Carbon Footprint Appraisal Report

Assessment Period:
1st October 2018 – 30th September 2019

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Executive Summary

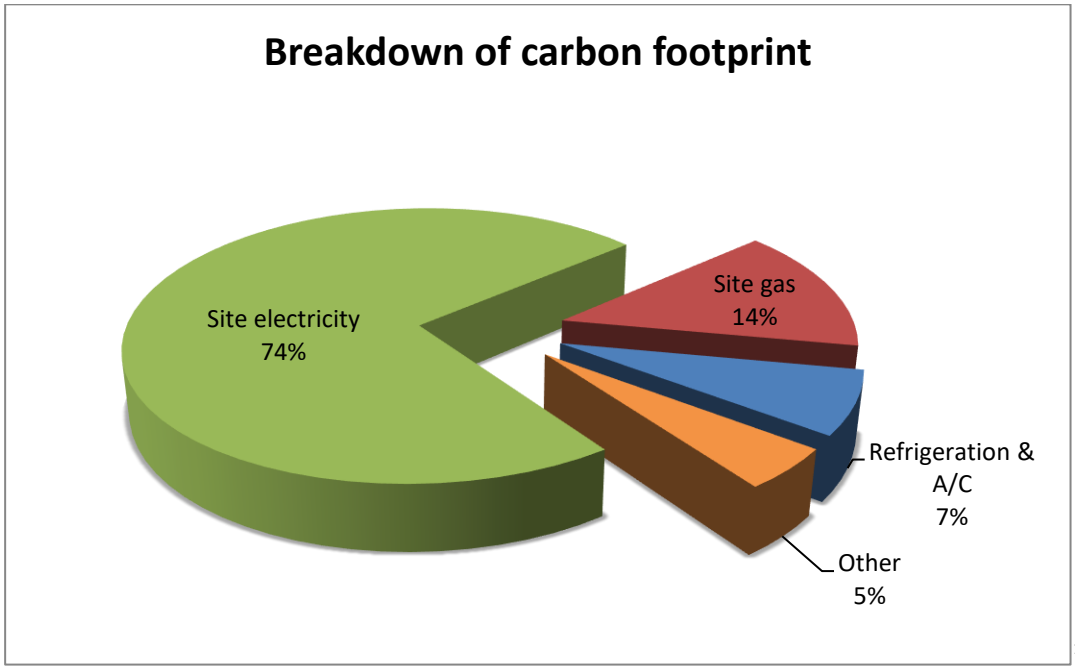
Carbon Footprint Ltd has assessed the greenhouse gas (GHG) emissions of Zen Internet Ltd (henceforth referred to as Zen) from 1st October 2018 to 30th September 2019 based on the dataset provided by the company.

Current Performance

- Zen's total market-based footprint is 2,809.24 tCO_2e; the total location-based footprint is 4,573.84 tCO_2e.
- Site electricity accounts for 74% of Zen's carbon footprint (market-based).

Future Implementations

→ Offset to compensate for Zen's emissions by funding a climate solution.
→ Switch to renewable energy tariffs at all of Zen's sites.
→ Investigate potential energy saving measures at the Sandbrook Park site (e.g. automatic power-off setting for all PC's after work hours, and switching to LED lights).



[1]

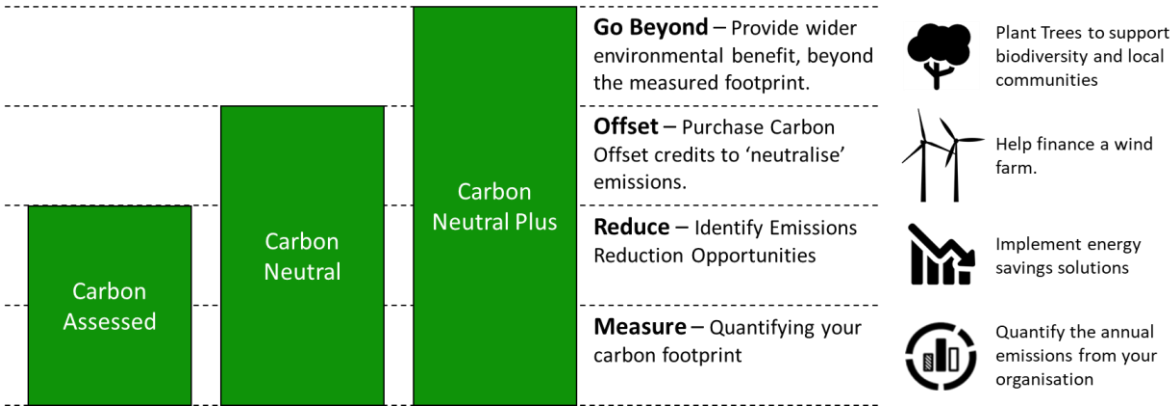
The table below provides a summary of this year's location and market-based emissions.

	Market-based Emissions (tCO_2e)	Location-based Emissions (tCO_2e)
Total Tonnes CO_2e	2,809.24	4,573.84
Tonnes of CO_2e per employee	2.55	4.16
Tonnes of CO_2e per £M turnover	36.96	60.18

[1] This breakdown uses market-based emissions

To reduce emissions going forward the focus should be on site electricity. Although Zen has a renewable energy tariff in place at the Sandbrook site, overall site electricity is still the largest contributor to the company's GHG emissions. Alongside switching to a renewable energy tariff across all Zen sites, we recommend investigating other methods to reduce initial consumption. As the majority of staff are based at the Sandbrook Park site, Zen should continue to investigate the potential for behavioural changes through methods such as annual refresher training at a management level; which allow this to feed back into the lower staffing structure. Whilst it is positive that all staff have access to the company's environmental policies, refresher training may help maintain the positive environmental behaviours within the company. Practical measures such as switching to LED lighting, and auto-power-off setting on PC's can also be utilised to help reduce energy consumption on-site.

Furthermore, we recommend an approach that goes beyond measuring the organisations GHG emissions. To become an exemplar in your market, Zen should consider offsetting its emissions to become a carbon neutral plus organisation.



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Quality Control

Report issue number:	1.0
Date:	12 February 2020
Calculations completed by:	Zoe Booth
Calculations reviewed by:	Hayley Maynard
Report produced by:	Zoe Booth
Report reviewed by:	Hayley Maynard
Director approval:	John Buckley

1. Introduction

1.1. Company Overview

Zen Internet Ltd (henceforth referred to as Zen) is a large telecoms provider based in Rochdale. They have seven sites including two offices (Sandbrook Park HQ and Moss Bridge Road) and five data centres, and have also chosen to include their 450 BT exchanges. Due to the nature of the business, energy use and air conditioning units on site (particularly within the data centres) are the key areas of business operation which contribute to the company's carbon footprint.

Zen already hold ISO 14001 and have now completed their first carbon footprint assessment, as detailed throughout this document.

1.2. Zen Internet Ltd's carbon management journey

Carbon Footprint provides a simple six step annual journey to enhance your sustainability credentials whilst complying to best practice and differentiating your brand. Zen Intenet Ltd has completed the first step of its carbon management journey.

The purpose of this report is to:

- Summarise the results of your carbon footprint assessment.
- Recommend realistic aims for your carbon reduction target.
- Provide practical recommendations to enhance your sustainability programme and reduce your emissions.
- Provide advice on how carbon offsetting may enhance your programme.

1.3. What is a carbon footprint?

A carbon footprint is a measure of the impact our activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide equivalents (CO_2e). A carbon footprint is made up of two parts, direct and indirect emissions.

1. **Direct emissions:**
   Direct emissions are produced by sources which are owned or controlled by the reporting organisation and include electricity use, burning oil or gas for heating, and fuel consumption as a result of business travel or distribution. Direct emissions correspond to elements within scopes 1, 2 and 3 of the World Resources Institute GHG Protocol, as indicated in Table 1.

Table 1: Direct emissions sources

Footprint	Activity	Scope
Direct	Electricity, heat or steam generated on-site	1
	Natural gas, gas oil, LPG or coal use attributable to company owned facilities	1
	Company owned vehicle travel	1
	Production of any of the six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs and SF_6)	1
	Consumption of purchased electricity, heat steam and cooling	2
	Employee business travel (using transport not owned by the company)	3

2. **Indirect emissions:**
   Indirect emissions result from a company's upstream and downstream activities. These are typically from outsourced/contract manufacturing, and products and the services offered by the organisation. Indirect emissions correspond to scope 3 of the World Resources Institute GHG Protocol excluding employee business travel as indicated in Table 2.

Table 2: Indirect emissions sources

Footprint	Activity	Scope
Indirect	Employee commuting	3
	Transportation of an organisation's products, materials or waste by another organisation	3
	Outsourced activities, contract manufacturing and franchises	3
	GHG emissions from waste generated by the organisation but managed by another organisation	3
	GHG emissions from the use and end of life phases of the organisation's products and services	3
	GHG emissions arising from the production and distribution of energy products, other than electricity, steam and heat, consumed by the organisation	3
	GHG emissions from the production of purchased raw or primary materials	3
	GHG emissions arising from the transmission and distribution of purchased electricity	3

For businesses, the assessment focuses on direct emissions, as these lie under the control of the organisation. However, we ask companies to recognise that there is an indirect emissions footprint and select suppliers based on their environmental credentials alongside price and performance.

1.4. Why is it important?

Over the past two decades the effects of climate change have accelerated. Considerable evidence exists proving climate change has been exacerbated by human activity. Changes in our post-industrial lifestyles have altered the chemical composition of the atmosphere, generating a build-up of

greenhouse gases – primarily carbon dioxide, methane, and nitrous oxide levels – raising the average global temperature.

The consequences of inaction will be disasterous. Sea level will continue to rise and local climate conditions to be altered causing an increase in extreme weather events, affecting forests, crop yields, and water supplies. It will also affect human health, accelerate species extinction, and disrupt many ecosystems.

Climate change is a global threat which will impact the lives of everyone on the planet. Hence, it is vital that all individuals, businesses, organisations and governments work towards the common goal of reducing greenhouse gas emissions. This carbon footprint assessment will enable Zen to begin doing their bit by monitoring, reducing and offsetting their emissions.

1.5. BS ISO 14064-1:2006

This GHG report has been prepared in accordance with Part 1 of BS ISO 14064: 2006. The GHG inventory, report, or assertion has not been verified.

1.6. Greenhouse Gas Protocol Corporate Standard

This GHG calculation and report has been prepared in accordance with The Greenhouse Gas Protocol Corporate Standard. The GHG inventory, report, or assertion has not been verified. This report states both the location-based and market-based emissions totals for Zen.

Location-based approach – reflects the emissions from electricity coming from the national grid energy supply.

Market-based approach – reflects the emissions from the electricity sources or products that the consumer has specifically chosen.

