

Carbon Emissions Framework Methodology

This is how we calculate the carbon footprint of your business.

Approach

The framework used to calculate the carbon emissions of businesses has been designed by Ecollective. The framework aims to measure the company's carbon footprint to a high degree of accuracy taking into account every element of the business.

[Ecollective](#) has worked with many businesses to help them measure their carbon footprint.

The aim is to calculate a highly accurate carbon footprint over a 12-month period. We also calculate a key metric for gauging carbon performance, typically per customer (or a similar metric) that can be tracked year on year as improvements are made.

As with any carbon calculation, it's not perfect, but we believe that this framework is currently one of the most thorough and therefore the most accurate methods in use in the industry. If you are familiar with carbon calculations, you will be pleased to know we follow the guidance outlined in the [GHG Protocol](#), the most widely recognised international standard for measuring emissions.

We have purposefully tried to minimise using carbon jargon in this methodology compared to our competitors, we believe that this makes it easier to read.

We are always open to questions and feedback. If you would like to get in touch, please contact info@ecollectivecarbon.com

What's included

The areas of the business which we calculated emissions for:

Offices, Stores and Buildings

Staff commuting

Working from home

Business travel

Accommodation

In-person events

Virtual events

The website

Purchased Goods

Waste

Company-owned vehicles

Customer trips

Transport

Accommodation

Cruises

Customer activities

Food

Trip leaders and local guides

What's not included

- Optional extras
- Investments

Data

During the audit, we analysed the data provided directly by the business, suppliers, and employees. When information was not available, we relied on relevant industry averages provided by DBEIS (DEFRA), EPA, IEA, our research and other trusted sources. Each year the aim is to use fewer assumptions to increase accuracy.

Our data is updated as carbon conversion factors evolve. As this is constantly being updated as new data becomes available, please contact ecollective for more details.

How we measure

Nearly everything has a carbon footprint, so measuring the exact carbon footprint of a business could be a lifetime's work. With the climate crisis, we simply do not have the time. So we have made assumptions in order to measure the carbon footprint of everything that goes into the running of the business and the products/services it sells.

This is normal practice in the carbon-calculating world, but at ecollective we go a step further than most. Many companies make assumptions that are too simple or use unreliable data, resulting in scores that are not as accurate as they could be.

For Scope 2 emissions we have followed the market-based method. When information or good quality data has not been available we have used location-based information as a proxy for the market-based method.

The devil is in the detail

The below section is long, because of our level of accuracy. However, for us, **this is so important as the best ideas for carbon reduction are found in the detail**. The section below could be far longer (as each bullet point could be expanded upon but we have kept it concise(ish) to make this document more digestible.

What are scopes?

This is carbon industry jargon, it helps people understand which part of your carbon footprint you can directly fix.

Scope 1 - These are emissions from all the fuel that the company pays for. It is usually the petrol in your company car, the diesel in your onsite generator, etc.

Scope 2 - Emissions from the electricity you pay for.

Scope 3 - Everything else that forms part of your company emissions. These are often things you cannot control but can influence (also known as 'indirect'). For most businesses, this is by far the biggest proportion of their footprint.

It's mandatory to include scope 1 and 2 emissions in your reporting. Best practice is to include scope 3 emissions too.

Offices, Stores and Buildings

- All buildings either owned or rented by the company are included in the calculations.
- Electricity-related emissions are based on the number of kWh used over a period of time and the energy provider used. If the energy provider is unknown we use the national average carbon intensity of electricity in that country to calculate.
- Fuel emissions are based on the quantity consumed over a period of time and the type of fuel used (e.g natural gas, oil, etc) If the fuel quantity is unknown we estimate based on the size of the building and the building function. (e.g office or warehouse).
- If the office is shared, a percentage of the emissions from the office and communal space is assigned to the business.
- Office emissions related to water consumption, waste and food are all taken into account. If the exact quantities of these are unknown we have used national averages so that they can be included in the calculation. These calculations can be updated as and when information on these items are known.
- Waste emissions include the waste type and how it is disposed of. This is because different materials have a different carbon footprint whether they are recycled or sent to landfill.
- Other scope 3 emissions such as WTT (well to tank) and T&D (transmission and distribution of electricity) are typically included as well for offices or other buildings managed by the company.

