# Carbon Footprint: Methodology and Calculations

5.7.7 P03 Carbon footprint report - May 2023





### **Executive Summary**

Since 2020 we have reported our carbon emissions annually in line with the Greenhouse Gas Protocol reporting guidelines.

In 2021, we updated our commitments to net zero carbon to align with the latest science under the UN Race to Zero through the SME Climate Hub. As such, we have incorporated our scope 3 emissions into our targets two years earlier than our previous commitment to do so by 2023, have set a short-term reduction target to half our emissions by 2030 (against a 2019 baseline) plus a long term target for a 90% reduction by 2040.

We estimated home working emissions in 2021, this methodology has now moved within the UK Government Carbon Factors for Company Reporting and is informed by our annual staff survey.

The downstream impacts from our projects are currently excluded from this assessment, but we acknowledge that these are significant. Our Architects Declare Statement outlines our actions and commitments to reduce these project related impacts in terms of embodied carbon, operational energy and wider environmental impacts.

Our 2022 emissions increased from 2021, this bounce-back was reflective of a return to a new normal post covid and also of the increased accuracy of our consumption data since moving to the Trinity 7<sup>th</sup> Floor office. Our gross emissions are reduced through purchase of good quality renewable energy (in accordance with UKGBC definitions). Our 2022 emissions are reduced compared to our base year but we need to do more to get back onto our reduction pathway.

New initiatives such as planned upgrades to our IT equipment (auto-shutdown/start-up to remote desktops) and a new electric car scheme for management are expected to result in significant carbon reductions over the coming year.

We have chosen to purchase Gold Standard international carbon offsets to be Carbon Neutral in operation and also to invest in UK woodland creation and peatland restoration which has biodiversity, flood prevention and amenity benefits initially as well as longer term carbon benefits.



Figure 1: Reported emissions compared with near term target reduction pathway.



## **Introduction**

In 2020, we committed to monitoring our carbon footprint, setting reduction targets and progressing on a journey to become carbon net zero as a business. We have chosen to record and report carbon data per calendar year (Jan – Dec). Our methodology is aligned to the Greenhouse Gas Protocol [GHGP] and identifies scope 1, scope 2 and scope 3 emissions.

In 2021, we updated our commitments to net zero carbon to align with the latest science under the UN Race to Zero through the SME Climate Hub. As such, we have incorporated our scope 3 emissions into our targets two years earlier than our previous commitment to do so by 2023, have set a short-term reduction target to half our emissions by 2030 (against a 2019 baseline) plus a long term target for a 90% reduction by 2040.

We estimated home working emissions in 2021, this methodology has now moved within the UK Government Carbon Factors for Company Reporting and is informed by our annual staff survey.

The downstream impacts from our projects are currently excluded from this assessment, but we acknowledge that these are significant. Our Architects Declare Statement outlines our actions and commitments to reduce these project related impacts in terms of embodied carbon, operational energy and wider environmental impacts.

We are working hard to enhance our Environmental Management System in accordance with ISO14001 and integrate this with a comprehensive practice management system to better capture environmental and social key performance indicators across our projects. This work shall lay the foundations to facilitate reporting of downstream project impacts in the future.

## Emission sources: identification

#### Scope 1 (direct) and 2 (indirect) emissions

Reporting of scope 1 and 2 emissions is mandatory under the GHGP.

#### Scope 1: company facilities and company vehicles

Throughout 2022 we have been located in a single office location in leased office space, fitted out to our own specification. General heating and cooling are provided by the Landlord, however our demise' consumption for landlord core building services is sub metered, as such emissions relating to general heating and cooling are included within our calculation.

In addition to the Landlord systems, we have 5 wall mounted air conditioning units with associated power inverter heat pump to control the temperature of our server and meeting rooms. The 5 wall mounted meeting room systems have been added to the existing landlord Mitsubishi VRF which has R32 refrigerant charge.

The server room system has two outdoor units and two indoor units each with a 4kg R32 refrigerant charge, so a total of 8kg, the system shall be serviced annually with any additional refrigerant charge required recorded.