1.7. Calculation methodology & dual reporting

The carbon footprint appraisal is derived from a combination of client data collection and data computation by Carbon Footprint's analysts.

Carbon Footprint's analysts have calculated the majority of Zen's footprint using the 2019 conversion factors developed by the UK Department for Environment, Food and Rural Affairs (Defra) and the Department for Business, Energy & Industrial Strategy (BEIS). These factors are multiplied with the company's GHG activity data. Carbon Footprint has selected this preferred method of calculation as a government recognised approach and uses data which is realistically available from the client, particularly when direct monitoring is either unavailable or prohibitively expensive. Additional methodology information is presented in Annex A. Emissions have been calculated using both a location-based and market-based approach.

Location-based approach – uses the average energy generation emission factors for the UK.

Market-based approach – uses the energy generation emission factor reflecting the energy contract.

For the location-based approach, the Defra 2019 conversion factors have been used for the whole calculation. To calculate the market-based emissions, the renewable electricity tariff at Zen's Sandbrook Park site is taken into account within the calculations. The renewable tariff is supplied by Haven Power. For the remaining sites, 2018 AIB Residual emission factors have been used within the market-based calculations. The Residual Emissions Factors are higher than the location based factors, as these represent the grid electricity without the contracted renewable energy.

1.8. Data supplied for the carbon footprint appraisal

A summary of the data supplied by Zen for the appraisal is presented in Annex B.

1.9. Abbreviations

A/C	Air Conditioning
BEIS	Department for Business Energy & Industrial Strategy
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
GHG	Greenhouse Gas
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
ISO	International Standards Organisation
km	Kilometres
kWh	Kilowatt Hours
PR	Public Relations
UN	United Nations
WCN	Waste Consignment Notes
WTN	Waste Transfer Notes
WEEE	Waste Electrical and Electronic Equipment

2. Calculation Scope and Accuracy

2.1. Scope of this work

Carbon Footprint has assessed the GHG emissions from 1st October 2018 to 30th September 2019 resulting from the energy consumption at Zen's facilities and its business transport activities.

This report will set the base year for all further reporting emissions to be compared to.

2.2. Organisational & operational boundaries

The organisation has accounted for all quantified GHG emissions and/or removals from facilities over which it has financial control. The assessment covers the following operational boundaries:

Figure 1: Assessment boundary

Scope 1 Direct Emissions	Scope 2 Energy Indirect	Scope 3 Other Indirect
Fuel combustion **Natural gas, Diesel**	Consumption of purchased electricity, heat steam and cooling **Electricity**	Purchased materials and fuels **Water, paper**
Owned Transport **Company car travel**		Transmission and distribution of energy **Electricity**
		Leased assets outsourcing and franchising **None**
Process emissions **None**		Transport related activities **Employee owned car (grey fleet), taxi, flights and rail travel**
		Sold goods and services **None**
Fugitive emissions **Refrigerants**		Waste Disposal **Residual, Green & Recyclable**

Key:

Within the assessment boundary	Not included within assessment boundary

Indirect GHG sources that are outside the assessment boundary have been excluded from quantification as it is not technically feasible or cost effective, to include these in the GHG assessment.

2.3. Calculation accuracy & materiality

The result of a carbon footprint calculation varies in accuracy depending on the data set provided. The more accurate the data supplied, the more accurate the final result which will subsequently allow for better targeting of areas where improvements can be made. Materiality is determined by the percentage contribution of each element to the overall footprint.

The data provided is derived from energy bills, expenses claims and data collected by Zen. Further information and an overview of the expected accuracy provided per element for this assessment is shown in Table 3.

Table 3: Assessment accuracy & materiality

Dataset	Source of data and comments	Accuracy	Materiality
Site electricity	Data derived from half-hourly meter readings which is very accurate. Utility bills were provided as evidence. The contract was provided as evidence of the renewable energy tariff at Sandbrook Park.	Excellent	High
Site gas	Utility bills with actual meter readings were provided.	Excellent	Medium
Refrigeration & A/C	F-gas register & leak records	Good	Medium
Employee owned car travel (grey fleet)	Mileages from expense claims	Good	Low
Waste	Data derived from waste contracts, WTN's and WCN's	Good	Low
Water (and wastewater)	Utility bills provided – wastewater assumed to be 100% based on bills	Excellent	Very Low
Flights	Purchase order database	Good	Very Low
Company car travel	Mileage expense claims. The CO_2 g/km & vehicle efficiency was taken from nextgreencar.com by Zen.	Good	Very Low
Rail travel	Monthly invoices. The average journey distance was used for two journeys (see highlighted figures in Annex B).	Good	Very Low
Site diesel	Internal records - invoices	Average	Very Low
Paper	Number of reams derived from internal records. Most of the paper used is A4 with a minimal amount of A3 – an estimate of 75% A4 and 25% A3 was used during the calculations.	Good	Very Low
Taxi travel	Internal records	Good	Very Low

The majority of data provided by Zen is Good to Excellent quality with regards to accuracy, with evidence provided for the most material elements of their carbon footprint. To improve the accuracy of future assessments, Zen could try to use more 'actual' water meter readings (rather than estimated) and the number of A4 vs A3 paper reams could be provided. The accuracy of waste data could also be improved by providing evidence that WEEE is recycled, as well as providing the weight of cardboard waste so that this can be included in future assessments.

3. Carbon Footprint Results

3.1. Summary of results

The total market-based carbon footprint for Zen, for the period ending 30th September 2019, was 2,809.24 tonnes CO_2e. Table 4 provides a summary of results for Zen's carbon footprint calculation by scope and source activity. Site utilities (electricity and gas use) account for a combined 88% of Zen's total market-based carbon footprint (Figures 2 & 3). Air-conditioning accounts for 7% of the total footprint. Comparatively, the emissions associated with waste, water use, paper, diesel fuel use (for an on-site generator) and company travel (company cars, grey fleet, flights, rail and taxi) is much lower, with a combined total of only 5% of the footprint.

Table 4: Results of Zen's carbon footprint assessment by scope and source activity

Scope	Activity	Location-based	Market-based
		Tonnes CO_2e	
Scope 1	Site gas	403.81	403.81
	Refrigeration & A/C	205.71	205.71
	Company car travel	16.20	16.20
	Site diesel	2.69	2.69
Scope 1 Sub Total		**628.41**	**628.41**
Scope 2	Electricity generation	3,531.43	1,911.84
Scope 2 Sub total		**3,531.43**	**1,911.84**
Scope 3	Electricity transmission & distribution	299.81	154.80
	Employee owned car travel (grey fleet)	40.01	40.01
	Waste	30.50	30.50
	Water (and wastewater)	18.91	18.91
	Flights	16.29	16.29
	Rail travel	6.77	6.77
	Paper	1.32	1.32
	Taxi travel	0.39	0.39
Scope 3 Sub Total		**414.01**	**269.00**
Overall Total		**4,573.84**	**2,809.24**
Tonnes of CO_2e per employee		**4.16**	**2.55**
Tonnes of CO_2e per £M turnover		**60.18**	**36.96**

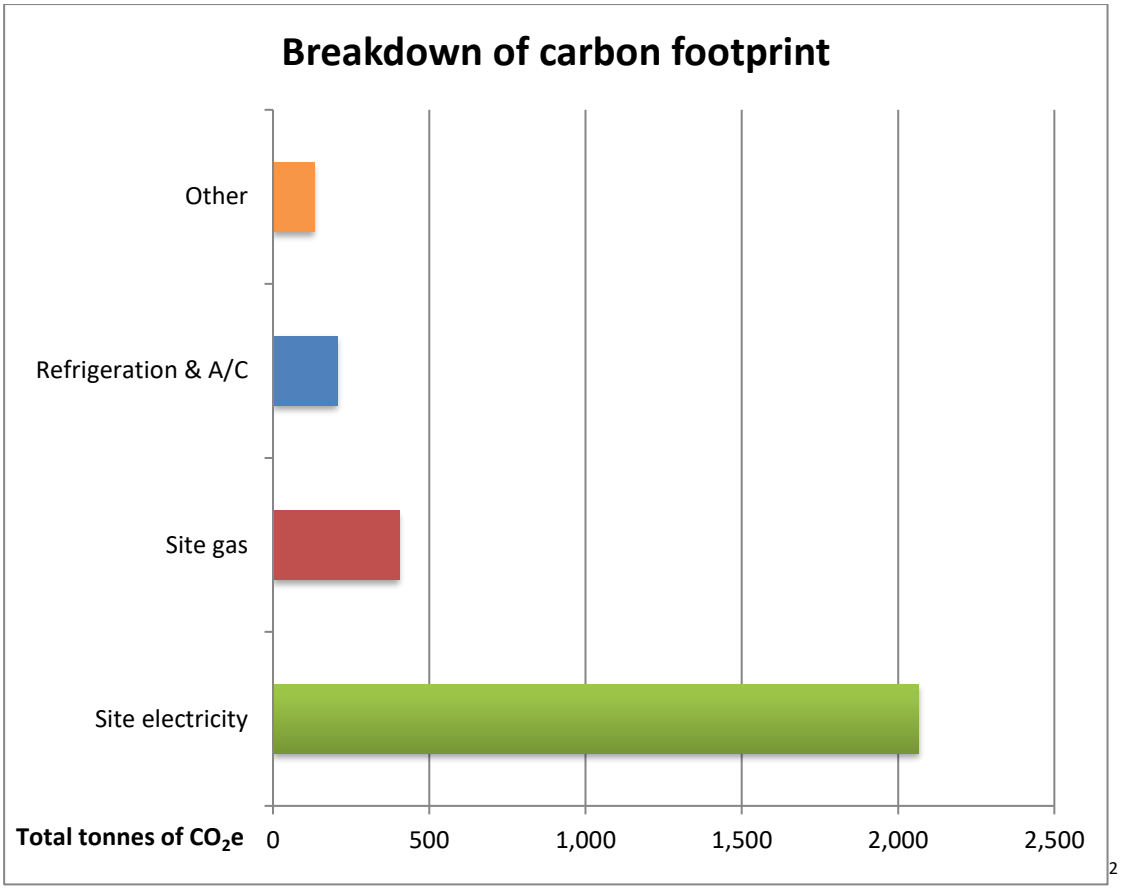


Figure 2: Contribution in tonnes of CO_2e of each element of Zen Internet Ltds carbon footprint

