Haworth Tompkins
Carbon Footprint Report 2019

HT Carbon Footprint Report 2019

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Executive summary

The current climate and biodiversity emergency highlighted by the Architects Declare movement has prompted individuals and organisations to become aware and take responsibility of their impact on the environment. As founding signatories of the AD declaration, HT have started to calculate their office carbon footprint[1], with the aim to find ways to reduce it, and then offset the remaining carbon emissions in a way that is meaningful for the environment.

This carbon footprint report was calculated with the data available at the time of writing, and it indicates that in 2019 HT emitted an estimated total of 73 tonnes CO2e, or 0.9tonnes CO2e / person.

The most significant emissions were due to project related flights (approx. 36%) and office electricity use (30%). Large contributions are also made by staff car commuting (approx. 10%) and office gas use (approx. 9%). See figure 1 below for the breakdown of 2019 carbon footprint.

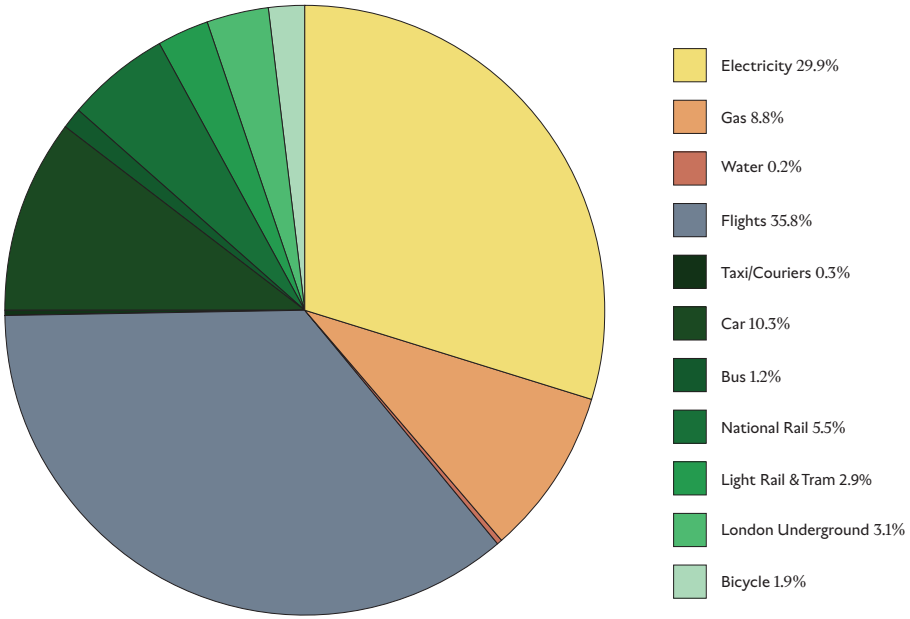


Figure 1. HT 2019 carbon footprint (73 tonnes CO2e/year ; 0.9 tonnes CO2e/person/ year)

The calculation includes the following three categories:
1. Utilities (electricity, gas and water),
2. Project related transport (flights, taxis and couriers)
3. Staff commuting (car, train, bus and bicycle).
The current report does not give a complete carbon footprint figure but includes the most significant sources of emissions.
A key omission is project related train travel which will be included for the 2020 calculation.

A full description of the methodology used and plans set in place to record accurate data in 2020 can be found in Appendix 1 and 2.
HT are committed to improving their carbon footprint and becoming a zero carbon practice[2]. As a result, the practice will take measures to reduce the carbon footprint according to the actions identified in this report in section *3 Analysis and improvements.* The immediate carbon reduction measures, and greatest challenge for 2020, will be to reduce the number of project related flights taken and the office electricity consumption.
Other opportunities to reduce the office carbon footprint would include:

- Behavioural changes to switch staff commute from carbon intensive means (car, bus) to cycling
- Zero carbon office supply chains, reduce office waste, maximise local sourcing
- Changes to the gas use (eliminating fossil fuel based heating by switching to electric, and implementing behavioural changes to lower thermostat set levels)
- The above could be coupled with fabric upgrades of one of the current office spaces (Greenwood Place) to eliminate cold draughts during the winter (secondary glazing). Alternatively, new office space could be sought for the expanding practice as an opportunity to have greater control over the type of services and utilities suppliers, and the quality of fabric performance.

HT will be implementing carbon reduction measures for 2020 with the aim to half their carbon footprint in the next 5 years and aim to become zero carbon. HT will offset the entire 73 tonnes CO2e emitted in 2019 by investing £80/tonne in the *Trees for life* tree planting scheme in Scotland which is a rewilding charity, focusing on biodiversity and enriching the lives of wildlife and communities.

HT recognise that their impact on the environment is two fold, via the operations of their offices, and the projects they design. HT acknowledge that reducing their own carbon footprint is a responsibility all business and individuals need to be aware of and so hope to inspire their staff and clients to follow suite and act now.

