Gardens Libraries & Museums
UNIVERSITY OF OXFORD

GLAM Environmental Sustainability

Annual Report for 2023/24

Overview and introduction

This paper provides a summary update on progress toward Gardens, Libraries, and Museums (GLAM) environmental sustainability goals—net zero carbon and biodiversity net gain by 2035—– in line with the University of Oxford's sustainability strategy.

The start of the financial year 2023–24 saw the successful completion of the Ashmolean Museum's pilot with 3Adapt to build a carbon net zero strategy for the museum. The remainder of 2023–24 focused on extending the pilot to the remaining five units within GLAM and the GLAM Divisional Office, again supported by 3Adapt. The wider GLAM efforts established a carbon baseline for 2021–22 and developed decarbonization scenarios. These scenarios were reviewed with colleagues in each GLAM unit through a series of mini-workshops. The outputs from the workshops were used to create local implementation plans. All outputs were then consolidated into a final GLAM net zero strategy report, providing a clear pathway and actions to reduce GLAM's carbon footprint.

In February 2024, GLAM created and recruited for a new role, the GLAM Environmental Sustainability Manager, further demonstrating the division's commitment to supporting the University's environmental agenda.

Many of the required carbon reduction actions are common across GLAM. Consequently, the GLAM Board has supported embedding these actions into existing GLAM committees and groups to ensure sustainability is integrated into the organization's core operations. The key areas of focus for carbon reduction are purchased goods and services, energy usage, commercial activities, and staff travel—these areas represent well over 90% of GLAM's carbon footprint.

Since the completion of the GLAM net zero strategy, further work has been undertaken to improve carbon data by creating a carbon data model. This approach will simplify annual reporting and enhance data accuracy. The carbon footprint for 2023–24 is now available for GLAM and is included in this report.

Initial work has also been undertaken to explore biodiversity footprint and climate adaptation. Additionally, efforts have been made to raise staff awareness of GLAM's environmental goals through staff briefings, intranet updates, and carbon literacy training.

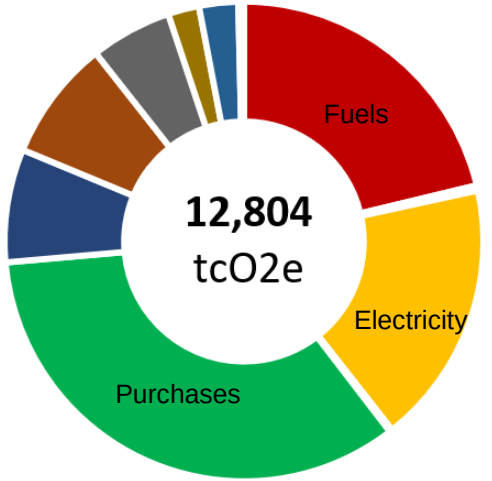
Carbon footprint – Financial year 2023-24

The adjacent chart shows the GLAM carbon footprint for the year 2023–24. The chart includes all categories formally included within the carbon footprint boundary. Visitor and reader travel are excluded. Employee commuting and home working data are refreshed every two years via a staff survey. Further work is required to update object travel data.

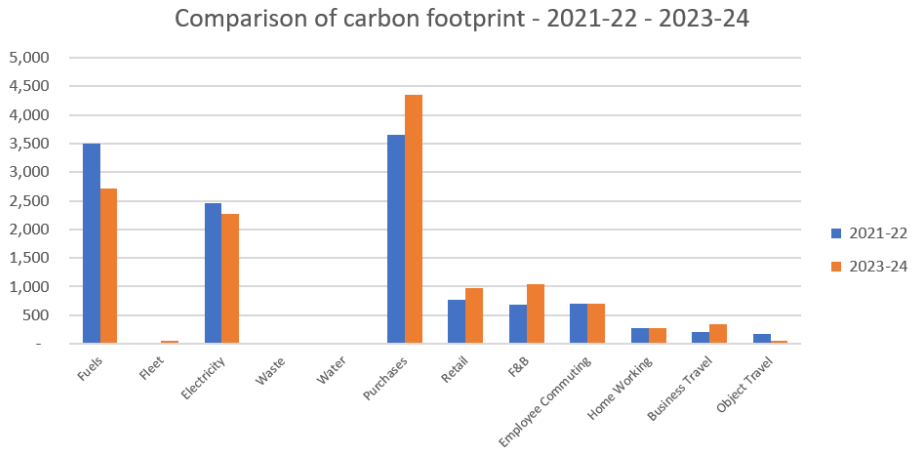
The total carbon emissions for the baseline year were 12,804 tCO_2e, representing an increase of 2.7%. This period saw the resumption of business as usual following the 2020–21 pandemic. For example, visitor numbers in 2021 were over 1 million, rising to over 3.5 million by 2024, driving increased retail and catering sales. The audience carbon intensity (footprint per visitor) declined substantially from 9.3 $kgCO_2$ per visitor in 2021–22 to 3.6 $kgCO_2$ per visitor in 2023–24. The income carbon intensity (footprint per £ of income) also decreased from 0.16 $kgCO_2$ per £ in 2021–22 to 0.15 $kgCO_2$ per £ in 2023–24.Positively, emissions from fuels, electricity, and waste all declined. GLAM, as part of the University, is on a zero-emissions electricity tariff, with a focus on shifting to a renewable tariff or power purchase agreement.

