



Carbon Footprint Appraisal for Civic Engineers Limited

Assessment Period:
1st March 2022 – 28th February 2023

Executive Summary

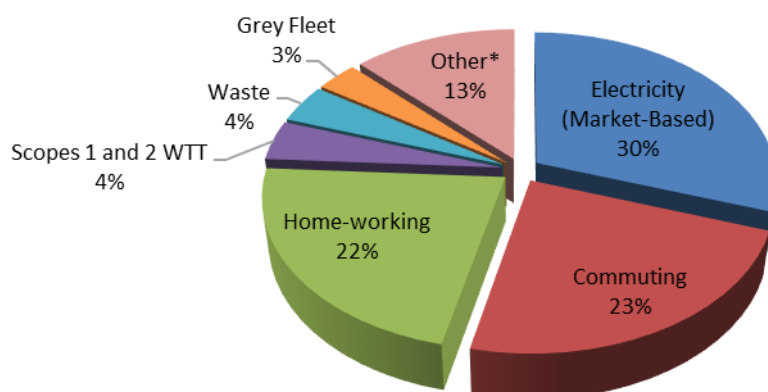
Current Performance

- Civic Engineers's total market-based emissions are 88.92 tCO₂e (with location-based emissions of 77.19 tCO₂e).
- The most significant market-based emission source is Site Electricity (market-based) accounting for 30% of Civic Engineers's carbon footprint.
- The estimated market-based error margin is a significant aspect at 18% (+/- 16.38 tCO₂e) and should be offset and be a key focus in future years.

Recommendations

- Continue switching sites to renewable energy tariffs to reduce your market-based emissions.
- Investigate opportunities to reduce site energy consumption across all sites through implementing regular energy monitoring and conducting an energy audit.
- Implement a salary sacrifice scheme to encourage employees to use more sustainable transport such electric vehicles and/or a cycle-to-work initiative.
- Encourage all homeworkers to transition to 100% renewable tariffs to reduce market-based emissions.
- Offset the GHG emissions created within this data period to maintain your carbon neutrality
- **Carry out a target setting and supply chain screening to facilitate your reduction strategy and increase the scope of your assessment.**

Market-based emissions breakdown (incl. WTT)



*Other= Rail, Taxi, Hotel Stays, Transmission & Distribution, Natural Gas, Flights, Paper, Bus, Wastewater & Water.

Year/Element	2021/22	2022/23	% change on baseline year (2021/22)
Location-based Tonnes of CO ₂ e	104.34	77.19	-26.0% ▼
Market-based Tonnes of CO ₂ e	105.96	88.92	-16.1% ▼
Market-based Tonnes of CO ₂ e per employee	0.68	0.62	-9.7% ▼
Market-based Tonnes of CO ₂ e per £ million turnover	9.63	7.41	-23.1% ▼

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Quality Control

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1. Introduction

1.1. Company Overview

Civic Engineers is an engineering company that provides structural engineering services, civil engineering services, flood risk assessment & mitigation and transport & movement analysis. The company operates from their studios in Glasgow, Leeds, London and Manchester. The company is comprised of:

- 144 employees
- 4 office/studio locations

1.2. Goals & objectives

Civic Engineers conducted a target setting assessment with Carbon Footprint Ltd on 16th March 2022. The recommended targets that arose from this are:

- A 50% reduction in emissions per £ million turnover by 2032
- A 90% reduction in emissions per £ million turnover by 2050

A summary of the data supplied by Civic Engineers for the appraisal can be provided on request.

1.3. Methodology for the Carbon Footprint Appraisal

The methodology document can be downloaded using this link,

https://www.carbonfootprint.com/docs/carbon_footprint_appraisal_-_methodology_document.pdf

1.4. Abbreviations

CO ₂ e	Carbon Dioxide Equivalent
Defra	Department for Environment, Food and Rural Affairs
EV	Electric Vehicle
km	Kilometres
kWh	Kilowatt Hours
T&D	Transmission & Distribution
WTT	Well-To-Tank

2. Calculation Scope and Accuracy

2.1. Scope of this work

Carbon Footprint has assessed the GHG emissions from 1st March 2022 to 28th February 2023 resulting from the energy consumption at Civic Engineers's facilities and its business transport activities.

Civic Engineers's baseline year data and emissions can be found in the 2021/22 report.

2.2. Organisational & reporting boundaries

Figure 1 shows the full boundaries of the *Greenhouse Gas Protocol Corporate and Value Chain Standards*. The organisation has accounted for all quantified GHG emissions and/or removals from facilities over which it has operational control. This assessment covers the reporting boundaries shown in Table 1, in line with the Greenhouse Gas Protocol Corporate Standard.