[1] Scope 1 and 2 of the GHG protocol and part of Scope 3
[2] Refer to UKGBC net zero carbon framework https://www.ukgbc.org/ukgbc-work/net-zero-carbon-buildings-a-framework-definition/

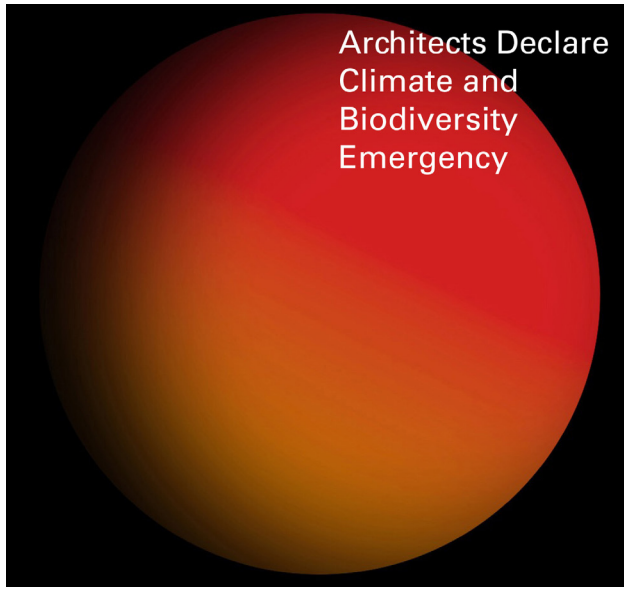
1. Introduction

Emergency response

Haworth Tompkins are founding signatories of the Architects Declare emergency movement. This acknowledges the impact of the construction industry on global climate and biodiversity, and sets out a list of goals to minimise carbon emissions. The AD movement supports the Government's legal commitment to bring all greenhouse gas emissions to net zero by 2050 and is aiming to accelerate the construction industry response towards achieving this goal.
HT are committed to acting now to reduce their carbon emission both through the projects they design and the way the business operates.

Carbon footprint

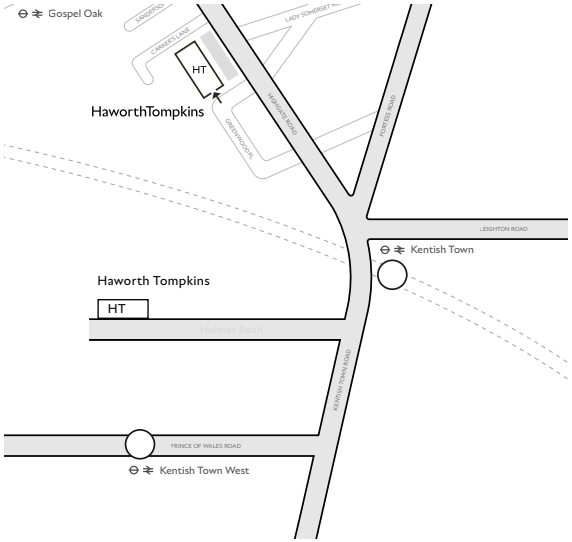
In 2019 HT have started an annual process of calculating their office carbon footprint[1] to become more aware of its impact on the environment. The aim is to become more aware of our own carbon emissions that arise from operating the office, understand how we operate as a practice, and to find ways to improve this and minimise our carbon footprint.



Location and premises

HT has two offices; their main Greenwood Place (GP) office and a smaller Holmes Rd (HR) office and the emissions from both are included in this calculation. HT are currently seeking to bring staff together in one office. Options for this include either moving into a new building in a new location, or leasing further space at their existing GP location.

[1] Scope 1 and 2 of the GHG protocol and part of Scope 3

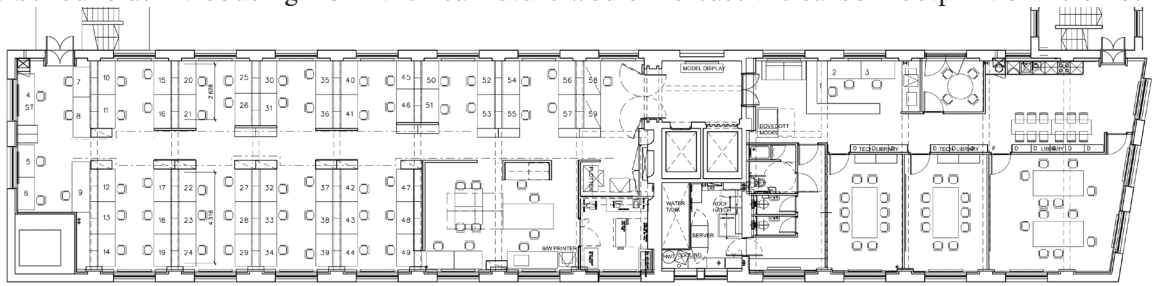


Greenwood Place (GP)