The largest source of emissions within Scope 3 was purchases, accounting for 34% of the total emissions for the baseline year.

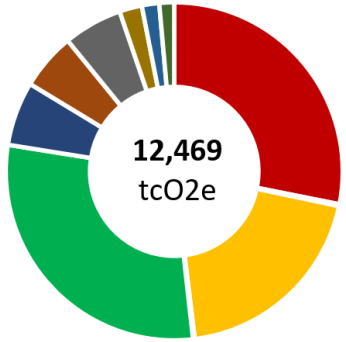
GLAM - carbon emissions - 2023-24
(*excluding* visitor & reader travel)



Category	tCO2e	%
Fuels	2,720	21%
Fleet	44	0%
Electricity	2,280	18%
Waste	1	0%
Water	22	0%
Purchases	4,358	34%
Retail	978	8%
F&B	1,041	8%
Employee Commuting	705	6%
Home Working	269	2%
Business Travel	338	3%
Object Travel	49	0%
TOTAL	**12,804**	**100%**



GLAM - carbon emissions - 2021-22
(*excluding* visitor & reader travel)



Category	tCO2e	%
Fuels	3,506	28%
Fleet	23	0%
Electricity	2,463	20%
Waste	3	0%
Water	17	0%
Purchases	3,653	29%
Retail	765	6%
F&B	679	5%
Employee Commuting	705	6%
Home Working	269	2%
Business Travel	208	2%
Object Travel	177	1%
TOTAL	**12,469**	**100%**

Gardens, Libraries & Museums
UNIVERSITY OF OXFORD

Ongoing environmental sustainability activity

Examples of actions implemented prior to 2023/24 and running ongoing

- **Biodiversity** – GLAM sites have invested in and set aside spaces to promote biodiversity through planters, beehives, bat boxes, bird boxes, and meadows. In total, GLAM has over 170 acres of natural landscapes including a 63-acre insect-friendly wildflower meadow and ancient bluebell woodland. These habitats have long term maintenance commitments to maximise their biodiversity impact as well as enhancing GLAM's public facing engagement programmes.
- **Public engagement**: Sustainability is central to education and public engagement across GLAM:
    - **Botanic Garden and Arboretum** (OBGA): programs range from public lectures on environmental issues to hands-on courses like *Your Garden in a Changing Climate*. School visits address biodiversity loss and climate change, while wellbeing initiatives, such as the new Forest School, deepen young people's connection with nature. A seminar series with the University's Department of Education equips future teachers to teach climate change while managing climate anxiety. OBGA also offer work experience programs to prepare young adults for careers in the environmental sector.
    - **Museum of Natural History**: developed and host an extensive programme of conferences, talks, workshops and informal events for adults and young people. These provide the museum's audiences with opportunities to engage with a wide range environmental themes, many focusing on biodiversity specifically. Events are often developed in collaboration with University departments and other partners.
    - **Pitt Rivers Museum**: run *What No Plastic?* sessions for schools.
    - **GLAM** also contributes to the Museum of Climate Hope trail.
- **Staff Engagement:** GLAM has a number of Green Impact Teams and LEAF schemes in place providing opportunities for colleagues to get involved and help deliver sustainable practices in their teams
- **Innovation** – Solar panels provide energy for wireless access points inside wooden bird boxes to provide Wi-Fi at the arboretum. Solar panels are also installed at Osney One and the Collections Storage Facility.
- **Recycling** – Various cross-GLAM schemes are in place to recycle nitrile gloves and digital waste. GLAM units use the University's WARPIT scheme, and none of GLAM's waste goes to landfill.
- **Commercial** – Teams have been active in reviewing suppliers and products. Our venues serve predominantly vegetarian food (and include environmental labelling). Our events teams in the Ashmolean Museum and Bodleian Libraries are accredited by the Sustainable Wedding Alliance. The Ashmolean Museum's licensing team has partnered with innovative products such as carbon-reduction paints.

