The Dextrous Web Limited Carbon Footprint Calculation 2021-2022

6 C Free

General Information Table

Company Name	The Dextrous Web Limited		
Company Address	Calls Landing, 36-38 The Calls, Leeds, West Yorkshire LS2 7EW		
Reporting Period	01/09/2021-31/08/2022		
Number of full-time employees	83		
Scope Emissions Claim	This calculation contains 100% of scope 1 and scope 2 emissions, and scope 3 emissions within the company's financial control and withing the bounds of what's required by the Greenhouse Gas Protocol.		
Methodology	This calculation follows the Greenhouse Gas Protocol: Corporate Standard. Scope 1 and 2 were calculated using activity data and scope 3 emissions were calculated using activity data where possible and a spend based method where activity data was not available. More details can be found in C Free's Calculation Methodology: https://c-free.notion.site/The-C-Free-Carbon-Footprint-Calculation-Methodology-f6a299ae0ed843fd801f9b3b079cc994		
Carbon Footprint	**Year**	**2019**	**2022**
	Scope 1	10.50	1.88 Tonnes CO2e
	Scope 2	7.00	10.36 Tonnes CO2e
	Scope 3	159.70	248.42 Tonnes CO2e
	Total	177.80	260.66 Tonnes CO2e
	Uncertainty on Calculation	159.58-198.10	233.33-291.20 Tonnes CO2e
	Total per Employee	0.63	3.14 Tonnes CO2e

Executive Summary

This report presents the results of the carbon footprint calculation for The Dextrous Web Limited (dxw), a digital consultancy. The purpose of this report is to assess dxw's environmental impact, set reduction targets, and provide a roadmap towards carbon neutrality.

The report begins by outlining the structure and purpose of the analysis, which involves calculating the greenhouse gas emissions (GHGs) for a specific reporting period. By undertaking this assessment, dxw aims to gain insights into their current environmental state and embed future sustainability practices.

dxw is a digital agency that works with public and third sectors, and operates in the dynamic and fast-paced digital industry. The company provides innovative solutions in the areas of technology, digital and public services. In an industry known for its rapid growth and technological advancements, dxw faces unique environmental challenges. As a company that relies on digital technology, their operations have significant energy requirements. Therefore, understanding and mitigating their environmental impact is crucial.

The technology sector, like many other industries, has a responsibility to address environmental sustainability. As technology continues to evolve, the industry must adapt and find innovative ways to minimise its carbon footprint. Balancing the growth and development of digital solutions with environmental stewardship is paramount. Companies in this sector must strive to increase energy efficiency, promote the use of renewable energy sources, and reduce waste generation to ensure a sustainable future.

In this report, GHG emissions are measured in kilograms of carbon dioxide equivalent (kgCO2e). This is a unit that measures the global warming potential of different greenhouse gases, such as carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), by converting their emissions to an equivalent amount of CO2. The use of kgCO2e allows for a comprehensive assessment of dxw's total environmental impact, accounting for various greenhouse gases and their respective warming potentials.

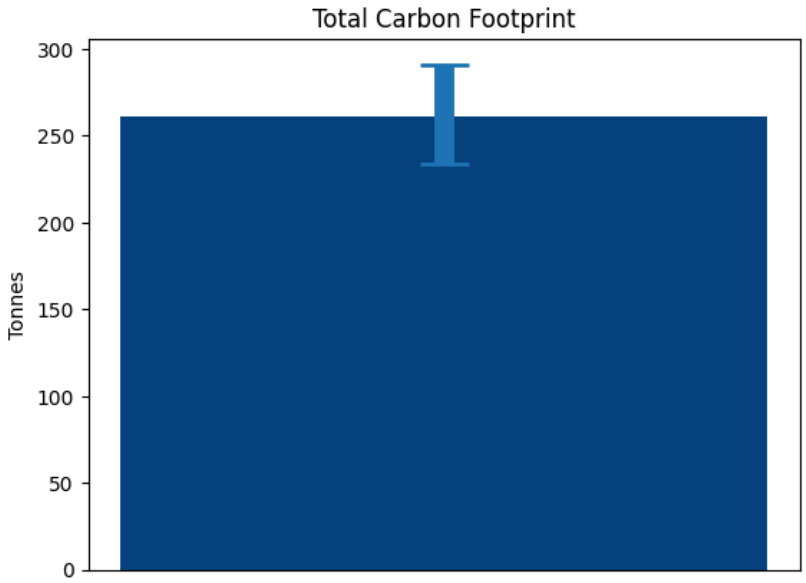
The GHG emissions are categorized into three scopes as per the GHG Protocol. Scope 1 includes direct emissions from sources that are owned or controlled by dxw, such as onsite fuel combustion. Scope 2 encompasses indirect emissions from the generation of purchased electricity consumed by dxw. Finally, Scope 3 covers indirect emissions from activities in the value chain, such as business travel, employee commuting, and procurement.

By calculating their carbon footprint and analysing each scope of emissions, dxw can identify areas for improvement and develop a comprehensive carbon management strategy. This will involve setting reduction targets and investing in offsetting initiatives to achieve carbon neutrality.

This report serves to strengthen dxw's sustainability journey, providing a roadmap to enhance environmental performance, meet stakeholder expectations, and contribute to a greener future for public and charity sector technology and service provision.

Breakdown of Carbon Footprint

Activity	*Unit(tCO2e)*	*2019-2020 Base Year*	*2020-2021*	*2021-2022 Reporting Year*
Scope 1 - Direct Emissions	**Total**	**10.50**	**1.59**	**1.88**
Gas		10.50	1.59	1.88
Scope 2 - Emissions from Electricity Purchased	**Total**	**7.00**	**3.70**	**10.36**
Electricity		7.00	3.70	10.36
Scope 3 - Indirect Emissions	**Total**	**159.70**	**173.24**	**248.42**
Digital		1.00	2.25	5.31
Employee Commuting		9.40	1.80	1.66
Expenses		17.2	16.88	52.03
Purchased Items		-	-	9.37
Travel		6.40	1.61	16.15
Mileage		-	-	0.11
Waste		3.50	0.17	0.02
Transmission And Distribution		0.60	0.16	1.01
Water		0.10	0.01	0.01
Web Hosting		110.00	129.45	127.91
Work From Home		12.10	43.33	32.03
Well-To-Tank		-	-	2.81
Total	**Tonnes**	**177.80**	**178.53**	**260.66**



Introduction

To begin a carbon management strategy, businesses must first calculate their greenhouse gas (GHG) emissions. The GHG Protocol is the most widely used international accounting tool for this purpose, providing a standardised way of quantifying and reporting emissions. Once emissions are calculated, businesses can develop reduction targets and offset unavoidable emissions, paving the way towards carbon neutrality. This report presents the results of dxw's carbon footprint calculation, using the GHG Protocol methodology for the reporting period 01/01/2022 - 31/12/2022.

dxw is a digital agency for the public and third sector, with teams across the UK.

The report not only highlights the current environmental state of the business but also identifies potential areas for improvement. By providing a clear breakdown of GHG emissions, dxw can easily identify opportunities to reduce their carbon footprint. This report is the third calculation in dxw's sustainability journey, strengthening a comprehensive carbon management strategy that will reduce costs and improve environmental performance.