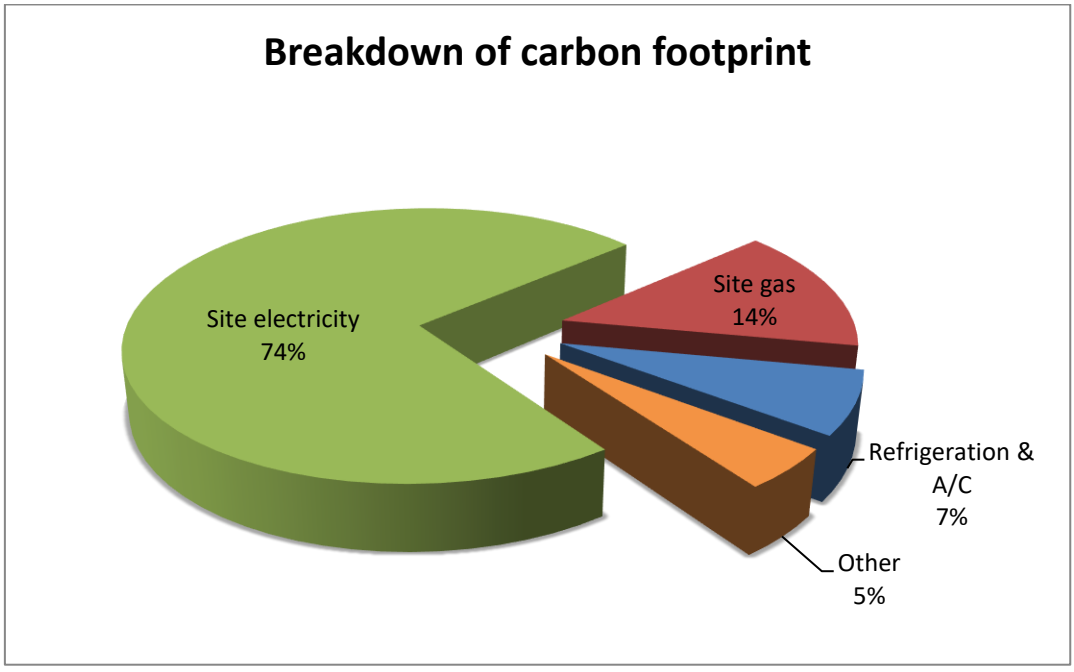


Figure 3: Percentage contribution of each element of Zen Internet Ltd's carbon footprint

[2] 'Other' comprises waste, water (and wastewater), paper, diesel fuel, and company travel (company cars, grey fleet, flights, rail and taxi)

The contribution of site utilities to the total GHG emissions when assessing using a location-based method is higher at a combined 93% (see Figure 4). Refrigeration & A/C accounts for 4% when using location-based methods, whilst 'Other' accounts for only 3% of the total footprint. Whilst it is positive that Zen have a renewable energy tariff at their Sandbrook Park site, the data shows that electricity use is still a large contributor to the company's GHG emissions.

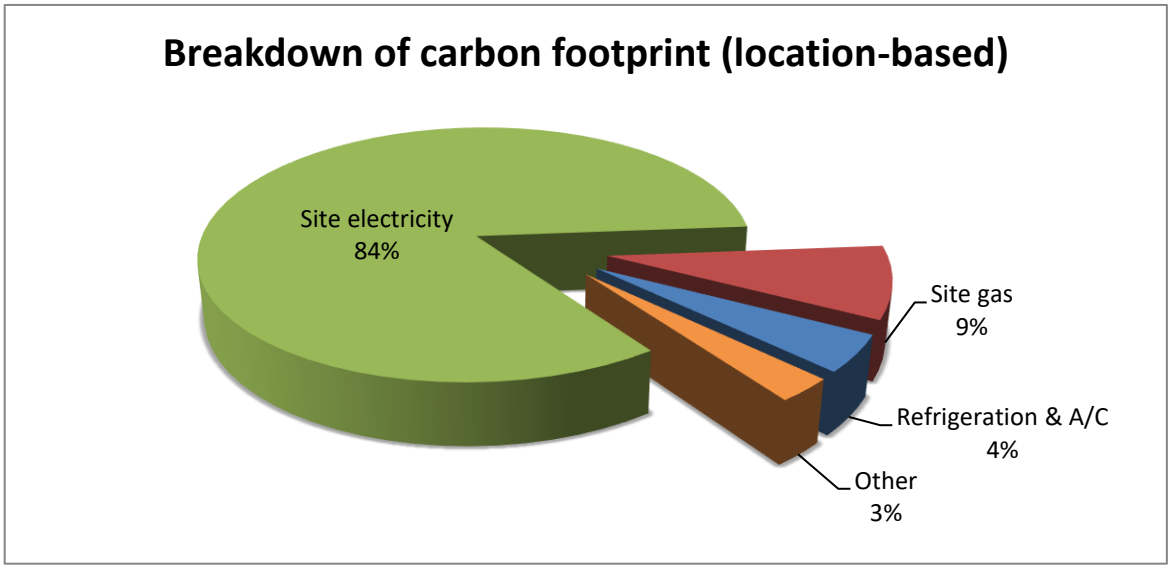


Figure 4: Percentage contribution of each element of Zen Internet Ltd's carbon footprint

3.2. Emissions from energy usage at site facilities

Zen has seven sites across the UK including two offices and five data centres. Zen has also chosen to include energy used in their BT exchanges to give a more accurate representation of the company's emissions. All 1,100 staff are based at the Sandbrook Park HQ site, although the Moss Bridge road site has still been in use during the data period, as suggested by the electricity and gas consumption. The Sandbrook Park site also contains a diesel generator. Moss Bridge Road was the HQ before Sandbrook Park and is currently pending sale.

Table 5 and 6, and Figure 5 show the breakdown of emissions from on-site energy usage at each of Zen's sites. Figure 6 shows that Sandbrook Park is the site with the greatest energy use (location-based emissions). However, due to the renewable energy tariff at this site, the associated CO_2e (using market-based factors) is lower than it would be with a standard tariff (400 tCO_2e and 2,253 tCO_2e, respectively). As a result, the 450 BT exchanges contribute the greatest emissions at 1,713 tCO_2e [3]. AQL has the lowest site emissions at 2.54 tCO_2e.

[3] When assessing using market-based emissions

Table 5: Market-based CO_2e emissions as a result of site energy consumption

Site	Electricity tCO_2e [4]	Gas tCO_2e	Diesel tCO_2e	Total tCO_2e
450 BT exchanges	1,713.00			1,713.00
Sandbrook Park (office)	0.00	397.36	2.69	400.05
Telehouse	152.53			152.53
Virtus	77.21			77.21
Moss Bridge Road (office)	50.72	6.44		57.17
Interxion	40.60			40.60
Equninx	30.04			30.04
AQL	2.54			2.54
Total	**2,066.64**	**403.81**	**2.69**	**2,473.14**

Table 6: Location-based CO_2e emissions as a result of site energy consumption

Site	Electricity tCO_2e [5]	Gas tCO_2e	Diesel tCO_2e	Total tCO_2e
Sandbrook Park (office)	1,853.05	397.36	2.69	2,253.10
450 BT exchanges	1,639.67			1,639.67
Telehouse	146.00			146.00
Virtus	73.91			73.91
Moss Bridge Road (office)	48.55	6.44		54.89
Interxion	38.87			38.87
Equninx	28.76			28.76
AQL	2.43			2.43
Total	**3,531.43**	**403.81**	**2.69**	**3,937.93**

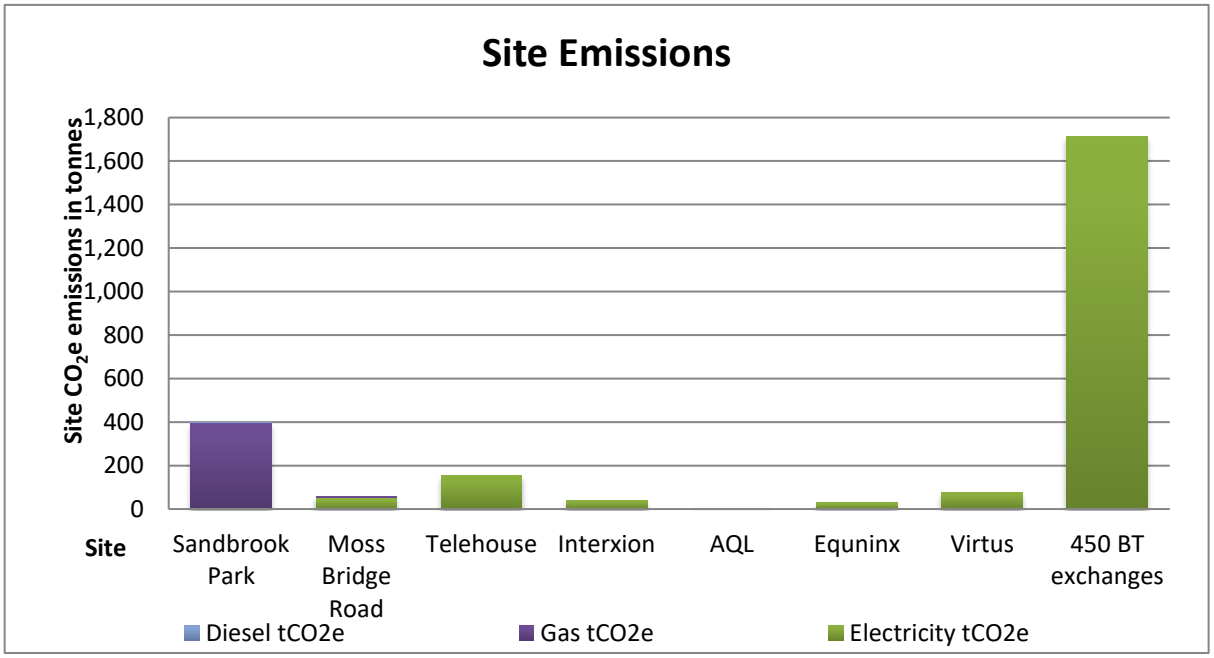


Figure 4 CO_2e emissions on a per site and fuel basis

[4] Includes transmission and distribution (T&D)
[5] Includes transmission and distribution (T&D)