Example of school sessions run by the Pitt Rivers Museum

Example of Water and Wildlife Activity Day run at the Oxford Botanic Garden

Gardens, Libraries & Museums
UNIVERSITY OF OXFORD

Progress during 2023-24

Key areas of success in 2023/24

- **Biodiversity** – The Botanic Garden and Arboretum (OBGA) works with partners across Southeast Asia to conserve Rafflesia, the world's largest flowers, most of which face extinction. In 2024, OBGA set up the Community for the Conservation and Research of Rafflesia (CCRR) - the first ever Rafflesia conservation working group that shares knowledge, tools and best practice. OBGA have a newly planted Mt Tateyama collection at Harcourt Arboretum, showcasing some of Japan's most beautiful trees for decades to come. Our work on local Oxford flora conservation involves partnering with local conservation groups including The Freshwater Habitats Trust (FHT) who run the 'Saving Oxford's Wetland Wildlife Project'. We're currently propagating plant species for the FHT for its 'Species Conservation Hub' at Boundary Brook Nature Park, for example Sium latifolium, a plant once typical of wet, species-rich, tall-herb fens in the UK, now much declined. We are also collaborating with Christ Church and TVWMRP to develop a restoration programme for Christ Church Meadow as part of the Thames Valley Wildflower Meadow Restoration Project.
- **Existing Buildings** – Rollout of new LED lighting in museums, replacement of gas humidifiers in the Ashmolean Museum, trial of secondary glazing in the Weston Library, and trial of quattro film to reduce solar gain.
    - LED lighting replacements in the museums have reduced carbon emissions by 16 tonnes.
- **Purchased Spend** – GLAM initiated a review of its key suppliers through a desk-based assessment to understand their key environmental initiatives.
- **Commercial Systems Team** – Sales in our commercial operations no longer include a paper receipt, which is forecast to save 1.35 million receipts over the next three years. Mobile ticketing has also been launched and is expected to reduce paper tickets by 479,000 over the next three years.
- **Staff Engagement** – Green Impact Teams across GLAM continue to help drive action in support of our environmental agenda. For example, the SSL Green Impact Team reinforced staff behaviours through a weekly building temperature check, turning off devices when not in use, sending books to *Good with Books*, and running a stationery amnesty.
- **New Builds and Refurbishments** – Sustainability is a key element in driving the replacement of the glasshouses in the Botanic Garden, Vision24 for the History of Science Museum, and the Ashmolean's Future Plan. The new Collections Storage Facility in Swindon will provide increased solar panel coverage as well as charging points for electric vehicles.
- Delivery of the **GLAM Carbon Net Zero Strategy**, which serves as the binding agent for the carbon reduction agenda.

Work of the Botanic Garden in conservation and research

University Green Impact and LEAF celebration – GLAM won a mix of bronze, silver, gold and beyond gold awards