We directly 'own' (leasehold) one pool car, available to all for business travel. Milage is recorded for all journeys. The current pool car has been a Toyota Corolla 1.8 petrol hybrid. Details of earlier vehicles remain available via historic lease details.

#### Scope 2: purchased electricity

We hold two electrical connections with both meters directly supplying the office and billed directly to us from our supplier.

We have no systems that use gas or steam.

From July 2022 one of our metered supplies is provided with good quality renewable tariff electricity, allowing us to report our emissions gross and net (excluding good quality renewable energy consumed).

#### Scope 3 (indirect, upstream, and downstream) emissions

Reporting of scope 3 emissions is optional under the GHGP.

Transmission and distribution of purchased electricity will be included in our scope 3 emissions.

We have chosen to calculate scope 3 emissions relating to business travel as the greatest non mandatory material factor in our overall carbon footprint as an SME consulting business.

Since July 2022 the EMS captures data regarding our business travel in a manner that now allows accurate carbon equivalent calculation.

For the first half of 2022 assumptions have been made over the data captured in the EMS to estimate our emissions relating to business travel.

Following changes towards a fully hybrid office environment from September 2021 we have chosen to expand our scope 3 emissions reporting to include an estimate for commuting and also for any increases in staff home energy consumptions that may occur due to home working.

Our 2021 sustainability survey was used to capture a snapshot of employees typical commuting transport modes and distances, alongside details of their living arrangements to help to inform estimates of any increases in energy use due to home working. Our calculations of home working impacts follow the Homeworking Emissions Whitepaper 2020 (By EcoAct in partnership with Lloyds Banking Group and NatWest Group) now incorporated within UK Government Carbon Factors for Company Reporting.



## **Results**

#### Scope 1 emissions, kgCO2e



Figure 2: Reported scope 1 emissions since baseline.

### Scope 2 emissions, kgCO<sub>2</sub>e



Figure 3: Reported scope 2 emissions since baseline.

Scope 3 emissions,  $kgCO_2e$  – electricity transmission & distribution, business travel, commuting & working from home



Figure 4: Reported scope 3 emissions since baseline

Total emissions, kgCO<sub>2</sub>e - scope 1, 2 (net) and 3 combined



Figure 5: Reported scope 1 – 3 total (net) emissions since baseline

	Scope 1 kgCO <sub>2</sub> e	Scope 2 (net) kgCO <sub>2</sub> e	Scope 3 kgCO <sub>2</sub> e	<b>Total</b> kgCO <sub>2</sub> e	% change year on year	% change cumulative
2019 Baseline	1622	8921	71554	82067	0	0
2020	1931	2742	48673	53346	-35%	-35%
2021	1443	7468	55871	64782	+21%	-21%
2022	119	13541	63601	78261	+21%	-5%

#### Total emissions, kgCO2e target comparison



Figure 6: Reported total (net) emissions since baseline compared to near and long term targets.



## Offsetting

Carbon offsetting presents an opportunity, beyond emission reductions, to develop a broader value proposition that is aligned to long-term business strategies and supports the UK and global transition to net zero.

Whilst the emphasis remains firmly on reducing emissions as a priority step, initiatives such as WorldGBC's Net Zero Carbon Buildings Commitment and Science Based Targets recognise that carbon offsets can play a critical role in the transition towards a state of net zero emissions.

UKGBC Renewable Energy Procurement and Carbon Offsetting March 2021

Carbon offsets must meet the following principles to safeguard quality and environmental integrity:

- 1. Real
- 2. Avoid leakage
- 3. Measurable
- 4. Permanence
- 5. Additional
- 6. Independently Verified
- 7. Unique
- 8. Avoid social & environmental harm

We have chosen a dual approach to carbon offsets, both of which have been made based on our total 2021 carbon emissions.

We are investing in international nature-based offsets supporting native forest regeneration. We receive verified carbon credits for these offsets.

We are also supporting a range of UK based nature protection, creation and restoration schemes. For the UK schemes we receive pending issuance credits based upon a carbon saving that shall be realised once the scheme have achieved a verified carbon saving.

All carbon offsets are verified to an international or national standard to ensure that they meet the UKGBC principles to safeguard quality and environmental integrity.