Organisational Boundaries

Setting boundaries is a crucial step in calculating a company's carbon footprint. The boundaries define the extent to which emissions will be measured and allow for consistency and comparability across different businesses. In this report, 100% of dxw's Scope 1, Scope 2, and outlined Scope 3 emissions are included in the carbon footprint calculation carried out by C Free. However, it should be noted that this is not a complete Lifecycle Assessment of emissions. This report provides valuable information on the carbon footprint of dxw's business operations and serves as a starting point for assessing and managing their environmental impact.

Scope 1

Scope 1 emissions are those that arise from sources owned or controlled by the company, such as their own fuel combustion and fugitive emissions.

Gas

The consumption of gas to power basic amenities under dxw's direct control resulted in emissions of greenhouse gases. These emissions are included in Scope 1 as they are a direct outcome of dxw's activities that are under their control.

Methodology

The amount of gas used was supplied by dxw in kWh from their energy bills. This number, multiplied by the UK governments conversion factor for natural gas (Government, 2021) gives the emissions.

Formula

$$x_{gas} \times e_{gas} = E_{gas}$$

> ***Where x_{gas} is the kWh consumption of gas over the given period, e_{gas} is the relevant emissions factor, and E_{gas} is the resultant emissions.***

Result

Calls Landing:

1.88 Tonnes CO2e

Scope 2

Scope 2 in carbon accounting refers to the indirect greenhouse gas emissions associated with the consumption of purchased electricity, heat, or steam by an organisation.

Electricity

Emissions associated with consumption of electricity are often generated offsite by a power station. Once produced, the electricity is then sold to dxw and distributed to their facilities. Since the production of electricity is often associated with emissions, the carbon footprint calculation must take these emissions into account. It should be noted that this is a location-based calculation and does not include the purchase of renewable energy certificates as such a methodology was not relevant in this case.

Methodology

Where possible dxw supplied the kWh used over the reporting period at their offices from their energy bills. If unavailable and average based on the occupancy of the location was used. This can be used in conjunction with the government conversion factors (Government, 2021) to give the carbon footprint associated with electricity purchased.

Formula

$$x_{elec} \times e_{elec} = E_{elec}$$

Where x_{elec} is the kWh consumption of electricity over the given period, e_{elec} is the relevant emissions factor, and E_{elec} is the resultant emissions.

Result

Calls Landing:

6.25 Tonnes CO2e

11 Hoxton Square:

0.82 Tonnes CO2e

Huckletree (Co-Working):

3.29 Tonnes CO2e

Scope 3

For dxw, scope 3 emissions were the primary contributor to their overall carbon footprint. Scope 3 includes all indirect emissions not included in scope 1 and scope 2, which resulted from the activity of the company but not from sources owned or controlled by the company. This includes the production of raw materials, transportation of materials, or use of third-party services such as online meeting platforms. While obtaining data on scope 3 emissions can be challenging, the report used suitable proxies to estimate these emissions. The GHG protocol recommends focusing on scope 3 areas that have the most significant GHGs, the best opportunities for reducing emissions, and are most relevant to dxw's business goals. By identifying these specific areas, dxw can develop targeted strategies to reduce their carbon footprint and demonstrate their commitment to sustainability.

The following sources were included:

- Employee Commuting
- Purchased Items
- Travel
- Hotel
- Waste
- Transmission And Distribution
- Water
- Work From Home
- Well-To-Tank
- Digital
- Web Hosting
- Expenses
- Mileage

Some emissions sources were excluded from this report due to unreliable or inadequate information, a lack of research, or irrelevance to dxw's operations. While it is important to include as many emissions sources as possible in the calculation, some sources may fall outside the scope of the report due to data limitations. However, the report made every effort to include all relevant emissions sources required for a Carbon Reduction Plan.

Sources that were not included are as follows:

- Pensions and Investments
- Franchises
- Upstream Transportation and Distribution
- Upstream Leased Assets
- Downstream Leased Assets
- Downstream Transportation and Distribution
- Processing of Sold Products
- Use of Sold Products
- End of Life Treatment of Sold Products

Employee Commuting

Employee commuting is an important component of a GHG emissions report as it contributes to a carbon footprint. Evaluating and addressing this allows dxw to develop effective strategies for reducing our overall environmental impact.

Methodology

Most employees answered the survey, so the previous calculation was used to find an average per person, then scaled by the number of employees to reflect the total workforce of the company. Therefore, the emissions were estimated by finding the distance travelled, multiplying the total commuting distance by the relevant conversion factor for a given mode of transport, and then weight this by the frequency multiplier supplied (Government, 2021) and the number of days worked per month.

Formula

$$\sum d_{dist} \times e_{mode} \times f = E_{EC}$$

Where d_{dist} is the distance of any given delivery journey, e_{mode} is the relevant emissions factor for the given journey leg, f is the number of commutes over the period, and E_{EC} is the resultant emissions. We then sum over the individual employees

Result

Bus:

0.34 Tonnes CO2e

Heavy Rail:

0.07 Tonnes CO2e

Subway:

0.27 Tonnes CO2e

Transit:

0.09 Tonnes CO2e

Commuter Train:

0.07 Tonnes CO2e

Driving:

0.82 Tonnes CO2e

Purchased Items

A company has a responsibility for the emissions produced by the production and distribution of the goods that are purchased in order to provide goods and services.

Methodology

Where the data was clear enough, activity data was extracted from dxw's Fest available conversion factor for said item to calculate the emissions rather than using the spend-based method. This method has a lower uncertainty.

Formula

$$x_{item}[\#] * e_i\left[\frac{kgCO2_e}{\#}\right] = E_{item}[kgCO2_e]$$

Where x is the number of items

Result

MacBook Air:

2.78 Tonnes CO2e

MacBook Pro:

4.90 Tonnes CO2e

Monitor:

1.69 Tonnes CO2e

Travel

Travel to and from client offices is an essential part of many businesses, enabling companies to interact with clients and provide services effectively. However, such travel generates greenhouse gas (GHG) emissions, contributing to the overall carbon footprint of the business. Reducing travel related GHG emissions can be achieved through a variety of solutions, including teleconferencing, video conferencing, and choosing alternative modes of transport, like public transport or electric cars.

Methodology

In order to calculate the carbon footprint of travel, distances and modes of transport were provided and necessary conversion factors were used.

Formula

$$\sum d \times e_m = E_{travel}$$

Where d is the distance travelled, e_m is the relevant emissions factor for the given mode of transport, and E_{travel} is the resultant emissions. This is then summed over all journeys and modes of transport. In some cases the spend based method is used as insufficient data is available (see expenses section for relevant equation).

Result

Plane Economy:

8.20 Tonnes CO2e

Train (spend based):

4.10 Tonnes CO2e

Train (activity based):

0.30 Tonnes CO2e

Travel:

2.85 Tonnes CO2e

Bus:

0.06 Tonnes CO2e

Cab:

0.64 Tonnes CO2e

Waste

Different types of waste have varying carbon footprints, which must be taken into account for an accurate assessment. Recycling, though beneficial for the environment, requires energy for sorting and repurposing, which can contribute to GHG emissions. Similarly, organic waste that ends up in landfills produces carbon dioxide and methane, both of which are potent GHGs.