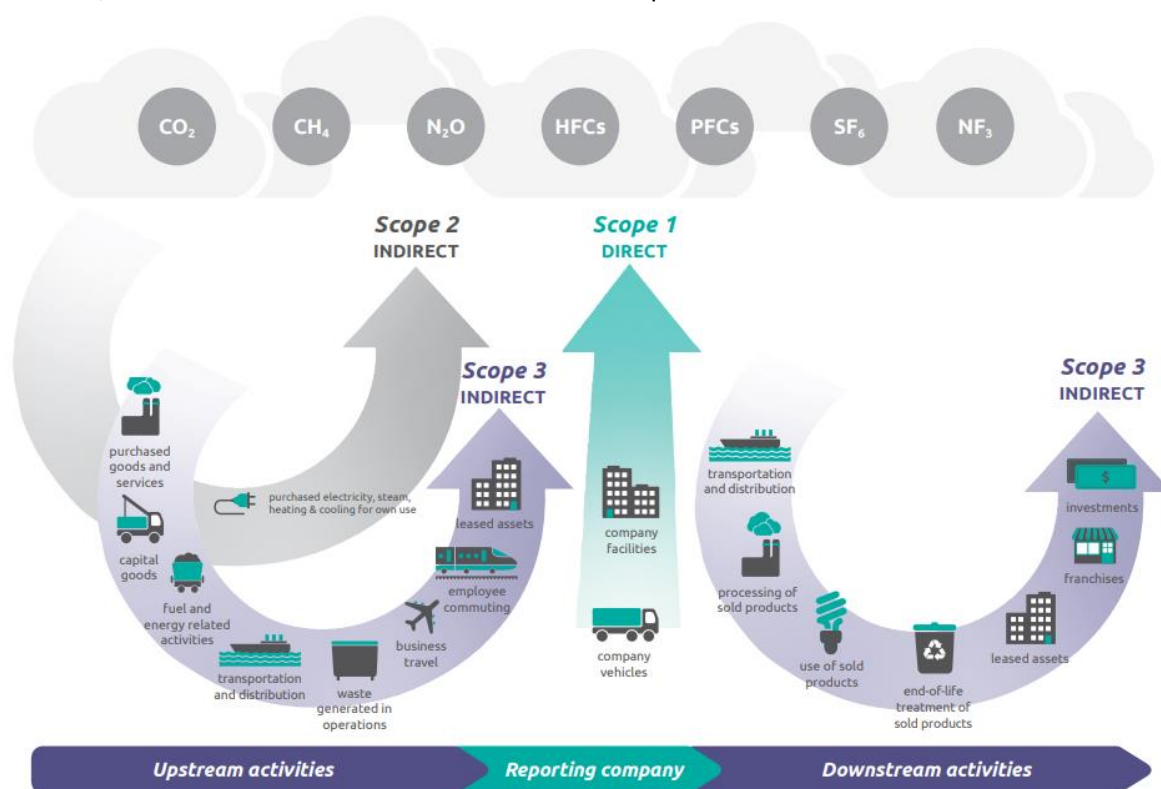


Figure 1: Overview of emissions scopes (GHG Protocol - Scope 3 Calculation Guidance v1.0 - 2013)

Table 1: Civic Engineers's GHG Assessment boundary based on the Greenhouse Gas Protocol Corporate Standard
(All green rows have been included in this assessment; all grey rows are not applicable; orange rows have been excluded)

Scope	Activity	Calculation Type	Completion Status	Justification
1	Electricity, heat or steam generated on-site		Not relevant	
	On-site fuel use	Activity Data	Complete	
	Company owned vehicles		Not relevant	
	Fugitive emissions (incl. Refrigerant gases and AC)		Not relevant	
2	On-site Consumption of purchased electricity, heat steam and cooling	Activity Data	Complete	
3	1. Purchased goods and services	Activity Data	Partial	The minimum boundary has not met under the GHG protocol
	2. Capital goods		Excluded	Relevant and intending to include in future assessments
	3. Fuel- and energy related activities (not included in scope 1 or scope 2)	Activity Data	Complete	
	4. Upstream transportation and distribution		Not relevant	
	5. Waste generated in operation	Activity Data	Complete	
	6. Business travel (not included in scope 1 or scope 2)	Activity Data	Complete	
	7. Employee commuting	Activity Data	Complete	
	8. Upstream leased assets		Not relevant	
	9. Downstream transportation and distribution		Not relevant	
	10. Processing of sold products		Not relevant	
	11. Use of sold products		Not relevant	
	12. End-of-life treatment of sold products		Not relevant	
	13. Downstream leased assets		Not relevant	
	14. Franchises		Not relevant	
	15. Investments		Not relevant	

2.3. Calculation uncertainty assessment & 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. Materiality is determined by the percentage contribution of each element to the overall footprint. Based on the accuracy of the data provided (Table 2), a simple uncertainty analysis has been used to estimate the potential error margin for the appraisal results.

