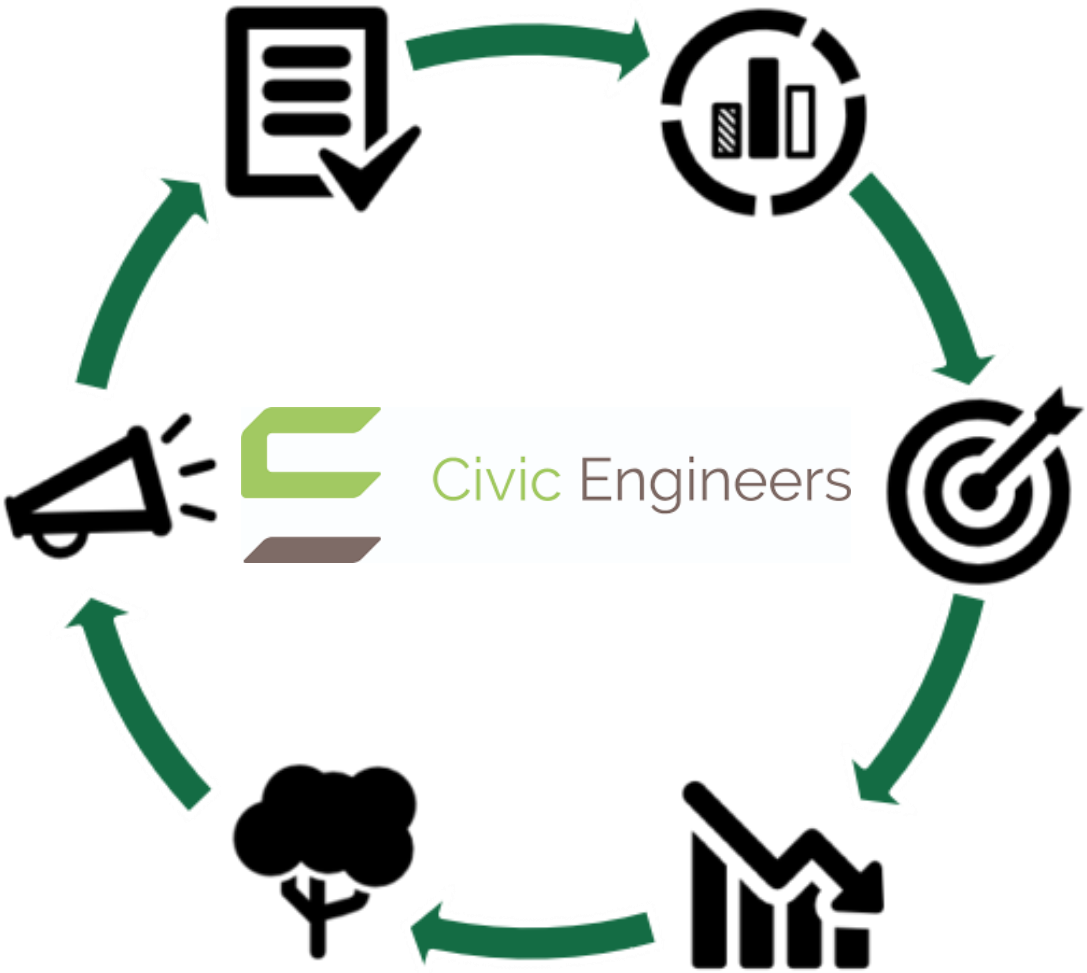
Carbon Footprint Appraisal Report




# Carbon Footprint Appraisal for Civic Engineers Limited

Assessment Period:
1st March 2021 – 28th February 2022

Carbon Footprint Ltd, Belvedere House, Basing View, Basingstoke, RG21 4HG,
UK | +44 (0)1256 592 599 info@carbonfootprint.com | www.carbonfootprint.com

# Executive Summary

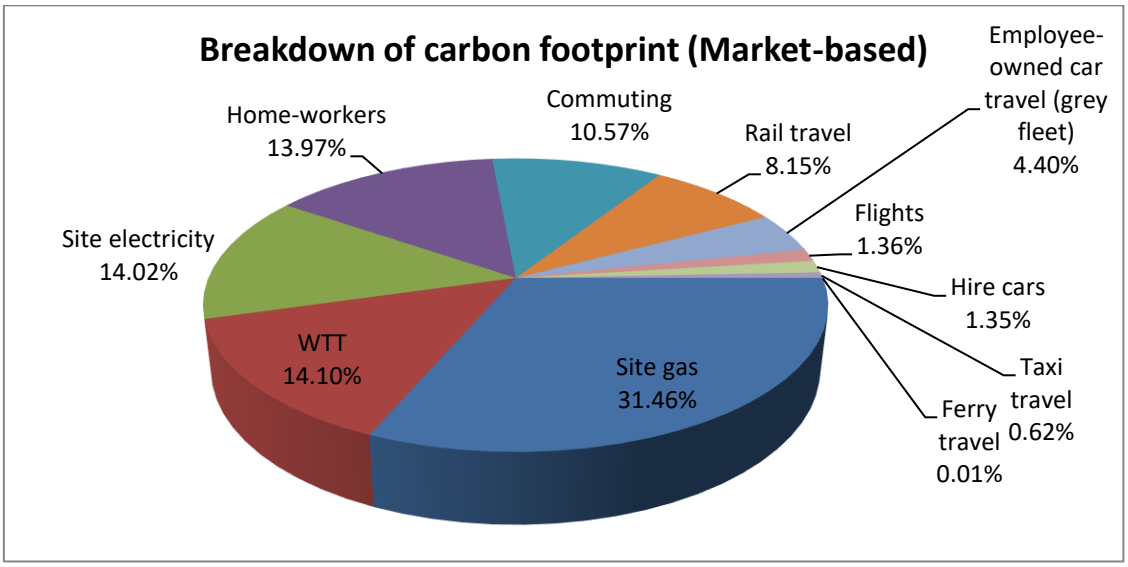
Carbon Footprint Ltd has assessed the greenhouse gas (GHG) emissions of Civic Engineers Limited (Civic Engineers) from 1st March 2021 to 28th February 2022 based on a dataset provided by the company.

**Current Performance**

- Civic Engineers' total market-based emissions are 105.19 $tCO_2e$.
- The most significant emission source is site gas accounting for 31.46% of Civic Engineers' market-based carbon footprint.

