




B&NES HERITAGE SERVICES
CARBON BASELINE REPORT
JUNE 2023

REVISION	DESCRIPTION	ISSUE BY	DATE	CHECKED
00	First Draft for Coordination and Comment	PB	02/05/2023	PH

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CONTENTS

1	INTRODUCTION	4
2	BOUNDARY DEFINITION	7
3	DATA COLLECTION & MATURITY	10
4	CARBON FOOTPRINT	15
5	STAKEHOLDER WORKSHOP	26
6	NEXT STEPS	29



1
INTRODUCTION

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

1. INTRODUCTION

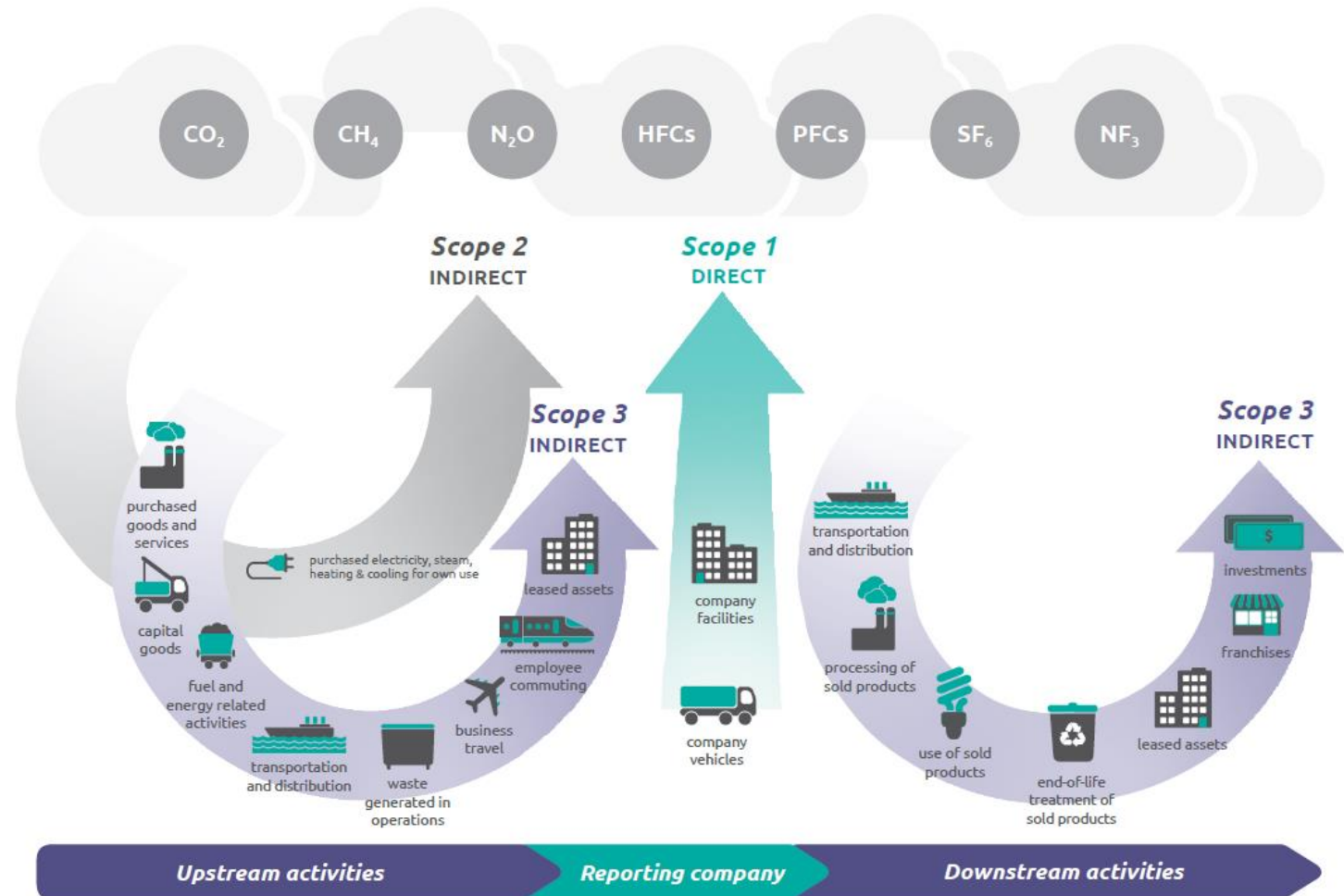
INTRODUCTION

This report provides a summary of the Heritage Services' carbon emissions for the financial year 2019-20. The Heritage Services do not currently regularly report on their emissions. This is the first holistic assessment of its carbon footprint including scopes 1, 2 and 3 emissions.

The different scopes of carbon emissions considered in this report are described below and in the adjacent diagram:

- **Scope 1 emissions:** *Direct emissions* from on site combustion of fuels and owned vehicle usage.
- **Scope 2 emissions:** *Indirect emissions* from purchased electricity and other energy supplies for use by the Heritage Services.
- **Scope 3 emissions:** *Indirect emissions* from the upstream and downstream activities including business travel, waste management, purchases, etc.

Emissions from all greenhouse gases are included within this assessment but are typically reported in carbon dioxide equivalent terms (CO₂e) which has been used throughout this report.



Overview of GHG Protocol scopes and emissions across the value chain1

1. Technical Guidance for calculating Scope 3 emissions; [Greenhouse Gas Protocol](#)

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

1. INTRODUCTION

ORGANISATION OVERVIEW

The Heritage Services are a department of the Bath and North East Somerset (B&NES) Council, responsible for managing and preserving the historic environment and cultural heritage of the city of Bath.

The Heritage Services' main attractions are the Roman Baths & Pump Rooms, Victoria Art Gallery, World Heritage Services and the Fashion Museum (now being relocated). Additional to this, the Heritage Services host events within their venues, such as the Guildhall and several other smaller properties, making the Heritage Services' operate in an area that covers over 20,000m².

Heritage Services attract over 1 million visitors annually (pre-COVID numbers), and in 2019, the Roman Baths & Pump Rooms was the [25th most visited attraction in the UK](#).

B&NES Council have set out their ambition in the '[Climate Emergency Strategy 2019-2030](#)' to be carbon neutral by 2030. They have identified their key priority areas to be decarbonising buildings; decarbonising transport; increasing renewable energy generation; and to cut council operational carbon emissions to net zero by 2030.





2

BOUNDARY DEFINITION

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2. BOUNDARY DEFINITION

INTRODUCTION

When assessing an organisation's carbon footprint, it is essential to establish the boundary of the assessment. This exercise identifies what emission sources are included within the assessment, as defined by the Greenhouse Gas (GHG) protocol¹. This protocol is the world's most widely used greenhouse gas accounting standard.

In some instances, it is not possible to quantify all sources of an organisation's carbon emissions. Emission sources are most commonly excluded due to a lack of available data, or an inability to influence reductions through an organisation's activities. However, there is increasing necessity to include a more comprehensive appraisal of carbon emissions in decarbonisation strategies from industry bodies such as the Science Based Targets initiative², to ensure that strategies are meaningful and robust.

The diagram opposite provides an overview of all emissions sources proposed to be included in the boundary for the Heritage Services' footprint assessment.

Several emission areas have not been included in the analysis, but this is primarily due to their lack of applicability to the 2019/20 baseline.

Home working calculations have not been included within this analysis. This is because home working was much less prevalent at the organisation before the COVID-19 pandemic, though it is important to understand the effect home working has made on employee commuting.

The Heritage Services sites included in the baseline include:

- Fashion Museum & Assembly Rooms
- No. 4 The Circus
- 24A Monmouth Place
- Bath World Heritage Centre (10 York St)
- Guildhall
- Lansdown Store
- Pixash Lane
- The Roman Baths & Pump Rooms
- Victoria Art Gallery
- Culverhay School
- Brassmill Warehouse

The site boundary is explored further on the next page.