Methodology

The amount of waste was unavailable. The nature of the business means there was no additional operational waste to consider. The average amount of waste per employee per day (The World Bank, 2022) along with the number of days worked at the office was used in conjunction with the government conversion factors used to calculate a figure for kgCO2e (Government, 2021).

Formula

$$\sum x_w \times e_m = E_{waste}$$

Where x_w is the amount of waste produced, e_m is the relevant emissions factor for the type of waste, and E_{waste} is the resultant emissions. This is then summed over all types of waste disposal.

Result

Water Waste:

0.02 Tonnes CO2e

Transmission And Distribution

Transmission and Distribution losses must be considered when calculating the GHG emissions associated with electricity consumption. During the transfer of electricity from the power plant to the end-user, a small percentage of energy is lost in the form of heat. These losses are known as Transmission and Distribution losses, and they contribute to the overall carbon footprint of an organisation.

Methodology

Multiplying the consumption of electricity consumed with the emissions factor for transmission and distribution gives the emissions associated with Transmission and Distribution.

Formula

$$x \times e_m = E_{T\&D}$$

> ***Where x is the kWh consumption, e_m is the relevant emissions factor for the given mode of transport, and $E_{T\&D}$ is the resultant emissions.***

Result

Calls Landing:

0.61 Tonnes CO2e

11 Hoxton Square:

0.08 Tonnes CO2e

Huckletree (Co-Working):

0.32 Tonnes CO2e

Water

The energy required to pump, treat and distribute water to homes and businesses can generate significant GHG emissions, which should be accounted for in a company's overall carbon footprint. Incorporating water usage in sustainability reporting and carbon management planning is crucial for companies committed to reducing their overall environmental impact.

Methodology

To calculate water-related carbon emissions, we took the litres of water used at dxw's premises and applied corresponding emissions factors to estimate the total carbon footprint associated with water usage.

Formula

$$x_w \times e_m = E_{water}$$

Where x_w is the amount of water used, e_m is the relevant emissions factor, and E_{water} is the resultant emissions. This is then summed over all types of waste disposal.

Result

Water Average:

0.01 Tonnes CO2e

Work From Home

Due to changing working behaviours, many employees have started work from home. This has resulted in a shift of emissions associated with office life, such as electricity consumption and heating, to the homes of employees. It is important to include these additional emissions in the calculation of dxw's carbon footprint, as they are a direct result of their operations.

Methodology

The Employees of dxw provided the days worked at home, this information and factors gathered from a paper regarding working from homes effect on utility usage (ecoact, 2020) was used to calculate the added gas and electricity used. Then with conversion factors kWh per pound spent on utilities and kWh emissions factors from (Government, 2021) we calculated the carbon footprint.

Formula

$$h_{FTE}[hour] \times e_{appliance}\left[\frac{kgCO2e}{hour}\right] = E_{appliance}[kgCO2e]$$

$$h_{FTE}[hour] \times e_{heating}\left[\frac{kgCO2e}{hour}\right] = E_{heating}[kgCO2e]$$

Where h_{FTE} is the total number of full-time equivalent hours worked at home

Result

Heating:

29.05 Tonnes CO2e

Appliances:

2.98 Tonnes CO2e

Well-To-Tank

The carbon footprint associated with energy use extends beyond the combustion of fossil fuels to generate electricity or heat. The extraction, transportation and production of materials required to generate energy contribute to the overall carbon footprint. It is essential to consider the well-to-tank (WTT) emissions factors associated with the various energy generation facilities used in the electricity grid mix. Additionally, in the case of gas, the carbon footprint must include the emissions during mining, transportation and production.

Methodology

Data for fuel-based activities was collected for scope 1 and 2 calculations. The emissions factors associated with these were found and combined to calculate the carbon footprint.

Formula

$$x_{WTT} \times e_m = E_{WTT}$$

Where x_{WTT} is the amount of electricity or gas consumed, e_m is the relevant emissions factor, and E_{WTT} is the resultant emissions.

Result

Calls Landing Electricity:

1.50 Tonnes CO2e

Calls Landing Gas:

0.32 Tonnes CO2e

11 Hoxton Square Electricity:

0.20 Tonnes CO2e

Huckletree (Co-Working) Electricity:

0.79 Tonnes CO2e

Digital

Although invisible to the user, online services are facilitated by data centres and server banks which consume significant amounts of energy. Naturally, this energy comes at some environmental cost. Therefore, these online services are critical to consider when establishing environmental impact; particularly for modern businesses who rely so heavily on this online infrastructure.

Methodology

Calculating the carbon emissions of digital activities, such as video conferencing, involves factoring in the data transfer rates, the duration of the video conference, and the energy intensity of data transmission and data centre operations. The unit of activity is multiplied by an average emissions factor which incorporates the average data transfer rates and energy intensities of network infrastructure and data centres, giving an estimate of CO2 equivalent emissions.

Formula

$$T[\text{hour}] * e_i \left[\frac{kgCO2_e}{\text{hour}}\right] = E_{\text{video calls}}[kgCO2_e]$$

$$S[Gb] * e_i \left[\frac{kgCO2_e}{Gb}\right] = E_{\text{cloud storage}}[kgCO2_e]$$

$$W[Gb] * e_i \left[\frac{kgCO2_e}{Gb}\right] = E_{\text{webpage loads}}[kgCO2_e]$$

$$M[\text{message}] * e_i \left[\frac{kgCO2_e}{\text{message}}\right] = E_{\text{message}}[kgCO2_e]$$

Where T is the number of hours video calling, S if the total Gb of data stored on the cloud, W is the total Gb of data loaded when visiting webpages and M is the number of instant messages sent.

Result

Instant Messages:

0.40 Tonnes CO2e

Video Calls:

4.91 Tonnes CO2e

Web Hosting

Web hosting makes up a large proportion of the service that dxw provides to their clients. Hosting online services is a carbon-intensive activity so it is important that the emissions related to web hosting are included in the calculation.

Methodology

Heroku

Heroku supply very limited information about their green practices, and indeed, the energy consumption associated with each user. dxw provided the CPU hours used per month, with this we used a conversion factor for CPU hours to kWh found using different CPU manufacturers data: Intel's mainstream Core processors have a Thermal Design Power (TDP) around 65W as do some of AMD's Ryzen CPUs. Higher-performance CPUs or those designed for gaming or professional workstations often have higher TDPs, sometimes exceeding 100W. Using the resultant electricity usage and the conversion factor for electricity we calculated the total emissions.

AWS

dxw supplied the data for their AWS usage in kWh per type for their CPU, database and frontend usage. This information and the emissions factor for electricity per kWh was used to calculate the emissions due to AWS web hosting (Government, 2022).

Formula

$$T_{CPU}[hour] * e_i\left[\frac{kgCO2e}{hour}\right] = E_{WebHost}[kgCO2e]$$

$$E_{CPU}[kWh] * e_i\left[\frac{kgCO2e}{kWh}\right] = E_{WebHost}[kgCO2e]$$

Where T_{CPU} is the total hours the CPUs are running to host the website and E_{CPU} is the total electricity used to run the relevant servers.