**Recommendations**

- Offset the GHG emissions created within this data period to become carbon neutral.
- Liaise with landlord about switching gas heating at your sites to low carbon alternatives such as air-sourced heat pumps.
- Discuss with landlord about switching to renewable electricity tariffs at your Glasgow, Manchester and Leeds sites.
- Evaluate the effectiveness of using remote meetings and limited travel during COVID-19 and re-define what your business classifies as "essential" travel going forwards.
- Install electric vehicles (EV) charging points at work. This will encourage and enable staff to switch to low carbon electric vehicles.




| Metric | Location-Based | Market-Based |
|---|---|---|
| **Total Tonnes $CO_2e$** | 104.34 | 105.19 |
| **Tonnes of $CO_2e$ per employee** | 0.67 | 0.68 |
| **Tonnes of $CO_2e$ per £M turnover** | 9.49 | 9.56 |

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# Quality Control

| | |
|---|---|
| **Report issue number:** | 1.0 |
| **Date:** | 16 March 2022 |
| **Calculations completed by:** | Shnelle Owusu-Mfum |
| **Calculations reviewed by:** | Rebecca Pattison |
| **Report produced by:** | Shnelle Owusu-Mfum |
| **Report reviewed by:** | Rebecca Pattison |
| **Director approval:** | John Buckley |

# 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.

## 1.2. Civic Engineers' 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. Civic Engineers has completed the first step of its annual carbon management journey.


The purpose of this report is to:

- Summarise the results of the carbon footprint assessment.
- Provide practical recommendations to enhance your sustainability programme and reduce your emissions.

## 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 scope 1 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 |

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 scopes 2 and 3 of the World Resources Institute GHG Protocol excluding employee business travel as indicated in Tab le 2.

***Table 2: Indirect emissions sources***

| Footprint | Activity | Scope |
|---|---|---|
| Indirect | Consumption of purchased electricity, heat steam and cooling | 2 |
| | Employee business travel (using transport not owned by the company) | 3 |
| | 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 costs of inaction will be catastrophic. 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, hasten 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 Civic Engineers to begin doing its bit by monitoring, reducing and offsetting its emissions.

## 1.5. ISO 14064: 2018

This GHG report has been prepared in accordance with Part 1 of ISO 14064: 2018. The GHG inventory, report, or statement has not been verified.

This standard requires the estimation of likely error margin based on a simple error analysis, to identify uncertainty in the calculations. Our simple error analysis provides a level of uncertainty based on the accuracy of the data provided. This shows the error for each emissions source, as well as the sum of these divided by the total emissions, to produce a total percentage error.

The GHG calculation and report has also been prepared in accordance with The Greenhouse Gas Protocol Corporate Standard. The GHG inventory, report, or assertion has not been separately verified.

**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.**

## 1.6. Calculation methodology

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 Civic Engineers' footprint using the 2021 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.

**Well-to-Tank (WTT) emissions factors (DEFRA 2021), have also been used to calculate the upstream emissions for fuels and energy. The emissions factors include an average of all GHG emissions released in the production, processing and delivery of fuels or energy.**

Additional methodology information is presented in Annex A.

## 1.7. Data supplied for the carbon footprint appraisal

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

## 1.8. 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 |
| EV | Electric Vehicle |
| GHG | Greenhouse Gas |
| HGV | Heavy Goods Vehicle |
| IPCC | Intergovernmental Panel on Climate Change |
| ISO | International Standards Organisation |
| km | Kilometres |
| kWh | Kilowatt Hours |
| ONS | Office for National Statistics |
| PHEV | Plug-in Hybrid Electric Vehicle |
| PR | Public Relations |
| UN | United Nations |
| WTT | Well-To-Tank |

# 2. Calculation Scope and Accuracy

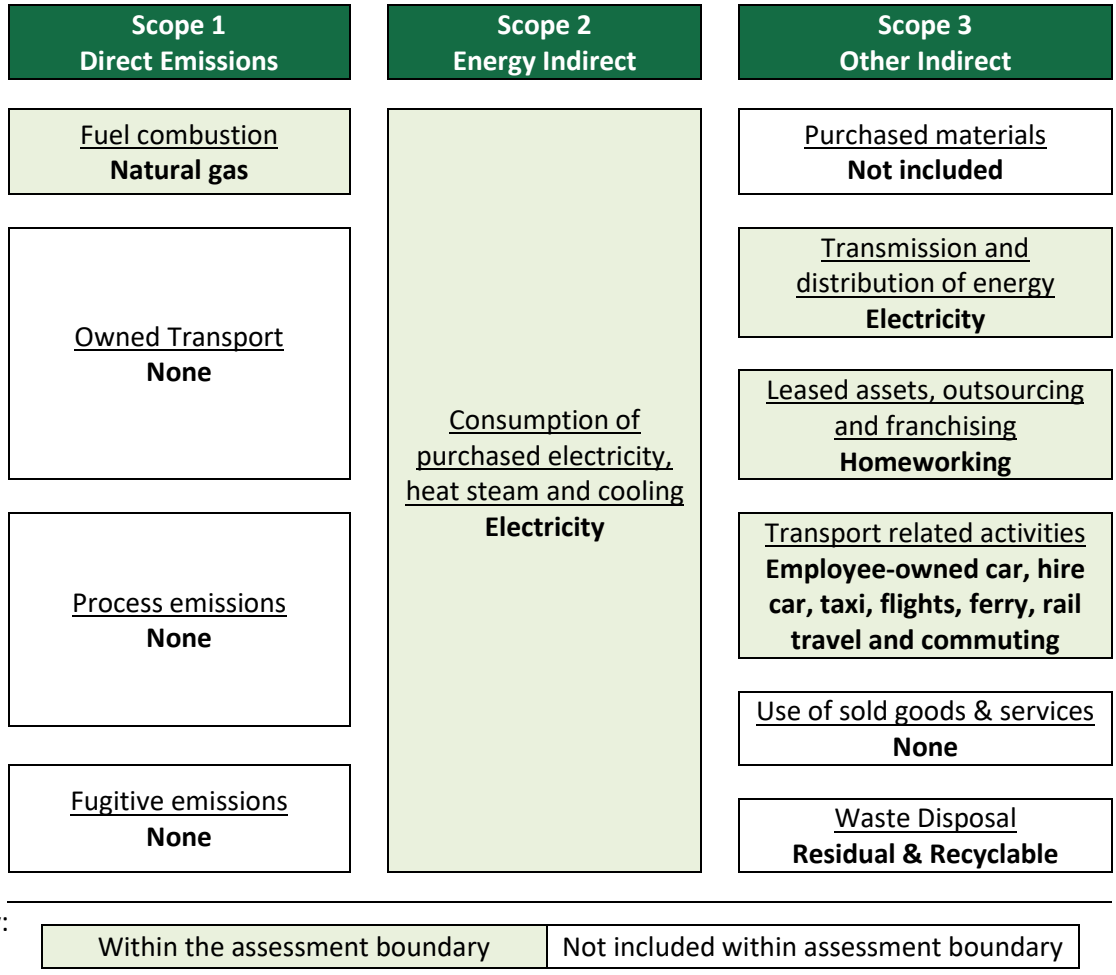
## 2.1. Scope of this work

Carbon Footprint has assessed the GHG emissions from 1st March 2021 to 28th February 2022 resulting from the energy consumption at Civic Engineers' facilities and its business transport activities.