[1. Green House Gas Protocol](#)
[2. Science Based Targets initiative](#)

SCOPE 1 & 2



Building electricity consumption



Building gas consumption

Data not available or not applicable to 2019/20 footprint
(see Section 3)

Refrigerant leakage

Owned vehicle fuel consumption

SCOPE 3



T&D and WTT*



Purchased Goods and Services



Capital Goods (Other)



Retail



Business Travel



Employee Commuting



Water



Waste



Home Working



Visitor Travel (Out Of Scope)



Food & Beverages (F&B)



Object Travel

Data not available or not applicable to 2019/20 footprint
(see Section 3)



Cloud-Based IT Services



Investments

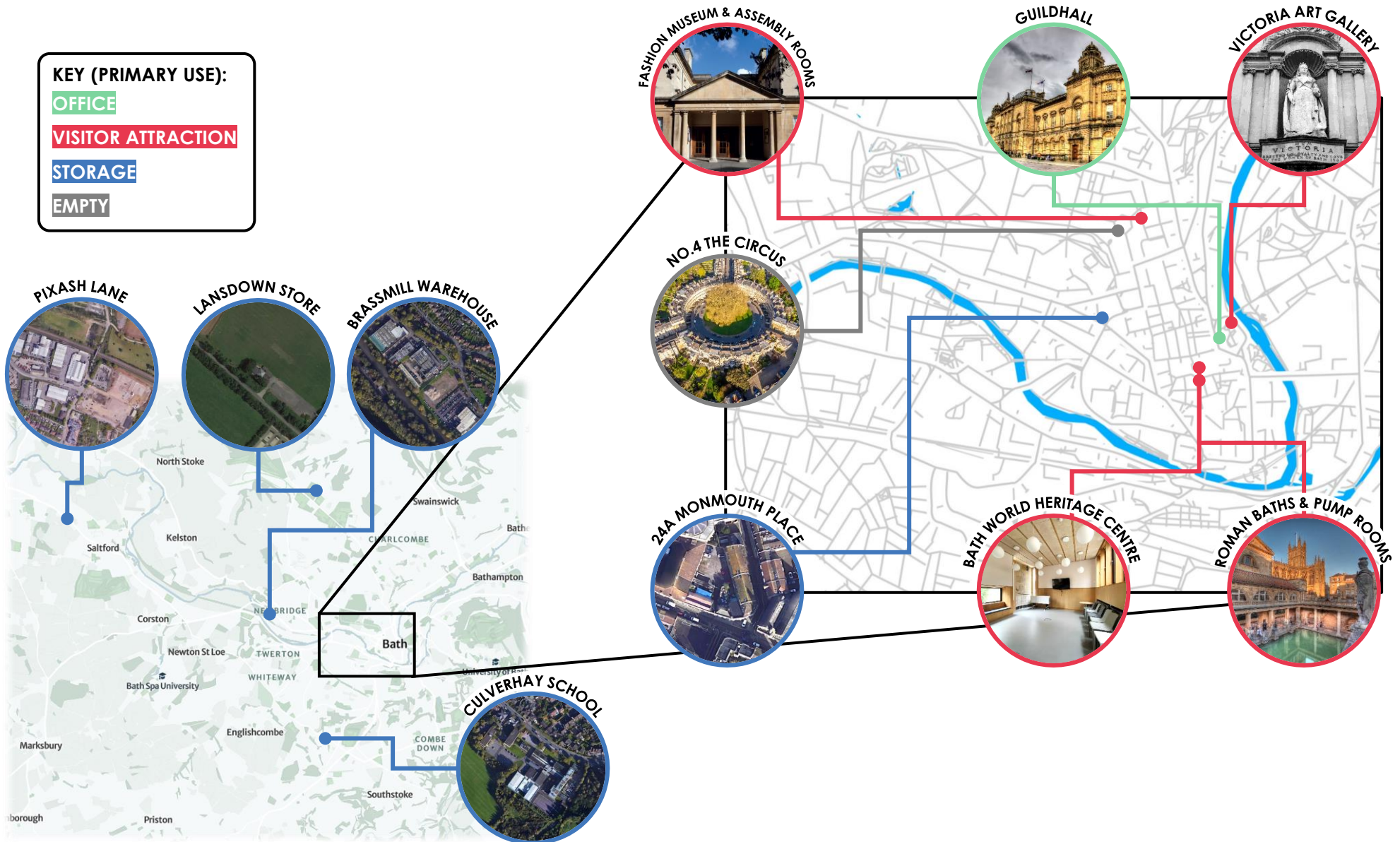


Capital Goods (Construction)

* Upstream energy 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).

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2. BOUNDARY DEFINITION





3

DATA COLLECTION AND MATURITY

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

3. DATA COLLECTION AND MATURITY

INTRODUCTION








In order to complete this study, a wide range of data was collated from across the Heritage Services' operations to support the calculation of an emissions baseline for the reporting year 2019-2020. An overview of the data gathered is summarised on the following pages along with data that wasn't available but would be beneficial for future studies.

AVAILABLE DATA

The table opposite provides an overview of the data available across each emission source and an assessment of its quality for calculating the carbon footprint.

- *High* – Complete data available for emissions calculations.
- *Medium* – Incomplete data or proxy information only for emissions calculations.
- *Low* – Basic information, largely estimated.

A series of data collection improvements are suggested focused on both the overall quality of reporting as well as developing additional understanding to support decarbonisation projects and initiatives.

	EMISSIONS SOURCE	DATA AVAILABLE	DATA QUALITY	POTENTIAL IMPROVEMENTS
SCOPE 1 & 2	 Building energy consumption	Pre-collated annual utility consumption data by fuels and site (gas and electricity).	Medium	Sub-meter level data across the Heritage Services sites would provide a better granularity of understanding, and strongly support the design and monitoring of any energy efficiency projects.
	 T&D and WTT	Pre-collated annual utility consumption data by fuels and site (gas and electricity).	Medium	Sub-meter level data across the Heritage Services sites would provide a better granularity of understanding, and strongly support the design and monitoring of any energy efficiency projects.
SCOPE 3	 Purchased Goods and Services	Annual procurement spend, manually tagged into spend categories.	Medium	Automated/pre-set tagging of spend categories with emissions factors to provide rapid analysis (short-term ambition). Supply chain engagement to work towards supplier-specific emissions data (long-term ambition).
	 Capital Goods	Annual procurement spend, manually tagged into spend categories.	Medium	LCA of everything purchased.
	 Retail	Annual procurement spend, manually tagged into spend categories.	Medium	Detailed product-specific information could be requested from suppliers for a more detailed assessment.
	 Business travel	Travel booking/expenses systems that provided data collection such as travel distances, travel mode, and spend.	Medium / High	Mode specific data from travel provider (e.g. journey class, etc.).
	 Employee commuting	Staff travel survey completed in 2023 with a 43% response rate.*	Medium	Annual comprehensive survey with all staff.

* The 2023 data was used as a proxy as no 2019 data was available

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

3. DATA COLLECTION AND MATURITY







Regarding Visitor Travel, if included within the footprint, this would be considered under the Scope 3 category, however, there are valid reasons to potentially remove this from consideration due to the low influence Heritage Services have on this particular emissions source. In some instances, other progressive heritage organisations are committing to bringing visitor travel into their organisational carbon footprint. For example, English Heritage state this the following in their Climate Action Plan 2022-2025.

“Carbon emissions from visitor travel are the hardest area to measure and influence. We will work to improve our understanding, trialling ways to reduce emissions, identifying a decarbonisation plan and bringing visitor travel into our organisational carbon footprint in 2025.”

Others are measuring and monitoring changes in Scope 3 emissions and influencing where practical but not formally accounting for this in their footprint.

SITE DATA COLLECTED

Where relevant the specific data that was collated for each site is identified overleaf.

	EMISSIONS SOURCE	DATA AVAILABLE	DATA QUALITY	POTENTIAL IMPROVEMENTS
SCOPE 3	 Water	Water invoices covering six buildings.	Medium	Sub-metered data.
	 Waste	Estimations based on size of bins / number of bin bags, and number of weekly collections.	Low / Medium	Tonnes per waste stream including disposal route.
	 Home Working	Staff travel survey completed in 2023 with a 43% response rate. Impacts of home working were removed for 19/20 analysis.	Medium	Staff working arrangement data (e.g. number of days on-site) can be combined with industry benchmarking standards. Detailed assessment would require ICT equipment specifications.
	 Food & Beverages	Cost of sales data from restaurant at the Pump Room	Low	Detailed ingredients information would result in a highly detailed assessment. This could be extrapolated from a sample.
	 Object Travel	Records for object travel (incoming and outgoing) origin and destination, travel mode and courier use.	Medium	Accurate object weight records.
OUT OF SCOPE	 Visitor Travel	Estimations based on ticket billing addresses.	Low	Up to date visitor surveys to capture travel arrival modes.

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

3. DATA COLLECTION AND MATURITY



SITE	BUILDING SIZE (m ²)	PROPORTION OF BUILDING OCCUPIED	PROPERTY OWNERSHIP	BUILDING USE	SITE –SPECIFIC DATA RECEIVED							
					ELECTRICITY	GAS	RETAIL	WASTE	WATER	F&B	VISITOR TRAVEL	OBJECT TRAVEL
Fashion Museum & Assembly Rooms	4133	100%	B&NES Heritage Services	Visitor Attraction/Restaurant/Offices/Store	Green	Green	Green	Green	Green	Grey	Grey	Green
No. 4 The Circus	417	100%	Third-Party Ownership	Empty House	Green	Green	Grey	Pink	Green	Grey	Grey	Grey
24A Monmouth Place	Unknown	Unknown	B&NES Council	Collections Store	Green	Pink	Grey	Pink	Green	Grey	Grey	Grey
Bath World Heritage Centre (10 York St)	Unknown	Unknown	B&NES Heritage Services	Visitor Attraction	Green	Pink	Grey	Pink	Pink	Grey	Grey	Grey
Guildhall	7200	11%	B&NES Council	Offices/Civic spaces/Venue hire	Green	Green	Grey	Green	Green	Grey	Grey	Grey
Lansdown Store	Unknown	Unknown	B&NES Council	Collections Store	Green	Pink	Grey	Pink	Pink	Grey	Grey	Grey
Pixash Lane	Unknown	Unknown	B&NES Council	Collections Store	Green	Pink	Grey	Pink	Pink	Grey	Grey	Grey
The Roman Baths & Pump Rooms	7662	100%	B&NES Heritage Services	Visitor Attraction/Restaurant/Offices/Store	Green	Green	Green	Green	Green	Green	Green	Grey
Victoria Art Gallery	1919	100%	B&NES Heritage Services	Visitor Attraction/Offices/Store	Green	Pink	Green	Green	Green	Grey	Grey	Green
Culverhay School	476	100%	B&NES Council	Collections Store	Green	Green	Grey	Pink	Pink	Grey	Grey	Grey
Brassmill Warehouse	Unknown	Unknown	Third-Party Ownership	Retail Warehouse	Pink	Pink	Grey	Green	Pink	Grey	Grey	Grey






B&NES HERITAGE SERVICES CARBON BASELINE REPORT

3. DATA COLLECTION AND MATURITY

DATA NOT AVAILABLE

As indicated within the boundary definition, for several emissions sources data was either not relevant nor applicable for the 2019/20 year.