Table 2: Assessment accuracy, materiality and simple error analysis

Emission Source	Data source / comments	Materiality	Uncertainty	Market-based Error Margin (tCO ₂ e)
Home-working	Data from an employee survey. Occupancy type, hours-per-day, days-per-week, weeks-per-year and country were provided for all homeworkers. 96 out of 144 employees answered, so emissions were apportioned up to account for the rest.	High (20-40%)	50%	9.93
Electricity (Market-Based)	London electric was sourced from bills giving meter readings covering two months of the period, which was then apportioned up to cover the whole period. Manchester had total kWh provided by bills, which were then approximated to Civic Engineers based on the square feet of the office it occupies. Leeds electric was provided by the landlord, but no evidence was available. Glasgow electric was calculated by Civic Engineers, but evidence could not be provided due to internal reasons.	High (20-40%)	10%	3.22
Commuting	Data from a company survey. Commute distance, type of transport used, and number of days commuted per week was provided. No specific vehicle details were provided for cars, so an average was used. 84 out of 144 employees answered, so emissions were apportioned up to account for the rest.	High (20-40%)	10%	2.08
Waste	Type of waste, bin size, frequency of collection, and disposal route was provided for all sites.	Low (1-5%)	10%	0.37
Grey Fleet	Vehicle emissions rating and annual mileage was provided for all vehicles, however fuel type was not provided.	Low (1-5%)	10%	0.29
Rail	Type of train, number of trips, and either distance in km or cost was provided for all trips.	Low (1-5%)	10%	0.28
Water (and Wastewater)	Annual consumption for London was provided in m3. All other sites were estimated based on their size comparative to the London site.	Very Low (<1%)	50%	0.11

Emission Source	Data source / comments	Materiality	Uncertainty	Market-based Error Margin (tCO ₂ e)
Natural Gas	For London, meter readings were provided covering 10 months of the year, with this apportioned to cover the remaining time in the data period. No evidence was provided for Leeds, but the total kWh was very low due to moving premises.	Low (1-5%)	5%	0.05
Taxi	Type of taxi, number of trips, and distance in miles was provided for all trips.	Low (1-5%)	1%	0.02
Hotel Stays	Number of guest nights and hotel location was provided for all stays.	Low (1-5%)	1%	0.02
Flights	Number of trips, ticket class, and departure and destination was provided for all trips.	Very Low (<1%)	1%	0.01
Paper	Data from supplier records. Amount of paper, type, size, and gsm was provided for all purchases.	Very Low (<1%)	1%	<0.01
Bus	Type of bus, number of trips, departure and destination, return details, and distance in km was provided for all trips.	Very Low (<1%)	1%	<0.01
Total			18%	16.38



3. Carbon Footprint Results

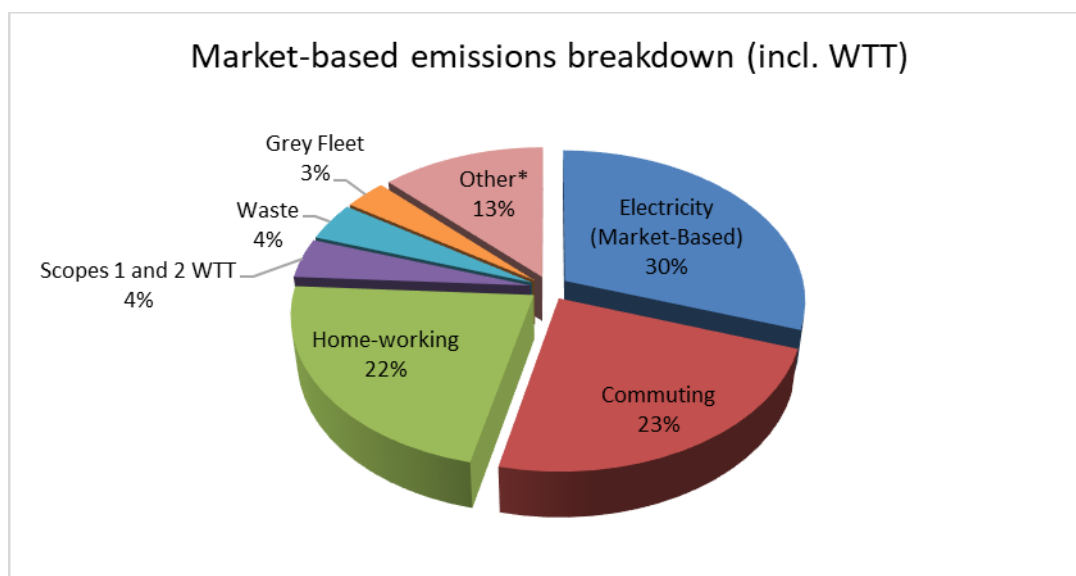
3.1. Summary of results

The total location-based carbon footprint for Civic Engineers for the period ending 28th February 2023 is 77.19 tonnes CO₂e, and the market-based total is 88.92 tonnes CO₂e.