## 2.2. Organisational & reporting 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 reporting boundaries:

***Figure 1: 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 Civic Engineers (Table 3). Based on the accuracy of the data provided, a simple error analysis has been used to estimate the error margin for the appraisal results.

***Table 3: Assessment accuracy, materiality and simple error analysis***

| Dataset | Data source / comments | Accuracy | Materiality | Uncertainty | Error Margin ($tCO_2e$) |
|---|---|---|---|---|---|
| Commuting | The annual distance travelled and type of vehicle used was supplied from company internal records. | Good | Medium (5-20%) | 10% | 1.4 |
| Home-workers | The occupancy type, number of hours, days and weeks that staff worked from home was supplied from company internal records. | Average | Medium (5-20%) | 50% | 7.3 |
| Site gas (Glasgow) | Gas consumption was based on the 2-month consumption for the building that the studio resides in. This was apportioned based on the cost billed to Civic Engineers and prorated for the rest of year. | Poor | Medium (5-20%) | 90% | 13.8 |
| Site gas (Leeds) | Gas consumption was based on the 2-month consumption for the building that the studio resides in. This was apportioned based on the cost billed to Civic Engineers and prorated for the rest of year. | Poor | Medium (5-20%) | 90% | 11.1 |
| Rail travel | The total of each journey taken in the assessment period was supplied from company expense claims. | Good | Medium (5-20%) | 10% | 1.1 |
| Site electricity (Manchester) | Electricity consumption was based on the 6-month consumption for the building that studio resides in. This was apportioned based on the cost billed to Civic Engineers and prorated for the rest of the year. | Average | Medium (5-20%) | 50% | 4.5 |
| Site gas (Manchester) | Gas consumption was estimated using the studio floor and gas consumption benchmarks | Average | Medium (5-20%) | 50% | 3.7 |

| Dataset | Data source / comments | Accuracy | Materiality | Uncertainty | Error Margin ($tCO_2e$) |
|---|---|---|---|---|---|
| | provided by CIBSE's benchmarking floor area tool. | | | | |
| Site electricity (Leeds) | Electricity consumption was based on the 3-month consumption for the building that the studio resides in. This was apportioned based on the cost billed to Civic Engineers and prorated for the rest of year. | Poor | Medium (5-20%) | 90% | 6.1 |
| Employee-owned car travel (grey fleet) | Total mileage was supplied from company expense claims. | Average | Medium (5-20%) | 50% | 2.9 |
| Site gas (London) | Gas consumption was based on estimated readings from Feb to March 2021, and was prorated for 12 months. | Good | Low (1-5%) | 10% | 0.2 |
| Flights | Cabin class, departure and destination airports was supplied from company expense claims. | Very Good | Low (1-5%) | 5% | 0.1 |
| Site electricity (Glasgow) | Electricity consumption was based on mixture of estimated and actual readings from Jan to March 2021, and was prorated for 12 months. | Good | Low (1-5%) | 10% | 0.2 |
| Hire cars | Annual mileage for each trip and vehicle specifications such as engine size was supplied from company expense claims. | Very Good | Low (1-5%) | 5% | 0.1 |
| Taxi travel | Total cost was supplied from company expense claims. | Average | Very Low (<1%) | 50% | 0.4 |
| Site electricity (London) | Electricity consumption was based on estimated readings from Feb to March 2021, and was prorated for 12 months. | Good | Very Low (<1%) | 10% | <0.1 |
| Ferry travel | Departure and destination ports were supplied from company expense claims. | Very Good | Very Low (<1%) | 5% | <0.1 |
| Total for Market-based ($tCO_2e$) | | | | +/- 50% | +/- 53 |

**To improve accuracy for future assessments, please see recommendations provided in Section 5.**

# 3. Carbon Footprint Results

## 3.1. Summary of results

The following Table 4 and Figure 2 provides a summary of results for Civic Engineers' carbon footprint calculation by scope and source activity. Both the location-based and market-based emissions have been calculated and reported for the current reporting period.

**The location-based emissions for Civic Engineers for the period ending 28th February 2022 was 104.34 tonnes $CO_2e$. The market-based emissions for Civic Engineers for the period ending 28th February 2022 was 105.19 tonnes $CO_2e$.** The market-based emission factors were derived from contractual instruments.

***Table 4: Results of Civic Engineers' carbon footprint assessment by scope and source activity***

| Scope | Activity | Location-Based | Market-Based |
|---|---|---|---|
| **Scope 1** | Site gas | 33.10 | 33.10 |
| **Scope 1 Sub Total** | | **33.10** | **33.10** |
| **Scope 2** | Electricity generation | 12.06 | 13.92 |
| **Scope 2 Sub Total** | | **12.06** | **13.92** |
| **Scope 3** | Well To Tank | 15.60 | 14.83 |
| | Home-workers | 14.69 | 14.69 |
| | Commuting | 11.12 | 11.12 |
| | Rail travel | 8.57 | 8.57 |
| | Employee-owned car travel (grey fleet) | 4.63 | 4.63 |
| | Flights | 1.43 | 1.43 |
| | Hire cars | 1.42 | 1.42 |
| | Electricity transmission & distribution | 1.07 | 0.83 |
| | Taxi travel | 0.65 | 0.65 |
| | Ferry travel | 0.01 | 0.01 |
| **Scope 3 Sub Total** | | **59.19** | **58.18** |
| **Total tonnes of $CO_2e$** | | **104.34** | **105.19** |
| **Tonnes of $CO_2e$ per employee** | | **0.67** | **0.68** |
| **Tonnes of $CO_2e$ per £M turnover** | | **9.49** | **9.56** |

Figure 2 shows the breakdown of the market-based GHG emissions produced by Civic Engineers. The most significant emission source is site gas, accounting for 31.46% of the total market-based emissions. Other significant sources are site electricity and homeworkers, contributing to 14.05% and 14.02% of the total market-based footprint respectively (Figure 2).