A short description of these sources and possible collection methods which could be implemented in the future are discussed in the table opposite.

EMISSIONS SOURCE	DESCRIPTION	DATA REQUIREMENTS
 <p>REFRIGERANT LEAKAGE</p>	<p>Refrigerant leakage comes from air-conditioning and refrigeration units, and the release of other gases into the atmosphere that have a global warming potential.</p>	<p>The name for the F gas, mass of F gas in the product (and its equivalence in CO₂), and global warming potential should be included on the labels of products.</p>
 <p>FLEET FUEL CONSUMPTION</p>	<p>Emissions from owned or leased vehicles used within the business. The Heritage Services had a limited fleet within 2019/20, with one leased diesel van.</p>	<p>Recorded mileage and vehicle data.</p>
 <p>CLOUD-BASED IT SERVICES</p>	<p>Emissions associated with storage and access of data in off-site data facilities and servers. This could be associated with day-to-day operations or digital archives.</p> <p>No data available for 2019/20, though it will have a much greater impact in future years with increased usage of video conferencing and remote working.</p>	<p>Performance data from service providers (becoming more widely available or available on request) required for specific services or average user data which can be extrapolated.</p>
 <p>INVESTMENTS</p>	<p>Assessment of emissions associated with investments has recently become more feasible due to the advent of ESG reports associated with funds. When considering investments, typically the scope 1 and 2 emissions of the organisations within the portfolio are considered with an apportionment based on the size of the held investment.</p>	<p>The portfolios of investments to include a carbon footprint of the analysis, and the size of the investment compared to the cost of the project.</p>
 <p>Capital Goods (Construction)</p>	<p>The embodied emissions of materials, and other capital goods such as construction plant and machinery used for construction projects.</p>	<p>Full LCAs of goods purchased.</p>



4

CARBON FOOTPRINT

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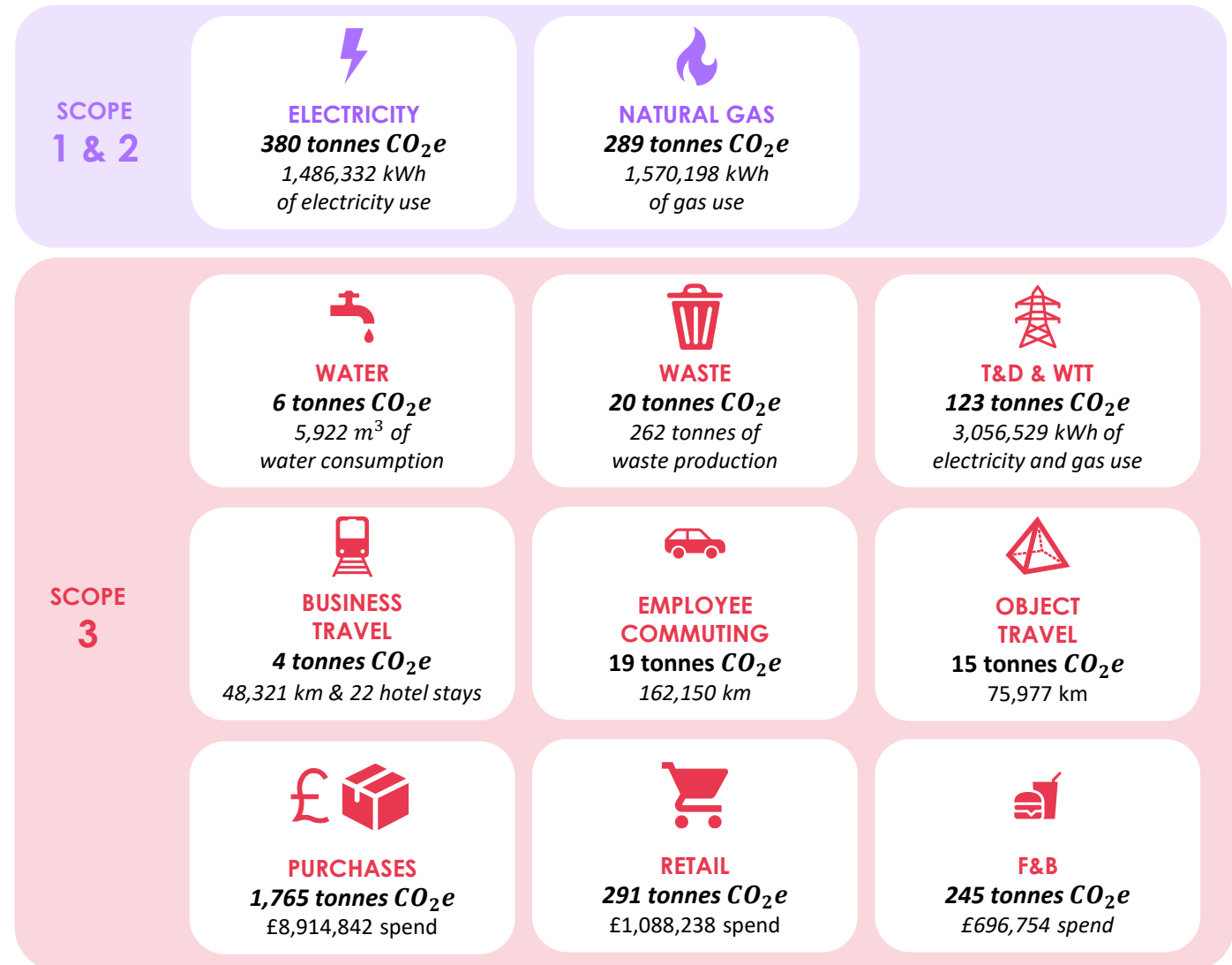
4. CARBON FOOTPRINT

OVERVIEW

A carbon footprint for the year 2019/20 was calculated based on the data provided by the Heritage Services. The year 2019/20 was chosen as it was largely unaffected by the Covid-19 pandemic, and therefore represents the most recent 'typical' year. The figure to the right shows the main sources of emissions along with the key figures.

See the page overleaf for the complete breakdown of emissions, and the rest of the section for a deeper analysis of each respective emission source.

As can be seen overleaf the Scope 3 emissions made up 79% of the overall emissions, with 'Purchases' making up 56%. Scopes 1 & 2 made up 21% of the overall emissions.