Table 3: Results of Civic Engineers's carbon footprint assessment by scope and GHG Protocol emission categories

Scope	Emission Source	Location-Based (tCO ₂ e)	Market-Based (tCO ₂ e)
1	Natural Gas	0.86	0.86
Scope 1 Total		0.86	0.86
2	Electricity	15.12	26.85
Scope 2 Total		15.12	26.85
3.1	Paper	0.30	0.30
	Water	0.08	0.08
3.3	Scopes 1 and 2 WTT	3.76	3.76
	Transmission & Distribution	1.71	1.71
3.5	Waste	3.66	3.66
	Wastewater	0.14	0.14
3.6	Grey Fleet	2.86	2.86
	Rail	2.83	2.83
	Taxi	2.30	2.30
	Hotel Stays	2.17	2.17
	Flights	0.58	0.58
3.7	Bus	0.15	0.15
	Commuting	20.80	20.80
3.7	Home-working	19.87	19.87
Scope 3 Total		61.21	61.21
All Tonnes of CO₂e		77.19	88.92
All Tonnes of CO₂e per employee		0.54	0.62
All Tonnes of CO₂e per £ million turnover		6.43	7.41

A full breakdown of emissions by source has been provided in Annex A.



*Other= Rail, Taxi, Hotel Stays, Transmission & Distribution, Natural Gas, Flights, Paper, Bus, Wastewater & Water.

Figure 2: Percentage contribution of each element of Civic Engineers's market-based carbon footprint

3.2. Emissions from energy usage at site facilities

Site energy, particularly market-based electricity, is the highest contribution to the footprint for Civic Engineers at 33.09% (30.20% market-based electricity, 1.93% for T&D and 0.97% for natural gas). The most significant studio location is the Manchester site which has a total of 11.19 tCO₂e. Not only did this site have the highest kWh consumption for the year, but also the tariff specific emissions factor from their supplier (Scottish Power) was relatively high as well due to the nature of the fuel mix. This location should be a point of focus for reductions in the future.

Table 4: CO₂e emissions as a result of site energy consumption

Name of Site	Tonnes of CO ₂ e			
	Market-based Electricity ¹	Natural Gas	Total	Per employee
Manchester	11.19	-	11.19	0.19
London	8.22	0.83	9.05	0.16
Glasgow	6.40	-	6.40	0.34
Leeds	2.43	0.03	2.46	0.21
Total	28.24	0.86	29.10	0.90

¹ Totals include emissions from Generation and Transmission & Distribution

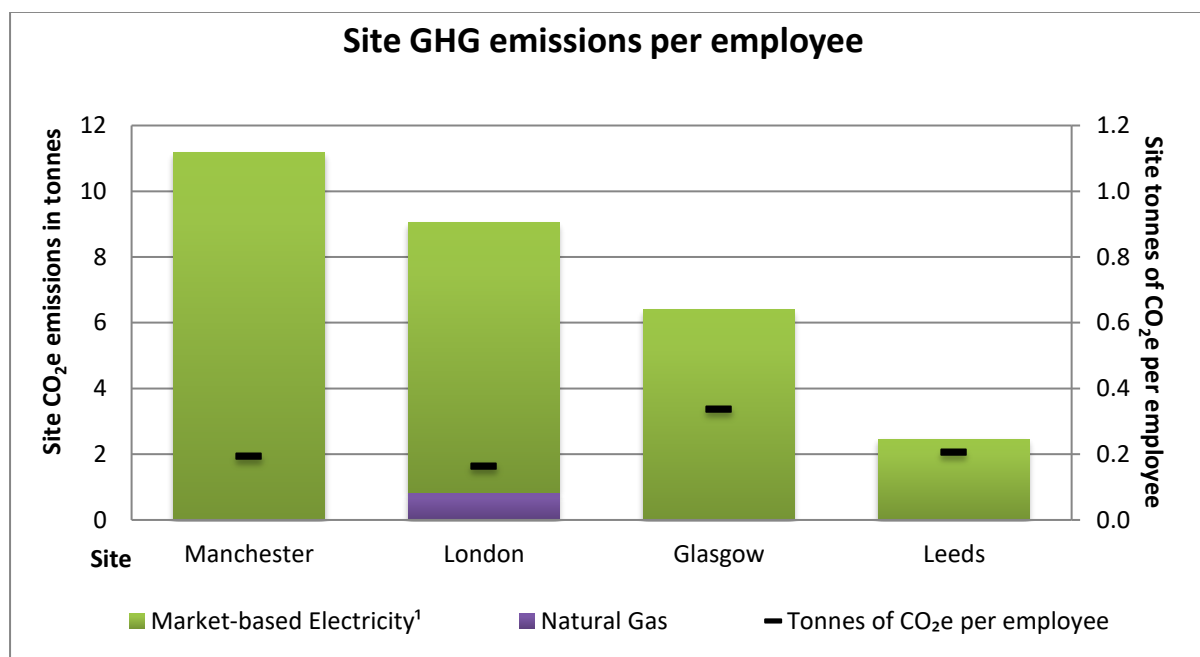


Figure 3: CO₂e emissions on a per site and fuel basis

Figure 3 shows that despite the Manchester site being the highest contribution to site energy emissions, on a per employee basis they are relatively low. The most significant emissions per employee are from the Glasgow office at 0.34 tCO₂e. This is mainly due to the nature of the brown tariff's fuel mix as the tariff specific emissions factor is the highest of all 4 sites. We recommend that for all sites, but for Glasgow and Manchester in particular, 100% renewable tariffs are purchased to ensure market-based electricity emissions are reduced to zero tCO₂e.