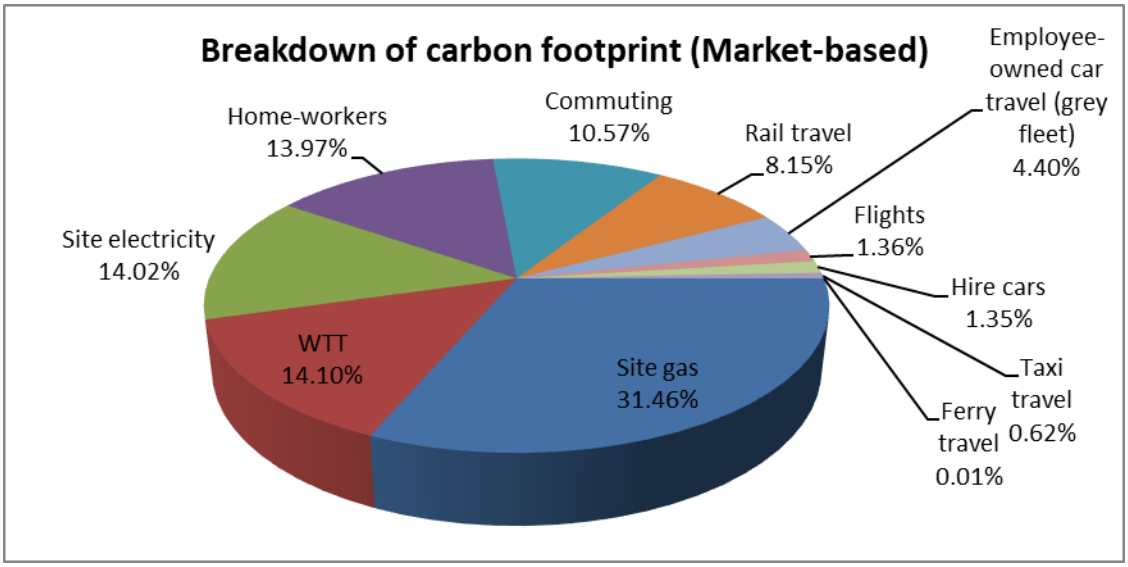



***Figure 2: Percentage contribution of each element of Civic Engineers' market-based carbon footprint***

## 3.2. Emissions from energy usage at site facilities

Civic Engineers operates studios in Glasgow, Leeds, London and Manchester. These studios consume both electricity and natural gas, which is used for office equipment and heating respectively.

The London studio has the lowest total market-based emissions compared with the other sites, as the site was on a 100% renewable electricity tariff during the assessment period (Table 5 and Figure 3).

***Table 5: $CO_2e$ emissions as a result of site energy consumption and per employee***

| Site | Location-based Electricity ($tCO_2e$) | Market-based Electricity ($tCO_2e$) | Gas ($tCO_2e$) | Location-based total $tCO_2e$ | Market-based total $tCO_2e$ | Location-based emissions per employee ($tCO_2e$) | Market-based emission per employee ($tCO_2e$) |
|---|---|---|---|---|---|---|---|
| Leeds | 4.12 | 5.68 | 10.69 | 14.86 | 16.37 | 1.17 | 1.10 |
| Glasgow | 1.42 | 1.30 | 13.25 | 14.68 | 14.56 | 0.73 | 0.67 |
| Manchester | 4.58 | 7.76 | 6.41 | 10.99 | 14.17 | 0.24 | 0.23 |
| London | 2.95 | 0.00 | 2.74 | 5.69 | 2.74 | 0.04 | 0.04 |
| **Total** | **13.12** | **14.74** | **33.10** | **46.22** | **47.84** | **0.54** | **0.52** |

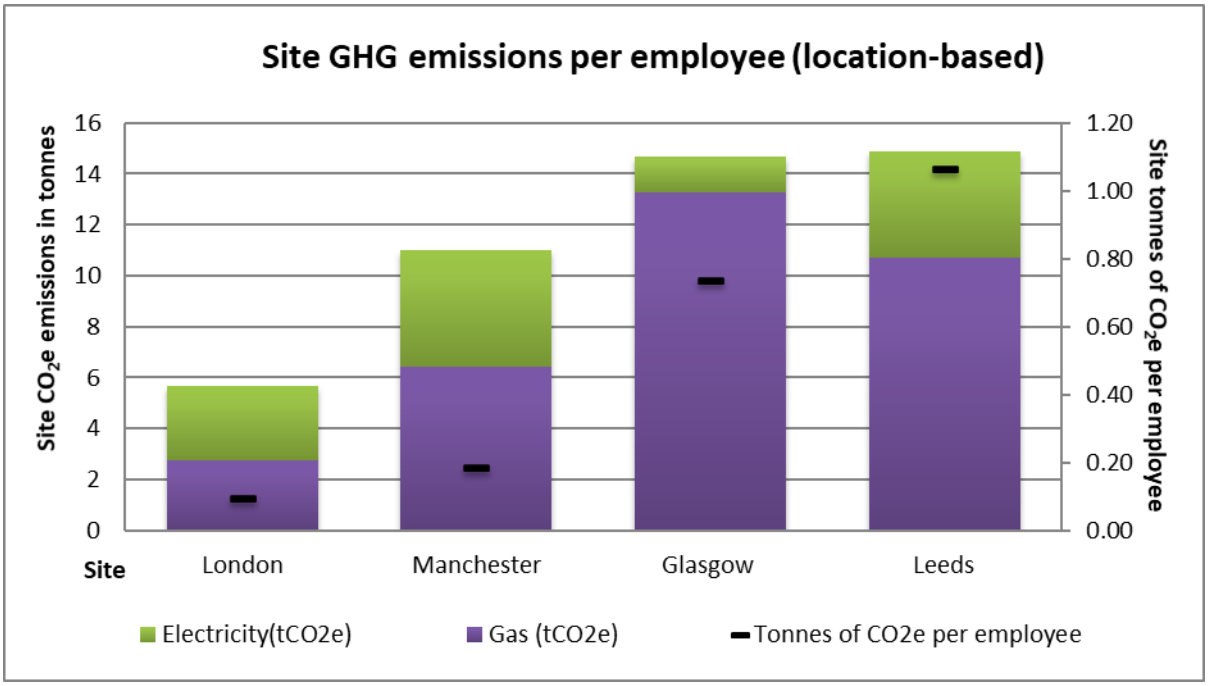



***Figure 3: Location-based $CO_2e$ emissions on a per site, employee and fuel type basis***

## 3.3. Home Worker

Table 6 shows the GHG emissions arising from homeworking. The COVID-19 pandemic led to strict social distancing regulations, this impacted several months of the appraisal period and 57% of staff were forced to work from home.