- Former industrial building
- Entire 5th floor of a 5 storey building
- 513m2 GIA
- Gas fired boiler with radiators;
- natural ventilation via single glazed, metal frame windows;
- uninsulated solid brick walls

Holmes Road (HR)

- Recent build
- Ground floor office with residential accommodation above.
- 205m2 GIA
- Gas fire boiler with underfloor heating;
- natural ventilation through high level openable double glazed windows with Alu frames.
- Overheating in summer requires localised fans and floor standing purifier units. Passive or low energy solutions need to be found as introducing AC in the near future would increase the carbon footprint of the office

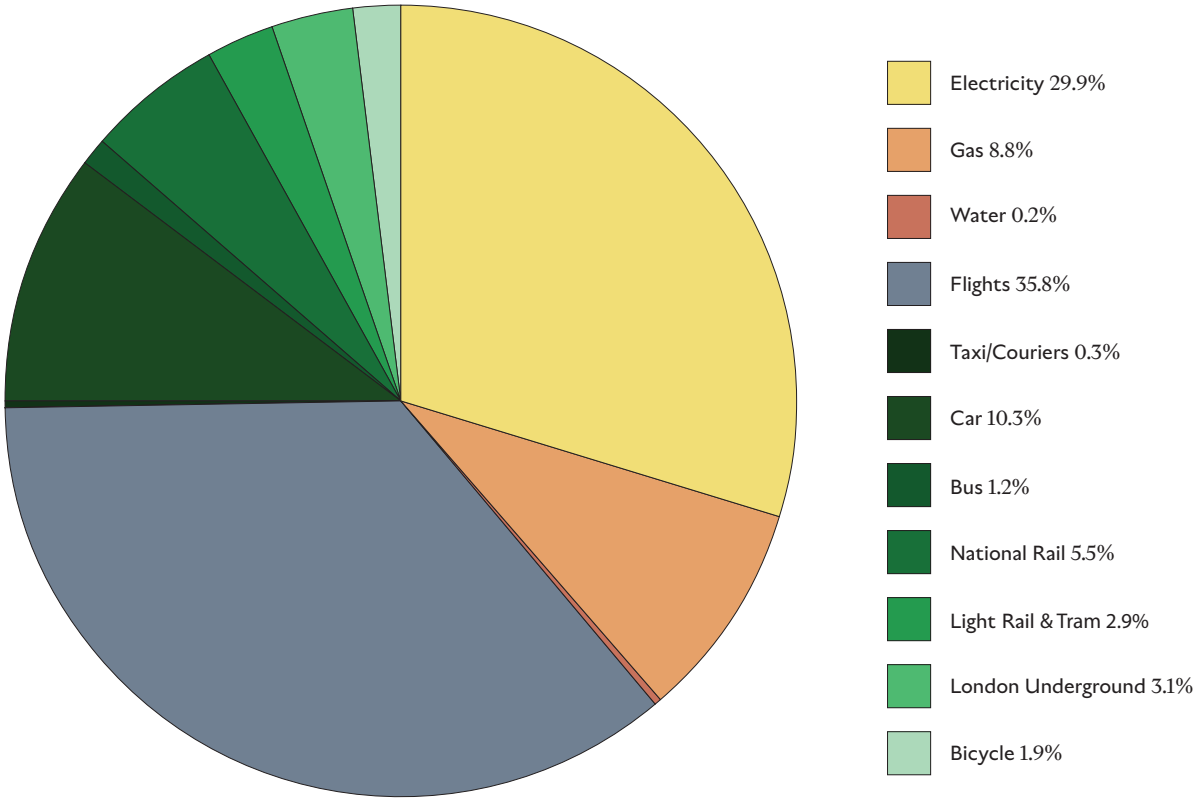


Greenwood Place office plan (GP)

Holmes Road office plan (HR)

2. Analysis & Recommendations

The analysis shows that HT's main sources of carbon emissions in 2019 were project related flights, electricity use and gas use in their two offices, and staff car commuting. These should therefore be the focus of carbon reduction measures in 2020 and beyond this, aiming to reduce the carbon emissions in 2 phases to halve the current level, and offset the remaining emissions through efficient measures.



HT 2019 carbon footprint (73 tonnes CO2e/year ; 0.9 tonnes CO2e/person/ year)

2. Analysis & Recommendations

Carbon emission reduction measures will focus on:

Flights

HT has increasingly taken on more international projects. The following possible carbon reduction measures have been identified:

- Improve remote collaboration technology in the office to avoid travel (online conference calls)
- Set up a practice flights carbon budget track and report every trimester
- Reduce travel on international projects and diversify sectors to expand UK projects
- Setup local office for duration of international projects or collaborate with local architecture practices
- Agree limit to number of flights per each work stage for international projects
- Only travel in economy class when flights are absolutely necessary for running the project

Car commuting

This is due to a relatively small number of employees travelling a large distance, having a significant impact despite the fact that large number of staff cycling and using public transport.
Generally, improvements could include:

- Encourage staff to switch bus/ public transport to bicycles/ electric bicycles via the cycle to work scheme and by providing office electric folding bikes (can be used for commuting and for attending project meetings in London during working hours)
- More flexible working hours with additional time to commute by public transport
- Provide loans for travel cards to make them more affordable
- Office electric car share

The long term goal would be for green transport to become the majority for commuting.