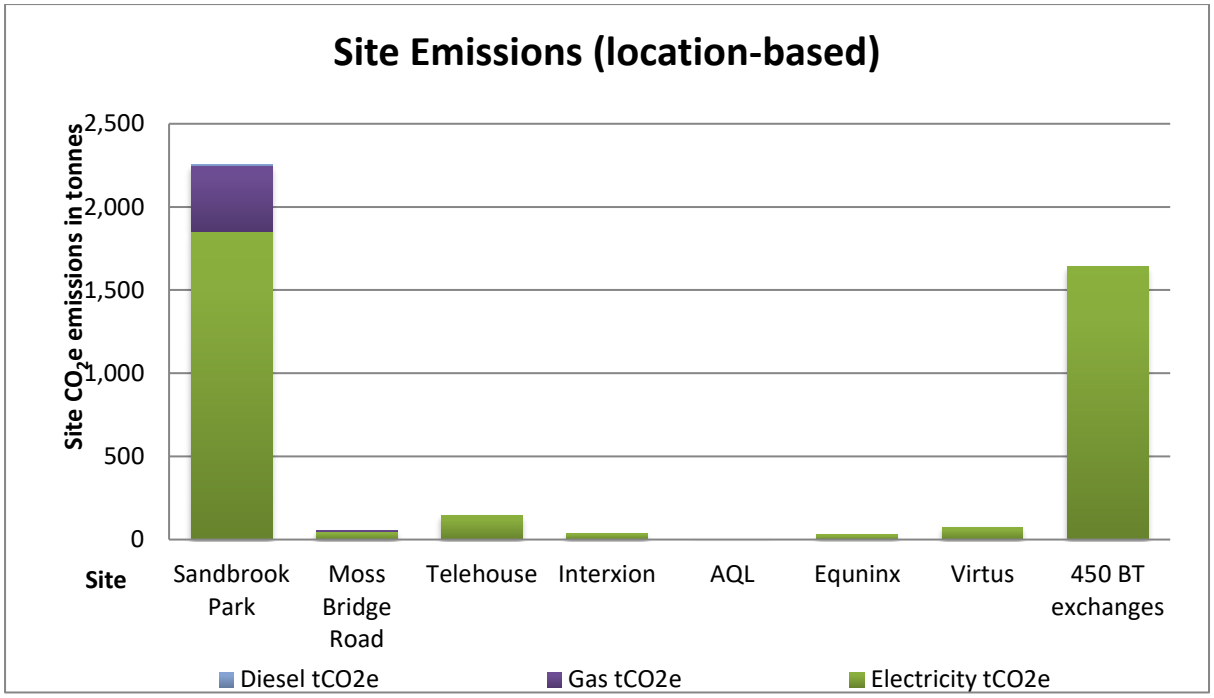


Figure 6 CO_2e *emissions* on a per site and fuel basis

3.3. Emissions from refrigerants

GHG emissions associated with refrigerants and A/C at Zen account for 7% of the total footprint (market-based) with a total of 205.71 tCO_2e. Due to the nature of the business, Zen requires A/C in its data centres and therefore are unlikely to be able to reduce the use significantly. However, Zen could assess the feasibility of switching some of their refrigerants to a type with a lower GWP.

Table 7: CO_2e emissions as a result of on-site refrigerant gas replenishment

Cost Centre / Location ID	Amount Refilled (kg)	Refrigerant type	GWP ($kgCO_2e$)	Emissions (tCO_2e)
ENP B 142.2 EX ST	45	HFC-134a	1430.00	64.35
ENP B 125.2 XE	40	HFC-134a	1430.00	57.20
ENP B 142.2 EX ST	26	HFC-134a	1430.00	37.18
OC5 DX ACU 10.5 (1)	14.5	R410A	2088.00	30.28
OC5 DX ACU 10.5 (1)	8	R410A	2088.00	16.70
Grand Total	**133.50**			**205.71**

3.4. Emissions from business travel

Figure 7 and Table 8 show the GHG emissions resulting from business travel. It can be seen that the largest contributor is car travel at 70.5% of the total transport emissions. Grey fleet accounts for the majority of all car travel at 50.2% of transport emissions. Flights account for 20.5% of the total transport footprint, whilst rail and taxi travel have a comparatively minimal impact at a combined total of 9%.

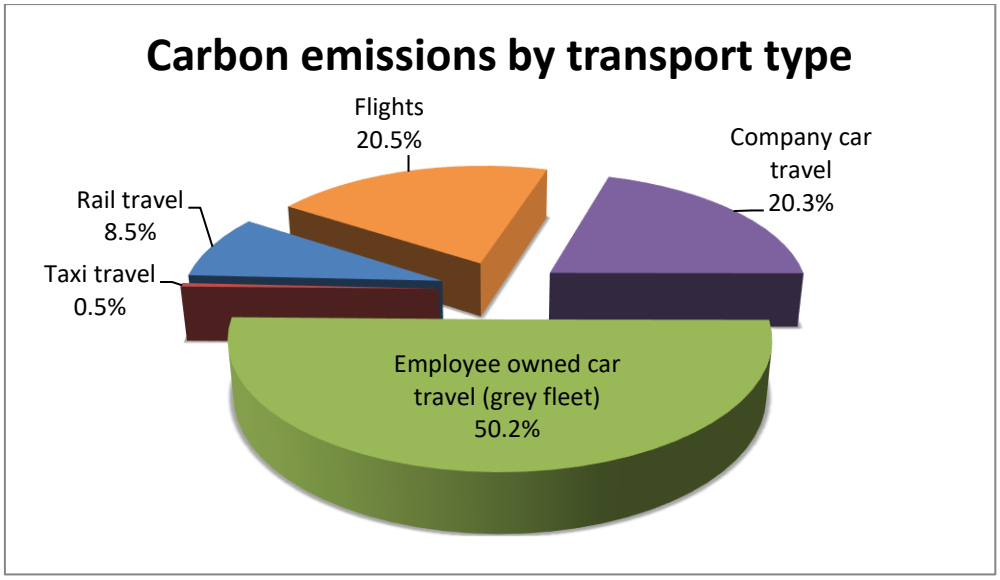


Figure 5: Percentage contribution of each element to transportation emissions

Table 8: CO_2e emissions due to transportation

Type of Travel / Transport	Tonnes of CO_2e
Employee owned car travel (grey fleet)	40.01
Flights	16.29
Company car travel	16.20
Rail travel	6.77
Taxi travel	0.39
Total	**80.98**

3.5. Water supply and wastewater

Zen have supplied data detailing their water consumption (see Table 9) through the provision of water bills. The evidence provided shows that Water Plus charge for wastewater treatment based on the assumption that wastewater equates to 100% of the metered water supply (m^3). Therefore, this assumption has also been used in the emissions calculation for Zen's water consumption. Sandbrook Park accounts for 98% of Zen's water consumption as the main HQ site. This is expected as all staff are based at Sandbrook Park. Moss Bridge Road site was previously used as the HQ and still has a water supply, although this site is currently pending sale.

Table 9: CO_2e emissions due to water consumption

Site	Water supply (m^3)	Estimated wastewater %	Total emissions from water consumption (tCO_2e)
Sandbrook Park	17527	100	18.44
Moss Bridge Road	446	100	0.47
Grand Total	**17,973**	**100**	**18.91**

3.6. Waste production

Table 10 provides a breakdown of the waste produced by Zen and the associated emissions. This does not include the cardboard waste produced by the company as they use a cardboard baler and store this in a separate room, for which the data was unavailable. In future assessments, the weight of the cardboard waste could be obtained from waste transfer note (WTN)'s and provided for the assessment. The 'Hazardous' waste produced by Zen consists solely of WEEE which is collected once or twice a year – waste consignment note (WCN)'s for WEEE collection were provided for the assessment. In terms of tonnes, 95% of waste produced is WEEE and Zen have stated that this is recycled.

Table 10: CO_2e emissions due to waste production

Type of waste	Waste produced per year (tonnes)	Total Emissions (tCO_2e)
Recyclable	40.20	0.86
Residual	25.26	0.54
Hazardous (WEEE)	1,361.00	29.06
Green	4.23	0.04
Grand Total	**1,430.70**	**30.50**

3.7. Paper consumption

Zen have provided data about the number of paper reams purchased by the company. An assumption of 75% A4 paper and 25% A3 paper has been used as this data was not available. However, the total number of reams is correct.

Table 11: CO_2e emissions due to paper consumption

Paper type	Weight (kg)	Number of reams	Total Emissions (tCO_2e)
Virgin Pulp – A4	2.36	345	0.78
Virgin Pulp – A3	5	115	0.55
Grand Total	**7.36**	**460**	**1.32**

4. Comparison and Benchmarking

4.1. Comparison to base year emissions

This is the first carbon footprint assessment Zen has carried out and, therefore, it will serve as a base year for future carbon footprint assessments. Table 12 shows Zen's total carbon footprint, tonnes of CO_2e per employee and tonnes of CO_2e per £M turnover.

Table 12: Zen's carbon footprint comparison and percentage change (market-based)

Element	2019
Site electricity	2,066.65
Site gas	403.81
Refrigeration & A/C	205.71
Employee owned car travel (grey fleet)	40.01
Waste	30.50
Water (and wastewater)	18.91
Flights	16.29
Company car travel	16.20
Rail travel	6.77
Site diesel	2.69
Paper	1.32
Taxi travel	0.39
Total Tonnes of CO_2e	**2,809.24**
Tonnes of CO_2e per employee	**2.55**
Tonnes of CO_2e per £M turnover	**36.96**

Carbon Footprint recommends that organisations use the base-year GHG inventory as a benchmark to measure against. When using the base-year GHG inventory as a benchmark, organisations can set realistic reduction targets and measure their progress year on year. This can also provide excellent marketing opportunities, where real figures can demonstrate your commitment towards helping fight climate change.

4.2. External benchmarking

Table 13 can be used to benchmark against a similar company within your industry.

Table 13: Zen Internet Ltd's benchmarked GHG emissions

Year/Element	Zen Internet (2018/19)[6]	TalkTalk Group PLC (2019)
Turnover in £million	76	1,632[7]
Total number of employees	1,100	2,187
Tonnes of CO_2e	2,809.24	40,249
Tonnes of CO_2e per £ million	36.96	24.66
Tonnes of CO_2e per employee	2.55	18.40
Scope 1 & 2 Emissions		
Scope 1 & 2 tonnes CO_2e	2,540.24	11,956
Scope 1 & 2 tonnes CO_2e per employee	2.31	5.47
Scope 1 & 2 tonnes CO_2e per £ million	33.42	7.33

[6] Using market-based emissions
[7] Based on statutory revenue (TalkTalk, 2019)

5. Key Recommendations

Zen have already implemented some positive measures to improve the environmental sustainability of their business. For example, their environmental policy is provided to all employees when they join the company, and is made available to all employees through their intranet. They also have an Environmental Steering Group which is chaired by the CEO and includes a number of senior managers from a variety of different business areas, as well as individuals with a personal interest.

The following recommendations are designed to help Zen build upon the results of the appraisal, as well as your current sustainability measures, to enhance your carbon management over the coming year.

5.1. Carbon & sustainability targets

Carbon offsetting is an excellent way to compensate for the emissions that you cannot reduce, by funding an equivalent carbon dioxide saving elsewhere.

We are aware that Zen is working towards Carbon Neutral Plus status as part of their carbon saving goals. I believe this is excellent forward thinking by Zen and recommend that they go ahead with this as planned.