For homeworkers under single-occupancy gas emissions for heating are included whereas for homeworkers under multi-occupancy gas emissions are excluded as it is assumed gas usage would have occurred regardless.

***Table 6: $CO_2e$ emissions as a result of site homeworking emissions***

| Home-worker type (occupancy during working hours) | No. of home-workers | Home-Work Hours in per 2020/2021 | Electricity Generation ($tCO_2e$) | Natural Gas ($tCO_2e$) | Total Emissions ($tCO_2e$) |
|---|---|---|---|---|---|
| Single-occupancy London | 20 | 21,420 | 0.56 | 6.60 | 7.16 |
| Single-occupancy Manchester | 14 | 11,092.5 | 0.29 | 3.42 | 3.71 |
| Single-occupancy Leeds | 3 | 4,207.5 | 0.11 | 1.30 | 1.41 |
| Single-occupancy Glasgow | 4 | 3,825 | 0.10 | 1.18 | 1.28 |
| Multi-occupancy Manchester | 18 | 19,125 | 0.50 | 0.00 | 0.50 |

| Home-worker type (occupancy during working hours) | No. of home-workers | Home-Work Hours in per 2020/2021 | Electricity Generation ($tCO_2e$) | Natural Gas ($tCO_2e$) | Total Emissions ($tCO_2e$) |
|---|---|---|---|---|---|
| Multi-occupancy London | 22 | 18,360 | 0.48 | 0.00 | 0.48 |
| Multi-occupancy Leeds | 5 | 4,207.5 | 0.11 | 0.00 | 0.11 |
| Multi-occupancy Glasgow | 2 | 2,677.5 | 0.07 | 0.00 | 0.08 |
| **Total** | **88** | **84,915.00** | **2.20** | **12.49** | **14.69** |

## 3.4. Emissions from business travel and commuting

Figure 4 and Table 7 below represent the GHG emissions resulting business travel and commuting. Rail travel and commuting represents the majority of the travel emissions, contributing to 73.56% of the total travel emissions (Figure 4).

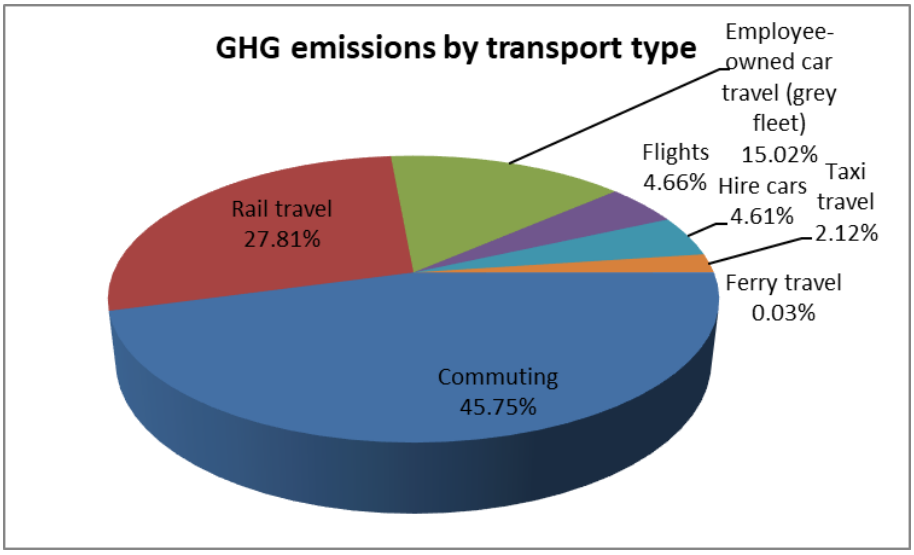



***Figure 4: Percentage contribution of each element to transportation emissions***

***Table 7: $CO_2e$ emissions due to transportation***

| Type of Travel / Transport | Tonnes of $CO_2e$ |
|---|---|
| Commuting | 11.12 |
| Rail travel | 8.57 |
| Employee-owned car travel (grey fleet) | 4.63 |
| Flights | 1.43 |
| Hire cars | 1.42 |
| Taxi travel | 0.65 |
| Ferry travel | 0.01 |
| **Total** | **27.83** |

The detailed results are given in Annex B.

## 3.5. Emissions from Well to Tank

Table 8 shows the GHG emissions arising from the market-based well-to-tank (WTT). Natural gas used at Civic Engineers' sites contributes for the largest proportion of the market-based WTT emissions, at 33%

***Table 8: Well To Tank $CO_2e$ Emissions market-based breakdown***

| Element of Footprint (Well-To-Tank) | Tonnes of $CO_2e$ | % of total $tCO_2e$ |
|---|---|---|
| Site gas | 5.11 | 34.5% |
| Commuting | 2.98 | 20.1% |
| Rail travel | 2.65 | 17.9% |
| Site electricity | 1.98 | 14.4% |
| Employee-owned car travel (grey fleet) | 1.22 | 8.2% |
| Hire cars | 0.42 | 2.8% |
| Flights | 0.16 | 1.1% |
| Taxi travel | 0.16 | 1.1% |
| Ferry travel | <0.01 | 0% |
| **Total** | **14.83** | **100%** |

# 4. Benchmarking

## 4.1. Base year emissions

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

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

Companies often like to bench mark 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 Carbon Benchmarking Tool is free to use and can be found online at:
https://www.carbonfootprint.com/carbon_benchmark.html

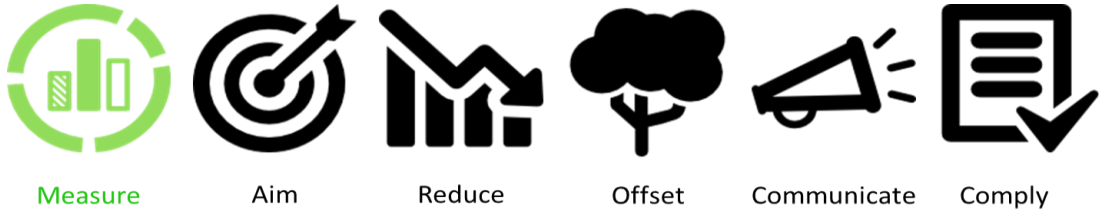
Many companies report Scope 1 & 2 emissions for comparison against others as elements included in Scope 3 can vary greatly. Table 9 Summaries the emissions across these Scopes, along with metrics showing emissions per unit turnover and per employee, to help your benchmarking.