2. Analysis & Recommendations

Electricity use

There is a high electricity demand for computers & IT, along with fluorescent lighting in both offices. Summer cooling at HR is primarily provided by natural ventilation and boosted via air purifiers. The following possible carbon reduction measures have been identified:

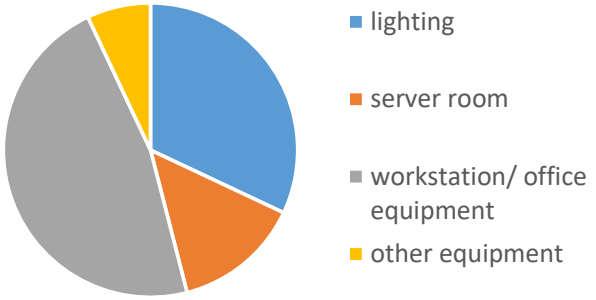
- Behaviour changes such as ensuring computers are turned off when not in use
- Changing all light fittings to LED in both offices.

An independent energy audit report carried out by Mesh energy has identified that behavioural changes and installing LED light fittings at GP could reduce the energy consumption by 25% and more[1]. Same changes at HR would also offer significant reductions.

- GP - engage other tenants and ask the landlord to switch to green supplier of electricity.
- GP – discuss with the landlords the possibility to install crowd funded PVs on the roof – in partnership with Power Up North London. Mesh Energy report notes as much as 24000kWh can be generated annually on the roof if fully covered with PV panels. This would be more than a third of the current energy use in the HT office. Alternatively it could power an electric bikes charging point in the parking area.

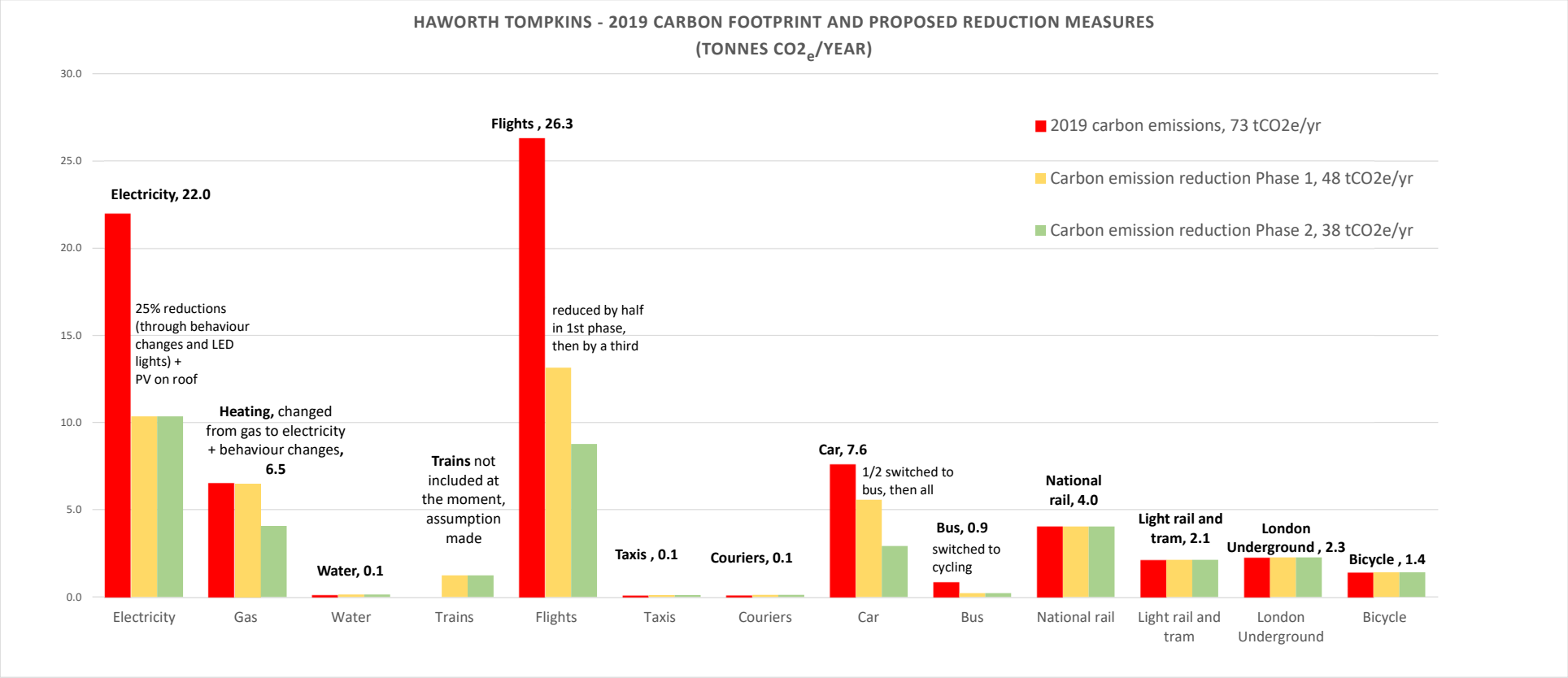
- HR – investigate potential for secure night time purging of exposed concrete thermal mass.
- HR – avoid use of air conditioning in the future and encourage natural ventilation – cross ventilation is possible in the office however seems to be hindered at the moment by large metal rolling blinds; encourage small desktop fan use instead of resorting to AC.