We can provide both UK-based and international projects for you to support. The majority of projects focus on the development of renewable energy in developing countries, however there are others which have a greater focus on social benefits as well as environmental benefits. Further detail on the type and specific projects that we currently have in our portfolio can be provided on request or be found at: http://www.carbonfootprint.com/carbonoffsetprojects.html.

Example of Carbon Offsetting Projects:

Tree Planting in UK Schools

Avoided Deforestation in the Brazilian Amazon

Clean Water in Rwanda

5.2. Improving the accuracy of future carbon footprint assessments

To improve the accuracy of future assessments, we recommend the following:

- Providing 'actual' water meter readings rather than estimated readings for at least the first and last reading of the data period. This will allow us to calculate the consumption more accurately.
- Obtaining the weight of cardboard waste for inclusion in future assessments. You should be able to do this by speaking to your waste carrier or by checking your WTN's. The waste data accuracy could also be improved with the provision of evidence that WEEE is recycled.
- For this assessment, the number of A4 vs A3 reams was estimated (although the total number of reams was correct). To improve accuracy of future paper calculations, the exact number of reams per size could be recorded throughout the year and provided for the annual assessment.

5.3. Reducing emissions

Zen has a number of targets in place including the reduction of CO_2e from commuting and business travel by 50%, and the reduction of energy use by 15%. Based on the results of this assessment, we recommend the following to help achieve these goals:

- Consider using video/tele conferencing where possible to reduce the use of company cars, grey fleet and flights. Where this is not possible, try to encourage the use of rail travel rather than cars or flights.
- Continue to investigate commuting habits and alternatives such as car-share incentives, shuttle buses and subsidised rail travel.
- Assess the feasibility of switching to A/C refrigerant gases with a lower GWP
- Implementing energy saving measures at the Sandbrook Park site such as an automatic power-off setting for all PC's after work hours, and switching to LED lights.
- Switching to a renewable energy tariff for all of Zen's sites. If this is not currently possible for all sites, the focus should be on maintaining the renewable energy tariff at Sandbrook Park, and switching to renewable energy for BT Exchanges.

5.4. Carbon Footprint Standard

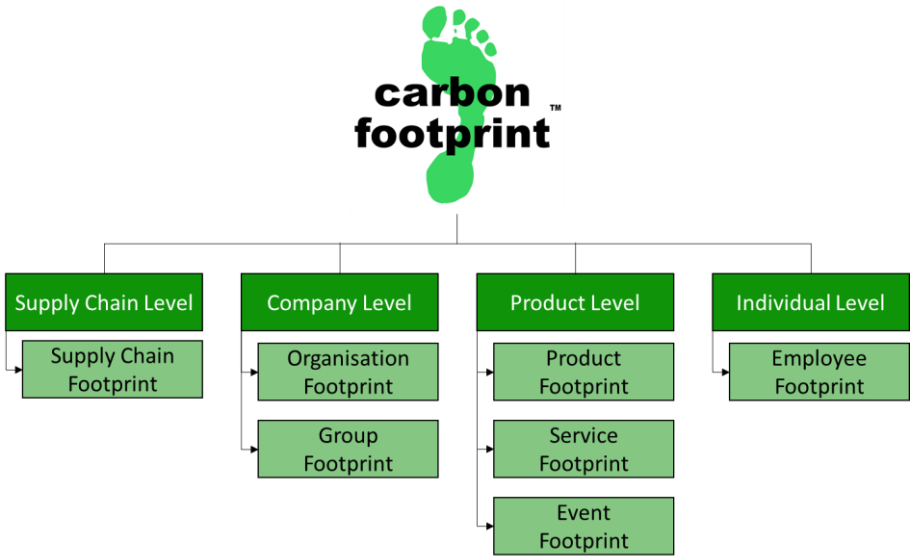
5.4.1. Brand endorsement

Zen Internet Ltd, in conjunction with Carbon Footprint Ltd, has assessed its carbon footprint. By achieving this Zen Internet Ltd has qualified to use the Carbon Footprint Standard branding. This can be used on all marketing materials, including website and customer tender documents, to demonstrate your carbon management achievements.

The Carbon Footprint Standard is recognition of your organisation's commitment to carbon management. The text to the right-hand side of the logo demonstrates what level you have achieved in line with international best practice.

5.4.2. Scope

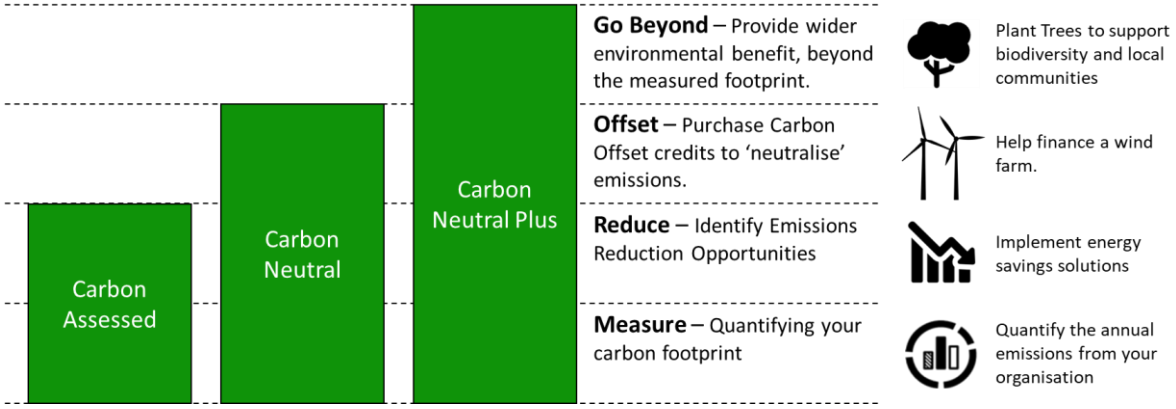
As you are at the beginning of your Carbon Footprint Journey, you have decided to focus on the carbon footprint at the organisational level. This is a great start. Over time, you can progress your carbon footprinting to increase the scope and encompass your products, supply chain and your employees. By doing so you will be able to receive the Carbon Footprint Standard for these categories, thus standing out amongst your competitors and truly driving the sustainability or your brand.



Once the scope has been identified, the Carbon Footprint Standard will allow Zen Internet Ltd to develop from a novice to an exemplar in the market. You can progress from a Carbon Assessed Organisation to a Carbon Neutral or a Carbon Neutral Plus Organisation by supporting a range of environmental projects that come with wider CSR and PR opportunities.

Carbon Neutral Organisation

Alongside the sustainability rationale, this will allow you to leverage the Carbon Footprint Standard to truly stand out in your market. Progressing will resonate with like-minded customers and will help your business grow.



5.4.3. Communicate

Make sure you communicate your actions and achievements effectively, both within your organisation, to help develop your culture, and externally to help improve your brand image.

When promoting your actions, be sure to utilise all marketing channels available to you, such as website, newsletters, brochures, press releases, conferences/events and social media etc.

You should:

- Explain why climate change matters to you (for more information visit: www.carbonfootprint.com/warming.html)
- Tell the story of where you have come from, the progress you have made and what your commitment is for the future (e.g. targets).
- Be clear and accurate about what you have achieved – take care not to exaggerate.
- Add your environmental policy to your website to show your customers that you are committed to continual improvement in accordance with your ISO14001 standard
- Use the Carbon Footprint Standard branding, certificates, images of offset projects you are supporting and graphs of your carbon performance to help communicate your point in a clear and enticing manner.

5.5. ISO standards

Zen currently holds the ISO14001 standard. This report can be used to compliment this as proof of the assessment of your carbon footprint. Future assessments can be used as evidence of any changes in emissions compared to this baseline year.

To help keep up-to-date on law and best practice, contact us to subscribe to our newsletters for regular updates.

6. References

1. BEIS GHG Conversion Factors for Company Reporting (June 2019)
2. Guidelines to Defra's Greenhouse Gas (GHG) Conversion Factors for Company Reporting – annexes (June 2013)
3. The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition (March 2004)
4. AIB European Residual Mix, Revised Report (2019)
5. TalkTalk Telecom Group PLC Annual Report (2019)

A. Annex A – Calculation Methodology (Additional Notes)

A.1 How is the carbon footprint calculated?

Carbon Footprint confirms that the methodology used to quantify the carbon footprint meets the following principles:

a) The subject and its boundaries have been clearly identified and documented.
b) The carbon footprint has been based on primary activity data unless the entity could not demonstrate that it was not practicable to do so, in which case an authoritative source of secondary data relevant to the subject was used.
c) The methodology employed minimised uncertainty and yielded accurate, consistent and reproducible results.
d) Emission factors used are germane to the activity concerned and current at the time of quantification.
e) Conversion of non-CO_2 greenhouse gases to CO_2e has been based upon the 100-year Global Warming Potential figures published by the IPCC or national (Government) publication.
f) Carbon footprint calculations have been made exclusive of any purchases of carbon offsets.
g) All carbon footprints have been expressed as an absolute amount in tCO_2e.

A.2 Biomass

There are no CO_2 emissions from the combustion of biomass to be considered within this report.

A.3 Greenhouse gas removals

Within the calculation of Zen Internet Ltd's carbon footprint, there are no business processes resulting in the reduction of greenhouse gases from the atmosphere to be deducted from the calculation.

B. Annex B – Supplied Data and Emissions Breakdown

This annex shows the data that Zen Internet Ltd has supplied Carbon Footprint Ltd for the calculation of its emissions. At the end of each table one or several columns have been added that display the emissions and calculations associated for each item of data provided by Zen Internet Ltd. It should be noted that the latter has been calculated by Carbon Footprint Ltd, and not provided by Zen Internet Ltd.

B.1 Data used for Scope 1 emissions assessment

This section contains the data related to the direct emissions attributable to Zen Internet Ltd. These include the energy usage in Zen Internet Ltd's buildings (excluding purchased electricity, since this corresponds to Scope 2, indirect emissions), any company owned vehicle transport and any of the other six greenhouse gases produced.