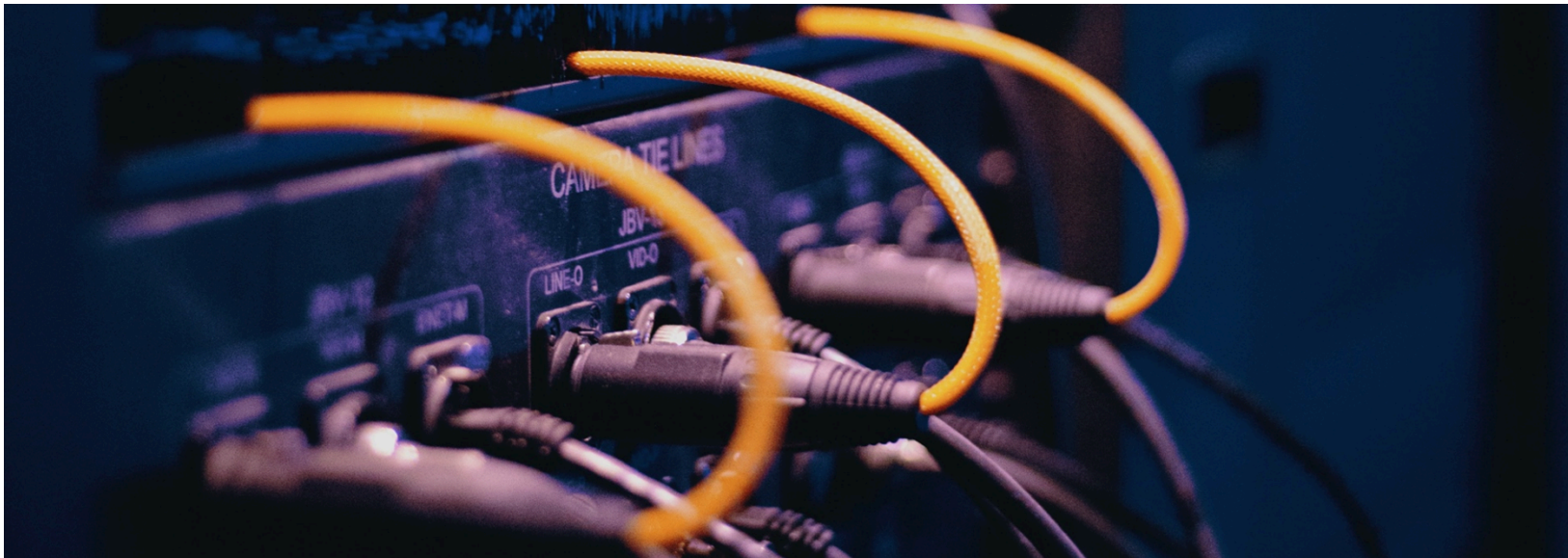
Result

Aws:

124.67 Tonnes CO2e

Heroku:

3.24 Tonnes CO2e



Expenses

Organisations have a responsibility to consider the GHG emissions associated with the goods and services they purchase, as these emissions contribute to the organisation's overall carbon footprint. The spend-based method is a useful tool for calculating the carbon impact of goods and services purchased by an organisation. This method involves quantifying the total expenditure associated with each good or service and using this information to estimate the GHG emissions associated with their production and distribution.

Methodology

It can be argued that the carbon footprint associated with the production of various commodities should be spread across their lifetime. However, for the purpose of this calculation, we treat them as a point source at the time of purchase as, in practice, the lifetime of such goods is highly variable. Furthermore, consumption is typically quite regular (on an annual basis) and therefore, treating emissions as a point source will not skew the resultant footprint.

Formula

$$x \times e_{esp} = E_{exp}$$

Where x is the amount spent, e_{exp} is the relevant emissions factor for the given expense, and E_{exp} is the resultant emissions.

Result

Staff Training:
4.28 Tonnes CO2e
Software And Digital Products:
14.86 Tonnes CO2e
Drink:
0.55 Tonnes CO2e
Photography Services:
0.88 Tonnes CO2e
Gift Unknown:
2.88 Tonnes CO2e
Cleaning Janitorial Services:
0.10 Tonnes CO2e
IT Equipment:
2.07 Tonnes CO2e
Health And Wellness Products:
0.03 Tonnes CO2e
Apparel And Clothing:
0.42 Tonnes CO2e
Restaurant:
1.91 Tonnes CO2e
Office Supplies and Equipment:
1.04 Tonnes CO2e
Financial Services Products:
2.25 Tonnes CO2e
Consulting Advisory Services:
8.58 Tonnes CO2e
Stationery:
0.72 Tonnes CO2e
Food:
1.33 Tonnes CO2e
Hotel:
4.47 Tonnes CO2e
Furniture And Decor:
0.65 Tonnes CO2e
IT Accessories:
0.16 Tonnes CO2e
Advertising:
3.87 Tonnes CO2e
Printing Services:
0.19 Tonnes CO2e
Telephone:
0.41 Tonnes CO2e
Legal Products and Services:
0.21 Tonnes CO2e
Ink:
0.17 Tonnes CO2e

Mileage

Fuel-related emissions resulting from vehicles not owned by dxw are classified as Scope 3 emissions. This is because these emissions are not under dxw's direct control but are indirect outcomes of their operations. When calculating Scope 3 emissions, dxw must account for all emissions associated with their supply chain activities, including transportation.

Methodology

The pound per mile and amount spent of fuel was supplied by dxw from their expenses where possible, elsewhere the average cost per litre of fuel was used along with the amount spent. These numbers, multiplied by the UK governments conversion factor for fuel (Government, 2021) gives the emissions.

Formula

$$\sum d \times e_m = E_{mileage}$$

$$\sum V \times e_m = E_{mileage}$$

Where d is the distance travelled, V is the volume of fuel, e_m is the relevant emissions factor for the given mode of transport or the volume of fuel, and $E_{mileage}$ is the resultant emissions. This is then summed over all journeys and modes of transport.

Result

Unknown Fuel:

0.10 Tonnes CO2e

Electric:

0.01 Tonnes CO2e

Conclusion

In conclusion, we find that dxw emitted 260.66 Tonnes over the reporting period of 01/09/2021-31/08/2022. This is approximately 3.14 Tonnes per full time equivalent employee.

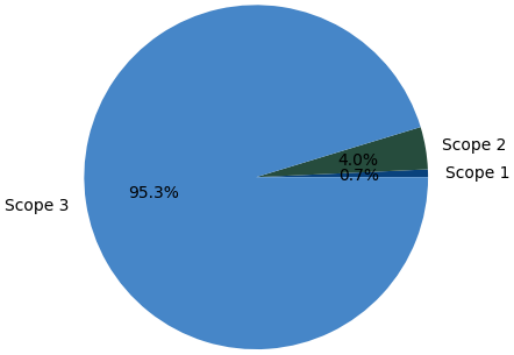


Figure 1: All emissions by scope

Figure 1 presents the breakdown of emissions by scope, with Scope 3 emissions being the largest contributor. This highlights the significance of indirect emissions from activities outside of dxw's operational control, such as upstream and downstream activities in their value chain, including business travel and procurement. It indicates the potential for emissions reduction through collaboration with suppliers, implementing sustainable procurement practices, and promoting greener transport alternatives.