Staff commuting

- Staff commuting, whilst typically minimal and not included by most businesses, has been included in this study.
- To avoid adding hours of admin for an item that will have a tiny carbon footprint we ask each employee to provide a summary of their yearly commute as opposed to every single journey they made in the last year.
- Each employee's carbon footprint is then calculated based on the mode of transport, average distance travelled and the frequency of the journey.
- We take into account all types of transport (public and private).
- For car journeys, we also detail the car size and the fuel type (petrol, diesel, electric or hybrid). If the exact model is known we use figures relating to this vehicle in order to improve the accuracy of the calculations.
- The carbon factors assigned to each mode of transport is based on those listed by DBEIS (DEFRA).
- For people who walk or bike, we assign them a zero carbon footprint for their commute.

Working from home

- Working from home emissions are based on estimated hours of work and estimated

additional electricity / heating requirements used at home due to you not being in an office. If the energy provider is unknown we use a national average carbon intensity of electricity in that country in order to calculate.

- For businesses with a lot of data, emissions are influenced by whether employee homes need air conditioning or have heating done by heat pumps or oil.
- Other emissions from waste, water, WTT and T&D are not included as part of our working from home emissions as they are deemed to be minimal.

Business travel

- Business travel is included. This covers all trips taken for work purposes.
- We include the following transport types: plane, car, bus, train, ferry and other less common forms of transport.
- We encourage businesses to list as much historical business travel as possible to provide context, together with the cost associated, in order to help identify areas for reduction.
- Emissions from car journeys are calculated using the distance travelled, fuel type and type of vehicle used.
- We have used emission factors provided by DEFRA to calculate the total emissions related to business travel on the transport types mentioned above unless the exact car model is known or private jets have been used, in which case we have used data from elsewhere in order to improve the accuracy of the calculations.
- Emissions are calculated on distances travelled. For land based trips, these are based on the 'fastest route' available as provided on [googlemaps.com](https://www.google.com/maps) unless stated otherwise.
- If vehicle type is unknown we assume cars are petrol powered medium-sized (Audi A4, Volkswagen Passat, etc) cars (roughly 2.0l engine) unless otherwise specified.
- For train travel, we calculate emissions per seat based on the kilometres travelled for that route. The exception being for any underground tube trips included in the calculations.
- For flights, we assume all flights are taken in economy unless otherwise stated. If the exact class of travel is known, calculations are updated accordingly.
- All flights are assumed to be direct unless otherwise stated. All commercial flights include a distance uplift of 8% to compensate for planes not flying using the most direct route (such as flying around international airspace and stacking).
- All flight emissions include radiative forcing and the emission factors are based on those released by DEFRA. Exception: The 2023 & 2024 DEFRA figures include load factors based on 2021 load data, which was significantly impacted by COVID, so we have continued with the 2022 factors when measuring 2023 emissions to provide a more accurate estimate.
- For all aviation emissions, we include the indirect effects of non-CO2 emissions when reporting to capture the full climate impact of their flight. However, it should be noted that there is significant scientific uncertainty around the magnitude of the indirect effect of non-CO2 aviation emissions and it is an active area of research. For information, emissions from aviation have both direct (CO2, CH4 and N2O) and indirect (non-CO2 emissions e.g. water vapour, contrails, NOx) which all have an effect on climate.
- We measure the emissions using the spend based method only when the trip details are unknown. This is seen as a short term solution as we much rather measure based on the activity taken place rather than how much it cost.

Accommodation

During business trips, accommodation may be used, if this is known, this is typically included in calculations too. All accommodation carbon scores are based on kilograms of CO2e emitted per

room per night.

- For properties that have not completed the ecollective hotel survey, we apply a national average emission factor for this property until they complete the survey. This score represents a higher than average value.
- In the future, hotels' scores may change as we hope to send a survey to the most commonly used properties to gather more accurate information on the carbon footprint of a particular hotel. This survey would include occupancy rates, all energy & fuel use, laundry requirements and other factors that have a significant carbon footprint.
- The total calculation is based on the number of rooms used and the number of nights stayed at the property.

In-person events

- Staff events hosted by the business during the reporting period are included. In the calculations, we include emissions related to all paid expenses by the business. This normally relates to the venue, accommodation, employee travel and meals. It is likely that emissions related to other people attending the event will be included if invited by the business. However, our calculations do not cover travel in most cases.
- If a venue is used multiple times we ask them to complete our venue carbon footprint survey. This gives us a more accurate reflection of their carbon footprint.
- For venues that have not completed the survey, we apply a global average emission factor for this venue until they complete the survey. This estimate is based on the country it is located in, the size of the venue and the duration of the event.
- Other scope 3 emissions such as transmission and distribution of electricity are assumed to be minimal and are excluded from the scope.
- For events hosted by the business where the majority of attendees are not employees, these emissions are calculated but in a different section and the details can be found below.