3.3. Emissions from commuting

Table 5 shows that the highest contribution to commuting emissions is from the London site at 33.5%. 100%² of their employees travel using the London Underground which is a relatively low transport method with regards to carbon intensity. The main reason is due to the considerable miles travelled using this method. For instance, those from the Manchester site who travelled by car contribute to the second highest commuting emissions at 27.8% whereas the annual miles are only 13.5% compared to the London employees. The tonnes of CO₂e avoided due to those who commuted via rail, across all sites, rather than car (using Defra's average unknown fuel emission factor) is 43.53 tCO₂e. Civic Engineers should strive to have all 100% of the employees using public transport or EVs for commuting where possible.

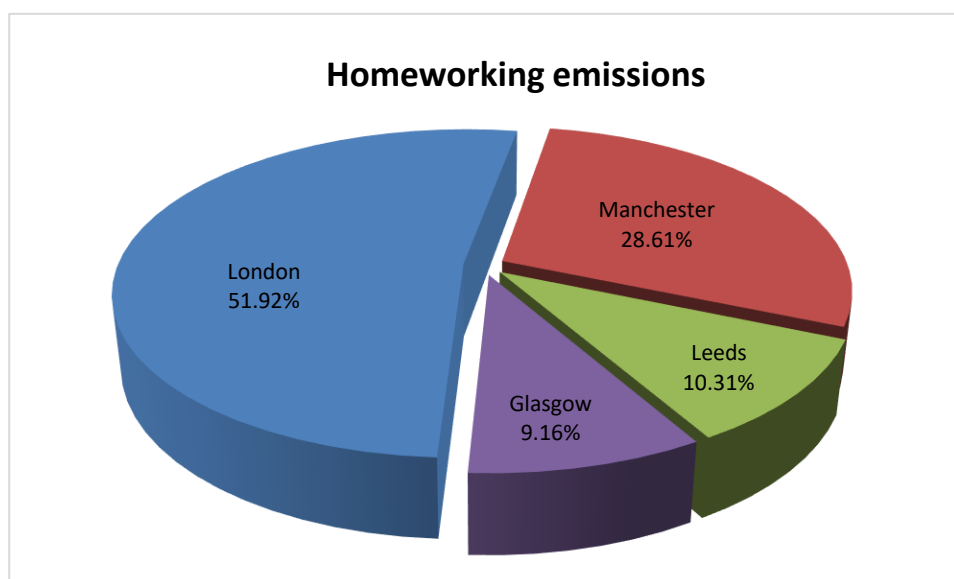
² 100% of survey respondents travelled using the London Underground and this data was extrapolated to account for non-respondents. It's possible that some non-respondents travelled by other means but such data wasn't able to be captured.

Table 5: CO₂e emissions from employee commuting

Name of Site	Transport Type	Annual Distance (miles)	Emissions (tCO ₂ e)
London	Rail	72,129	5.53
London sub-total		72,129	5.53
Manchester	Cars	9,734	4.58
	Rail	14,674	1.44
Manchester sub-total		24,408	6.02
Glasgow	Cars	3,640	1.71
	Rail	16,042	1.57
	Bus	1,591	0.47
Glasgow sub-total		21,273	3.76
Leeds	Rail	9,776	0.96
	Cars	520	0.24
Leeds sub-total		10,296	1.20
Overall Total		128,106	16.51

3.4. Emissions from homeworking

Homeworking emissions contributed to 22.4% of the overall market-based footprint. Of these, the London site has the highest contribution at 51.92%. It's important to note that, similar to commuting, the data from survey respondents was extrapolated to account for homeworkers who didn't respond. Emissions are estimated based on occupancy type and for Civic Engineers's employees there were 49 respondents who worked multi-occupancy and 43 who worked single-occupancy (i.e., in an empty house). It's assumed that natural gas is used for heating and therefore heating emissions are estimated for those who stated single-occupancy due to the assumption that there aren't any other occupants who already influence the decision to heat the dwelling.

**Figure 4: CO₂e homeworking emissions across all sites**

3.5. Emissions from Well to Tank

Well-to-tank emissions relate to the upstream emissions of fuel and energy; accounting for extraction, processing, and transport of fuels/energy. Civic Engineers can reduce these emissions by reducing fuel and energy usage. As Table 6 shows that the highest contributor to WTT emissions is from commuting and therefore this should be a focus for reduction by incentivising public transport or EVs where possible. For instance, installing EV charging points at the sites would make purchasing such vehicles more attractive to those who commute to the office.