***Table 9: Civic Engineers' benchmarked GHG emissions***

| Year/Element | Location based | Market based |
|---|---|---|
| Turnover in £million | 11.00 | 11.00 |
| Total number of employees | 155 | 155.0 |
| Tonnes of $CO_2e$ | 104.34 | 105.19 |
| Tonnes of $CO_2e$ per £ million | 9.49 | 9.56 |
| Tonnes of $CO_2e$ per employee | 0.67 | 0.68 |
| **Scope 1 & 2 Emissions** | | |
| Scope 1 & 2 tonnes $CO_2e$ | 45.15 | 47.01 |
| Scope 1 & 2 tonnes $CO_2e$ per £ million | 4.10 | 4.27 |
| Scope 1 & 2 tonnes $CO_2e$ per employee | 0.29 | 0.30 |

# 5. Key Recommendations

The following recommendations are designed to help you build upon the results of the appraisal and your carbon management over the coming year.




## 5.1. Carbon & sustainability targets

### 5.1.1. Target setting

We recommend setting reduction targets based on intensity metrics such as emissions per employee or per £M turnover, to account for changes in the size of the business. For Civic Engineers we recommend setting the reduction target on a $tCO_2e$ per £million turnover basis, to allow comparison with future emissions, when the company may have grown.

There are four categories of carbon dioxide[1] reductions to consider whilst setting targets:

1. **Passive Reductions** – these are carbon reductions that would happen without any action needed by the company e.g., the decarbonisation of the electricity grid will gradually reduce the carbon emissions associated with the electricity you use and purchase.
2. **Market-Based Reductions** – these are achieved by selecting and paying for energy tariffs that have lower emissions e.g., buying a green electricity tariff.
3. **Active Reductions** – these are achieved by making technological, behavioural and operational changes within the business. E.g., choosing to reduce the number of miles driven in cars; choosing to put a limit on the number of flights people make; investing in new technology to reduce energy consumption etc.
4. **External Reductions** – carbon **compensation / offsetting** to reduce emissions external to your own footprint to reduce your Net emissions.

**Error! Reference source not found.Error! Reference source not found.** shows this recommended approach applied to Civic Engineers' emissions to 2050.

The **Passive Reductions** assume:

- Electricity Grid emissions will reduce linearly to zero by 2035 (which is the UK's target to achieve Net Zero emissions). Note: the grid emissions have reduced by approximately 50% over the last 5-6 years on a $tCO_2e$ per kWh basis.
- Car will transition to be 100% electric (or hydrogen fuelled) by 2040. Note: the UK government has moved to end the sale of fossil fuel cars by 2030. In the assessment we assume electric

[1] Referred to as "carbon" or "$CO_2$"

cars will require the same amount of energy as those powered by internal combustion engines based on the litres of fuel burned by Civic Engineers in the 2020/21 data period.

- Natural gas used homes for heating will transition to low carbon fuel sources by 2050, assuming low carbon alternatives will be readily available or enforced by relevant legislation.

The **Active Reductions** assume an additional 5% and 10% year on year improvements in efficiency electricity usage and business travel (especially from cars and flights) respectively. Additionally, the following is assumed:

- Natural gas used for heating will be phased out by 2030 after existing tenancies expire, alternative low-carbon fuel sources will be utilised. It is recommended that Civic Engineers explores the options for alternatives such as air-sourced or ground-source heat pumps.
- A policy encouraging more remote meetings and minimal business travel especially via cars will be introduced.
- All cars will transition to be 100% electric by 2030.

We have assumed no changes in other transport, as these are effectively minor parts of Civic Engineers' overall footprint. Though, Civic Engineers should encourage rail travel as an alternative to car travel, where possible.