[1] 'Potential savings of 25% through operational changes, and further savings through lighting upgrades'. MESH, Energy Audit Report, January 2018



Mesh Energy Audit, energy usage in the Greenwood Place office, 2018

2. Analysis & Recommendations



HT 2019 carbon footprint - proposed reduction measures

2. Analysis & Recommendations

Gas

Both offices are heated by gas fired boilers. GP is an old building with uninsulated walls and single glazing that has a high heating load. The following improvements have been identified:

- GP - engage other tenants to request landlord switches to green supplier.
- GP - install separate gas meter to accurately monitor HT office consumption.
- GP - discuss fabric improvements with the landlord. The internal gains from people and equipment help provide a high indoor temperature (noted via recently installed environmental sensors in the office), and secondary glazing could be used in the winter to reduce the cold draughts for people sat next to the windows and turn down the thermostats on radiators.
- GP - long term solution: Eliminate fossil fuel heating and switch to electric heating powered by PVs to be installed on the roof.
- HR - research supplier for HR
- HR - set thermostat to constant temperature (20C) , avoid increasing the set point above that and instead encourage wearing an extra jumper during winter and accept a wider range of temperatures

Below are identified improvements for all other categories measured:

Water

- Install water efficient fittings and monitor consumption regularly throughout the year

Taxis

- Use hybrid and electric vehicle only, provide office electric folding bikes that can be used for meetings and site visits.

Courier

- Use hybrid and electric vehicle only, use cycle courier as default.

Commuting (bus, trains, bicycle)

- Consider providing access to showers at HR through nearby sports centre.

2. Analysis & Recommendations

Possible new office location

The potential for a new office offers the opportunity to significantly improve the operational energy and control that HT has over the office environment. The following are identified as key considerations when choosing a new office:

- Building fabric and systems performance
- Ability to upgrade the fabric of an existing building
- Ability to choose the utility provider and monitor consumption of HT office area
- Localised control over heating/ ventilation systems
- Good transport links
- Facilities to encourage the use of bicycles (showers, lockers, changing room)
- Opportunity to install renewable energy sources

Other opportunities to reduce the current office carbon footprint would include:

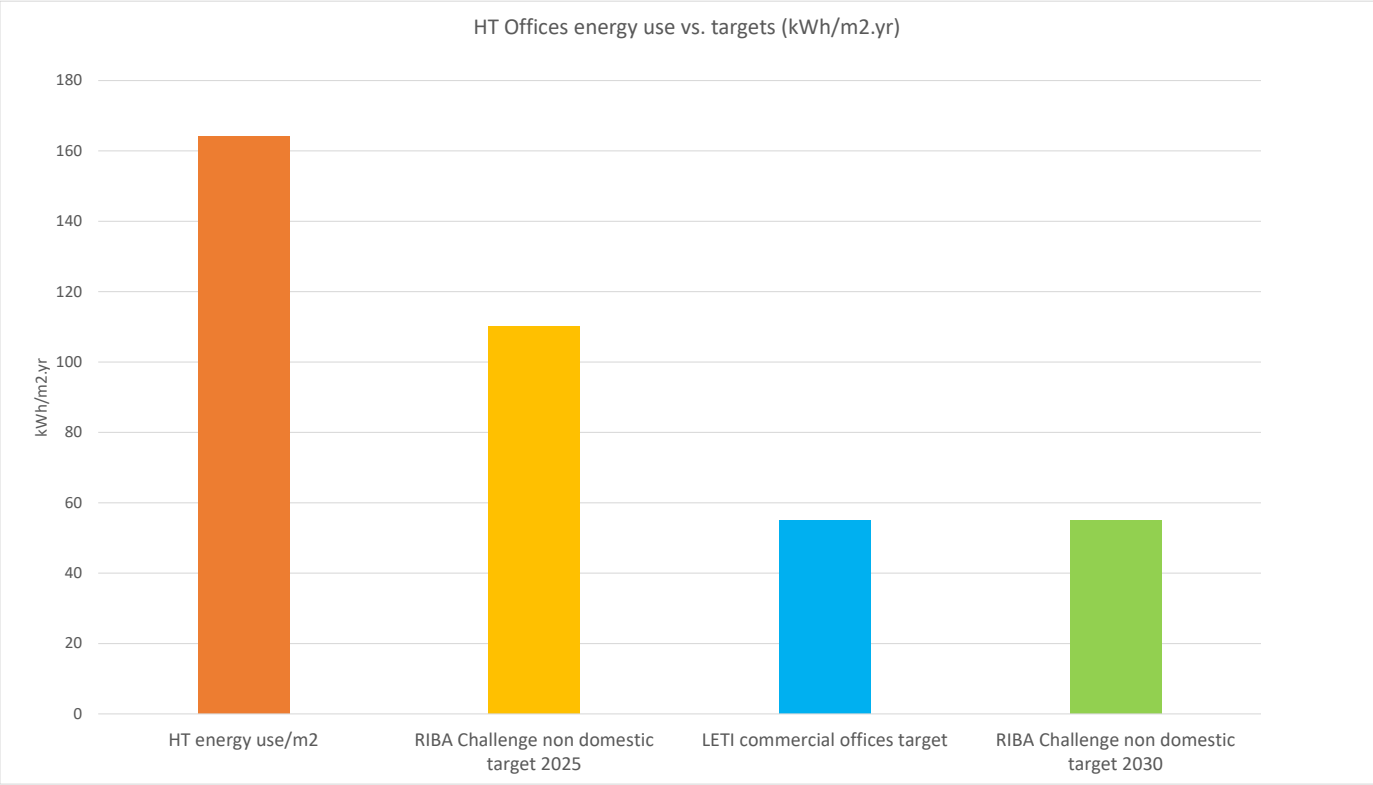
- Zero carbon office supply chains, reduce office waste, maximise local sourcing
- Fabric upgrades of one of the current office spaces (Greenwood Place) to eliminate cold draughts during the winter (secondary glazing).

Personal responsibility

- Set up a *Carbon budget/ allowance*, to be managed by the creative support admin team, with trimester reports at office meetings. Each design team to be made aware of their commute and project related transport carbon emissions. Admin team to keep track of office wide carbon emissions (utilities, food, stationery etc).
- Raise awareness by supporting/ encouraging the staff to carry out a personal carbon footprint as an office challenge.