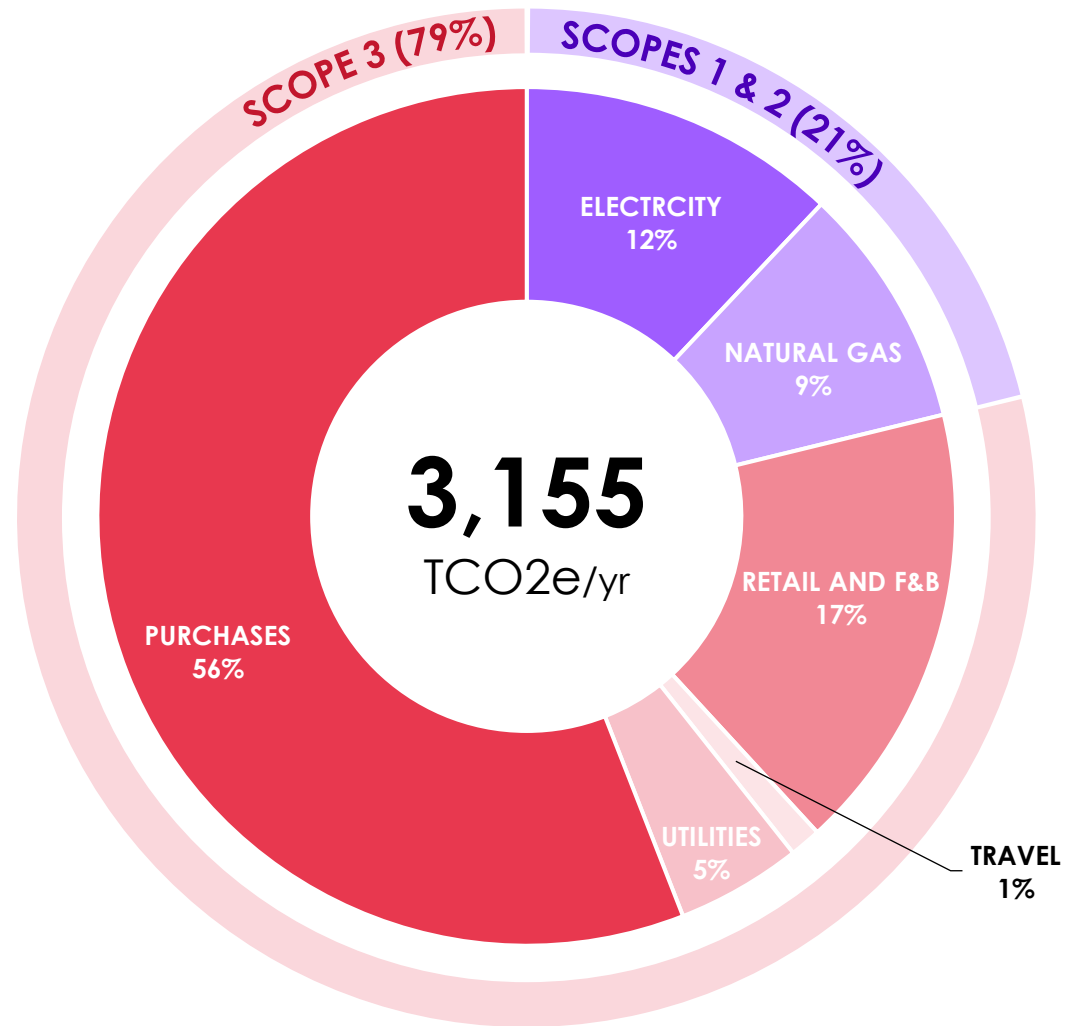


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4. CARBON FOOTPRINT

2019/20 (TONNES CO2e/ YEAR)		
SCOPE 1 & 2	Natural Gas	289
	Electricity	380
SCOPE 3	T&D and WTT (Utilities)	123
	Waste (Utilities)	20
	Water (Utilities)	6
	Purchased Goods and Services (Purchases)	1,746
	Capital Goods (Purchases)	18
	Business Travel (Travel)	4
	Employee Commuting (Travel)	19
	Object Travel (Travel)	15
	F&B	245
	Retail	291
	Total	3,155

B&NES Heritage Services' carbon emission distribution
(excluding visitor travel)



B&NES HERITAGE SERVICES CARBON BASELINE REPORT

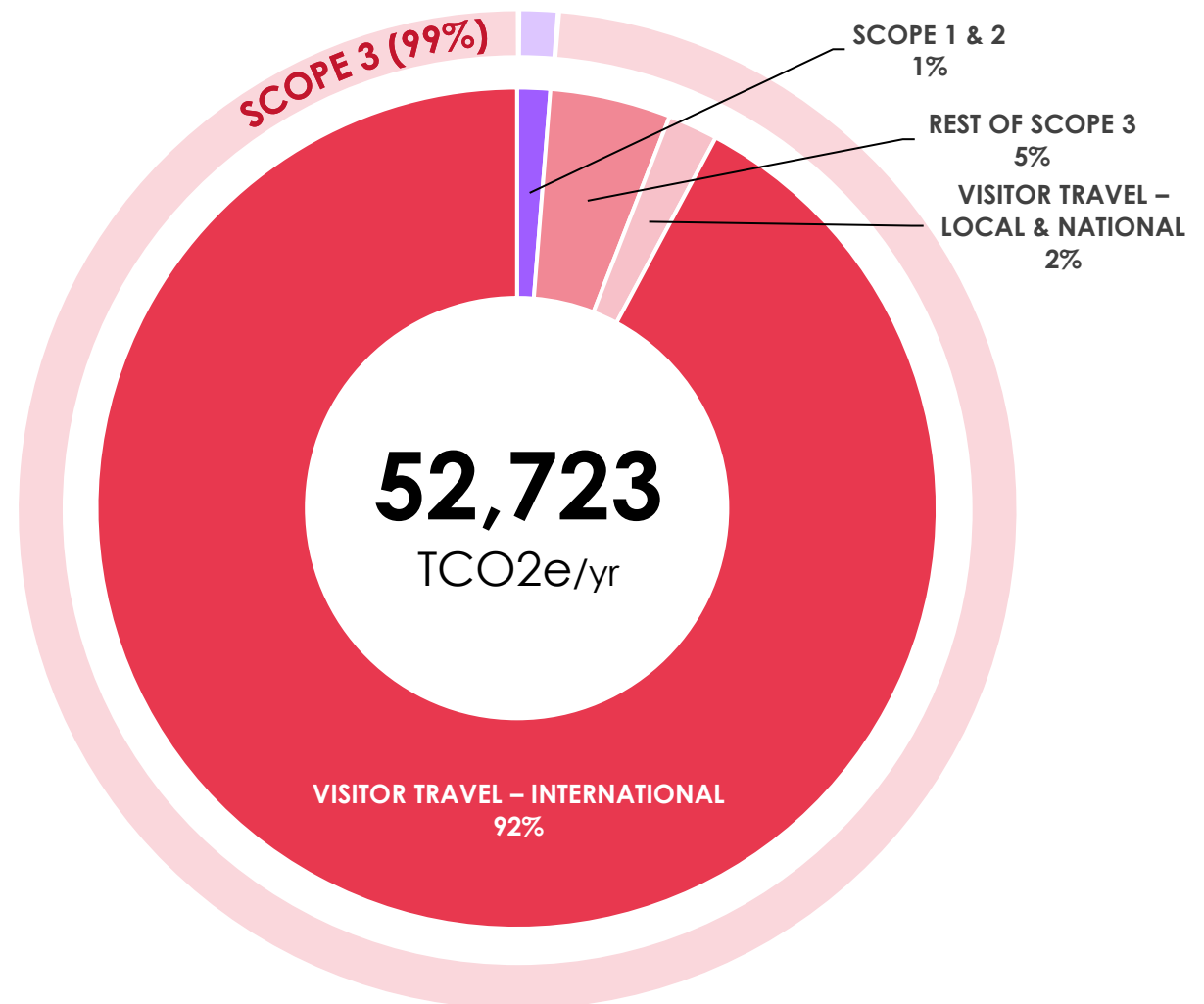
4. CARBON FOOTPRINT

THE IMPACT OF VISITOR TRAVEL

The chart adjacent includes 'Visitor Travel', which then represents over 90% of the emissions. However, due to limited control over these emissions, it is recommended that these are excluded from the baseline. However efforts to influence these emissions should be pursued where feasible.

2019/20 (TONNES CO2e/ YEAR)		
SCOPE 1 & 2	Scope 1 & 2	669
	<hr/>	
SCOPE 3	Visitor Travel	49,568
	Local	1
	National	975
	International	48,592
	Rest of Scope 3	2,487
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	Total	52,723

B&NES Heritage Services' carbon emission distribution
(including visitor travel)





4. CARBON FOOTPRINT

SCOPE 1 & 2

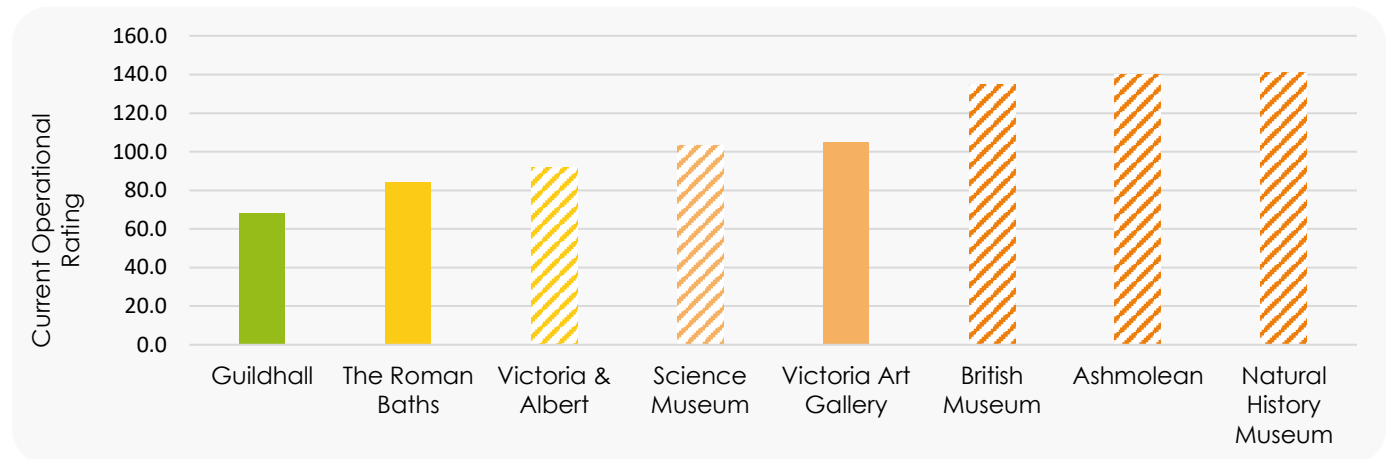
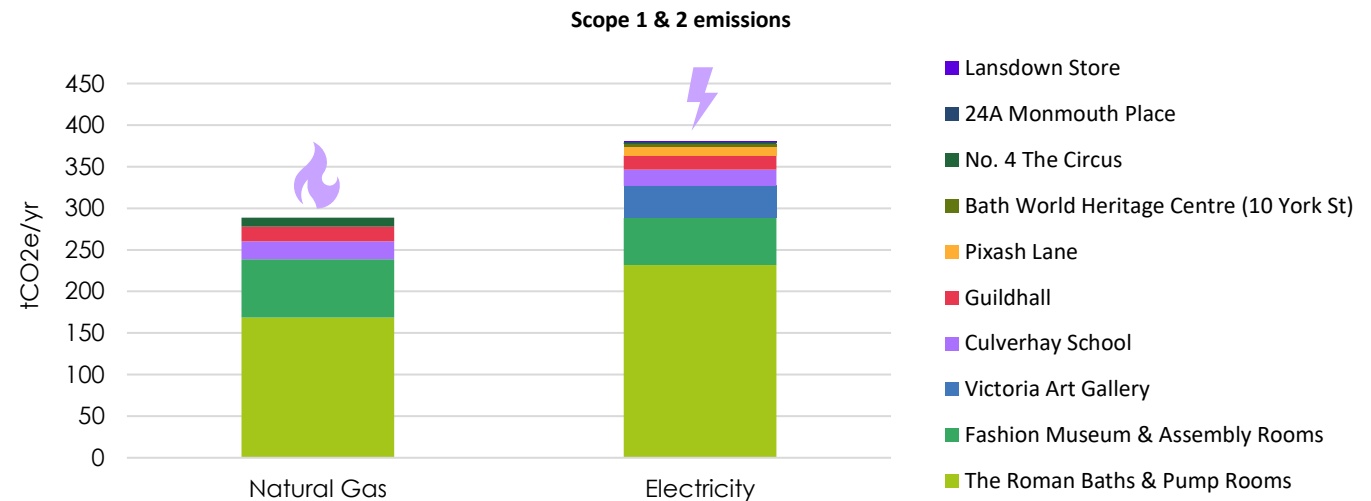
The graph adjacent provides a breakdown of the scope 1 & 2 emissions for the Heritage Services.