Table 6: Well-To-Tank CO₂e Emissions breakdown

Emission Source	Total (tCO ₂ e)
Commuting	4.29
Electricity	3.62
Grey Fleet	0.61
Rail	0.57
Taxi	0.45
Transmission & Distribution	0.33
Natural Gas	0.15
Flights	0.06
Bus	0.03
Total	10.11



4. Comparison and Benchmarking

4.1. Comparison to base year emissions

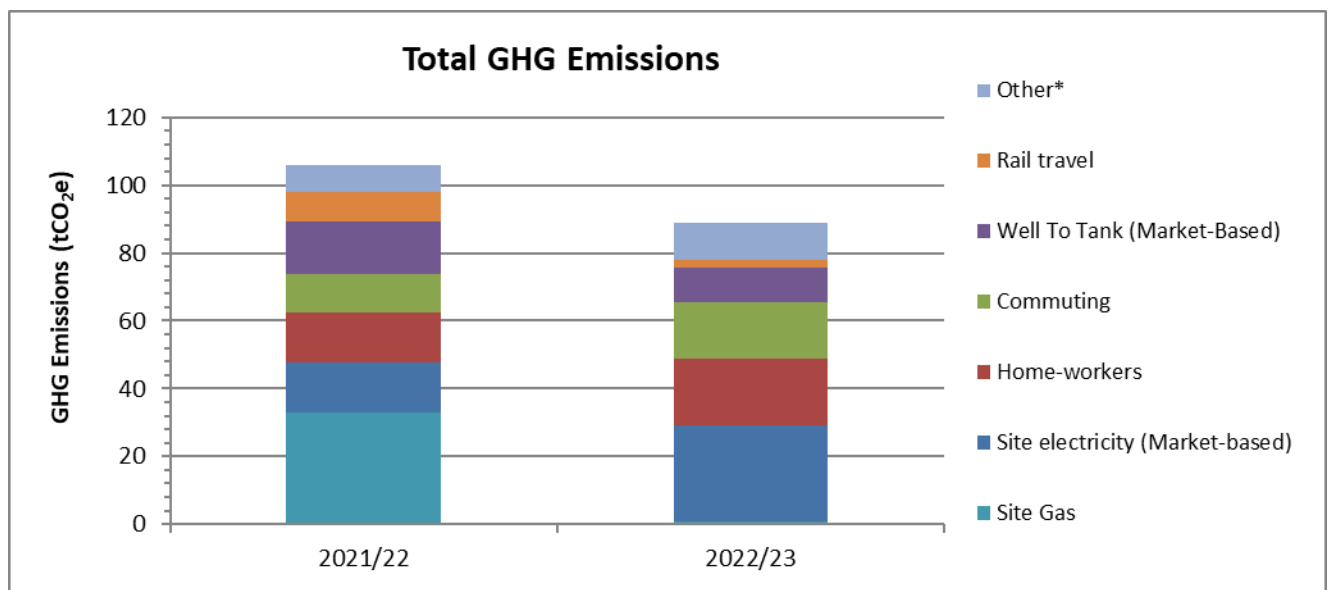
The Table 5, Figure 5 and Figure 6 below shows historical emissions per activity, as well as the total carbon footprint and carbon intensity metrics (tonnes of CO₂e per employee and tonnes of CO₂e per £M turnover).

Table 7: Civic Engineers's carbon footprint comparison and percentage change

Element	2021/22	2022/23	% change on baseline year (2021/22)
Site electricity (Market-based)	14.74	28.23	91.5% ▲
Home-workers	14.69	19.87	35.2% ▲
Site electricity (Location-based)	13.12	16.51	25.8% ▲
Commuting	11.12	16.51	48.5% ▲
Well To Tank (Location-Based)	15.60	10.10	-35.2% ▼
Well To Tank (Market-Based)	15.60	10.10	-35.2% ▼
Waste	*	3.66	n/a
Rail travel	8.57	2.26	-73.7% ▼
Employee-owned car travel (grey fleet)	4.63	2.25	-51.4% ▼
Hotel stays	*	2.17	n/a
Taxi travel	0.65	1.85	183.1% ▲
Site Gas	33.10	0.86	-97.4% ▼
Flights	1.43	0.52	-63.5% ▼
Paper	*	0.30	n/a
Water (and wastewater)	*	0.22	n/a
Bus travel	0.00	0.12	n/a
Ferry travel	0.01	0.00	-100.0% ▼
Hire cars	1.42	0.00	-100.0% ▼
Total Tonnes of CO₂e (Location-based)	104.34	77.19	-26.0% ▼
Total Tonnes of CO₂e (Market-based)	105.96	88.92	-16.1% ▼
Market-based tCO₂e per employee	0.68	0.62	-9.7% ▼
Market-based tCO₂e per £ M turnover	9.63	7.41	-23.1% ▼

* Not previously assessed

Total market-based emissions have decreased since the baseline year by 16.1% and the most significant change in emissions is due to site gas which has decreased by 97.4%. The main reasons for this decrease are the Glasgow site installing an air source heat pump whilst the Manchester site switched from natural gas to electricity for heating. In addition, the Leeds site had very low gas usage due to issues with moving premises in the reporting year. Furthermore, the London and Leeds sites have switched to smart meters for more accurate measurements and greater control on how to limit natural gas usage and thus, reducing associated emissions. It's also important to note that the market-based site electricity has increased by 91.5% mainly due to increased consumption but also as there was no evidence of 100% renewable tariffs. Despite this, when evaluating the location-based total footprints for both years, there has also been a decrease here of 26.0% which further supports the assertion that overall reductions were achieved.



