5 As indicated within the Blue and Green Infrastructure (B&GI) topic paper, the Project includes a range of works which would act to remove existing natural habitats and vegetation features, but would also introduce an extensive package of habitat creation and enhancement measures. The ES will seek to quantify carbon emissions and removals from natural habitats including woodland, taking into account relevant guidance. These emissions or savings would be very small in the context of the Project's overall emissions, but would be quantified in direct response to scoping opinion requirements.

Non-CO₂ impacts

- 10.9.6 Non-CO₂ impacts are specific to aviation and relate to the 'additional' climate forcing impacts of aviation at altitude, from nitrogen oxides (NO_x), aerosols, particles and water vapour emissions and effects due to contrails and induced cloudiness. These impacts include a mixture of both warming and cooling, but which overall lead to additional atmospheric warming.

- 10.9.7 In the scoping opinion (ID 3.3.2), the Planning Inspectorate acknowledges that this is an emerging field and that there are currently no established methods to quantitatively assess non-CO₂ impacts, but requests that the applicant seeks to develop an appropriate and credible methodology to assess non-CO₂ impacts, in agreement with the relevant stakeholders.
- 10.9.8 The approach to non-CO₂ effects will be developed further for the ES in consultation with stakeholders, taking into account any policy direction included in the final HENPS, once published.

10.10 Glossary of terms

Acronym	Definition	Explanation
ABAGO	Airport buildings and ground operations	Greenhouse gas emissions that come from running the airport terminals and everyday activities on the ground.
ANPS	Airports national policy statement	The Government policy framework governing major airport expansion applications and their carbon limits.
APU	Auxiliary power unit	An on-board aircraft engine used to provide electricity and cooling while parked on the ground.
ATM	Air traffic movement	A single commercial flight taking off or landing at the airport.
B&GI	Blue and green infrastructure	A network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of delivering a wide range of environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity.
CCC	Climate Change Committee	An independent expert group that advises the UK Government on climate policy and carbon emission targets (carbon budgets).
CCD	Climb, cruise and descent	The main parts of a flight once the plane leaves the airport area including climb to high altitude, flying at high altitude, and descent to the destination airport.
CCS	Carbon capture and storage	The process of trapping waste carbon dioxide from emission sources and securing it permanently underground.
CMS	Carbon management standard	A standard mandated by Heathrow that suppliers must follow to capture, report, and minimise carbon impacts.
CO₂	Carbon dioxide	The most common greenhouse gas produced by human activity and burning fossil fuels.
CO₂e	Carbon dioxide equivalent	A standard metric unit used to compare the relative warming impact of different greenhouse gases against CO ₂ .
DCO	Development Consent Order	The Governmental planning regime used for consenting nationally significant infrastructure projects in the UK.
Draft CoCP	Draft Code of Construction Practice	A draft document that details how the construction process will be managed to avoid and reduce carbon emissions.
EIA	Environmental impact assessment	A detailed study that evaluates the potential environmental effects of a proposed project before granting development permission.
EICD	Environmental information consultation document	This is a document published during the planning stages outlining all current environmental findings.

Acronym	Definition	Explanation
EMG	Environmentally managed growth	A system to monitor and manage the airport's environmental impacts (like carbon) alongside airport expansion.
EU ETS	European Union Emissions Trading Scheme	A UK carbon market that requires companies to trade allowances to limit the total carbon emissions they emit.
EV	Electric vehicle	A car, van, or other vehicle that runs purely on electric batteries instead of petrol or diesel.
GHG	Greenhouse gases	A group of gases (including carbon dioxide and methane) that trap heat from the sun and cause global warming.
GWP	Global warming potential	A score given to a greenhouse gas to show how much heat it traps in the atmosphere compared to carbon dioxide.
ISEP	Institute of Sustainability and Environmental Professionals	A professional institute that sets standards for professionals working in the environmental and sustainability fields.
kWh	Kilowatt hour	The standard unit to measure electrical consumption across airport facilities and equipment.
LTO	Landing and take-off	The specific parts of a flight that includes the aircraft arriving and leaving the airport as well as taxiing on the runway up to 3,000 feet.
MtCO₂e	Million tonnes of carbon dioxide equivalent	A unit of measures for large volumes of carbon.
NO_x	Nitrogen oxides	Exhaust gases from aircraft engines that contribute to air pollution and add to global warming.
SAF	Sustainable aviation fuel	Alternative jet fuel made from sustainable materials like cooking oil or household waste instead of traditional jet fuel.
UK ETS	UK Emissions Trading Scheme	The UK's own carbon trading system, sets a limit on emissions and governs the trading of carbon emission allowances.
WTT	Well-to-tank	The carbon released while drilling, refining and transporting a fuel before it is used in an engine or burned.
ZEA	Zero emission aircraft	Future aircraft designs that produce zero carbon pollution when they fly, including hydrogen or electricity powered aircraft.

10.11 References

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