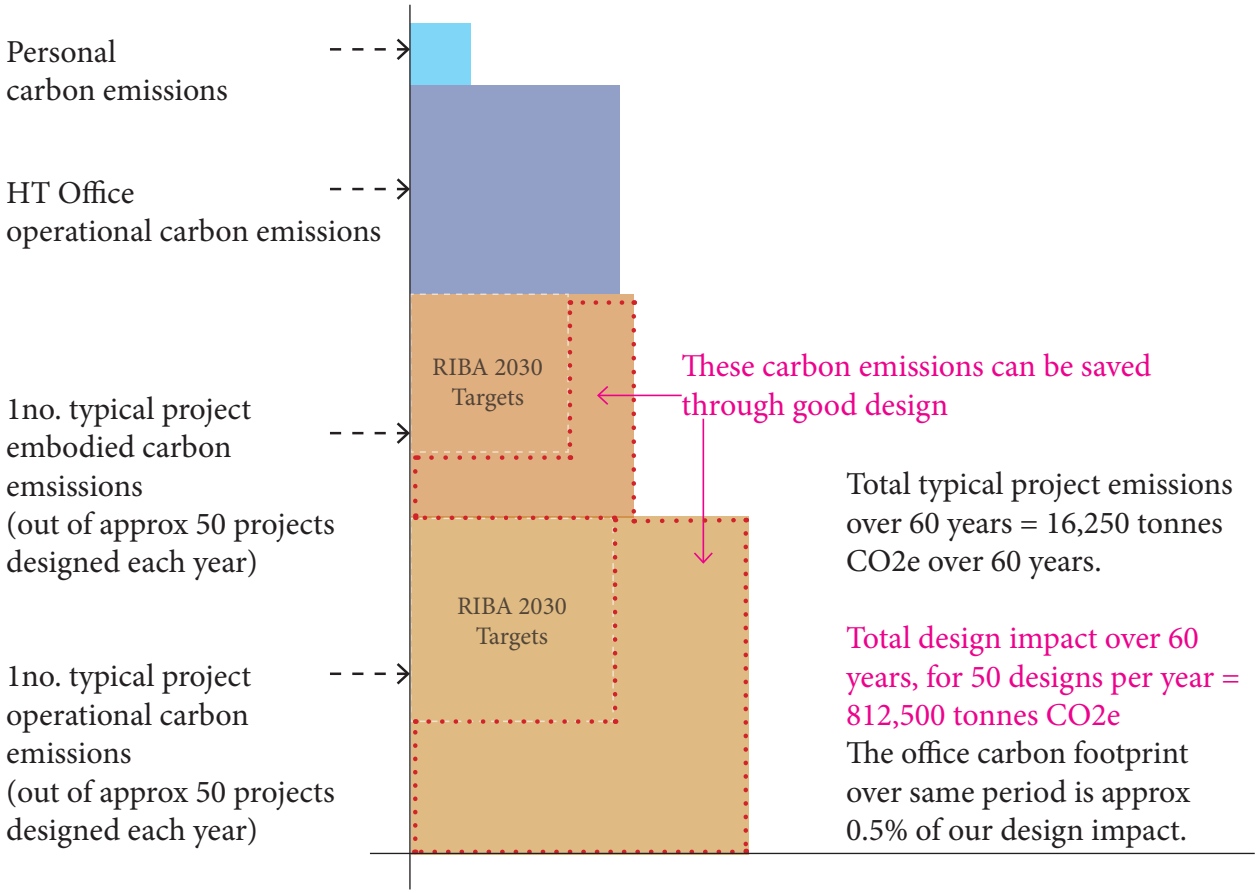
2. Analysis & Recommendations

Comparison between current HT offices energy use and the energy performance targets we aim for in our design work:



2. Analysis & Recommendations

The chart below is illustrating HT office carbon emissions (operational) in tonnes CO2 emissions over 60 years, compared with the embodied and operational emissions over the same time span for ***just one*** typical project (of approx 5000sqm), out of about 50 projects we design ***each year.***
This is illustrating the impact of our design work, the importance of discussing carbon reduction measures and agreeing carbon targets with our clients.



Assumptions:
HT yearly carbon footprint:
73 tonnes currently x 60 years = 4,380 tonnes CO2e over 60 years

Typical project of approx. 5,000sqm
Embodied carbon typical project:
Estimated 1tonne CO2e/sqm x approx. 5,000sqm = 5,000 tonnes CO2e over 60 years

Operational carbon typical project: assumed 150 kWh/m2.year
Approx. 150kWh/sqm. year x 5,000sqm x 0.25 carbon factor (kgCO2/kWh) x 60 years = 11,250,000 kgCO2e over 60 years = 11,250 tonnes CO2e over 60 years

RIBA Challenge 2030 embodied carbon: 500kgCO2e/sqm
0.5tonnes CO2e/sqm x 5,000sqm = 2,500 tonnes CO2e over 60 years

RIBA Challenge 2030 operational carbon: 55kWh/m2.year
55kWh/sqm.year x 5,000sqm x 0.25 carbon factor (kgCO2/kWh) x 60 years = 4,125,000 kgCO2e over 60 years = 4,125 tonnes CO2e over 60 years

Personal carbon footprint
Estimated 6 tonnes/year x 60 years = 360 tonnes CO2e over 60 years

3. Conclusion

2019 was the first year that HT have calculated their office carbon footprint (Scope 1 and 2 of the GHG protocol, and part of Scope 3). We hope to be able to include food, stationery, and waste disposal in the carbon emissions calculation for 2020.

The process has in itself made the practice more aware of their office operations and environment, especially issues such as:

- the impact of fluorescent lighting on overall electricity consumption, as well as small power (computer use) outside working hours
- location and access to utility meters and availability of data regarding office energy use,
- record keeping on office and project related transport (trains, flights, couriers, etc) and
- ability to choose utility suppliers.

The analysis has revealed that the four key emissions to improve in 2020 are: flights, electricity use, car commuting and gas use. A series improvements that can be taken to significantly reduce the carbon emissions in the current year have been listed, to be actioned by the Office Working Environment Group with support from the Sustainability Team and all staff and Directors.

A longer term approach is needed, regarding the office premises (either significant improvements to current offices, or searching for a new office that would accommodate all teams and provide better building fabric and services).

Once the carbon reduction measures are implemented, the remaining carbon emissions will be offset via a carbon offsetting scheme. We have opted for the *Trees for life* tree planting scheme in Scotland to offset the carbon emissions for 2019.

HT recognise that offsetting their 2019 carbon footprint is not a solution but offers a short-term mitigation of their impact.
We will continue to monitor and improve our carbon footprint throughout 2020 on the path to become a zero carbon practice, and we also aim to raise the awareness of our staff regarding the impact of our design work and the decisions we make daily on the projects we design.

Appendix A. Methodology and actions for improvement in 2020

This was the first time HT has calculated its office carbon footprint (Scope 1 and 2 of the GHG protocol, and part of Scope 3). The focus was establishing a core set of data to identify the main carbon emissions contributors, (flights and electricity), and ways in which the emissions could be reduced. Locating the utility meters and obtaining utility bills from the landlords of the two HT offices was a convoluted and time-consuming process, as well as gathering office-wide data regarding project related travel. The carbon footprint calculation for 2019 includes the most carbon intensive items and provides a base for a more detailed 2020 calculation.