International verified carbon credits							
Project	% 2022 CO <sub>2</sub> offset	Verification scheme	Verified project ID				
Nii Kaniti - Rainforest Protection through community	30	Verified Carbon	1360				
based sustainable forestry		Standard (VCS)					
Forestal el Arriero - Forestry Stewardship Council	30	Verified Carbon	961				
certified sustainable timber		Standard (VCS)					
Conservation Coast - Protection of the Mesoamerican	30	Verified Carbon	1622				
Biological Corridor		Standard (VCS)					
Cochabamba Plan Vivo - Community based	10	Plan Vivo	10000000000695				
sustainable timber and rainforest protection							

UK nature-based protection, creation and restoration schemes (Pending Issuance Units)							
Project	% 2022	Verification	Verified project				
	CO <sub>2</sub> offset	scheme	ID .				
Doddington North - Continuous cover sustainable	40	UK Woodland	10400000026630				
forestry and native broadleaf riparian planting		Carbon Code					
Corriechuillie - Enhancing ecological diversity through	20	UK Woodland	10400000026341				
sustainable land-use management		Carbon Code					
Tom's Wood - New native woodland creation for	20	UK Woodland	10400000026404				
greater habitat connectivity		Carbon Code					
Gameshope Loch - Restoring degraded bog habitat in	20	UK Peatland	10400000026992				
the Scottish Borders		Code					



Figure 7: Carbon emissions and offsets compared to near and long term targets.



# **Reduction actions**

### Short term (coming 12 months).

#### Office energy

+ Implement auto shutdown and start up of remote desktops. Trials over 2022/2023 Christmas break indicated potential for 10% reduction in electricity.

#### Transport

+ Launch electric car scheme for management. Publicise and encourage take-up of electric cars on salary sacrifice.

### Medium term (coming 5 years)

- + Switch tariff so both meters are on good quality renewable energy tariffs.
- Consider plug in electric for pool car replacement.



Figure 8: Projected emissions towards near term target with key reduction measures and assumed incremental improvements.



### Appendix A Calculation methodology

Carbon equivalent conversion factors are taken from UK government data: <u>https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting</u> Relevant conversion factors have been used for each reported year as noted.

Accuracy of data is critical for truthful reporting. We will continue to refine our data capture and reporting to ensure the highest levels of accuracy.

Scope	Source	Measure	Notes	Data accuracy
1	Server heat pump / cooling system	Mass (kg) of gas top up required at annual service	Service reports available for 2015 onwards. No reported top up gas; 2 possible answers: 1. No leakage 2. Small leakage below levels deemed reportable Office manager to request that ANY top up is noted in future	Med
1	Pool car	Distance travelled (m / km)	Full diary of use available broken down per journey, job number and date. Vehicle type known	High
2	Electricity	Energy consumption (kwh)	Sub metered for office space	High
3	Electricity transmission and distribution	Energy consumption (kwh)	Sub metered for office space	High
3	Business travel – car	Distance travelled (km)	Pre-July 2022 Milage recorded but no data regarding vehicle type, size or fuel source per journey Post-July 2022 Milage and vehicle fuel type reported.	Med
3	Business travel – train	Distance travelled (km)	Pre-July 2022 No record of milage or type of train system. Cost recorded only Post-July 2022 Journey milage recorded.	Med
3	Business travel - air	Distance travelled (km)	Pre-July 2022 No record of milage or type of airline / class. Cost recorded only Post-July 2022 Journey milage & type recorded.	Med

3	Business travel - taxi	Distance travelled (km)	Pre-July 2022 No record of milage or vehicle type, size or fuel source per journey. Cost recorded only. Post-July 2022 Journey milage & type recorded.	Med
3	Business travel - tram	Distance travelled (km)	Pre-July 2022 No record of milage. Cost recorded only Post-July 2022 Journey milage recorded.	Med
3	Business travel – London underground	Distance travelled (km)	Pre-July 2022 No record of milage. Cost / travel card top up cost recorded only Post-July 2022 Journey milage recorded.	Med
3	Commuting	Distance travelled (km)	Survey collected employee typical commuting distances and mode of transport.	Med
3	Home Office	None	Although survey carried out to enhance accuracy of calculations for correction factor it is not based on measured data.	Low

All kgCO $_2$ e figures rounded to the nearest whole number when reporting.