Carbon reduction focus for 2024-25 & beyond

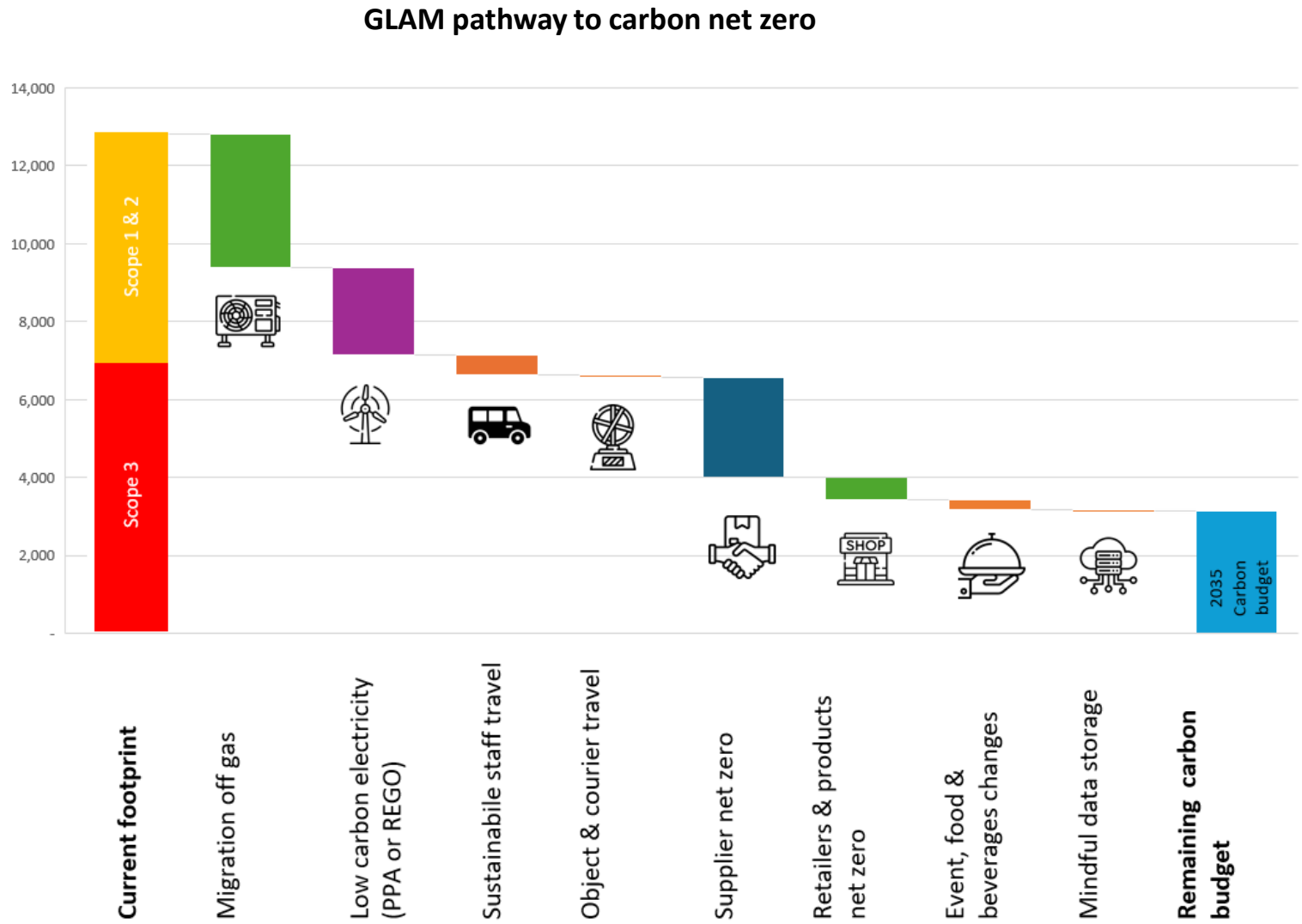
The waterfall diagram maps out the pathway for GLAM to achieve its decarbonisation goals. The major areas of focus are:

- **Migration off gas** – Continue to support and lobby the Estates Department to deliver its heat decarbonisation plans.
- **Low-carbon electricity** – Encourage the University to migrate to a Power Purchase Agreement or ensure it remains consistently on a renewable energy tariff.
- **Sustainable staff travel** – Enforce the University's travel hierarchy for business travel, understand the key reasons for air travel and explore alternatives, and promote sustainable staff commuting options.
- **Supplier net zero** – Engage suppliers to understand their environmental positions, develop a supplier engagement approach, and more clearly embed sustainability into the procurement process.
- **Retailers & products net zero** – Engage suppliers to understand their environmental positions and explore, where relevant, rolling out a product grading system to remove unsustainable products.
- **Event, food & beverage changes** – Continue to explore low-carbon menu options and assess the wider biodiversity impacts of the food and drink served.

Tackling these six areas is forecast to reduce GLAM's footprint by over 9,000 tCO_2e by 2035. Any remaining emissions will need to be offset, as per University policy.

Alongside these key areas, GLAM will need to continue actions already in place, such as reducing energy usage where possible and improving recycling rates.

The full carbon action plans are available internally to colleagues.