The carbon footprint has been calculating using 2019 UK Government GHG Conversion Factors for Company Reporting (https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019) :

Data x carbon factor kgCo2e = Total kilograms Co2e
/ 1000 = total tonnes
/ number of employees = total tonnes per person

Below is an account of the 2019 data gathering process, assumptions and recommended improvements for 2020.

Electricity

- In GP there is a meter installed on the 5th floor (HT office) which accurately monitors the consumption of the office. Readings are recorded manually by HT on a monthly basis.
- In HR there is a meter installed by the utility provider that accurately monitors the consumption of the office. Monthly readings are recorded manually by HT on a monthly basis.

Gas

- In GP there is one meter for the entire 5 storey building. The bills are included within the rent and therefore under the control of the landlord. A 2019 bill containing actual readings by the utility provider was obtained from the landlord after continued persistence. HT consumption has been estimated via a pro rata calculation.

o Action: HT should consider installing a separate meter to monitor the 5th floor consumption.

- HR has a meter installed by the utility provider that accurately monitors the consumption. Monthly readings are recorded manually by HT on a monthly basis.

Water

• In GP there is one meter for the entire 5 storey building. The bills are included within the rent and therefore under the control of the landlord. GP consumption is based on the Castle Water bill period 1/10/19 – 21/3/20. The bill is estimated from meter readings taken on 22/11/19 and 10/05/19. From this information a daily consumption rate was established for the entire building and divided per floor.
• HR – There are records of the utility bills since early 2019, however they are not based on actual meter readings. HR has a dedicated meter for the building that was only able to be located at the end of the data gathering process. This meter has been changed since the last actual reading taken by the utility providers and therefore it was decided to use an office benchmark to estimate the water consumption.
o ACTION: Meter readings will be taken manually by HT for the 2020 calculation.

Flights

• A full report of the class and mileage was provided by the travel agent that books the majority of HTs flights
• Other additional flights were accounted for through expenses records.
o ACTION: Admin team will keep accurate project related transport records for 2020, to include train travel

Commuting

• Commuting distances and mode of transport were calculated through an office survey. To maintain a high return this was simplified to a daily 'average mode of transport' and 'return distance'. The yearly total was calculated by the average working days in 2019.
o ACTION: The 2020 survey could be more precise by including a second mode of transport and frequency of each.

Category	Item	Units	Greenwood Place	Holmes Road	Total	Carbon Factor (kg CO2e)	Carbon Factor Reference	Carbon Footprint (tonnes CO2e)	Carbon Footprint per person (tonnes CO2e)	Comments
Utilities	Electricity	kWh	70893.9	15143	86037	0.2556	19, S2, UK Electricity, F24	22.0	0.3	
	Gas	kWh	12807.8	18985.1	31793	0.20428	19, S1, Fuels, E37	6.5	0.1	
	Water	m3	401	15	416	0.344	19, S3, Water supply, E18	0.14	0.0018	Figures calculated on pro rata basis
Project related transport	Trains	km			TBC	0.04115	19, S3, Business travel - land, E87			Data not available at the time the report was drafted
	Flights	km			145435	varies	varies	26.3	0.3	
	Taxis	km			521	0.21024	19, S3, Business travel - land, E72	0.1	0.001	Based on average price per km
	Couriers	km			586	0.21024	19, S3, Business travel - land, E72	0.1	0.002	
Staff Commuting	Car	km			43618	0.17336	19, S3, Business travel - land, E53	7.56	0.093	
	Bus	km			10671	0.08208	19, S3, Business travel - land, E80	0.88	0.011	London bus (hybrid electric)
	National rail	km			98142	0.04115	19, S3, Business travel - land, E87	4.04	0.050	
	Light rail and tram	km			60676	0.03508	19, S3, Business travel - land, E89	2.13	0.026	
	London Underground	km			73372	0.03084	19, S3, Business travel - land, E90	2.26	0.028	
	Bicycle	km			67414	0.021	European Cyclists Federation	1.42	0.017	
							TOTAL (tonnes CO2e)	73	0.9	

HT 2019 carbon footprint calculation

Apendix B. 2020 Data Aspirations

Below is a list of the data required to improve the accuracy of the 2020 carbon footprint calculation.

Trains

- All train travel should log the following:

o No. passengers
o Distance (km)
o Class
o Type

Flights

- Any flights that are not booked through the travel agent should include:

o No. passengers
o Distance (km)
o Class:
o Type: Long haul, short haul

Hotels

- Location
- Nights
- No. rooms

Archiving

- tbc

Food

- tbc

Stationery / model making

- tbc

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