# Appendix B Calculation summary

Calculation summary provided from revised baseline year 2019 onwards. Please see 2020 Carbon Report for calculations summary of preceding years.

#### Scope 1 emissions

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2019	Pool car (m)	6,559	0.24736	1622	Small car, petrol (1.0 focus)
	Server cooling (kg)	0	2088	0	R410A refrigerant gas
			Total	1622	
2020	Pool car (m)	8,087	0.23877	1931	Small car, petrol (1.0 focus)
	Server cooling (kg)	0	2088	0	R410A refrigerant gas
			Total	1931	
2021	Pool car (m)	5,237	0.24052	1260	Small car, petrol (1.0 focus)
		1,084	0.16889	183	Small car, HYBRID - Lease from June 21
	Server cooling (kg)	0	2088	0	R410A refrigerant gas
			Total	1443	
2022	Pool car (m)	6,732	0.16628	1119	Small car, HYBRID
	Refrigerant emissions (kg)	0	675	0	R32 refrigerant gas
			Total	1119	

### Scope 2 emissions

Period	Source	Annual quantum	Conversion factor	kgCO₂e
2019	Electricity	34,901 kWh	0.2556	8,921
2020	Electricity	ricity 11,762 kWh 0.23314		2,742
2021	Electricity	35,172 kWh	0.21233	7,468
2022	Electricity (Gross)	84,974 kWh	0.19338	16,432
	Electricity (Net)	70,020 kWh	0.19338	13,541

### Scope 3 emissions – electricity transmission and distribution

Period	Source	Annual quantum	Conversion factor	kgCO₂e
2019	Electricity	34,901 kWh	0.0217	757
2020	Electricity	11,762 kWh	0.02005	236
2021	Electricity	35,172 kWh	0.01879	661
2022	Electricity	84,974 kWh	0.19338	1,503

### Scope 3 emissions – business travel

Period	source	Annual quantum	Conversion factor	kgCO₂e	Notes
2019	Car (m)	55,094	0.27459	15,128	Assumed all milage in medium sized diesel car. Cost data equates to 45p / mile
	Taxi (passenger.km)	3290	0.15018	494	Regular taxi. Cost data assumed to equate to $\pounds1.49$ / km (see prior years)
	Air (passenger.km)	20,406	0.25493	5,202	Assumed all short haul flights (domestic to / from UK) with RF. Cost data assumed to equate to £0.42 / km (see prior years)
	Train (passenger.km)	78,963	0.04115	3,249	Assumed 'national rail' from 2019 data. Cost data assumed to equate to £0.341 / km based on 100% peak travel, advanced tickets and Manc to London: 260 km (thetrainline.com) and cost of £88.60 (receipts)
	Tram (passenger.km)	1,786	0.03508	63	Light rail and tram from 2019 data. Cost data assumed to equate to £0.33 / km (see prior years)
	London underground (passenger.km)	581	0.03084	18	London underground from 2019 data. Cost data assumed to equate to £0.35 / km (see prior years)
	Bus (passenger.km)	92	0.10471	10	Average local bus conversion factor due to whole UK use of public transport. Cost data assumed to equate to £0.30 / km based on other modes of public transport. Insignificant travel method to Aew
	Unallocated pseudo train (passenger.km)	181	0.04115	7	Unallocated travel expenses total £61.56 for the period, less than 0.15% of all travel expenses. 100% associated to train –reduced mode from 2018
			Total	24,171	