*Other= Waste, Grey Fleet, Taxi, Hotel Stays, Transmission & Distribution (Market-Based), Flights, Paper, Bus, Wastewater, Water, Ferry travel, Hire cars.

Figure 5: Detailed emissions comparison for the various aspects of Civic Engineers's market-based emissions

Benchmarked against employee numbers and company turnover (adjusted for inflation) the carbon emissions statistics show a decrease in both intensity metrics since 2021/22 of 9.7% and 23.1% respectively.

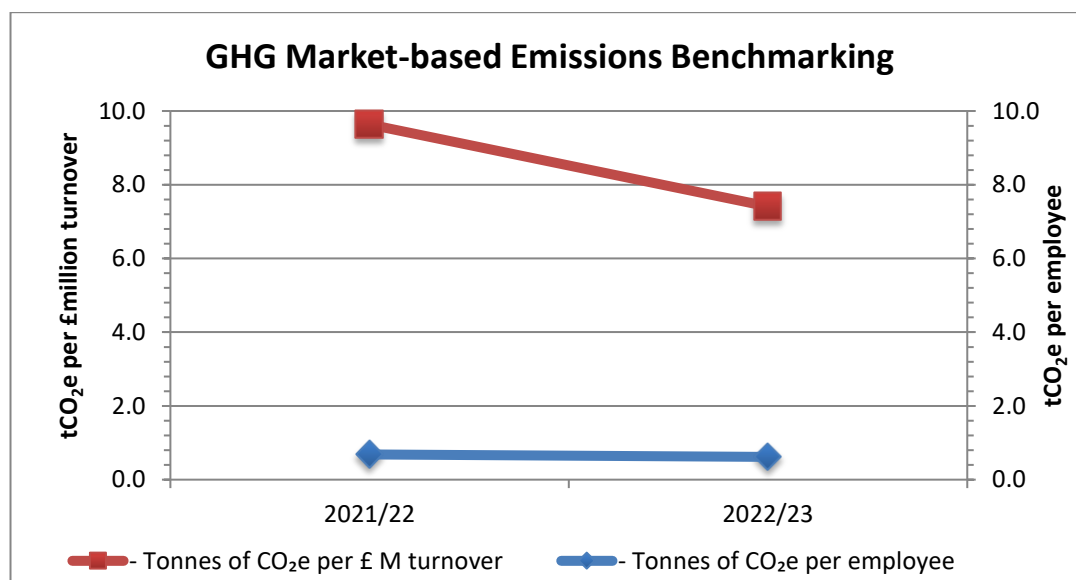


Figure 6: Carbon footprint of Civic Engineers for internal benchmarks

4.2. External benchmarking

Companies often find it useful to benchmark themselves against similar organisation in their sector. Carbon Footprint Ltd has an online tool you can use to find publicly available information on other organisations that have reported their emission.

The emissions of other organisations can be viewed on the Carbon Database Initiative (CaDI), which provides a transparent, freely available source for GHG emissions benchmarking. Civic Engineers should consider publishing its own emissions on the database to improve transparency and the completeness of the database: <https://carbondi.com/>

Many companies report Scope 1 & 2 emissions for comparison against others as elements included in Scope 3 can vary greatly. Table 8 summarises the emissions across these Scopes, along with metrics showing emissions per unit turnover and per employee, to help your benchmarking.

Table 8: Civic Engineers's benchmarked GHG emissions

Year/Element	Location based	Market based
Total number of employees	144	
Turnover in £ million	12	
Tonnes of CO ₂ e	77.19	88.92
Tonnes of CO ₂ e per employee	0.54	0.62
Tonnes of CO ₂ e per £ million turnover	6.43	7.41
Scope 1 & 2 Emissions		
Tonnes of CO₂e	15.98	27.71
Tonnes of CO₂e per employee	0.11	0.19
Tonnes of CO₂e per £ million turnover	1.33	2.31

5. Conclusion

Civic Engineers Limited, in conjunction with Carbon Footprint Ltd, has assessed and reduced its carbon footprint. By achieving this Civic Engineers 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.