Gas and electricity data was available via utility bills. Fleet and refrigerant leakage was unavailable, however it is understood that the Heritage Services leased only one diesel van between 2019-20, therefore the emission associations for vehicle fuel use for the very limited vehicle fleet can be assumed as negligible.

Data regarding the floor area that the Heritage Services (11%) occupy within the Guildhall was used to apportion emissions accordingly.

As shown, the majority of the emissions are associated with the Roman Baths & Pump Rooms, however the energy consumption associated with the smaller sites under the Heritage Service's ownership or long-term use are also included.

Scope 1 & 2 emissions are influenced significantly by the age and heritage characteristics of the site. This is highlighted in the chart on the bottom right, comparing DEC ratings for major museums in the UK with the Roman Baths and Victoria Art Gallery highlighted. A lower rating = greater energy efficient operation. The Guildhall has also been included in this comparison.



B&NES HERITAGE SERVICES CARBON BASELINE REPORT

4. CARBON FOOTPRINT

SCOPE 3

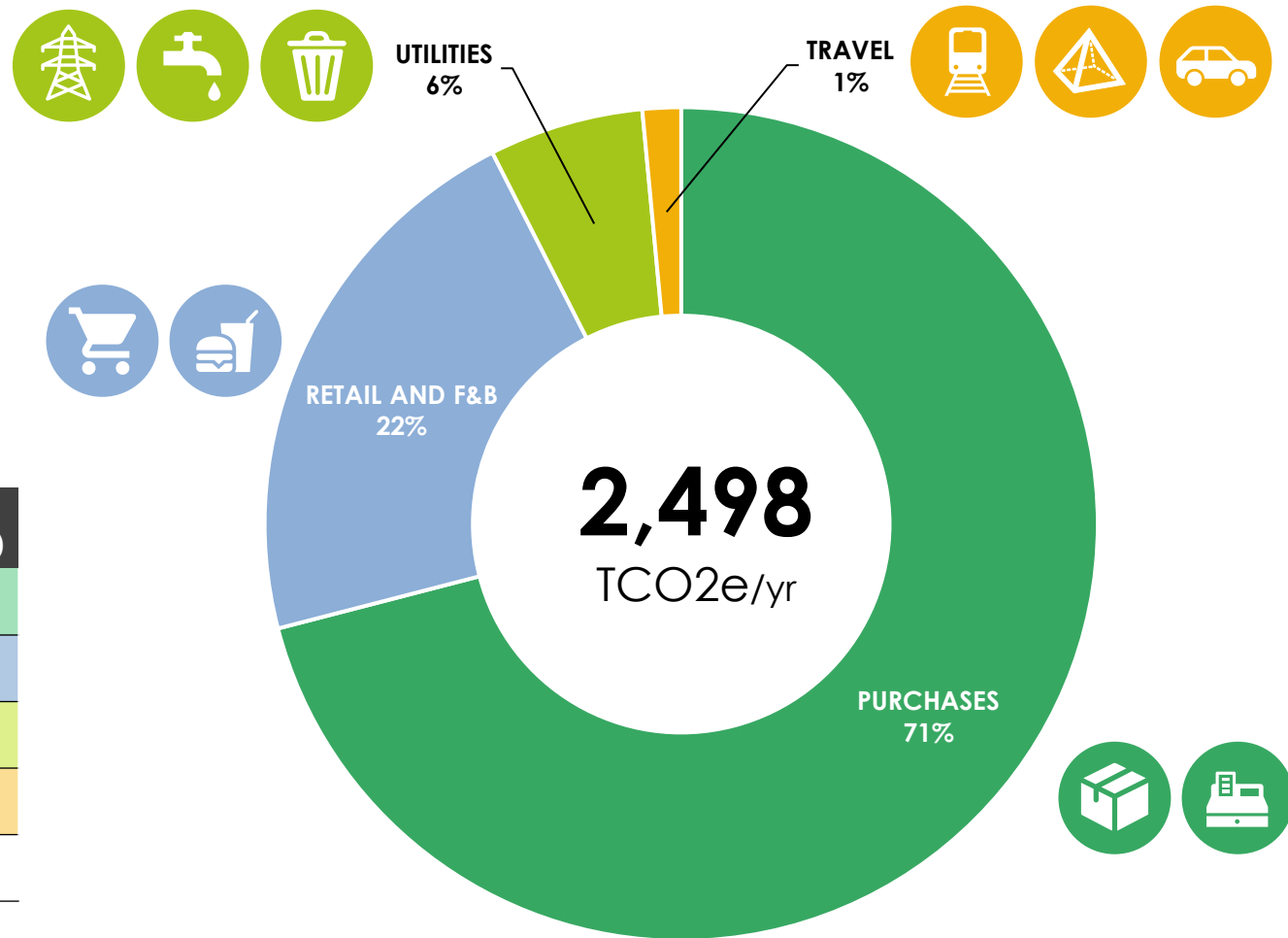
The chart opposite provides a breakdown of the scope 3 emissions footprint across the main scope 3 emissions areas. It should be noted that 'Visitor Travel' has been excluded from the chart.

Unlike scope 1 and 2, quantification of scope 3 has a much lower confidence as often proxy data is used, or calculation methods are less mature. For this reason emission estimates often have high error margins, and we therefore recommend using this analysis to identify focus areas for action as opposed to detailed monitoring and analysis.

Each of the emission areas summarised in this chart are discussed over the following pages:

SCOPE 3 EMISSIONS	2019/20 (TONNES CO ₂ e/ YEAR)
Purchases	1,765
Retail and F&B	536
Utilities	149
Travel	35
Total	2,498

Scope 3 emissions distribution



4. CARBON FOOTPRINT



UTILITIES

Emissions from utilities are comprised of the scope 3 component of energy use (referred to as upstream energy emissions) and the emissions associated with water use and waste generation.

Upstream energy

Whilst energy and fuel use is accounted for as scope 1 and 2 emissions this only relates to the generation-related fuel emissions. All emissions associated with production, processing and distribution of those fuels/energy sources are accounted for as scope 3 emissions. They are comprised of 2 categories:

- **Well-to-tank:** Emissions related to the production, processing and delivery of fuel (applies to all fuels).
- **Transmission and distribution:** Emissions associated with losses in the distribution of electricity between generator and the end consumer (applies to electricity only)

Whilst they form a significant emissions source they are directly linked to energy consumption and cannot be reduced independently. As the electricity continues to decarbonise however, their proportional impact is expected to decrease due to the reduction in well-to-tank emissions associated with fossil fuel-based energy generation.

Water

Water emissions relate to the treatment, processing and distribution of both potable water and foul water (sewage). These emissions are directly correlated with usage, and whilst there are wider environmental benefits to reducing water consumption the carbon emissions impact is often very small compared to other emission sources. This is demonstrated in the graph adjacent.