Period	source	Annual quantum	Conversion factor	kgCO <sub>2</sub> e	Notes
2020	Car (m)	26,971	0.26775	7,221	Assumed all milage in medium sized diesel car. Cost data equates to 45p / mile
	Taxi (passenger.km)	636	0.14549	93	Regular taxi. Cost data assumed to equate to £1.49 / km (see prior years)
	Äir (passenger.km)	2,396	0.2443	585	Assumed all short haul flights (domestic to / from UK) with RF. Cost data assumed to equate to £0.42 / km (see prior years)
	Train (passenger.km)	18,981	0.03694	701	Assumed 'national rail' from 2019 data. Cost data assumed to equate to £0.353 / km based on 100% peak travel, advanced tickets and Manc to London: 260 km (thetrainline.com) and cost of £91.75 (receipts)
	Tram (passenger.km)	445	0.02991	13	Cost data assumed to equate to £0.33 / km (see prior years)
	London underground (passenger.km)	87	0.0275	2	Cost data assumed to equate to £0.35 / km (see prior years)
	Bus (passenger.km)	44	0.10312	5	Average local bus conversion factor due to whole UK use of public transport. Cost data assumed to equate to £0.30 / km based on other modes of public transport. Insignificant travel method to Aew
	Unallocated pseudo car miles	n/a	n/a	0	No unallocated travel expenses over the year
			Total	8,621	

Period	source	Annual quantum	Conversion factor	kgCO₂e	Notes
2021	Car (m)	37,227	0.26549	9,883	Assumed all milage in medium sized diesel car. Cost data equates to 45p / mile
	Taxi (passenger.km)	495	0.14876	74	Regular taxi. Cost data assumed to equate to £1.49 / km (see prior years)
	Äir (passenger.km)	0	0.24587	0	Assumed all short haul flights (domestic to / from UK) with RF. Cost data assumed to equate to £0.42 / km (see prior years)
	Train (passenger.km)	17,485	0.03549	621	Assumed 'national rail' from 2021 data. Cost data assumed to equate to £0.353 / km based on 100% peak travel, advanced tickets and Manc to London: 260 km (thetrainline.com) and cost of £91.75 (receipts)
	Tram (passenger.km)	524	0.02813	15	Cost data assumed to equate to £0.33 / km (see prior years)
	London underground (passenger.km)	93	0.02781	3	Cost data assumed to equate to £0.35 / km (see prior years)
	Bus (passenger.km)	103	0.10227	11	Average local bus conversion factor due to whole UK use of public transport. Cost data assumed to equate to £0.30 / km based on other modes of public transport. Insignificant travel method to Aew
	Unallocated pseudo car miles	n/a	n/a	0	No unallocated travel expenses over the year
			Total	10,605	

Period	source	Annual quantum	Conversion factor	kgCO <sub>2</sub> e	Notes
2022	Car (m)	31,879	0.27039	8,620	Assumed all milage in medium sized diesel car. Cost data equates to 45p / mile. (Pre June 2022)
	Car (m)	12,174	0.27492	3,347	Average diesel car (Post June 2022)
	Car (m)	12,756	0.27436	3,500	Average petrol car (Post June 2022)
	Car (m)	2,497	0.19318	482	Average hybrid car (Post June 2022)
	Car (m)	1,400	0.08272	116	Average electric car (Post June 2022)
	Taxi (passenger.km)	1737	0.14876	258	Regular taxi. Cost data assumed to equate to $\pounds 1.49 / \text{km}$ (see prior years) (Pre June 2022) Reported distance (Post June 2022)
	Air (passenger.km)	11,019	0.19309	2,128	Assumed all short haul EU flights. Cost data assumed to equate to £0.42 / km (see prior years) (Pre June 2022) Reported distance (Post June 2022)
	Air (passenger.km)	583	0.24587	143	Domestic flight (UK) reported distance (Post June 2022)
	Train (passenger.km)	34,311	0.03549	1,218	Assumed 'national rail' from 2021 data. Cost data assumed to equate to £0.353 / km based on 100% peak travel, advanced tickets and Manc to London: 260 km (thetrainline.com) and cost of £91.75 (receipts) (Pre June 2022) Reported distance (Post June 2022)
	Tram / Underground (passenger.km)	917	0.02861	26	Cost data assumed to equate to £0.33 / km (see prior years) (Pre June 2022) Reported distance (Post June 2022)
	Bus (passenger.km)	188	0.0965	18	Average local bus conversion factor due to whole UK use of public transport. Cost data assumed to equate to £0.30 / km based on other modes of public transport. Insignificant travel method to Aew (Pre June 2022) Reported distance (Post June 2022)

Unallocated pseudo car miles	n/a	n/a	0	No unallocated travel expenses over the year
		Total	19,856	