Table 14: Data supplied and emissions breakdown for energy usage

Site Name	No. of staff	Natural Gas (kWh)	Diesel (litre)	Natural Gas (tCO_2e)	Diesel (tCO_2e)	Total Emissions (tCO_2e)
Sandbrook Park	1,100	2,132,924	1,000	392.14	2.69	394.83
Moss Bridge Road	0	34,489		6.34		6.34
Telehouse	0					
Interxion	0					
AQL	0					
Equninx	0					
Virtus	0					
450 BT exchanges	0					
	1,100	**2,167,413.00**	**1000.00**	**398.48**	**2.69**	**401.17**

Table 55: Data supplied and emissions breakdown for company owned car transportation

Registration Plate	Make	Model	Engine Size (cc)	Fuel Type	Emissions Rating (gCO_2/km)	Annual Distance (miles)	Vehicle Efficiency (UK MPG)	Car Type	Emissions (tCO_2e)
CX66GWW	Audi	3 Series Saloon Petrol 330e 2.0 Phev M Sport Auto	1994	Hybrid	37	3,703	135.0	Average Plug in Hybrid Electric car	0.26
N777TSH	Mercedes	350e Saloon	1991	Hybrid	52	2,961	123.0	Average Plug in Hybrid Electric car	0.30
AO18ZYE/D7VEB	Volkswagen	Passat Est 1.4TSi GTE Advance DSG	1395	Hybrid	40	925	166.0	Average Plug in Hybrid Electric car	0.07
BG67AOZ	Volkswagen	Golf 5 DR 1.4TSi GTE ADVANCE DSG	1395	Hybrid	38	1,165	166.0	Average Plug in Hybrid Electric car	0.09
CX67MKO	BMW	330e SE Saloon	1998	Hybrid	44	1,175	149.0	Average Plug in Hybrid Electric car	0.10
MV17URB	Mercedes	CLA Class CLA200 Coupe 4Dr	2143	Diesel	109	2,103	67.0	Average Diesel	0.44
MX65VPK	Mercedes benz	C Class C350e Estate	1991	Hybrid	48	3,011	123.0	Average Plug in Hybrid Electric car	0.28
CP66ATF	BMW	5 Series Touring 520d [190] M Sport 5dr Step Auto	1995	Diesel	108	1,160	69.0	Average Diesel	0.24

Registration Plate	Make	Model	Engine Size (cc)	Fuel Type	Emissions Rating (gCO_2/km)	Annual Distance (miles)	Vehicle Efficiency (UK MPG)	Car Type	Emissions (tCO_2e)
KM67XMB	Audi	A4 Sal 2.0TDi SPT ULTRA LTHR S-TRNC	1968	Diesel	99	126	74.0	Average Diesel	0.02
MC16PJO	BMW	520d SE Touring Auto	1995	Diesel	123	1,060	61.0	Average Diesel	0.25
PE17VUP	BMW	Mini Clubman Estate	1499	Unleaded	111	9,017	67.0	Average Petrol	1.93
MD16BUE	Skoda	Superb SE Business	1968	Diesel	97	14,544	76.0	Average Diesel	2.72
CY66FBL	BMW	3 series saloon petrol 330e 2.0 Phev M Sport Auto	1998	Hybrid	38	2,954	135.0	Average Plug in Hybrid Electric car	0.22
HV68RCY	BMW	530e M SPORT4DR	1998	Hybrid	36	3,707	141.0	Average Plug in Hybrid Electric car	0.26
DT17OGW	Mitsubishi	Outlander Estate 2.0 PHEV 4hs 5Dr Auto	1998	Hybrid	40	3,574	139.0	Average Plug in Hybrid Electric car	0.28
HV68KWF	BMW	5 SERIES SALOON 530e M Sport	1998	Hybrid	38	1,966	141.0	Average Plug in Hybrid Electric car	0.14
FX16GXT	Jaguar	XE Diesel Sallon 2.0d Prestige 4dr 17	1999	Diesel	130	13,449	57.0	Average Diesel	3.38
ME19 OAV	JAGUAR	294kw Ev400 S 90kwh 5dr Auto 20		Electric	0	247			0.00

Registration Plate	Make	Model	Engine Size (cc)	Fuel Type	Emissions Rating (gCO_2/km)	Annual Distance (miles)	Vehicle Efficiency (UK MPG)	Car Type	Emissions (tCO_2e)
HX68PZP	BMW	530e M Sport 4dr Auto	1998	Hybrid	36	106	141.0	Average Plug in Hybrid Electric car	0.01
GF65HNT	Jaguar	XF Diesel Saloon 2.0D R-Sport 4 Dr Auto 16	1999	Diesel	139	3,684	54.0	Average Diesel	0.99
MD15 FJV	Hyundai	Tucson		Petrol (retail)	113	15,540	66.0	Average Petrol	2.36
Usually Ford Mondeo or Vauxhall Insignia				Petrol (retail)	116	11,785	64.0	Average Petrol	1.85
						97,961.05			**16.20**

Table 16: Data supplied and emissions breakdown for refrigerant gas replenishment

Cost Centre / Location ID	Amount Refilled (kg)	Refrigerant type	GWP ($kgCO_2e$)	Emissions (tCO_2e)
ENP B 142.2 EX ST	45	HFC-134a	1430.00	64.35
ENP B 142.2 EX ST	26	HFC-134a	1430.00	37.18
OC5 DX ACU 10.5 (1)	8	R410A	2088.00	16.70
OC5 DX ACU 10.5 (1)	14.5	R410A	2088.00	30.28
ENP B 125.2 XE	40	HFC-134a	1430.00	57.20
	133.50			**205.71**

B.2 Data used for Scope 2 emissions assessment

This section contains the data associated to the energy indirect emissions attributable to Zen Internet Ltd. The table below shows the purchased electricity, heat or steam usage in Zen Internet Ltd's buildings.

Table 176: Data supplied and emissions breakdown for purchased electricity usage

Site Name	No. of staff	Grid Electricity	Unit	Renewable Resource	Country	Electricity Generation(tCO_2e)
Sandbrook Park	1,100	6,777,000	kWh	Yes	United Kingdom	0.00[8]
Moss Bridge Road	0	175,092	kWh	No	United Kingdom	46.92
Telehouse	0	526,500	kWh	No	United Kingdom	141.10
Interxion	0	140,160	kWh	No	United Kingdom	37.56
AQL	0	8,760	kWh	No	United Kingdom	2.35
Equninx	0	103,708	kWh	No	United Kingdom	27.79
Virtus	0	266,524	kWh	No	United Kingdom	71.43
450 BT exchanges	0	5,913,000	kWh	No	United Kingdom	1584.68
	1,100	**13,910,744**				**1,911.84**

[8] Using market-based emissions.

B.3 Data used for Scope 3 emissions assessment

The tables below demonstrate the company's employee business travel (not including staff commuting), any outsourced transport, and emissions from the transmission and distribution of purchased energy.

Table 187: Data supplied and emissions breakdown for staff business travel by employee owned car

Registration Plate	Make	Model	Annual Distance	Car Type	Distance unit	Emissions (tCO_2e)
MK68 OWA	Peugeot	108	382	Average Unknown Fuel	mile	0.11
FH14 GKZ	Toyota	Auris	171	Average Unknown Fuel	mile	0.05
A281 GES	BMW	3 Series	668	Average Unknown Fuel	mile	0.19
SJ15 PNV	Mazda	3	140	Average Unknown Fuel	mile	0.04
MV10 BKX	BMW	5 Series	3,220	Average Unknown Fuel	mile	0.92
PO65 JWE	Vauxhall	Zafira	412	Average Unknown Fuel	mile	0.12
YT15 KUD	Ford	Focus	333	Average Unknown Fuel	mile	0.09
YK14 ZPC	Ford	Kuga	213	Average Unknown Fuel	mile	0.06
ND64 YXN	Nissan	Qashqai	137	Average Unknown Fuel	mile	0.04
YC14 WFM	Ford	Focus	362	Average Unknown Fuel	mile	0.10
AM66 PBM	Mercedes	C Class	6,334	Average Unknown Fuel	mile	1.81
DE68 KTV	Toyota	Prius	208	Average Unknown Fuel	mile	0.06
PG66 VKM	Audi	A1	26	Average Unknown Fuel	mile	0.01
BJ55 YUV	Mercedes	C Class	14,060	Average Unknown Fuel	mile	4.01
CE09 FOH	Mini	Cooper	130	Average Unknown Fuel	mile	0.04
A7 NBX	BMW	1 Series	535	Average Unknown Fuel	mile	0.15
YP16 FBF	Jeep	Renegade	6,507	Average Unknown Fuel	mile	1.85
DE60 NEE	Toyota	Yaris	60	Average Unknown Fuel	mile	0.02
KF04 ELF	Mazda	MX5	1,124	Average Unknown Fuel	mile	0.32

Registration Plate	Make	Model	Annual Distance	Car Type	Distance unit	Emissions (tCO_2e)
WF57 UYC	Renault	Megane	3,810	Average Unknown Fuel	mile	1.09
NV16 KLJ	Ford	Fiesta ST	546	Average Unknown Fuel	mile	0.16
MK14 BYL	Citroen	DS3	149	Average Unknown Fuel	mile	0.04
HG60 NLV	Renault	Scenic	875	Average Unknown Fuel	mile	0.25
K99 AWG	Alfa Romeo	Giulietta	3,159	Average Unknown Fuel	mile	0.90
MA16 NCN	BMW	1 Series	147	Average Unknown Fuel	mile	0.04
YB15 TXG	Mazda	CX 5	810	Average Unknown Fuel	mile	0.23
MW66 BOV	Volkswagen	CC	58	Average Unknown Fuel	mile	0.02
YT16 MBY	Kia	Sportage GT	91	Average Unknown Fuel	mile	0.03
KD57 EKR	Vauxhall	Astra	138	Average Unknown Fuel	mile	0.04
RJ12 VSF	BMW	5 Series	4,774	Average Unknown Fuel	mile	1.36
N3 RDU	Lexus	IS 250?	400	Average Unknown Fuel	mile	0.11
AO66 LLP	Ford	Fiesta	679	Average Unknown Fuel	mile	0.19
DC17 DHU	Audi	Q5	4,079	Average Unknown Fuel	mile	1.16
KT65 WNF	Mercedes	A Class	604	Average Unknown Fuel	mile	0.17
MW13 JXM	Honda	Civic	177	Average Unknown Fuel	mile	0.05
FH19 WCL	Land Rover	Range Rover	68	Average Unknown Fuel	mile	0.02
YR17 WEP	Volkswagen	Polo	332	Average Unknown Fuel	mile	0.09
F9 SPJ	Porsche	Cayenne	1,345	Average Unknown Fuel	mile	0.38
BU07 JWG	LDV	Maxxus	301	Average Unknown Fuel	mile	0.09
V10 LLO	Audi	A5	536	Average Unknown Fuel	mile	0.15
MH18 FTV	Volkswagen	Golf GTI	2,348	Average Unknown Fuel	mile	0.67
N10 WWE	Audi	A3 Cabriolet	183	Average Unknown Fuel	mile	0.05
EX62 XFC	Mercedes	CLS 350	727	Average Unknown Fuel	mile	0.21