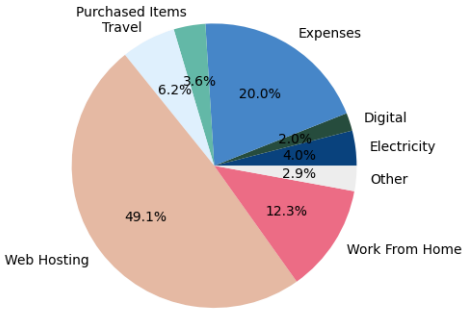


Figure 2: All emissions of 2% and over

Figure 2 exhibits the emissions sources that contribute 2% or more to the total footprint. Web Hosting emerges as the most significant contributor, followed by Expenses and Home Working. This analysis sheds light on the specific areas where dxw can focus their efforts for emissions reduction. Targeting emissions associated with web hosting, optimising expenses related to energy usage, and exploring sustainable alternatives for home working could all play crucial roles in reducing the company's environmental impact.

Figure 3: All emissions less than 2%

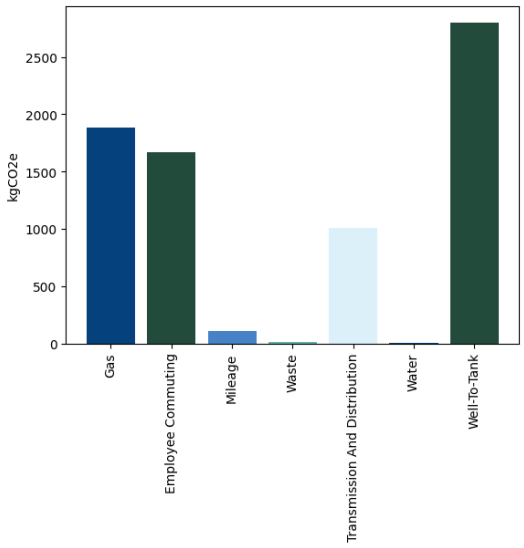


Figure 3 represents the emissions collectively labelled as 'Other' in Figure 2, each contributing less than 2% to the total footprint. While individually these emitters may have a relatively minor impact, collectively they still account for a notable portion of the overall emissions. It is essential to further investigate and understand these specific sources to effectively address them. Although they may seem insignificant compared to the larger contributors, tackling and minimising emissions from these various sources can still contribute to the overall reduction and sustainability goals of dxw.

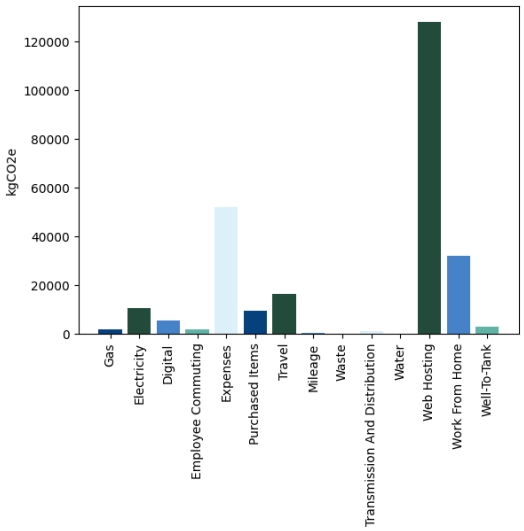


Figure 4: Emissions from each category

Figure 4 displays the emissions breakdown by category, with Web Hosting, Expenses, Home Working, and Purchased Items emerging as the highest contributors. This analysis provides valuable insights into the areas where dxw should prioritise emissions reduction efforts. By focusing on optimising energy usage in web hosting, identifying opportunities for sustainable expense practices, promoting greener home working initiatives, and implementing sustainable procurement strategies, dxw can effectively mitigate their environmental impact. The plot serves as a useful tool for identifying key emission sources and guiding targeted sustainability initiatives within the company's operations.

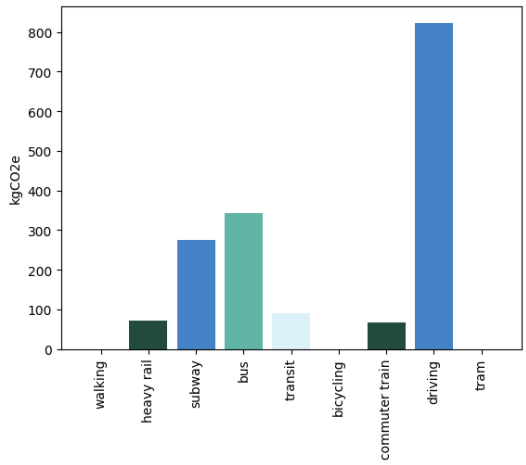


Figure 5: Employee Commute emissions by mode

Figure 5 illustrates the emissions attributed to different types of commuting to work by employees, with driving being the highest contributor, followed by travelling via bus. This provides valuable insights into the transportation-related emissions generated by dxw's workforce.

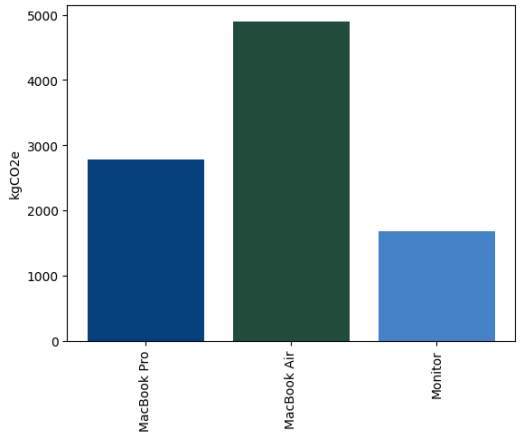


Figure 6: Purchased Items emissions by type

Figure 6 highlights the emissions associated with different types of purchased items, with MacBooks being the most dominant contributor. This plot provides valuable insights into the environmental impact of dxw's procurement practices, particularly in terms of electronic devices. To reduce emissions in this category, dxw could consider implementing sustainable procurement policies, such as selecting energy-efficient products, prioritising suppliers with strong environmental credentials, and promoting recycling and refurbishment programs.

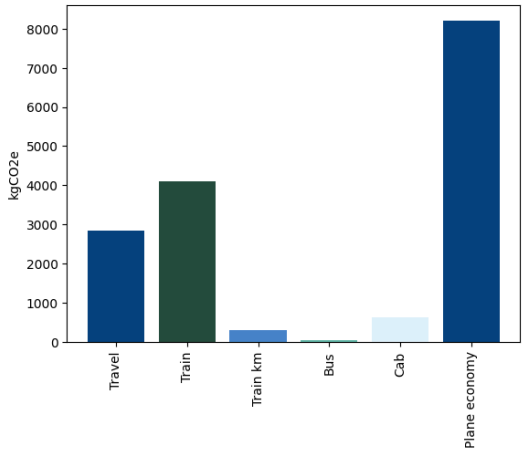


Figure 7: Travel emissions by mode

Figure 7 showcases the emissions attributed to various modes of travel, with plane and train transportation contributing significantly, particularly flights. This plot sheds light on the environmental impact of dxw's travel practices. To mitigate these emissions, dxw can explore alternatives such as video conferencing, promoting train travel over flights where feasible, and implementing travel reduction strategies.