6. Recommendations

6.1. Carbon & sustainability targets

6.1.1. Target setting

Civic Engineers has set targets based on per £M turnover, which will account for business growth. Many organisations are now setting targets based on the Science Based Target initiative. Civic Engineers's targets cover mid term and longer terms goals such as:

- A 50% reduction in emissions per £ million turnover by 2032
- A 90% reduction in emissions per £ million turnover by 2050

All targets set should be reviewed regularly and amended accordingly (i.e. target increased if it is met ahead of schedule). A clear roadmap for individual emissions sources should be in place. This will ensure the strategy for reducing CO₂e emissions and tracking toward a net zero target is appropriate for the business.

6.1.2. Expand the Scope of the Assessment

We recommend that the scope of the assessment is expanded in future to include the aspects that are identified as excluded in Table 1.

The most material element would likely be, purchased goods and services and capital goods, due to the nature of your business, so we recommend you focus on capturing data for this ready for next year's appraisal. We recommend completing a top-level Scope 3 supply chain screening assessment in order to do this.

6.1.3. Improving the accuracy of future carbon footprint assessments

The estimated overall error margin is 18% (+/- 16.38 tCO₂e).

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

- Obtain a greater proportion of total employees' survey results for commuting and homeworking. For market-based homeworking, ask if the employee is on a 100% renewable tariff for electricity or not. For commuting, ask for vehicle details such as fuel type, engine size etc.
- Seek to obtain 12 monthly bills for all electricity and gas where possible in order to avoid extrapolating and estimating emissions for these. If there are any sites with 100% renewable tariffs, provide evidence of this.

6.2. Reducing emissions

To reduce GHG emissions, we recommend the following:

- Continue switching sites to renewable energy tariffs to reduce your market-based emissions.
- Investigate opportunities to reduce site energy consumption across your sites. This could be done through conducting an onsite energy audit at your most energy intensive site. Carbon Footprint Ltd can complete site energy audit for you and provide recommendations for saving energy.
- Set up a scheme where employees can purchase electric vehicles, bicycles (e-bikes) and scooters through a salary sacrifice scheme. If possible, install charging points on-site to encourage staff to switch to electric vehicles.
- Encourage all homeworkers to transition to 100% renewable tariffs to reduce market-based emissions and increase the sustainability of their homes.
- Offset the calculated footprint by supporting change solutions around the world to maintain the 'Carbon Neutral Organisation' certification.
- Install EV charging points at work. This will encourage and enable staff to switch to low carbon electric vehicles. Providing electric charging facility shows your staff and stakeholders that your business is serious about reducing emissions, and will support other staff behavioural change initiatives.
- To extend the life of your computing hardware, aim to purchase models with sufficient RAM and modern components (there are available databases such as Eurostar that highlight more efficient models). Consider purchasing refurbished or easily repairable models to avoid purchasing new appliances.

6.3. Carbon offsetting

Carbon offsetting is a pragmatic way to compensate for the emissions that you cannot reduce, by funding an equivalent carbon dioxide saving elsewhere. We note that Science Based Targets supports this as what they call Beyond Value Chain Mitigation (BVCM) and that it provides an urgently needed way for companies to cut emissions outside of their value chains in line with societal net-zero (see link - [Net-Zero: Urgent Beyond Value Chain Mitigation Is Essential - Science Based Targets](#)).

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>.

The cost of offsetting has reduced considerably over recent times. This could be readily funded via the internal carbon pricing system.

Example of Carbon Offsetting Projects:



Tree Planting in UK Schools



*Avoided Deforestation in the
Brazilian Amazon*



Clean Water in Rwanda

Annex A

A full breakdown of Civic Engineers's emission sources is given below. This aligns with the GHG Protocol classification methodology and provides each associated emission source:

Scope	GHG Protocol Emission Category	Emission Source	Location-Based (tCO ₂ e)	Market-Based (tCO ₂ e)
1	On-site fuel use	Natural Gas	0.86	0.86
Scope 1 Total			0.86	0.86
2	On-site Consumption of purchased electricity, heat steam and cooling	Electricity	15.12	26.85
Scope 2 Total			15.12	26.85
3.1	1. Purchased goods and services	Paper	0.30	0.30
		Water	0.08	0.08
3.3	3. Fuel- and energy related activities (not included in scope 1 or scope 2)	Scopes 1 and 2 WTT	3.76	3.76
		Transmission & Distribution	1.71	1.71
3.5	5. Waste generated in operation	Waste	3.66	3.66
		Wastewater	0.14	0.14
3.6	6. Business travel (not included in scope 1 or scope 2)	Grey Fleet	2.86	2.86
		Rail	2.83	2.83
		Taxi	2.30	2.30
		Hotel Stays	2.17	2.17
		Flights	0.58	0.58
		Bus	0.15	0.15
3.7	7. Employee commuting	Commuting	20.80	20.80
		Home-working	19.87	19.87
Scope 3 Total			61.21	61.21
Tonnes of CO ₂ e			77.19	88.92
Tonnes of CO ₂ e per employee			0.54	0.62
Tonnes of CO ₂ e per £ million turnover			6.43	7.41