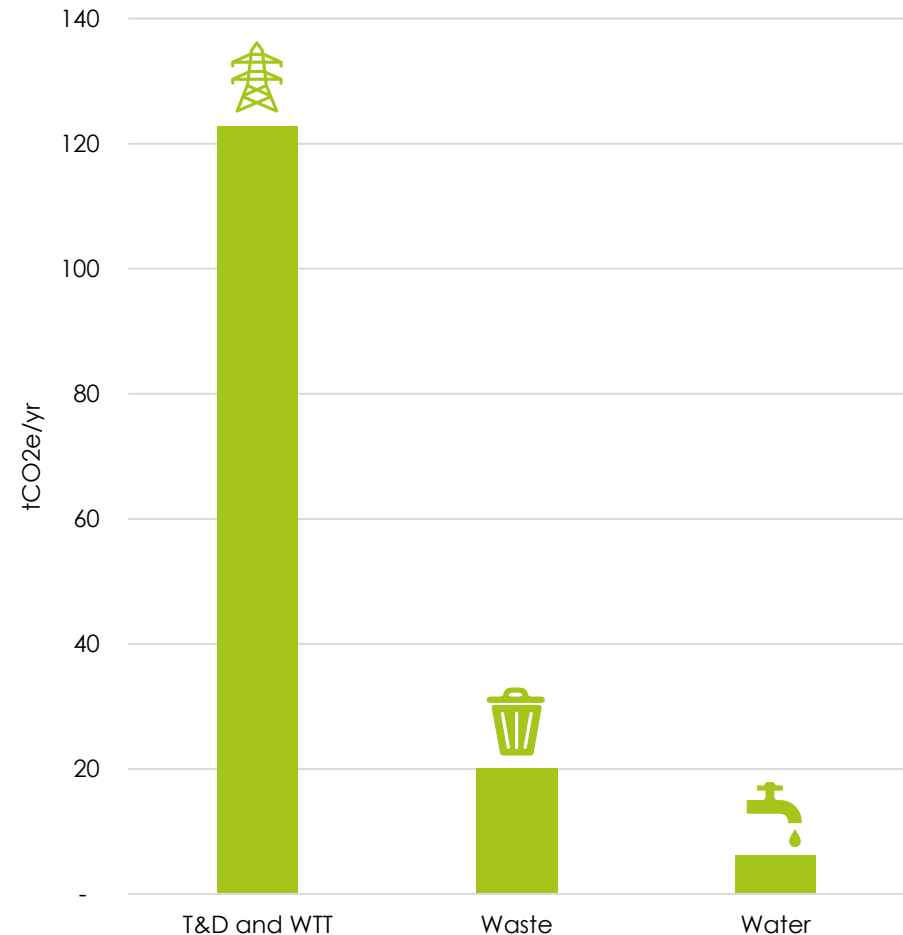
Waste

Waste emissions are determined by both the quantity of waste generation and the relevant disposal methods. They do not reflect the 'embodied carbon' disposed of in the products as this is accounted for in the 'purchases' category.

Waste data came from the Victoria Art Gallery, Guildhall Records Office, Assembly Rooms, Roman Baths/Pump Rooms, and Brassmill. From the data received it was assumed that there was a 65 : 35 split of waste going to landfill : recycled.

Emission rates for landfill are 30 times higher than those associated with recycling because of decomposition and methane generation. Whilst efficient use of materials (e.g. re-use and repurposing) will reduce these emissions slightly through waste reduction, their carbon impact will be more significant through the reduction in purchasing.

Utilities emissions



B&NES HERITAGE SERVICES CARBON BASELINE REPORT

4. CARBON FOOTPRINT



PURCHASES

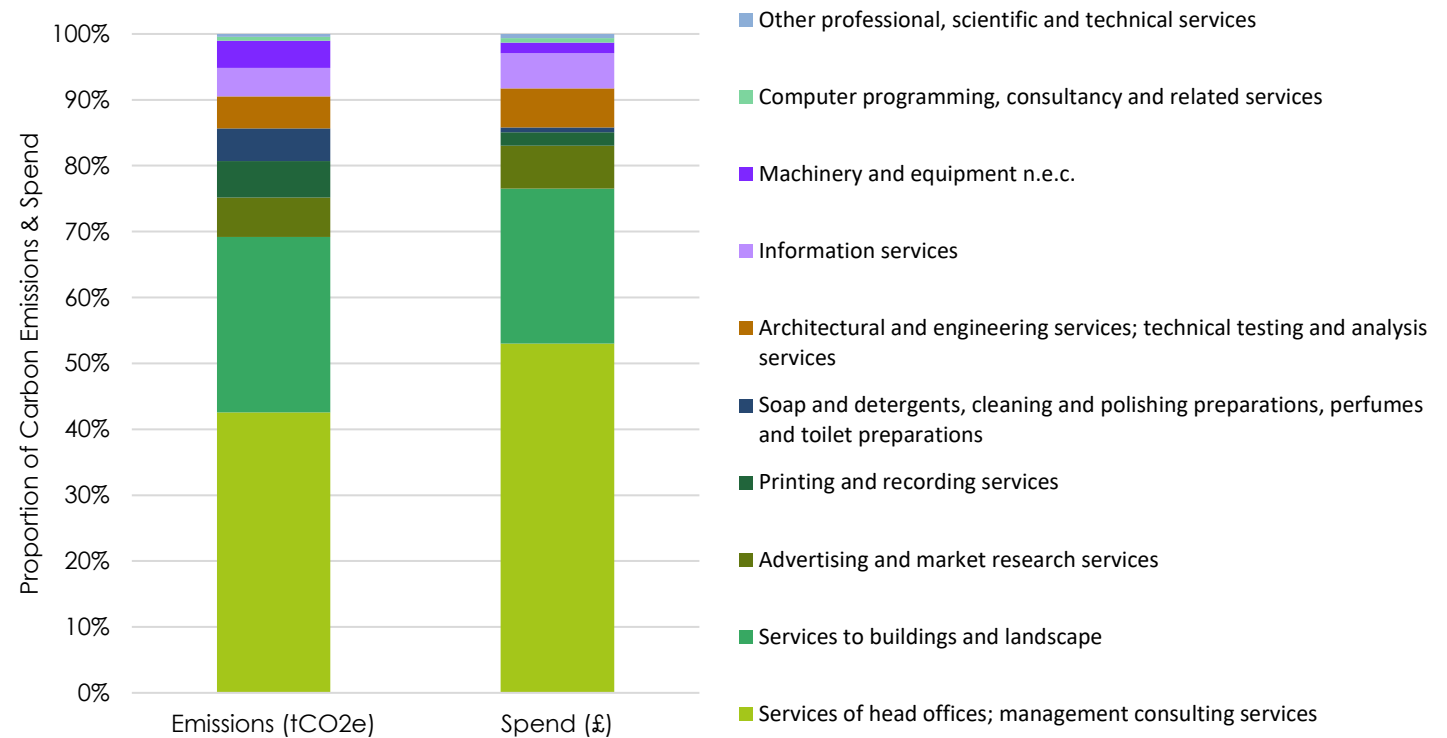
In order to assess the emissions associated with purchases, carbon emissions factors need to be assigned to the different goods/services purchased as accurately as possible. In the absence of comprehensive emissions data from every supplier, high-level conversion factors are utilised as the best available alternative. These factors consider the carbon emission intensity of a wide-range of industrial sectors and provide a kgCO₂e/£ spent metric to estimate emissions. For our analysis we have used a UK-focussed data set from DEFRA. These factors were published over 10 years ago (2011) therefore spend values have been appropriately adjusted for inflation within our assessment.

Unfortunately this methodology has low accuracy as it utilises out of date, and highly generalised emissions factors, but it does help to quantify the magnitude of these emissions relative to the overall footprint. Emissions associated with purchases account for the majority of scope 3 emissions, 71% of the total scope 3 and 51% of the entire footprint (excluding visitor travel).

The graph adjacent highlights the different carbon intensities of spend categories from the analysis. For example, whilst 'Services of head offices; management consulting services' represents 42% of the spend shown, it accounts for 30% of carbon as these are mostly driven by business operations that are typically less carbon intense.

Conversely categories such as 'Printing and recording services' show the opposite as emissions are typically more carbon intensive.