Registration Plate	Make	Model	Annual Distance	Car Type	Distance unit	Emissions (tCO_2e)
M444 LTM	Land Rover	Discovery Sport	153	Average Unknown Fuel	mile	0.04
MJ14 XME	BMW	1 Series	58	Average Unknown Fuel	mile	0.02
MK10 OSP	Suzuki	Swift	126	Average Unknown Fuel	mile	0.04
MF62 VLS	MIni	Clubman?	418	Average Unknown Fuel	mile	0.12
DM10 DOM	Vauxhall	Corsa	545	Average Unknown Fuel	mile	0.16
LO65 ZNC	Mercedes	GLC	8,556	Average Unknown Fuel	mile	2.44
BW19 OVR	Volvo	XC60	3,343	Average Unknown Fuel	mile	0.95
LO19 XGR	Mercedes	A Class	5,288	Average Unknown Fuel	mile	1.51
FV07 KGK	Citroen	Picasso	208	Average Unknown Fuel	mile	0.06
MC65 WKE	Skoda	Octavia	101	Average Unknown Fuel	mile	0.03
ML67 BXC	Mini	Cooper S	428	Average Unknown Fuel	mile	0.12
MV66 RNO	Toyota	Rav 4 Hybrid	1,644	Average Unknown Fuel	mile	0.47
YG64 OHJ	Mazda	6 Sport	6,480	Average Unknown Fuel	mile	1.85
MJ65 DSZ	Skoda	Yeti	612	Average Unknown Fuel	mile	0.17
AO04 PRZ	Volvo	V40	1,084	Average Unknown Fuel	mile	0.31
NU65 GGF	BMW	5 Series	285	Average Unknown Fuel	mile	0.08
YS65 AKJ	Mazda	6	1,521	Average Unknown Fuel	mile	0.43
BN16 KWW	Vauxhall	Insignia Sport	488	Average Unknown Fuel	mile	0.14
AD09 AHF	Volkswagen	Golf	164	Average Unknown Fuel	mile	0.05
2 MNB	Volvo	V70	83	Average Unknown Fuel	mile	0.02
KP11 HVC	Ford	Fiesta	90	Average Unknown Fuel	mile	0.03
MM13 YBD	Mini	One	474	Average Unknown Fuel	mile	0.14
EN64 FVA	Seat	Mii	445	Average Unknown Fuel	mile	0.13
OE55 XSP	Honda	Jazz	236	Average Unknown Fuel	mile	0.07

Registration Plate	Make	Model	Annual Distance	Car Type	Distance unit	Emissions (tCO_2e)
KT15 YFL	Seat	Leon	764	Average Unknown Fuel	mile	0.22
HY02 SWN	Ford	Fiesta	51	Average Unknown Fuel	mile	0.01
CU57 AOV	Vauxhall	Astra	31	Average Unknown Fuel	mile	0.01
R700 SHW	Mini	John Cooper Works	131	Average Unknown Fuel	mile	0.04
G11 AFF	Jaguar	XJ	5,474	Average Unknown Fuel	mile	1.56
GC16 LND	Volkswagen	Passat	816	Average Unknown Fuel	mile	0.23
C20 CBS	Toyota	Corolla	862	Average Unknown Fuel	mile	0.25
LX12 WWF	Mini	Countryman	288	Average Unknown Fuel	mile	0.08
BK66 XDW	Kia	Sportage	860	Average Unknown Fuel	mile	0.25
NJ64 WFH	BMW	X3	819	Average Unknown Fuel	mile	0.23
YB63 CLO	Skoda	Octavia VRS	406	Average Unknown Fuel	mile	0.12
MD17 XDL	Mini	Cooper S	81	Average Unknown Fuel	mile	0.02
FX67 VRL	Jaguar	F Pace	5,449	Average Unknown Fuel	mile	1.55
T321 GHE	Mini	London Edition	36	Average Unknown Fuel	mile	0.01
BD13 RFX	Kia	Sportage	217	Average Unknown Fuel	mile	0.06
EA61 OKZ	Mercedes	E Class	12,490	Average Unknown Fuel	mile	3.56
FG14 NPF	Ford	Fiesta	230	Average Unknown Fuel	mile	0.07
YD19 SJF	BMW	5 Series Estate	505	Average Unknown Fuel	mile	0.14
EN13 AYC	Ford	S Max	314	Average Unknown Fuel	mile	0.09
LH51 AAZ	Mercedes	CLK	851	Average Unknown Fuel	mile	0.24
YA10 NUF	BMW	118 Sport	428	Average Unknown Fuel	mile	0.12
DS68 ULR	Nissan	Qashqai	78	Average Unknown Fuel	mile	0.02
MF17 YFS	Dacia	Duster	522	Average Unknown Fuel	mile	0.15

Registration Plate	Make	Model	Annual Distance	Car Type	Distance unit	Emissions (tCO_2e)
MX15 VOY	Volkswagen	Golf R	440	Average Unknown Fuel	mile	0.13
FR13 OUA	Toyota	Auris Hybrid	3,412	Average Unknown Fuel	mile	0.97
KY04 LKG	Mercedes	C Class	2,390	Average Unknown Fuel	mile	0.68
YC62 DZK	Audi	Q3	32	Average Unknown Fuel	mile	0.01
UFZ 456	BMW	640D	194	Average Unknown Fuel	mile	0.06
KM68 MVG	Mercedes	A Class	3,212	Average Unknown Fuel	mile	0.92
			140380.90			**40.01**

Table 198: Data supplied and emissions breakdown for staff business travel by train

Train Type	No. of Passenger Trips	Origin	Destination	Return Trip?	Distance (km)	passenger km	Emissions (tCO_2e)
National rail	1	Birmingham International	Rochdale	Yes	181.4	362.74	0.01
National rail	3	Blackburn	London Euston	Yes	372.8	2,236.86	0.09
National rail	1	Blackburn	London Marylebone	Yes	370.3	740.68	0.03
National rail	1	Blackburn	Milton Keynes	Yes	287.5	574.96	0.02
National rail	1	Bromley Cross	London Euston	Yes	353.7	707.30	0.03
National rail	1	Burnley Barracks	London Euston	Yes	390.4	780.80	0.03
National rail	1	Burnley Manchester Road	Leeds	Yes	94.1	188.16	0.01
National rail	1	Carlisle	Edinburgh	Yes	158.5	317.02	0.01
National rail	4	Chester	London Euston	Yes	315.9	2,527.52	0.10
National rail	1	Chester	Cambridge	Yes	274.1	548.18	0.02
National rail	4	Chester	Leeds	Yes	131.9	1,055.52	0.04
National rail	2	Chester	Manchester Piccadilly	Yes	64.7	258.80	0.01

Train Type	No. of Passenger Trips	Origin	Destination	Return Trip?	Distance (km)	passenger km	Emissions (tCO_2e)
National rail	1	Crewe	Cardiff Central	Yes	255.6	511.20	0.02
National rail	1	Crewe	London Euston	Yes	284.4	568.78	0.02
National rail	1	Dore & Totley	Manchester Oxford Road	Yes	62.1	124.18	0.01
National rail	1	EDA (not sure of station code)	Dundee	Yes	246.3[9]	492.53	0.02
National rail	1	Edinburgh	York	Yes	336.1	672.14	0.03
National rail	1	Flowery Field	Milton Keynes	Yes	239.4	478.76	0.02
National rail	1	Flowery Field	London Euston	Yes	315.5	631.00	0.03
National rail	1	Garforth	Manchester Victoria	Yes	82.5	165.04	0.01
National rail	1	Garforth	ZHU (not sure of station code)	Yes	246.3	492.53	0.02
National rail	1	Greenfield	Hereford	Yes	238.5	476.90	0.02
National rail	2	Greenfield	Leeds	Yes	53.2	212.68	0.01
National rail	1	Halifax	London Kings Cross	Yes	316.4	632.80	0.03
National rail	1	Handforth	Birmingham International	Yes	146.0	292.00	0.01
National rail	3	Harrogate	London Kings Cross	Yes	325.7	1,954.02	0.08
National rail	1	Haydons Road	London Blackfriars	Yes	13.6	27.10	0.00
National rail	1	Haydons Road	Accrington	Yes	408.1	816.24	0.03
National rail	1	Haydons Road	City Thameslink	Yes	22.7	45.44	0.00
National rail	1	Hebden Bridge	London Kings Cross	Yes	325.8	651.68	0.03
National rail	1	High Wycombe	London Marylebone	Yes	48.0	96.06	0.00

[9] The two highlighted figures used a mean distance as the actual journey distance could not be obtained based on the information provided

Train Type	No. of Passenger Trips	Origin	Destination	Return Trip?	Distance (km)	passenger km	Emissions (tCO_2e)
National rail	1	Highbridge & Burnham	Elephant & Castle	Yes	1,562.4	3,124.80	0.13
National rail	6	Huddersfield	Manchester Piccadilly	Yes	45.5	546.48	0.02
National rail	1	Huddersfield	Manchester Victoria	Yes	45.8	91.56	0.00
National rail	12	Huddersfield	Leeds	Yes	32.3	776.16	0.03
National rail	1	Huddersfield	Glasgow Central	Yes	379.0	757.90	0.03
National rail	1	Knaresborough	London Kings Cross	Yes	327.5	654.92	0.03
National rail	5	Leeds	London Kings Cross	Yes	313.1	3,130.70	0.13
National rail	1	Leeds	London Euston	Yes	312.0	624.00	0.03
National rail	1	Littleborough	Manchester Victoria	Yes	26.9	53.76	0.00
National rail	1	Littleborough	London Euston	Yes	352.9	705.80	0.03
National rail	1	Littleborough	Leeds	Yes	54.3	108.66	0.00
National rail	1	Littleborough	London Kings Cross	Yes	354.0	707.94	0.03
National rail	1	Liverpool Lime Street	Leeds	Yes	115.3	230.62	0.01
National rail	2	Liverpool Lime Street	London Euston	Yes	351.8	1,407.16	0.06
National rail	1	Liverpool South Parkway	Watford Junction	Yes	320.8	641.54	0.03
National rail	8	London Euston	Manchester Piccadilly	Yes	332.7	5,323.84	0.22
National rail	1	London Euston	Preston	Yes	366.3	732.60	0.03
National rail	1	London Euston	Chester	Yes	314.9	629.78	0.03
National rail	1	London Euston	Walsden	Yes	340.5	680.96	0.03
National rail	1	London Euston	Rochdale	Yes	349.7	699.40	0.03
National rail	1	London Kings Cross	Dewsbury	Yes	300.7	601.34	0.02
National rail	2	London Kings Cross	Harrogate	Yes	335.8	1,343.08	0.06
National rail	3	London Kings Cross	York	Yes	333.0	1,998.06	0.08
National rail	1	London Kings Cross	Wakefield Westgate	Yes	295.1	590.18	0.02
National rail	1	London Paddington	Castle Cary	Yes	203.6	407.24	0.02