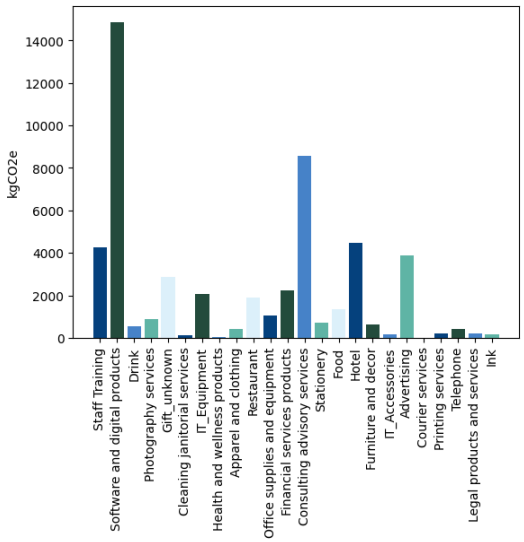


Figure 8: Expenses emissions

Figure 8 presents the emissions breakdown across different areas of expenses. It reveals that software expenses contribute the most to emissions, followed by consultancy costs, drinks, staff training, hotel, and advertising costs. This plot offers insights into the key areas where dxw can focus their efforts to reduce emissions.

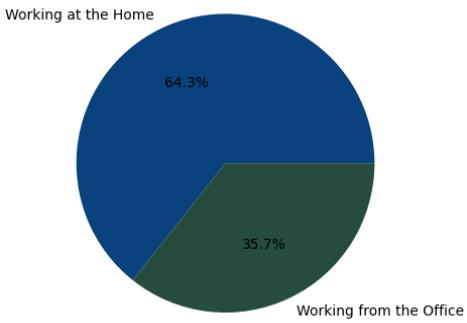


Figure 9: Work from home vs Working at the office emissions

Figure 9 provides a comparison of emissions between employees working from home and those working in the office. Interestingly, the plot reveals that working from home results in higher emissions compared to office-based work. This finding may be attributed to various factors such as increased energy use in employees' homes or the different emissions associated with home-based equipment and infrastructure.

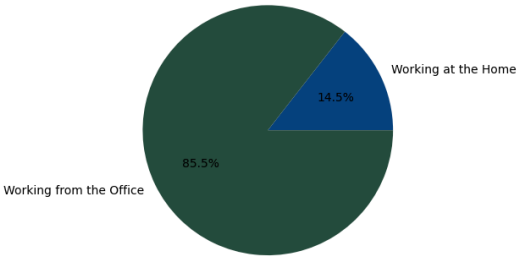


Figure 10: A day at home vs A day at the Office

Figure 10 represents the same data as Figure 9 but weighted to represent a single day for an employee at either location. Contrary to the previous plot, this analysis reveals that working at the office results in higher emissions compared to working from home when considering emissions on a per-day basis.

Comparison to Base Year

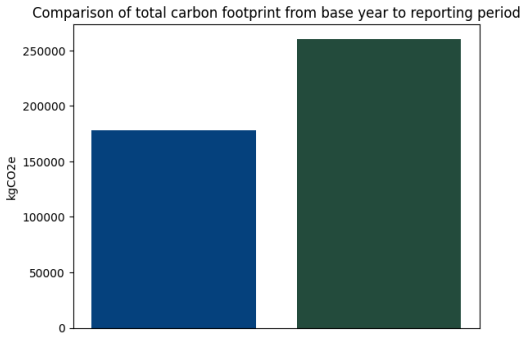


Figure 11: Comparison to base years total

Figure 11 displays the comparison between the base year and the reporting period in terms of total carbon footprint. By analysing this plot, it becomes evident that the total carbon footprint has increased during the reporting period as compared to the base year. This suggests a growth in emissions and highlights the need for dxw to address this upward trend, develop more effective emission reduction strategies, and prioritise sustainability measures to mitigate their environmental impact.

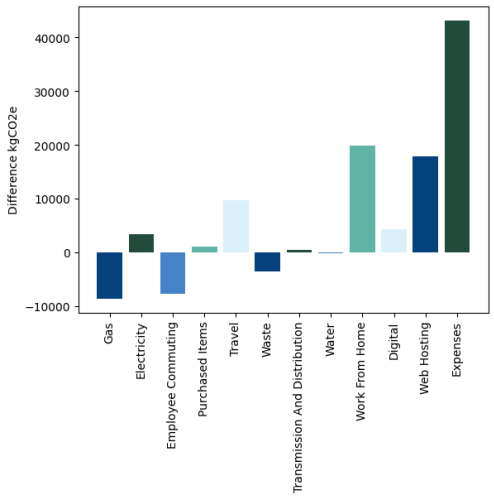


Figure 12: Absolute change in emissions for each category

Figure 12 displays the absolute difference in emissions for each category. It highlights the changes in emissions between the base year and the reporting period. Expenses have changed most significantly this may be due to a wider variety of expenses being accounted for.

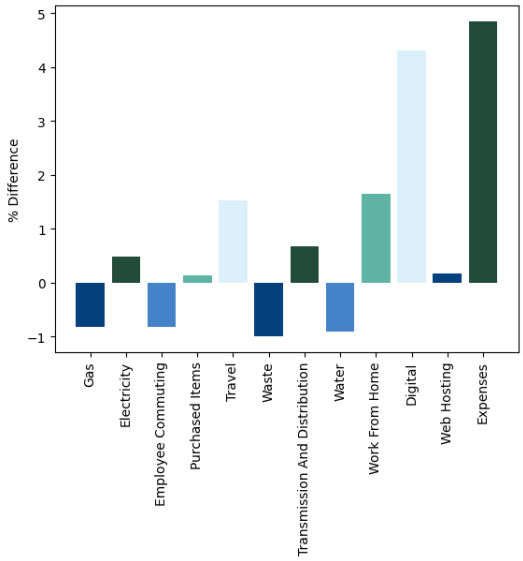


Figure 13: Percentage change in emissions for each category

Figure 13 displays the percentage difference in emissions for each category. There are several areas of reduction despite corporate growth, however the areas of increase were greater.

Reduction Strategy

The reduction strategy may focus on areas where dxw has the most significant impact, such as their supply chain or energy consumption. The strategy should also consider feasible and realistic options, taking into account factors such as cost and implementation timeframes.

Electricity

1. **Switch to LED lighting:**

   LED lights use up to 80% less energy than traditional incandescent bulbs and have a longer lifespan.

2. **Turn off lights and equipment when not in use:**

   Encourage employees to turn off lights and equipment when they are not needed or when leaving the office.

3. **Use power strips:**

   Plug office equipment into power strips and turn off the power strip when the equipment is not in use. This can help prevent energy waste from devices that draw standby power even when not in use.