Top 10 'purchases' categories





4. CARBON FOOTPRINT

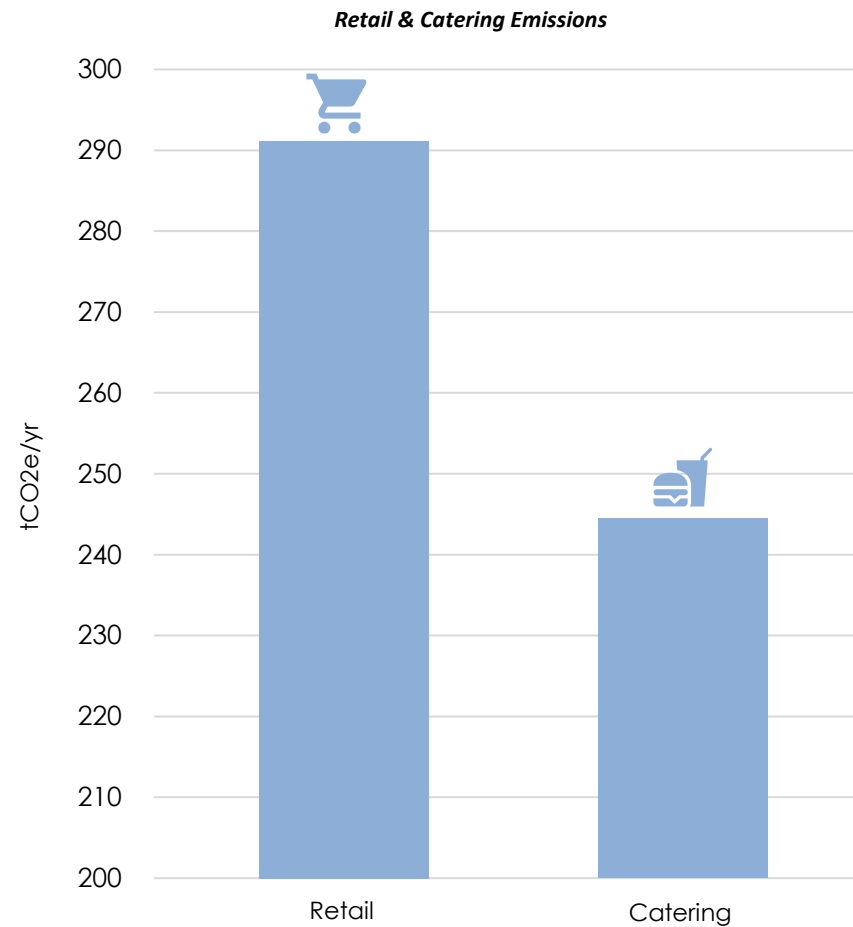
RETAIL AND CATERING

Retail and catering emissions relate to the production and distribution of sold items on-site, from the shops at the Roman Baths, Fashion Museum, and Victoria Art Gallery, and The Pump Room Restaurant, respectively.

Emissions from these sources have been calculated in the same way as purchases. Cost of sales data was provided for both retail and catering activities which was converted to carbon emissions using DEFRA emissions factors.

Whilst the cost of sales associated with catering is ~27% that of retail, it is typically a more carbon-intensive operation mostly due to the large impact of farming and agriculture on greenhouse gas emissions. Catering emitted an equivalent of ~84% of retail's greenhouse gas emissions.

A more accurate calculation method would be to understand the carbon emissions associated with the individual sold items either by considering the raw ingredients for catering or supplier specific product data in the case of retail. Supply chain engagement around this issue could provide greater clarity on this, as some suppliers may already have emissions estimates for their products.



B&NES HERITAGE SERVICES CARBON BASELINE REPORT

4. CARBON FOOTPRINT



TRAVEL

Travel (when excluding Visitor Travel) represents the smallest scope 3 emissions area comprised of multiple different activities. However, Visitor Travel alone represented the biggest source of emissions for the Heritage Services.

Business Travel

Business Travel made by employees of the Heritage Services mostly consisted of rail travel, which accounted for 54% of business travel emissions. Hotel stays were also included within the baseline of Business Travel.

Object Travel

Object Travel made up the largest travel category (excluding Visitor Travel).

These emissions are associated with the transport of objects loaned between the Fashion Museum and Victoria Art Gallery (the Roman Baths had no objects loaned within this baseline year), and other, often international, museums. In addition to the transport of these objects, often very heavy and highly packaged further increasing weight, it is common practice for museum staff to sometimes courier these objects and observe installation.

During 2019/20, the Heritage Services dealt with over 1000 individual objects (incoming and outgoing) within under 40 courier trips.

Assumptions made in Object Travel include:

1. Apportionment of emissions, whereby the purpose of the travel was identified, whether the trip was made for the sole purpose of transporting the object, or whether the trip was shared with another museum, as part of their consignment.
2. No weight/tonnage information was available, therefore objects were treated as people, e.g., CO₂e/passenger.km was used. Use of couriers were also included.

Employee Commuting

From a survey performed in March 2023, data for employee commuting was collected. This data is being used as the baseline, with assumptions of the increase of home working being considered. It was found that 16% of hours per year, for part-time and full-time employees, was spent on home working. It is known there was practically no home working in 2019/20 due to the absence of necessary IT infrastructure to support this, therefore a valid assumption was made that employee commuting has been reduced since the 2019/20 baseline, which has been counteracted in the baseline calculation.

61.7% of commuting emissions were completed by public transport, walking or cycling.

Visitor Travel

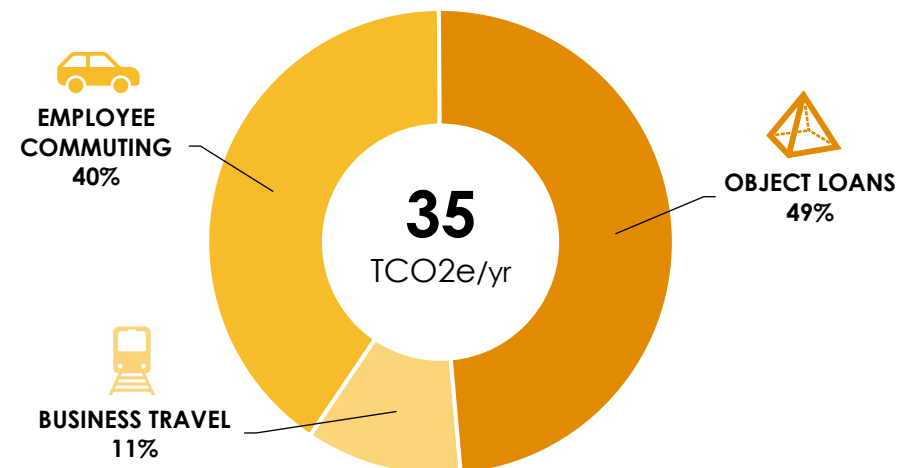
Visitor travel emissions were developed using 2019/20 billing data and the 2019/20 ticket data for the Roman Baths. For the purposes of this study, many assumptions were made:

1. Every visitor to Heritage Services visited the Roman Baths, therefore the total number of Roman Baths tickets can be assumed to represent all the Heritage Services visitors (1,163,129).
2. For international visitors, it was assumed they travelled from their respective capital cities to London Heathrow.
3. Assumptions on modal split was made for both UK and International visitors.

3. All group tickets arrived by coach.
4. Assumed distances for B&NES Resident and National visitors were made.
5. Additionally, visitors are likely to visit multiple attractions in the UK per journey, therefore an apportionment factor for the emissions to different destinations was used.

Many organisations choose to exclude visitor travel from their assessment boundary or report on it as a separate item. This is due to the limited influence and complexity in accurately isolating the emissions relevant to the organisation. We have included it within this report, but suggest this issue is discussed further within the Heritage Services.

B&NES heritage services' travel emission distribution (excluding visitor travel)



B&NES HERITAGE SERVICES CARBON BASELINE REPORT

4. CARBON FOOTPRINT



IMPACTS OF HOME WORKING

Following the COVID-19 pandemic, hybrid working arrangements have dramatically risen in popularity. Increased home working results in a direct reduction of employee commuting emissions. To complete a thorough assessment of these benefits however, the additional emissions resulting from greater heating and power demands at staff homes needs to also be accounted for.

Assessing the impact of home working is a relatively new subject due to limited demand for such analysis prior to the pandemic. EcoAct in partnership with Lloyds and Natwest have developed an [approach](#) which we have considered for the Heritage Services.

Methodology

The methodology consists of assessing the carbon emissions associated with 2 key sources:

- Office equipment (e.g., electricity use of laptops and additional lighting).
- Heating demand (increased heating use due to being at home during working hours).

For both sources a 'Base Case' approach has been used as outlined on page 8 of the methodology paper, which relies on assumptions and benchmark data. An 'Enhanced case' methodology is also available but requires significant additional information.

Office equipment

To estimate equipment emissions, the survey asked Heritage Services' employees what type of devices they use at home (laptop, monitor screen, second monitor screen, and docking station).

Calculated based on a survey that was conducted in March 2023, it was assumed that the Heritage Services have 72 staff that work from home.

Assumptions on the average power loads of the respective types of devices were applied across the applicable home working hours across a year, accompanied with an assumption on the per desk. This calculated energy value is then converted to carbon using the relevant grid electricity emissions factor.

Heating demand

Unlike office equipment which is generally likely to be similar across all staff, the additional heating demands of home working can vary significantly based on the type of property, type of heating fuel, and occupancy levels in the house etc. The 'Enhanced case' tries to take account of these variables, where the 'Base case' uses a simplistic approach.

The Heritage Service employees were asked how many people occupy their household during working hours and what their main source of energy is to heat their home.

This accounts for the seasonality of heating and typical heating schedules of homes. This value is then multiplied by the number of home working hours occurring during the heating season (October – March). Finally, reductions are applied to apportion heating between other household members.

Results

Using this methodology and the 2019 emissions factors, the impact associated with home working is estimated to be 32 tonnes CO₂e per year.

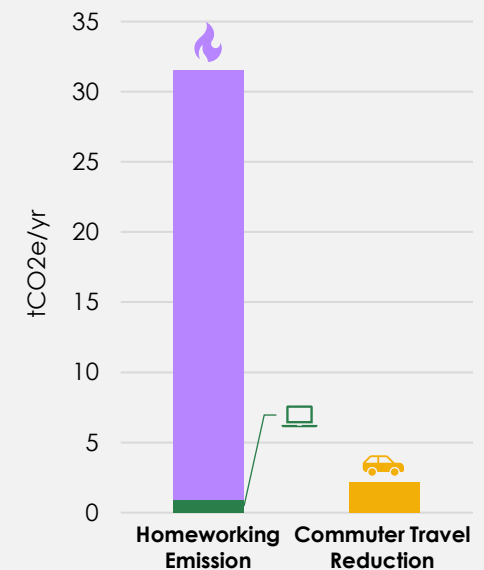
As long as the proportion of home working remains consistent this value is unlikely to change significantly in the short-term. While grid decarbonisation will have a small impact, over 97% of the emissions are associated with heating which will therefore only be impacted by energy efficiency improvements or decarbonisation of heating systems within staff homes.