Virtual events

- We have included the carbon emissions of virtual events (such as zoom meetings). For virtual events hosted by the business, we have included the total emissions. We have excluded virtual webinars attended by employees, as the carbon footprint will be negligible. Video calls or webinars under 300 people are not calculated as the carbon footprint is minimal.
- For virtual events:
 - The amount of electricity used per viewer is based on including electricity consumed by data transmission, data centres and the device itself that it is being viewed on.
 - We assume that all viewers are watching on a laptop. It is worth noting that the score accuracy can be improved if a clear breakdown of devices used is known. For example, watching on a phone would require less electricity and a large TV would require more.
 - The carbon footprint of the electricity used is then based on the average electricity mix of the countries in which the event is being watched in. The carbon conversion factor of the electricity used is based on the latest figures published by IEA.
 - The number of viewers and the average duration of the transmission are then combined to give a total carbon footprint of the virtual event.

The website

- Whilst a website will have a fairly small carbon footprint, it is something nearly every business has and something that can go unnoticed. However, having a more efficient website not only has a smaller carbon footprint but will also perform better for your business. So whilst it isn't normal to include a website in this kind of work, we nearly always do.
- To calculate the entire carbon footprint of a website we consider whether the web host uses renewable energy, take the amount of site traffic over the course of the reporting period, and multiply this by the average size of the company website. The geographic location of visitors is also taken into account to create a total carbon footprint.
- When the average page size of a website is unknown we take the page size of the homepage. To avoid any confusion, when we say 'page size' we mean "the data transferred when a web page is loaded".
- If the host is unknown we assume the website host does not use renewable energy.
- If the geographic location of the website visitors is unknown, ecollective makes an assumption according to your client base. This helps us to calculate the carbon intensity of the electricity used.
- We use an average value to account for the energy intensity of the web data. This covers the energy used at the data centre, by the telecoms networks and by the end user's computer or mobile device.

Purchased Goods

- Goods and Services purchased in the reporting period and not already covered by another category already are included in the calculations.
- However not all goods and services will be included, this will typically only include large spent items or expensive pieces of machinery. For example, the most typical areas that are included in this category are marketing activities and IT equipment.
- Calculations for physical items are based on the typical emissions of that product, if unknown then the calculations are based on the spend-based method.
- The spend-based method estimates emissions for goods and services by collecting data on the economic value of goods and services purchased and multiplying it by relevant secondary (e.g., industry average) emission factors (e.g. average emissions per monetary value of goods).

Waste

- This covers any large amounts of waste created by the business in production or other activities.
- Waste is split into different categories to identify the type of waste it is as well as the next destination of that waste. For example, waste is split into food waste, paper, general waste, and electronic waste to name a few.
- We then collect data on the waste stream for each pound of waste. For example, waste could be sent to landfill, recycling, combustion, or even composting for food waste.
- The total quantity of waste is then multiplied by the conversion factor for that type of waste going into that waste stream.

Company-owned vehicles

- Travel using vehicles owned by the company is calculated separately from business travel and commuting because it falls under Scope 1.
- The type of car driven and the type of fuel used greatly affects the carbon footprint emitted from this category. We prefer calculations based on the total quantity of fuel (or electricity) used by the company vehicle.
- If that is unknown, CO2 emissions are estimated based on the total distance travelled in the last year. The emissions per kilometer vary depending on the vehicle type used.
- Other scope 3 emissions such as WTT (well to tank) and T&D (transmission and distribution of electricity) are typically included in the calculations.

Customer trips

This is where the bulk of emissions lie. As all trips can be different, we have broken down the source of carbon emissions into different areas so we can calculate the emissions of each trip based on the itinerary, the suppliers used and the number of inclusions. We assume there will likely be activities that happen that are not either recorded or known during trips, so we include a 15% additional buffer on all calculations to help cover these items.