Gardens, Libraries & Museums
UNIVERSITY OF OXFORD

Other areas for 2024-25 & beyond

GLAM's environmental actions extend beyond the pure decarbonisation agenda. The following areas will continue to be a focus for 2024-25 as well:

- **Climate risk and adaptation** – GLAM has already identified climate risk as an operational risk (already impacting GLAM sites such as the Botanic Garden). Work in the year ahead will focus on collaborating with colleagues to map out specific areas and begin developing mitigation actions. The aim for 2024-25 is to have a draft climate risk action plan in place.
- **Biodiversity** – GLAM has a biodiversity net gain goal by 2035, aligned with the University of Oxford's target. Initial work has resulted in a draft biodiversity action plan. For 2024-25, the goal is to refine and expand the draft plan in partnership with University of Oxford researchers—particularly to continue the model of a 'living laboratory' before embedding it into relevant areas within GLAM.
- **Data** – A carbon baseline was developed in 2023-24. Work is now underway to create a carbon data model to support the ongoing calculation of the annual carbon footprint. Additional efforts will be made to improve carbon data and biodiversity footprint data, particularly in relation to food and beverages.
- **Engagement** – The focus in 2023-24 was on staff engagement. Raising awareness will remain a key driver for 2024-25, with the theme of 'every job is a climate job.' Additional efforts will be made to highlight the positive work GLAM is undertaking with key industry partners such as AIM, ALVA, Fit for the Future, and the Green Libraries Campaign.

GLAM, in line with the wider University, will prioritise reducing its own impact to minimise the need for offsets before beginning to use offsetting from 2030 onwards. This approach aligns with the Oxford Principles for Net Zero Aligned Carbon Offsetting and helps prevent unintended impacts on communities and ecosystems.

Botanic Garden in early 2024 – adaptation to climate change. Courtesy of Chris Thorogood

Fit for the Future

AiM Association of Independent Museums

ALVA Association of Leading Visitor Attractions

Gardens, Libraries & Museums
UNIVERSITY OF OXFORD

Gardens Libraries & Museums
UNIVERSITY OF OXFORD

Appendix

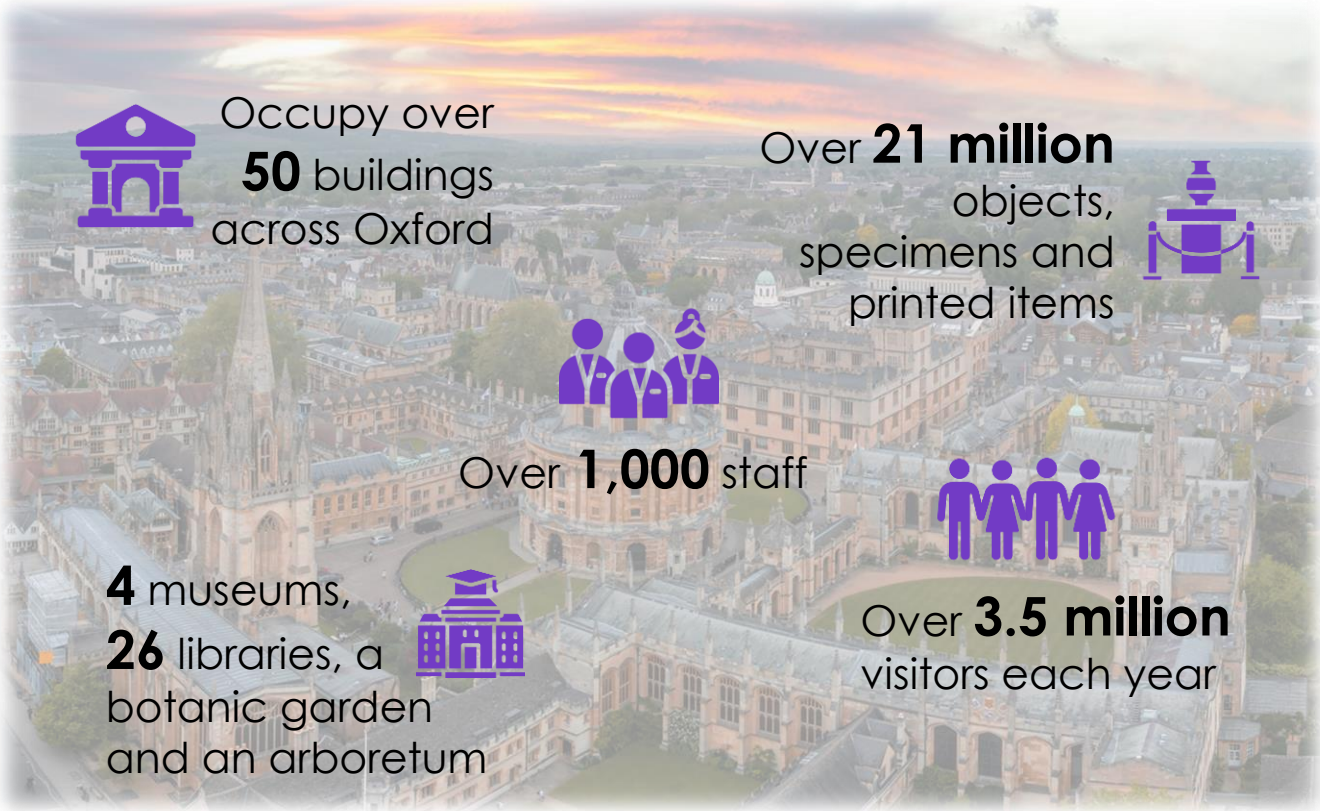
Overview of GLAM
Carbon Footprint – Boundaries and Methodology