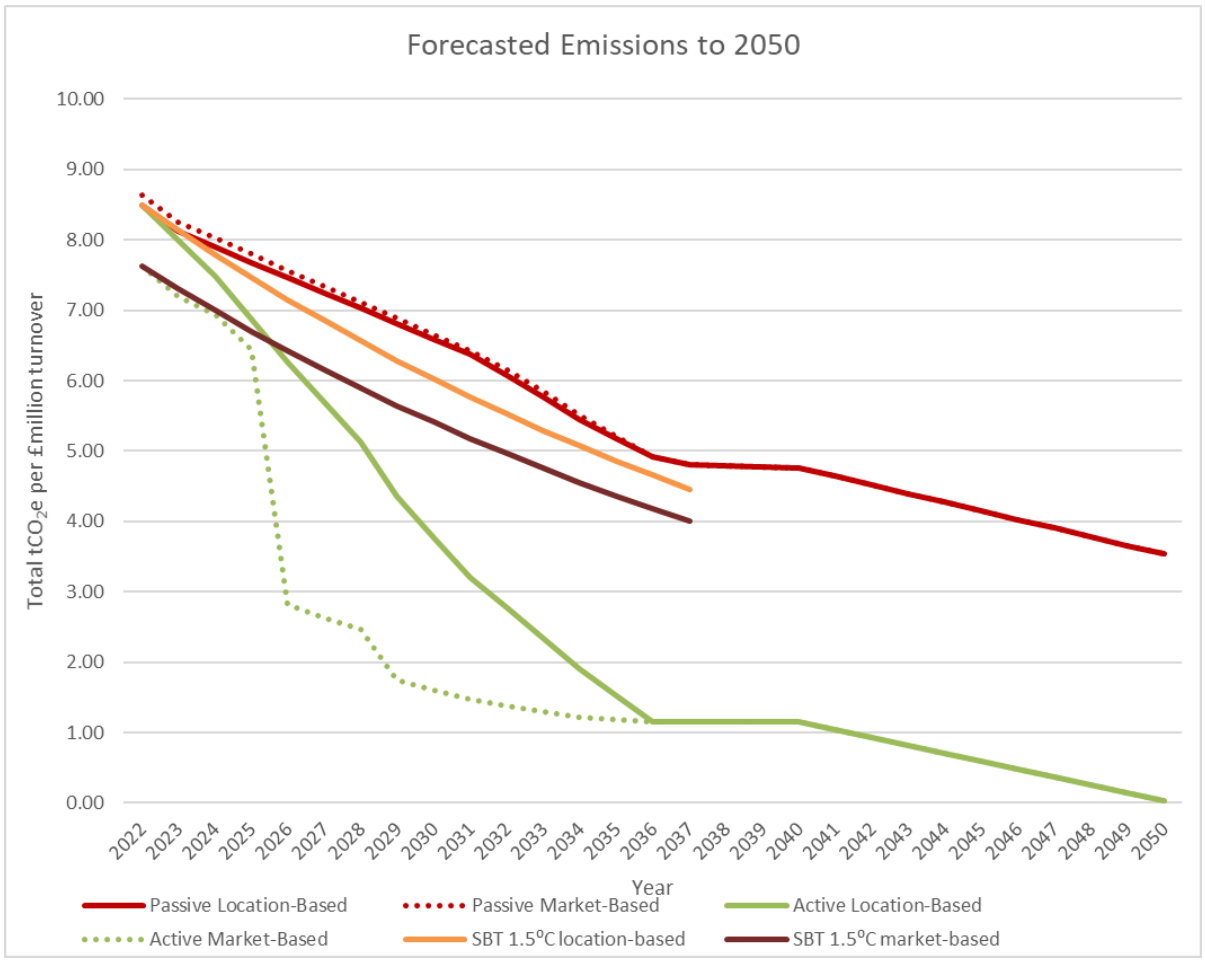



**Figure 5: Emissions forecast for Civic Engineers until 2050**

Market-based emissions forecasts remove emissions from electricity usage, assuming that Civic Engineers will decide to transfer all sites onto a renewable electricity tariff by 2025.

The above graph (Figure 5) gives simulations that are designed to be best and worst-case scenarios. However, it is impossible to predict the future with 100% accuracy. The area between the passive and active lines represents emissions that could be saved. The science-based targets lines have been included, it should be noted that these reductions would be required on an absolute basis, should Civic Engineers' wish to apply for this initiative.

Figure 6 forecasts the estimated breakdown of Civic Engineers' future emissions per £million turnover. This graph shows that as well as reductions in emissions, some of the vehicle fuel is transferred to vehicles, which reduces with the decarbonisation of the electricity grid.

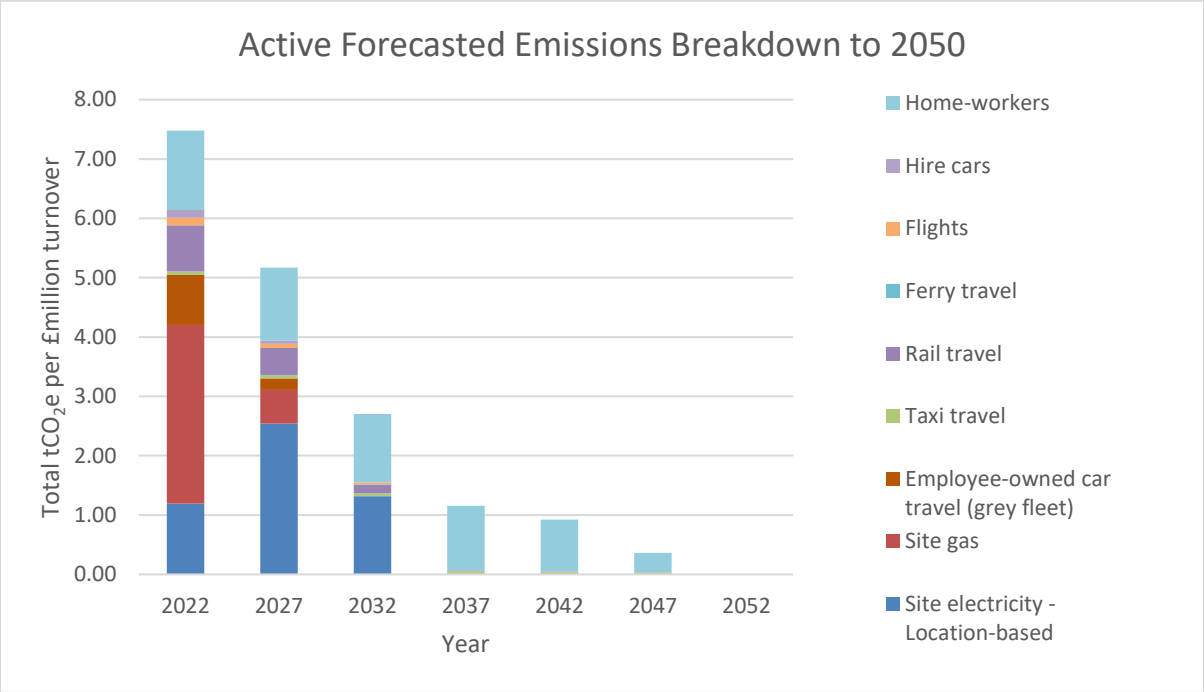



***Figure 6: Breakdown of Civic Engineers' future emissions sources, based on an active approach.***

All targets set should be reviewed regularly (e.g., on an annual basis) and amended accordingly (i.e., target increased if it is met ahead of schedule). This will prevent complacency if the target set was too conservative to start with. An action plan should be developed to set out how the targets will be met, and an employee should be allocated the responsibility of carrying out the plan.

### 5.1.2. Summary of Target Setting Recommendations

In summary we recommend Civic Engineer set the following targets:

- **Become a Carbon Neutral Organisation this year by offsetting this year's footprint**. This is a last resort, for emissions that have been already been produced and therefore Civic Engineers should account for.
- **Swap all electricity utilities to 100% renewable tariffs to reduce market-based emissions.**
- **Set a target to reduce emissions on a per £M turnover basis by 50% by 2032**
- **Set a target to reduce emissions by 90% on a per £M turnover by 2050.** The results of the target setting show it should be possible for Civic Engineers' business to cause 90% less emissions by 2050.
- **Encourage staff switch to a renewable tariff and implement energy efficient behaviours when working from home.**

### 5.1.3. Improving the accuracy of future carbon footprint assessments

The estimated overall error margin is +/- 50%. To improve the accuracy of future assessments, we recommend the following:

- Review to see if utility bills records can improved to ensure the capture of electricity and gas consumption for the entire assessment period.
- Aim to provide fuel type for employee-owned cars.
- Aim to provide journeys details and distance of each journey for taxi travel.

## 5.2. Reducing emissions

To reduce GHG emissions, we recommend the following:

- Offset the calculated footprint by supporting climate change solutions around the world to become a 'Carbon Neutral Organisation'.
- Liaise with landlord about switching gas heating at your sites to low carbon alternatives such as air-sourced heat pumps.
- Discuss with landlord about switching to a renewable electricity tariff at your Glasgow, Manchester, Leeds and Manchester sites.
- Evaluate the effectiveness of using remote meetings and limited travel during COVID-19 and re-define what your business classifies as "essential" travel going forwards.
- 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.