### Scope 3 emissions – commuting

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2019	Car (m)	99,249	0.27459	27,253	
	Train (passenger km)	273,047	0.04115	11,236	Annual quantum calculated by:
	Tram (passenger.km)	60,358	0.03508	2,117	100% in office x 228 workdays x 65 no. staff x daily commute distance by mode (2021 survey
	Bus (passenger.km)	57,484	0.10471	6,019	data)
			Total	46,625	

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2020	Car (m)	31,620	0.26775	8,466	
	Train	86,990	0.03694	3,213	
	(passenger.km)				Annual quantum calculated by:
	Tram	19,229	0.02991	575	30% in office x 228 workdays x 70 no. staff x
	(passenger.km)				daily commute distance by mode (2021 survey
	Bus	18,314	0.10312	1,889	data)
	(passenger.km)				
			Total	14,143	

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2021	Car (m)	34,203	0.26549	9,080	
	Train	94,096	0.03549	3,339	
	(passenger.km)				Annual quantum calculated by:
	Tram (passenger.km)	20,800	0.02813	585	28% in office x 228 workdays x 85 no. staff x daily commute distance by mode (2021 survey
	Bus (passenger.km)	19,810	0.10227	2,026	data)
			Total	15,031	

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2022	Car (m)	88,968	0.27665	24,613	
	Motorbike (m)	6,572	0.18274	1,201	
	Train (passenger.km)	76,743	0.03549	2,724	Annual quantum calculated by: Surveyed transport modes, distance and no.
	Tram (passenger.km)	34,288	0.02861	981	days office/week of 74 survey respondents converted to CO2/person/year average x 83 no.
	Bus (passenger.km)	8,142	0.10778	878	statt
			Total	30,397	

Scope 3 emissions - home office (working from home)

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2019	Workstation Power (kWh)	0	0.2773	0	Annual quantum calculated by: 0% WFH x 1710 work hours x 65 no. staff x 0.140 kW per workstation
	Lighting Power (kWh)	0	0.2773	0	Annual quantum calculated by: 0% WFH x 1710 work hours x 65 no. staff x 0.010 kW per workstation
	Space Heating (kWh)	0	0.1839	0	Annual quantum calculated by: 0% WFH x 1710 work hours x 0.5 (heating season) x 65 no. staff x 5 kWh x 0.58 (additional usage metric based on 2021 surveyed data of staff who would result in additional heating by wfh)
			Total	0	

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2020	Workstation Power (kWh)	11,800	0.2532	2,988	Annual quantum calculated by: 70% WFH x 1710 work hours x 70 no. staff x 0.140 kW per workstation
	Lighting Power (kWh)	843	0.2532	213	Annual quantum calculated by: 70% WFH x 1710 work hours x 70 no. staff x 0.010 kW per workstation
	Space Heating (kWh)	122,219	01839	22,472	Annual quantum calculated by: 70% WFH x 1710 work hours x 0.5 (heating season) x 70 no. staff x 5 kWh x 0.58 (additional usage metric based on 2021 surveyed data of staff who would result in additional heating by wfh)
			Total	25,674	

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2021	Workstation Power (kWh)	13,789	0.2311	3,187	Annual quantum calculated by: 70% WFH x 1710 work hours x 70 no. staff x 0.140 kW per workstation
	Lighting Power (kWh)	985	0.2311	228	Annual quantum calculated by: 70% WFH x 1710 work hours x 70 no. staff x 0.010 kW per workstation
	Space Heating (kWh)	142,819	0.1832	26,159	Annual quantum calculated by: 70% WFH x 1710 work hours x 0.5 (heating season) x 70 no. staff x 5 kWh x 0.58 (additional usage metric based on 2021 surveyed data of staff who would result in additional heating by wfh)
			Total	29,573	

Period	Source	Annual quantum	Conversion factor	kgCO₂e	Notes
2022	Homeworking Power (kWh)	61,375	0.03168	1,944	Annual FTE hours quantum calculated by: Surveyed % WFH x 1710 work hours x 83 no. staff
	Space Heating (kWh)	32,030	0.30907	9,900	Annual FTE hours quantum calculated by: Surveyed % WFH x 1710 work hours x 83 no. staff
			Total	11,844	

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