Overview of the gardens, libraries and museums

Oxford University's Gardens, Libraries, and Museums (GLAM) represent a diverse and prestigious group of institutions dedicated to the preservation, study and public dissemination of knowledge across a wide array of disciplines. GLAM comprises the:

- Oxford Botanic Garden and Arboretum
- Bodleian Libraries
- Ashmolean Museum of Art and Archaeology,
- History of Science Museum
- Museum of Natural History
- Pitt Rivers Museum
- GLAM Divisional Office.

Each institution holds a unique and significant collection of artefacts, specimens and documents, offering invaluable resources for both academic research and public education. The GLAM Strategic Framework has a guiding principle of environmental responsibility.



Carbon footprint – our boundaries

Our approach is informed by the Greenhouse Gas (GHG) protocol. This protocol is the world's most widely used greenhouse gas accounting standard.

This identifies the material emissions sources to be included and defining this allows for repeatability in future assessments. This enables effective measurement and management to guide clear reduction efforts.

The diagram adjacent provides an overview of the applicable emissions sources included in the boundary for GLAM's carbon footprint assessment

SCOPE 1 & 2

- Building Electricity Consumption
- Building Gas Consumption
- Fleet Fuel Consumption
- Refrigerant Leakage

SCOPE 3

- T&D and WTT*
- Waste
- Upstream fleet
- Water
- Purchases
- Object travel
- Retail
- Homeworking
- Business travel
- Food and beverage (F&B)
- Employee commuting

Investments, Grants & Fundraising	**No data available**
Cloud-based IT Services & University IT Services	**No data available**
Visitor travel	**Analysis included but not within formal boundary**

* T&D (Transmission and Distribution) and WTT (well-to-tank) represent the emissions associated with processing and distribution of fuels/energy which are classified as Scope 1 & 2 emissions (e.g. natural gas, electricity, diesel).

Carbon footprint – data sources and approach

SCOPE	EMISSIONS AREA	DESCRIPTION OF DATA SOURCE
1	Fuels	Monthly apportioned fuel (natural gas) consumption data via SystemsLink. Litres of diesel used for the sprinkler system in the Swindon Book Storage Facility also included.
	Fleet	Total distance travelled and/or amount of fuel consumed by Fleet vans.
	Refrigerants	Engineer reports containing leak test data, including leakages, additions and refrigerant type within the baseline year.
2	Electricity	Monthly apportioned electricity consumption data via SystemsLink.
3	T&D and WTT	Data is the same as 'Fuels' and 'Electricity'.
	Upstream Fleet	Data is the same as 'Fleet'.
	Waste	Tonnes per waste stream including disposal route provided through SystemsLink.
	Water	Water consumption in m^3 provided through SystemsLink.

SCOPE	EMISSIONS AREA	DESCRIPTION OF DATA SOURCE
3	Purchased Goods and Services	Procurement spend including department, supplier, category and description.
	Retail	Procurement spend including department, supplier, product type and description.
	Food & Beverage (F&B)	F&B quantities with associated supplier provided LCAs, and catering commission from specific suppliers used for venue hire.
	Employee & Volunteer Commuting	Staff survey on commuting and working from home. Data extrapolated from survey respondents to total staff. A separate volunteer survey also used. This data is refreshed every two years.
	Working from home	
	Business Travel	Cost-based expenses and procurement data with some entries displaying travel mode and destination. Distance estimated based on cost. Flight levy data used for flight data.
	Book, Manuscript & Object Travel	Transport mode and start and end destinations for all object and courier travel, including inward and outward loans. Tonnage provided for some journeys.
	Visitor & Reader Travel	Estimations of travel mode and distance based on audience survey providing partial postcodes or country of origin, and number of readers by types. This data is refreshed every two years

Gardens Libraries & Museums

UNIVERSITY OF OXFORD