4. **Set up sleep mode on computers:**

   Configure computers to enter sleep mode when not in use, which can reduce energy consumption by up to 70%.

5. **Optimise heating and cooling:**

   Ensure that your heating and cooling systems are properly maintained and set at appropriate temperatures. You can also use programmable thermostats to adjust the temperature settings based on occupancy patterns.

6. **Use natural light:**

Take advantage of natural light by opening blinds and curtains during the day, reducing the need for artificial lighting.

7. **Purchase energy-efficient equipment:**

Consider purchasing energy-efficient equipment, such as Energy Star-certified computers and printers, which can help reduce energy consumption.

8. **Conduct an energy audit:**

Conduct an energy audit to identify areas where energy consumption can be reduced, such as through insulation, weather stripping, and energy-efficient windows.

Business Travel

1. **Choose low-carbon modes of transportation:**

Instead of flying or driving, consider taking a train or using public transportation. When driving, consider using a hybrid or electric vehicle, or carpooling with others to reduce emissions.

2. **Reduce the frequency of business travel:**

Consider using video conferencing instead of travelling for business meetings.

3. **Choose eco-friendly accommodations:**

When travelling for business, choose hotels that are eco-friendly, such as those that use renewable energy sources, have water-saving features, and use environmentally friendly cleaning products.

4. **Pool meetings:**

in that location for the same day/ week so that you are only travelling there once.

5. **Choose direct flights:**

If you must fly, direct flights are more fuel-efficient than connecting flights because take offs and landings use a lot of fuel. So, by choosing direct flights, you can reduce your carbon emissions.

6. **Fly economy class:**

If you must fly, the carbon footprint of flying in business or first-class is much higher than in economy class because of the extra space and amenities. So, by flying economy, you can reduce your carbon footprint.

Educate Employees

1. **Raise Awareness:**

Start by raising awareness about the importance of reducing carbon footprint and its impact on the environment. Use emails and messaging to educate employees about carbon footprint and its effects on the planet.

2. **Provide Training:**

Provide your employees with training on how to reduce their carbon footprint, such as how to use less energy and water, how to reduce waste, and how to use green products.

3. **Lead by Example:**

As a leader, it's important to set an example by implementing sustainable practices in the workplace. Show your employees that you care about the environment and are taking action to reduce your carbon footprint.

4. **Offer Incentives:**

Consider offering incentives such as rewards or recognition for employees who consistently implement sustainable practices in the workplace.

5. **Create a Green Team:**

Establish a green team or a sustainability committee to help implement and promote sustainable practices in the workplace. This team can organise educational workshops, activities, and campaigns to raise awareness about the importance of reducing carbon footprint.

6. **Monitor Progress:**

Track and monitor progress by measuring the company's carbon footprint and identifying areas for improvement. Share this data with your employees to demonstrate the impact of their efforts.

Employee Recommendations

- *"Creating a green/low tech option for clients. To support this, measuring the carbon footprint of the clients service (existing ones to begin with) to allow them(and us) to understand the impact their service is having CO2e wise (and to help them with their own carbon footprint reports). With this measuring data, find ways that reduce the carbon footprint either by how the service works (code level) or the devos side of things regarding the hosting (where it's hosted), the amount of servers it uses (can this by dynamic, reducing/increasing at peak times etc), and other ways that may make a difference without potentially changing the service. Trailing dxw's website as a prototype to find out what is possible.*
Funding proper research into this. There will be people doing this already. Let's get experts in to teach us. Or have a focused tech away day where the tech team investigates this internally. (this suggestion is from Lorna - I am very keen to lead on this)"

- *"Be conscientious about our food choices for team gatherings (use local supplier + local supply chains), have a process for vetting suppliers, work as much as possible with those that have made net zero pledges and are showing progress. "*

- *"Automatic IT settings (eg. dark mode?)*
Contracts / procurement decisions
Sharing tips (like not putting your video on?)
Helping people to change with incentives (not just giving the reason for doing it) for example a voucher if you switch to a renewable energy supplier or something
"

- *"There are considerations of environmental (and social) impacts of digital technologies, I know there is discussion e.g. on infrastructure impacts and related technical points such as around software design"*

- *"We seem de facto to be tipping from 'remote' into 'hybrid'. This has its advantages - but one of its disadvantages is that it presumably increases our carbon footprint. "*

- *"Procurement - no investment in this area. We can be wasteful with purchasing and replacing tech or other office items as we just buy new from Amazon. We don't have a dedicated person who is able to source environmentally friendly goods/services. "*

- *"Education on how to reduce carbon footprint for staff is important. So helping staff to understand what they can do to make a difference both in the context or work and outside of work. "*

- *"4 day working week to reduce active working hours."*

- *"working 4 days a week."*

- *"Think about the carbon emissions of its equipment suppliers."*

- *"not really, heating at home?"*

- *"Be more conscious about how we develop, deploy and host software."*

- *"Recycling tech kit? Any kind of AWS for good exist? who, I don't know, use more eco stuff for their warehouses? Give some profits to eco causes? "*

- *"Should we consider the carbon generated whilst we are working remotely / from home?*

Offset through one of the offsetting services.

Plant a tree (or three) for every employee! (Not necessarily my idea)"

- *"Nothing springs to mind. Maybe how we do hosting and what tools we use. "*

- *"Support for colleagues who take alternative forms of transport during holidays - train, boat etc - vs flights. "*

- *"- Give access to more local offices so we don't need to commute to the bigger ones*
- Shout out more about the EV scheme - not everyone is aware of it
- Talk about carbon footprint a lot more - make it a thing that is always spoken about i.e. a 2 minute update in the monthly show and tells"

- *"No - just to note though that in 2022 my postcode was N19 3HT. I moved house in October 2022. "*

- *"Not really, especially not in any meaningful way. I think efforts to reduce emissions would be better spent on huge super wealthy business in industries like energy and fossil fuels. Investment into carbon capture or carbon neutral fuels like Porsche is doing are also a good idea.*

Carbon offset schemes have just shifted the problem from point A to point B and we

aren't going to convince poor countries to stay poor. The problem doesn't lie with small businesses like ours which have a completely insignificant impact, it lies with governments and the corporations that lobby said governments. I'd also crank up the tax the super wealthy billionaires that leach off the rest of humanity and put a cap on the total wealth a single individual can accumulate. Nobody needs more than a cool $250 million. Nobody."