### 5.2.1. Setting carbon reduction budgets based on emissions

Having an agreed and defined system for investing in future carbon reduction activities helps drive carbon reduction and cost savings in a business. Many leading organisations are doing this through setting an "Internal Carbon Tax" or an "Internal Carbon Price" within their organisation (see http://www.carbonfootprint.com/internal_carbon_pricing.html for more information).

We suggest starting by setting a price of £20-25 per tonne of $CO_2e$, as this typically relates to 1-6% of the cost of causing emissions (as shown in the table below). You may wish to collect the "taxation" by each functional group (depending on their emissions), or simply account for this at the top-level company budgeting.

***Table 10: Carbon price compared to energy and travel costs***

| Emissions Source | Electricity | Natural Gas | Car Miles | Flights |
|---|---|---|---|---|
| **1 tonne $CO_2e$ is equivalent to** | 2400 kWh | 5500 kWh | 3300 miles | 5200 km |
| **Cost to produce 1 tonne $CO_2e$** | £335 | £220 | £1485* | £400 |
| **£20 carbon price represents** | 6% | 9% | 1% | 5% |

**assumes a rate of 45p per mile*

We recommend allocating this defined budget to help both internal and external carbon reduction activities. For example, it could be split:

- 75% on internal carbon reduction measures
- 25% on external carbon offsetting activities

Investments in internal carbon reduction activities should be made based on the level of carbon savings and the associated cost savings. Good carbon reduction investments usually pay for themselves and give a return on investment to the business within 3 years. Carbon offsetting return on investment is primarily measured through access to tenders, brand enhancement and PR (use marketing return on investment techniques).

## 5.3. Carbon offsetting

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

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*

## 5.4. Carbon Footprint Standard

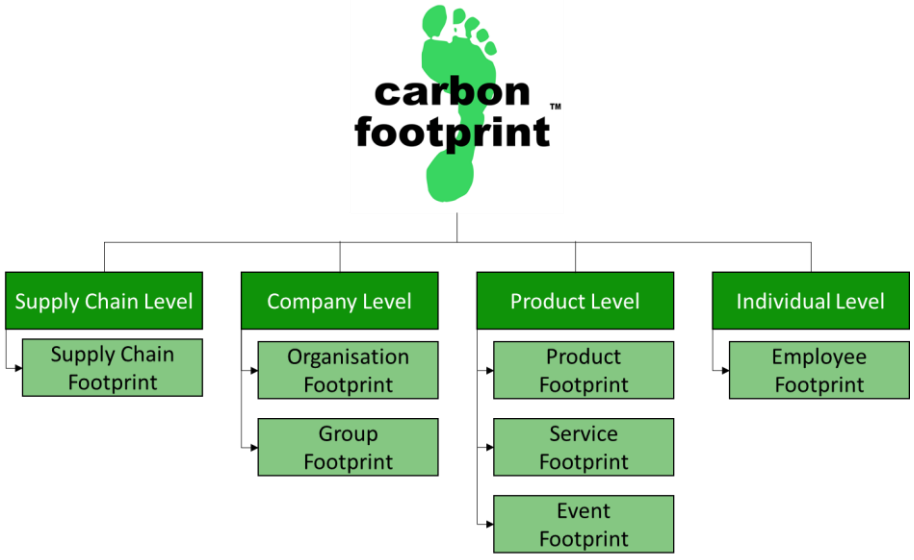
### 5.4.1. Brand endorsement

Civic Engineers, in conjunction with Carbon Footprint Ltd, has assessed 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.


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.

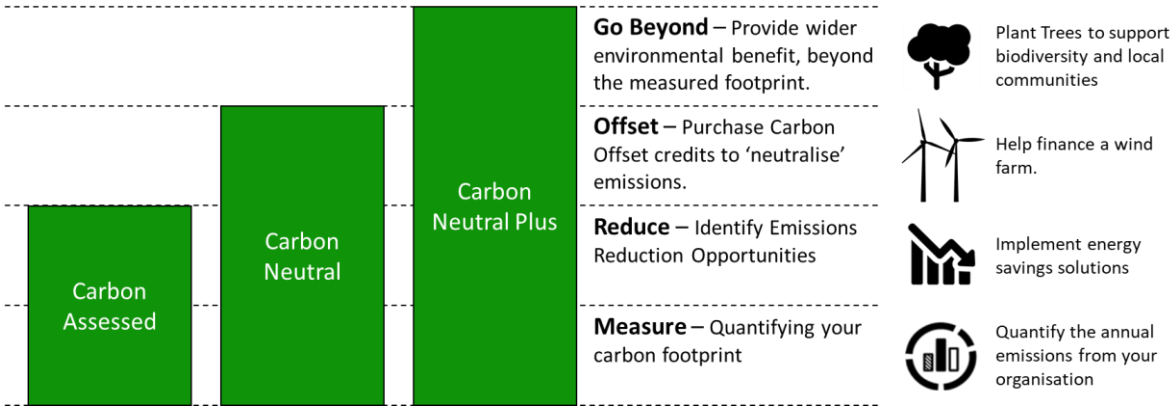
### 5.4.2. Scope

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 Civic Engineers 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.

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.
- 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.

# 6. References


1. BEIS GHG Conversion Factors for Company Reporting (July 2021)
2. Decarbonising transport: a better, greener Britain (publishing.service.gov.uk)
3. Guidelines to Defra's Greenhouse Gas (GHG) Conversion Factors for Company Reporting – annexes (June 2013)
4. HM Revenue & Customs (2019) https://www.gov.uk/government/publications/enhanced-capital-allowances.
5. The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition (March 2004)
6. UK Government (July 2021) UK Government's Decarbonising Transport Plan (July 2021)

# 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 Civic Engineers' 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 has been provided as a separate Excel file alongside the report.

This annex shows the data that Civic Engineers 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 Civic Engineers. It should be noted that the latter has been calculated by Carbon Footprint Ltd, and not provided by Civic Engineers.

## B.4 Scope 1 emissions breakdowns

The table below demonstrates the company's Scope 1 $CO_2e$ emissions in their respective greenhouse gases.

***Table 11: $CO_2e$ Emissions breakdown for Scope 1 emissions into their greenhouse gases.***

| Activity | kg $CO_2e$ | kg $CO_2$ in $CO_2e$ | kg $CH_4$ in $CO_2e$ | kg $N_2O$ in $CO_2e$ |
|---|---|---|---|---|
| Site gas | 33,095 | 33,034 | 43 | 18 |
| **Total** | **33,095** | **33,034** | **43** | **18** |