Concerning the Heritage Services' carbon analysis, home working makes up less than 1% of the overall carbon emissions. It is understood that the Heritage Services employees work mostly on-site, with 15% of working hours per year calculated to be at home.

The increase of home working was used to calculate an assumed reduction of employee commuting from the baseline year to when the survey took place. The reduction in employee commuting was found to be equivalent to 2 tCO₂e per year.

Conclusions

Any increased levels of home working at the Heritage Services are likely to deliver a carbon saving from employee commuting, albeit a minor reduction. However, it was found that the emissions caused from home working is higher than the reduction in employee commuting it has caused. This could be explained through the fact that employee commuting emissions are already relatively low, calculated to be 16 tonnes CO₂e per year, due to less than 16% of travel being made by car. Although this analysis has been done based on high-level assumptions and estimates, it is anticipated that a more detailed study would yield similar results.





5

**STAKEHOLDER
WORKSHOP**

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

5. STAKEHOLDER WORKSHOP

INTRODUCTION

Following completion of the emissions footprint a short workshop was held with key stakeholders across the Heritage Services to explore the footprint in more detail, and begin to identify decarbonisation opportunities and barriers for future exploration, and the different spheres of influence they fit in: the Heritage Services; B&NES; the wider influence.

This section provides a high-level summary of the key points discussed in the workshop. It is recommended that these are explored further in the next stages of this work.

CARBON BASELINE WORKSHOP

Attendance at this workshop included information providers and interested participants, within the Heritage Services and those who working within wider B&NES.

Following a presentation of the assessed emissions, participants shared their thoughts on possible opportunities that should be explored during the future decarbonisation phase, and the barriers that may inhibit this. This is summarised adjacent and on the next page.

DECARBONISATION BARRIERS

Within the Heritage Services:

- Lack of resources to be able to improve purchase choice, coupled with a lack of understanding of emissions from suppliers. There are also supply chain constraints such as the availability of products only from certain countries.
- The Heritage Services have an economic model based on consumption.
- The Heritage Services do not influence client contracts, such as F&B, for all their venues.
- The ability to influence electricity load for Heritage Services buildings is reliant on the infrastructure of protected heritage buildings, bringing challenges to the perception of retrofit options.

Within B&NES:

- The Heritage Services are not involved in the Council's climate emergency strategy.
- A perceived barrier and availability of renewable technology that can be implemented on and still conserve heritage building.
- B&NES rely on retail, car parking, and the Heritage Services as a source of income. There is a perceived lack of appetite to change, as statutory requirements are

being met.

- An identified high cost for a local power network upgrade (electrification).

Within the wider influence:

- Heritage Services visitor demographic is 'international-heavy', providing many constraints.
- There is a lack of understanding of the carbon emergency.
- There is a lack of cycling infrastructure and promotion of low carbon travel options, that could help reduce travel emissions.



Figure: Image of baseline workshop

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

5. STAKEHOLDER WORKSHOP

OPPORTUNITIES TO INFLUENCE

Within the Heritage Services:

- Influence to educate visitors on sustainability.
- Data on the origin of products being purchased is already being collected. Spend hotspots can be identified and targeted to reduce carbon. A framework for decision making can also be made to embed climate into decisions.
- Products to be sourced that have carbon Lifecycle Assessments, so that carbon labelling can be done for F&B, retail and events.
- Staff to undergo carbon literacy training.
- Marketing in the overseas market to be considered and reassessed to understand if Visitor Travel can be influenced.
- Lift sharing for employee commuting.
- Use the Fashion Museum relocation project to influence across all scopes.
- Better zoning of HVAC across assets and sub-metering.
- Use best practice case studies on retrofitting.
- Reduce electricity demand to enable more electrification in a constrained grid.

- Sector voice – collective lobbying asking for change together from suppliers.
- Efficient technology upgrades to be bought for the whole of the Heritage Services, e.g., LEDs.
- Expand heat pumps.
- Policy shift included in briefs to have more local suppliers.

Within B&NES:

- Model the economic impact on B&NES from the impact of transitioning to net zero.
- Combined procurement power across B&NES departments - through the economic strategy, such as creating coach contracts for better efficiency and data collection.
- Create more bike parks to improve the cycling infrastructure and introduce e-bikes.
- More messaging around sustainable travel to push for public transport such as park & ride.
- Acquire a PPA to target scope 1 and 2 emissions.
- Move local markets forward through procurement framework developments.

- Introduce renewables on site – an example of this can be seen at King's College Chapel in Cambridge.

Within the wider influence:

- Offer visitors offsets.
- Make Bath a longer holiday destination through marketing and encourage people to stay in Bath for longer, e.g., visit Stonehenge.
- Dialogue with manufacturers around Heritage sensitive technologies, e.g., PV.
- Diversify visitor demographic to more local tourists, reducing the number of international flights.



6

NEXT STEPS

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

6. NEXT STEPS

NEXT STEPS

This piece of work has provided a complete assessment of the Heritage Services' scope 1, 2 and 3 carbon emissions. Having now defined this baseline footprint, the logical next step would be to explore organisational decarbonisation pathways which would typically consist of the following activities:



2. TARGET-SETTING

Having developed a detailed baseline carbon footprint, this future stage would include developing a set of reduction targets to drive decarbonisation across the organisation. To complete this, the following provides an illustration of the tasks that could be undertaken:

a. External review

The Science-Based Target initiative (SBTi) provides robust methodologies for defining carbon reduction targets aligned with limiting global warming to below 1.5°C and achieving Net Zero. An overview of what these approaches require and how it relates to the footprint will be developed for discussion.

Additionally, a short review of similar organisations will be carried out to understand what other organisations are committed to. This review aligned with the SBTi input will ensure a target is developed which responds to the latest scientific thinking as well as sector-specific trends.

b. Target definition

Following the external review, a meeting will be held with the Client team to explore potential targets which could be committed to. Whilst routes to achieving these targets are to be explored in the next activity, it is important to explore a possible target at this stage to structure the analysis.

As well as the technical details and requirements of the target, opportunities for clear communication will also be explored for use within external communications and strategy documents.

The chosen targets will be reviewed following completion of the decarbonisation analysis to ensure they remain appropriate and achievable.



3. DECARBONISATION

This future stage will focus on defining viable routes to achieve the defined decarbonisation targets, with an illustration of tasks that could be undertaken as follows:

a. Decarbonisation Options

A detailed review and evaluation of decarbonisation options available to B&NES Heritage Services to address Scope 1, 2 and 3 emissions will be carried out. Options will be explored in the following areas:

- **Building level:** energy efficiency measures, low-carbon heating solutions, on-site energy generation, etc.
- **Organisation level:** purchasing, vehicle fleet, business travel, insetting opportunities, etc.
- **External:** grid decarbonisation, policy impacts, carbon offsetting, etc.

The applicability of each option will also be considered against the different portfolio categories developed in the *baseline* activity.

B&NES HERITAGE SERVICES CARBON BASELINE REPORT

6. NEXT STEPS

Where information is available, typical key intervention points, i.e. replacement periods for key plant / interventions, will also be considered. Our experience is that it is the *phasing* of the decarbonisation opportunities that must be considered to deliver achievable cost-effective scenarios.

b. Pathways workshops

A facilitated workshop will be held with key stakeholders to explore the different options and collectively create a pathway for decarbonisation.

The aim of the workshop will be to discuss the longlist of options and prioritise these using multi-criteria assessment (e.g. cost, risk, benefits, scalability, level of influence). Opportunities and constraints to their implementation as well as ownership will also be explored.

The workshop may be divided into two sessions to address scope 1 and 2 emissions, and scope 3 emissions, respectively. In our experience this can be beneficial to engage the most relevant stakeholders. The scope 1 and 2 would primarily involve estate teams, and scope 3 would be more focussed on procurement and business operations teams.

Structured interviews with key stakeholders could also be carried out as an alternative to the workshop format.

c. Pathway analysis

Following the workshop, a pathway data-model will then be developed to explore the contributions of the shortlisted options to the decarbonisation targets agreed in the previous activity.

For scope 1 and 2 this will be an excel-based model, however scope 3 emissions may require a more qualitative analysis due to limitations of the data availability and calculation methodologies.

Results of this exercise will be presented to the client team, in particular discussing performance against the chosen targets.

d. Implementation workshop

Following completion of the data model, a final workshop will be held with the client team. The aim of this session will be to review outputs of the data model and develop an implementation plan for delivery.

This plan will include considering ownership of the key options proposed as well as recommended immediate next steps for delivery.

e. Net zero strategy

A summary report will be provided covering the developed scope 1,2,3 pathway and implementation plan.

A concise and highly visual executive summary will also be provided for the purposes of broader engagement and communication around the subject.

3 ADAPT

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