- *"as we are remote first, i feel we have improved our carbon footprint."*
- *"move everyone off the intel macs."*
- *"We could stop printing stickers just to decorate the tables at parties (no one was tasked to collect them at the end, and the venue threw most of them away); we don't need balloons at parties either. Request that venues have good, attractive vegan and vegetarian options from the start. Put pressure on the web hosting companies we use to clean up their energy sources and go beyond their greenwashing claims. "*

Sources

Factor	Unit	Source	Date	Comment
Electricity kWh	kWh	UK Government	2022	Average emissions per kwh of electricity used
Driving	km	UK Government	2022	Average emissions per km driving an average car of unknown fuel
Transit	passenger. km	UK Government	2021	Average emissions of unknown public transport per passenger per km
Heavy Rail	passenger. km	UK Government	2022	Average emissions per km travelled by heavy rail
Subway	passenger. km	UK Government	2022	Average emissions per km travelled on an underground train line
Bus	passenger. km	UK Government	2021	Average emissions per km driven per person in a bus of unknown fuel
Hotel Pound	pound	UK Government	2021	Average emissions per pound spent on hotel stays
Stationery And Paper Products Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on stationery
Flights Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on flights
Soft Hot Drinks Pound	pound	BEIS	2019	Average emissions per pound spent on drinks
It Support Pound	pound	BEIS	2019	Average emissions factor for IT support in an office per pound spent
Restaurant Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent at a restaurant
Train Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on train travel
Apparel And Clothing Pound	pound	Owen. A, University of Leeds	2018	Average emissions produced per pound spent on clothing
Furniture And Decor Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on new furniture
Venue Hire Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent hiring a room
General Travel Pound	pound	EPA	2022	Average emissions per pound spent on unspecified ground travel
Insurance And Financial Services Pound	pound	BEIS	2018	Average emissions per pound spent on insurance
Software And Digital Products Pound	pound	U.S EPA Office of Research and Development	2020	Average emissions per pound spent on software

Staff Training Pound	pound	Department for Environment, Food and Rural Affairs, UK Government	2019	Average emissions per pound spent on training staff
Banking And Financial Services Pound	pound	BEIS	2018	Average emissions per pound spent on financial services
Cleaning And Janitorial Services Pound	pound	BEIS	2018	Average emissions factor per pound spent on cleaning services
Advertising Pound	pound	Department for Environment, Food and Rural Affairs, UK Government	2019	Average emissions per pound spent on advertising services
Legal Services Pound	pound	BEIS	2019	Average emissions per pound spent on legal services
Gift Unknown Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on gifts
Health And Wellness Products Pound	pound	Owen. A, University of Leeds	2018	Average emissions produced per pound spent on healthcare products
It Equipment Pound	pound	K. Stadler et al. Journal of Industrial Ecology	2021	Average emissions per pound spent on electronic IT accessories (mouse, keyboard etc)
Food Pound	pound	K. Stadler et al. Journal of Industrial Ecology	2021	Average emissions per pound spent on food
Maintenance And Repair Services Pound	pound	EPA	2018	Average emissions per pound spent on office maintenance
Printing And Publishing Services Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on printing
Cleaning Janitorial Supplies Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on cleaning products
Courier Services Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on postage
Packaging Pound	pound	EPA	2018	Average emissions per pound spent on packaging materials
Computers Pound	pound	EXIOBASE	2019	Average emissions per pound spent on computers
Financial Services And Products Pound	pound	K. Stadler, Journal of Industrial Ecology	2021	Average emissions per pound spent on financial services
Internet Services Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on internet services
It Accessories Pound	pound	K. Stadler et al. Journal of Industrial Ecology	2021	Average emissions per pound spent on non-electronic IT accessories (laptop sleeves and monitor stands etc)

Safety Equipment Pound	pound	BEIS	2018	Average emissions per pound spent on safety equipment
Office Supplies And Equipment Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on miscellaneous office spending
It Monitors Pound	pound	EPA	2022	Average emissions per pound spent on monitors
Gift Flowers Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on cut flowers
Cameras And Photography Equipment Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on filming equipment
Paper And Cardboard Pound	pound	EPA	2018	Average emissions per pound spent on paper and cardboard
Gift Cards And Vouchers Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on vouchers or other types of gift cards
Cards Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on greeting cards
Telephone Contracts Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on phone and internet services
Taxi Pound	pound	Owen. A, University of Leeds	2018	Average emissions per pound spent on taxi travel
Unknown Fuel Miles	mile	UK Government	2022	Average emissions per miles travelled in an average car using unknown fuel
T And D kWh	kWh	UK Government	2021	Average emissions of the transportation and distribution of 1 kWh of electricity
Recycling Waste Kg	kg	UK Government	2022	Average emissions per kg recycled waste
Landfill Waste Kg	kg	Government, UK	2022	Average emissions per kg of waste sent to landfill
Water Litre	litre	UK Government	2022	Average emissions per litre of water through UK supply
Water Waste Litre	litre	UK Government	2022	Average emissions for treating 1 litre water waste in the UK
Wfh:Heating Hour	fte_hour	UK Government	2022	Average emissions per hour spent working from home due to heating
Wfh:Appliances Hour	fte_hour	UK Government	2022	Average emissions per hour spent working from home due to the use of electrical appliances
Wtt Electricity Kwh	kWh	UK Government	2021	Average emissions attainting and transporting raw materials from their source to the power station

Wtt Gas Kwh	kWh	UK Government	2021	Average emissions attaining and transporting natural gas from its source to users location

Glossary of Terms

Accessories	For the purposes of report 'Accessories' refers to purchasing of office equipment excluding otherwise stated like computers, furniture, etc.
Base year	A year of accounting GHG emissions against which of organisation emissions can be tracked.
Carbon sequestration	The uptake of Carbon Dioxide. In context, the removal of greenhouse gases from the atmosphere.
CO2e	Carbon Dioxide and Equivalent Greenhouse gases.
Conversion factor	A factor also known as an emissions factors which allows GHG emissions to be estimated from a unit of available activity data (e.g. tonnes of fuel consumed, tonnes of product produced) and GHG emissions.
Direct GHG emissions	Emissions that are from sources controlled or owned by the organisation.
Double counting	Accounting for emissions or reductions more than once. This can be done either through two separate reporting companies accounting for the same emissions/reductions, or one company including emissions/reductions related to one activity more than once.
Emission factor	A factor allowing GHG emissions to be estimated from a unit of available activity data (e.g. tonnes of fuel consumed, tonnes of product produced) and GHG

	emissions.
Emissions	The release of Greenhouse Gases into the atmosphere.
GHG protocol	The Greenhouse Gas protocol is a comprehensive, global, standardized framework for measuring and managing GHGs from private and public sector operations, value chains, products, cities, and policies.
Greenhouse gasses (GHGs)	GHGs are the sic gases listed in the Kyoto Protocol
Indirect GHG emissions	Emissions that are a consequence of the operations of an organisation but occur at sources owned or controlled by another organisation.
IT Equipment	Throughout this report IT equipment refers to computers.
Kyoto protocol	A protocol to the United Nations Framework Convention on Climate Change (UNFCCC). It requires countries listed to meet reduction targets of GHG emissions relative to their 1990 levels during the period of 2008-12.
PAS:2060	PAS:2060 is an internationally renowned standard detailing how to demonstrate carbon neutrality produced and published by the British Standards Institution.
Renewable energy	Energy taken from sources that are not limited, e.g. wind, water, solar, geothermal energy, and biofuels.
Scope 1	All direct GHG emissions under an organisation control.

Scope 2	An organisation's emissions associated with the generation of electricity, heating/cooling, or steam purchasing for own consumption.
Scope 3	All organisation's indirect GHG emissions not covered in Scope 2.
Spend-based method	This is a way of estimating emissions for goods and services by collecting data on the value of goods and services purchased and multiplying it by relevant emission factors.

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