Transport

- Transfers are calculated per vehicle unless the vehicle is used on a shared basis in which case the CO2e emissions will be calculated per seat.
- Emissions are calculated on distances travelled. For land-based journeys, these are based on the 'fastest route' available as provided on [googlemaps.com](https://www.google.com/maps) unless stated otherwise.
- Emissions from car journeys are calculated using the distance travelled, fuel type and type of vehicle used.
- If vehicle type is unknown we assume cars are petrol powered large-sized unless otherwise specified. If we know there are a lot of passengers, we calculate the emissions based on a minibus or coach.
- Some journeys will be one way but in reality, the vehicle will return to the point of origin after drop off. In these instances, we include the total mileage of the vehicle and not the customer if this is known.
- For train travel, we calculate emissions per seat based on the kilometres travelled for that route.
- For flights, we assume all flights are taken in economy class unless otherwise stated. If the exact class of travel is known, calculations are updated accordingly.
- All flights are assumed to be direct unless otherwise stated. However, all commercial flights include a distance uplift of 8% to compensate for planes not flying using the most direct route (such as flying around international airspace and stacking).
- All flight emissions include radiative forcing and the emission factors are based on those released by DEFRA.
- Meals or other items provided by airlines during a flight are not included in the emissions.
- When private aviation is used the carbon footprint of this journey is calculated using the estimated burn rate of aviation fuel based on the type of aeroplane used. We then use the estimated distance travelled to calculate the carbon emissions of this journey.
- For private aviation, the total carbon footprint is based on the entire emissions of the aircraft rather than per seat as it is assumed to be for exclusive use. If it is known that the journey

included an 'empty leg' then the emissions of this journey are included in the calculation. However, this is often unknown.

- For all aviation emissions, we include the indirect effects of non-CO2 emissions when reporting to capture the full climate impact of their flight. However, it should be noted that there is significant scientific uncertainty around the magnitude of the indirect effect of non-CO2 aviation emissions and it is an active area of research. (Emissions from aviation have both direct (CO2, CH4 and N2O) and indirect (non-CO2 emissions e.g. water vapour, contrails, NOx) climate change effects.)

Accommodation

All accommodation carbon scores are based on kilograms of CO2e emitted per room per night.

- We send an accommodation carbon footprint survey to accommodation providers where possible. This helps us to know their carbon footprint per room per night as opposed to using national averages.
- To calculate the carbon footprint per room per night we include the following:
 - Accommodation occupancy rate: properties with relatively low or high occupancy rates during the time of the audit are assigned a score that reflects an accurate per room carbon emission score. We know that a property with a 20% occupancy will have a lower energy requirement than the same property with 100% occupancy and have factored this into the calculation.
 - Fuel and energy usage at the property: this includes electricity, gas, oil, petrol, diesel, wood, kerosene, LPG and a few more. These quantities are then converted into their estimated carbon emissions based on conversion factors provided by DEFRA, with the exception of electricity.
 - Electricity: determined by the number of kWh used and the fuel mix of the energy provider. When the fuel mix of the energy provider is unknown, the national average fuel mix for that country is used.
 - If exact quantities of the electricity or fuel amounts are unknown we apply average fuel and electricity rates for hotels within that country to calculate the total emissions per room.
 - We assume that energy requirements remain the same throughout the year and that the carbon emission per room in the summer is the same as in the winter. We ask for annual energy usage when possible in order to average this out.
 - When primary data is half completed we use a mixture of primary data and secondary data to calculate the total score. For example, if a supplier provides us with electricity data but no gas data, we calculate the emissions from their electricity and apply the industry average emissions from gas use based on their property type.
 - Food, water, and outsourced tasks are classified as estimates (due to time constraints). The hope is that year on year, our calculations will get more accurate as we collect more information.
- For properties that do not complete the survey, we apply a national average emission factor of a hotel until they do.
- If the quality of the property is unknown, we assume it is similar to a 5 or 4-star hotel as these properties tend to have a higher average carbon footprint per room per night.
- When accommodation is on a cruise liner, the carbon footprint is calculated using a cruise specific survey focused on the fuel and electricity used onboard for the duration of the itinerary.
- The total calculation is based on the number of rooms used and the number of nights stayed

at the property.

Cruises

All cruise carbon scores are based on kilograms of CO₂e emitted per cabin per night.

- We ask for fuel usage reports based on the whole year along with the fuel type. This would ideally include fuel used when the vessel has customers as well as without.
- Other scope 3 emissions such as well-to-tank emissions are typically included as well for vessels owned by the company.
- If additional fuels or electricity are used these are also taken into account.
- Ship crew food emissions are taken into account but their travel emissions are excluded from the calculations.
- Customer meals are included in the calculations.
- Additional emissions such as waste and water are often estimated as the quantity and method of disposal are often unknown.
- The total calculation is based on the number of rooms used and the number of nights stayed on the vessel.