Train Type	No. of Passenger Trips	Origin	Destination	Return Trip?	Distance (km)	passenger km	Emissions (tCO_2e)
National rail	1	Maidstone East	London Victoria	Yes	63.3	126.58	0.01
National rail	1	Manchester Airport	Leeds	Yes	90.7	181.42	0.01
National rail	1	Manchester Piccadilly	Birmingham International	Yes	153.0	306.00	0.01
National rail	3	Manchester Piccadilly	Birmingham New Street	Yes	141.2	846.90	0.03
National rail	5	Manchester Piccadilly	Edinburgh	Yes	352.7	3,526.60	0.15
National rail	1	Manchester Piccadilly	Hemel Hempstetad	Yes	292.5	585.04	0.02
National rail	1	Manchester Piccadilly	Kensington Olympia	Yes	329.2	658.42	0.03
National rail	2	Manchester Piccadilly	Leeds	Yes	83.3	333.16	0.01
National rail	1	Manchester Piccadilly	London Blackfriars	Yes	337.9	675.70	0.03
National rail	67	Manchester Piccadilly	London Euston	Yes	333.2	44,651.48	1.84
National rail	1	Manchester Piccadilly	London Liverpool Street	Yes	326.3	652.68	0.03
National rail	1	Manchester Piccadilly	London Victoria	Yes	334.1	668.12	0.03
National rail	1	Manchester Piccadilly	London Waterloo	Yes	342.0	683.92	0.03
National rail	1	Manchester Piccadilly	Maidstone East	Yes	410.5	820.98	0.03
National rail	3	Manchester Piccadilly	Reading	Yes	297.1	1,782.66	0.07
National rail	1	Manchester Piccadilly	Twickenham	Yes	340.1	680.18	0.03
National rail	2	Manchester Piccadilly	Watford Junction	Yes	301.2	1,204.72	0.05
National rail	4	Manchester Victoria	Leeds	Yes	69.5	556.16	0.02
National rail	1	Manchester Victoria	Shipley	Yes	67.8	135.68	0.01
National rail	2	Manchester Victoria	Rochdale	Yes	21.8	87.12	0.00
National rail	1	Newcastle	Birmingham New Street	Yes	332.9	665.74	0.03
National rail	1	Newcastle	York	Yes	141.5	283.08	0.01
National rail	2	Pannal	Manchester Oxford Road	Yes	103.9	415.56	0.02
National rail	1	Preston	Brentwood	Yes	379.4	758.76	0.03
National rail	3	Preston	Glasgow Central	Yes	297.6	1,785.72	0.07

Train Type	No. of Passenger Trips	Origin	Destination	Return Trip?	Distance (km)	passenger km	Emissions (tCO_2e)
National rail	3	Preston	High Wycombe	Yes	321.8	1,930.68	0.08
National rail	8	Preston	London Euston	Yes	367.1	5,873.92	0.24
National rail	1	Preston	Watford Junction	Yes	335.1	670.16	0.03
National rail	1	Rochdale	Chester	Yes	84.1	168.14	0.01
National rail	2	Rochdale	Leeds	Yes	52.4	209.76	0.01
National rail	8	Rochdale	London Euston	Yes	351.0	5,616.32	0.23
National rail	1	Rochdale	Manchester Piccadilly	Yes	20.2	40.42	0.00
National rail	1	Rochdale	Stansted Mountfitchet	Yes	325.3	650.58	0.03
National rail	1	Rose Hill Marple	Manchester Piccadilly	Yes	17.7	35.38	0.00
National rail	1	Runcorn	London Euston	Yes	328.2	656.44	0.03
National rail	1	Sheffield	London St Pancras	Yes	267.7	535.34	0.02
National rail	1	Sowerby Bridge	London Kings Cross	Yes	317.9	635.88	0.03
National rail	10	Stockport	London Euston	Yes	330.8	6,615.80	0.27
National rail	2	Stockport	Wellingborough	Yes	235.1	940.56	0.04
National rail	1	Tamworth	London Euston	Yes	204.0	407.92	0.02
National rail	1	Templecombe	Basingstoke	Yes	114.1	228.24	0.01
National rail	5	Templecombe	London Waterloo	Yes	194.4	1,944.20	0.08
National rail	1	Todmorden	Glasgow Central	Yes	346.3	692.54	0.03
National rail	1	Todmorden	Leeds	Yes	63.1	126.26	0.01
National rail	1	Trafford Park	Leeds	Yes	79.3	158.66	0.01
National rail	1	Urmston	London Euston	Yes	335.2	670.40	0.03
National rail	1	Warrington Bank Quay	Leeds	Yes	93.9	187.74	0.01
National rail	1	Warrington Bank Quay	London Blackfriars	Yes	325.9	651.80	0.03
National rail	7	Warrington Bank Quay	London Euston	Yes	321.3	4,497.78	0.19
National rail	1	Warrington Bank Quay	Syon Lane	Yes	313.1	626.22	0.03

Train Type	No. of Passenger Trips	Origin	Destination	Return Trip?	Distance (km)	passenger km	Emissions (tCO_2e)
National rail	1	Warrington Central	Sheffield	Yes	99.0	197.96	0.01
National rail	2	West Kirby	London Euston	Yes	373.0	1,492.04	0.06
National rail	1	West Kirby	Manchester Victoria	Yes	95.8	191.52	0.01
National rail	1	York	Cardiff Central	Yes	390.8	781.52	0.03
National rail	1	York	Coventry	Yes	218.9	437.86	0.02
National rail	1	York	Harrogate	Yes	34.5	68.96	0.00
National rail	1	York	Horsham	Yes	397.7	795.38	0.03
National rail	8	York	Leeds	Yes	44.6	713.60	0.03
National rail	3	York	London Blackfriars	Yes	349.0	2,094.24	0.09
National rail	6	York	London Bridge	Yes	348.2	4,177.80	0.17
National rail	10	York	London Kings Cross	Yes	324.1	6,482.00	0.27
National rail	1	York	Maidstone East	Yes	393.5	787.06	0.03
National rail	1	York	Manchester Airport	Yes	135.1	270.22	0.01
National rail	1	York	Manchester Oxford Road	Yes	127.0	253.92	0.01
National rail	4	York	Manchester Victoria	Yes	112.2	897.76	0.04
National rail	1	York	Reading	Yes	336.3	672.68	0.03
National rail	1	York	Rochdale	Yes	96.1	192.14	0.01
	313				**30,290.4**	**164558.27**	**6.77**

Table 20: Data supplied and emissions breakdown for staff business flights

No. of passenger trips	Type	Leg 1	Leg 2	Return Trip?	Leg 1 Airport Name	Leg 2 Airport Name	Leg 1 Country	Leg 2 Country	Total Distance (km)	Passenger km	tCO_2e (incl uplift factor)	Total Emissions (tCO_2e)
11	Economy	MAN	EDI	Yes	Manchester	Edinburgh	UK	UK	297	6,538	0.83	1.67
1	Economy	MAN	PVG	Yes	Manchester	Shanghai	UK	China	9,185	18,371	1.38	2.75
3	Economy	MAN	CPH	Yes	Manchester	Copenhagen	UK	Denmark	995	5,968	0.46	0.93
2	Economy	MAN	LAS	Yes	Manchester	Las Vegas	UK	United States	8,166	32,666	2.45	4.89
1	Economy	NCE	LPL	No	Nice	Liverpool	France	UK	1,304	1,304	0.20	0.20
1	Economy	LHR	NCE	No	London Heathrow	Nice	UK	France	1,042	1,042	0.16	0.16
1	Economy	MAN	ARN	Yes	Manchester	Stockholm	UK	Sweden	1,415	2,831	0.22	0.44
1	Economy	LPL	NCE	Yes	Liverpool	Nice	UK	France	1,304	2,608	0.20	0.41
1	Economy	MAN	LHR	Yes	Manchester	London Heathrow	UK	UK	242	484	0.06	0.12
1	Economy	DBV	MAN	No	Dubrovnik	Manchester	Croatia	UK	1,932	1,932	0.30	0.30
2	Economy	MAN	DBV	No	Manchester	Dubrovnik	UK	Croatia	1,932	3,865	0.60	0.60
2	Economy	MAN	LHR	Yes	Manchester	London Heathrow	UK	UK	242	969	0.12	0.25
1	Economy	MAN	PRG	Yes	Manchester	Prague	UK	Czech Republic	1,192	2,383	0.19	0.37
3	Economy	MAN	BCN	No	Manchester	Barcelona	UK	Spain	1,380	4,139	0.64	0.64
2	Economy	MAN	SOU	Yes	Manchester	Southampton	UK	UK	274	1,098	0.14	0.28
1	Economy	MAN	EIN	Yes	Manchester	Eindhoven	UK	Netherlands	560	1,120	0.09	0.17
3	Economy	MAN	BFS	Yes	Manchester	Belfast	UK	UK	295	1,773	0.23	0.45
1	Economy	MAN	FCO	Yes	Manchester	Rome	UK	Italy	1,678	3,355	0.26	0.52

No. of passenger trips	Type	Leg 1	Leg 2	Return Trip?	Leg 1 Airport Name	Leg 2 Airport Name	Leg 1 Country	Leg 2 Country	Total Distance (km)	Passenger km	tCO_2e (incl uplift factor)	Total Emissions (tCO_2e)
2	Economy	MAN	BER	Yes	Manchester	Berlin	UK	Germany	1,047	4,186	0.33	0.65
1	Economy	BER	MAN	No	Berlin	Manchester	Germany	UK	1,047	1,047	0.16	0.16
1	Economy	AGP	BER	No	Malaga	Berlin	Spain	Germany	2,224	2,224	0.31	0.31
42									**37753.79**	**99901.94**		**16.29**

Table 219: Data supplied and emissions breakdown for staff business travel by taxi

Type of Taxi	No of Journeys	Departure	Destination	Distance	Distance Unit	Passenger Distance (km)	Emissions (tCO_2e)
Regular taxi	1008	OL11 1RY	Rochdale train station	1.60	mile	2595.55	0.3898
	1008			**1.60**		**2595.55**	**0.39**

Table 22: Data supplied and emissions breakdown for the transmission and distribution of purchased electricity.

Site Name	No. of staff	Grid Electricity	Unit	Renewable Resource	Country	Electricity T&D (tCO_2e)
Sandbrook Park	1,100	6,777,000	kWh	Yes	United Kingdom	0.00[10]
Moss Bridge Road	0	175,092	kWh	No	United Kingdom	3.80
Telehouse	0	526,500	kWh	No	United Kingdom	11.43
Interxion	0	140,160	kWh	No	United Kingdom	3.04
AQL	0	8,760	kWh	No	United Kingdom	0.19
Equninx	0	103,708	kWh	No	United Kingdom	2.25
Virtus	0	266,524	kWh	No	United Kingdom	5.78
450 BT exchanges	0	5,913,000	kWh	No	United Kingdom	128.31
	1,100	**13,910,744.00**				**154.80**

[10] Using market-based emissions