Customer activities

- Any activities not booked and offered directly by the travel company are not included.
- Activities are measured on a per-person basis unless it's a private group experience in which case we measure the total emissions of the experience.
- We include all associated emissions of the experience, including transport to and from the starting point.
- Most carbon emissions relating to activities come from fuel such as petrol or diesel. We calculate the fuel needed to complete the activity and convert this into kg of CO₂e using DEFRA conversion factors.
- Some activities such as visiting a museum have a small carbon footprint from the heating and electricity of the building itself. The framework takes these small footprints into account but awards them a global average footprint due to the lack of available information and projected size of the emissions per person per visit.
- Activities that are similar in their offering are assigned the same score across different suppliers due to their relatively low carbon footprint and the variation between different suppliers being minimal. For example, 30 minutes of quad biking in one location is given the same carbon footprint as 30 minutes of quad biking somewhere else.
- Any transport or meals included in the activity are calculated using the same method as other transport and meals.
- Any emissions relating to the activity provider's employees or HQ have are not included in the calculation. We have only included the emissions related to the completion of the activity.

Food

- The lifecycle of producing a meal involves a complex supply chain with various different and disparate processes, manufacturers and suppliers and involves a number of major steps before the food enters the premises where the meal is made. These steps include land use, farming, animal feed, processing, waste disposal, transport, packaging and retail. There is also a high level of variability in the dietary choices of consumers and the data available is not yet sophisticated enough to go to this level of granularity.

- We therefore categorise meals into categories such as high meat, medium meat, low meat, vegetarian and vegan with a carbon footprint attached to each.
- Where data on the meal or food provided is unknown, we apply the highest-scoring emissions (high-meat meal) factor for food.
- We assume every meal included in the itinerary is eaten by the customer and also include food for the guides unless stated otherwise.
- Food waste is often unknown and therefore not included in the calculations.
- Meals that may be consumed by customers during a trip but are not included by the company are not included in the calculations.
- Occasional snacks and drinks are not included as the related emissions are minimal.

Trip leaders and local guides

- All guide emissions are taken into account including any international flights taken.
- We apply the same process to guides as we do to customers. If additional transfers are needed for a guide they are factored in.
- Additional local guides, who may only be involved in one activity as opposed to the majority of the itinerary, are not typically included in calculations.

What is not included:

Investments

- The carbon footprint associated with any investments in the reporting year, not already included in scope 1 or scope 2 is not included. This section is typically for companies that invest to make a profit, such as investors or financial service companies.
- At the time of writing, the GHG Protocol states certain types of investments or sponsorships should be calculated in different methods with different priority levels. Emissions from investments should be allocated to the reporting based on the reporting organisation's proportional share of investment in the investee. For example, if you own 20+% of another company, this would be a high priority for inclusion.

Everything else

- Supply chain (scope 3) emissions are difficult to quantify, as there is mathematically no limit to the number of pathways that can contribute to total greenhouse gas (GHG) emissions. Increased complexity as the supply chain grows leads to a level of uncertainty associated with emissions metrics, which has been used as justification by many organisations to pay little attention to or ignore supply chain emissions. Achieving 'good enough' and incorporating sufficiently meaningful information into emissions calculations is essential for effective and targeted emissions management.
- The aim of this methodology is to look at what your business can influence and improve year on year. Your time is best spent implementing your carbon reduction strategies rather than perfecting these measurements.

Reporting Period

The reporting period is from 1st January - 31st December of each year.

The audit took place in 2024 but has been designed with future data in mind which would mean the accuracy will increase.

The carbon calculating tool is easy to update with changes. This results in the accurate tracking of improvements year on year based on the same metrics. Therefore previous year calculations can also change over time to benefit from the improvements made, making it a fairer benchmark.

The conversion factors and other industry data used are also constantly updated by ecollective to improve the accuracy of the calculations.

Ecollective's long term goal is not only to help companies measure their carbon footprint, but reduce emissions so we need to strike a balance and make changes in order to make smarter decisions when it comes to reduction.

Please bear this in mind as calculations may be improved before this document is updated. This methodology provides a guide to our calculations, rather than the exact detail of the formula used on every single item we included in the project.

Recommendations and limitations

It is understood that emissions will not be 100% accurate due to time constraints and the lack of perfect data. What is exciting about this approach is that it is well-received by suppliers and gives us the opportunity to increase the accuracy of the carbon footprint.

The aim of any business should be to reduce its carbon footprint per customer (or another similar metric) as well as increase the quality of the data it has on its operations and suppliers.

Realistically, there is no shortage of areas to improve the score but they all come with a balance of finding time-sensitive improvements, that will make a tangible difference. Below is a snapshot of some areas we suggest the business to actively improve on.

Some areas for improvement in future calculations:

- Increase the accuracy of data available on food provided on trips.
- Increase the percentage of primary data available for accommodation calculations.

Feedback

A review process is in place to improve the framework based on new research and user feedback. For feedback on the framework or to share ideas, please contact: info@ecollectivecarbon.com or sustainability@kilroy.net