



Greenhouse Gas Code of Practice

Version Control

VERSION	DATE	COMMENTS
1	13/08/21	Addition of comments from WG meeting on 13th
2	02/09/21	Addition of comments from WG meeting on 27th
3	02/09/21	Draft for circulation
4	27/09/21	Includes feedback from wider network (ADS, SPWG etc)
5	19/08/22	Addition of comments from review by WG members and guidance on Scope 3 category 11 emissions added at Annex A.
6	18/08/23	Section 7 Carbon Calculators Section on Scope 3 Category 1 in Annex A Annex B useful resources
7	24/05/24	Section 10 (Offsetting) expanded. Guidance on Scope 3 Category 6 and Category 7 added to Annex A

Index

Version Control.....	1
1. Introduction	3
2. Defence's approach to greenhouse gas emissions baselining	4
3. Purpose of this document	4
4. Best practice in guidance.....	5
5. Sources for emissions factors.....	6
6. Data collection & maturity	7
7. Carbon Calculators.....	8
8. Organisational boundaries.....	9
9. Incentivisation.....	10
10. Offsetting.....	10
11. Alignment with PPN 06/21 (Carbon Reduction Plans)	11
12. Alignment with PPN 06/20 (Social Value)	12
13. Review arrangements and further information	12
Annex A – Scope 3 Emission Guidance	13
1. Introduction	13
2. Category 1 – Purchased Goods and Services	13
3. Category 11 – Use of Sold Products.....	17
Annex B Summary of Resources:	24

1. Introduction

- 1.1 Defence has a significant role to play in meeting the UK Government's Net-Zero commitment. Building a clear understanding of the Greenhouse Gas (GHG) footprint from Defence acquisition and supply chain activities is a key initiative. This also enables us to identify the most GHG intensive activities and inform efforts to reduce energy and fuel use and support the transition away from fossil fuel use.
- 1.2 Whilst the importance of Scope 3 GHG emissions¹ is widely recognised, they are also the most challenging and complex to address and our research has shown the way organisations have been approaching these issues has varied significantly. This Code of Practice has been developed by a working group made up of MOD and Defence industry representatives under the direction of the Defence Suppliers' Forum.
- 1.3 This Code of Practice is important in supporting the development of more accurate and consistent reporting and to demonstrate how Defence is meeting the commitment set out in MOD's Climate Change and Sustainability (CC&S) Strategic Approach as well as informing the development of innovative solutions to meet both our environmental and future operational objectives.

Stephen Wilcock & Steve Wadey (Joint Chairs of DSF CC&S Steering Group)

¹ As described by the Greenhouse Gas Protocol Corporate Standards - [Corporate Standard | GHG Protocol](#)

2. Defence's approach to greenhouse gas emissions baselining

- 2.1 The Government has set out a number of high-profile policy developments including The Ten Point Plan for a Green Industrial Revolution and the accompanying National Infrastructure Strategy. Other initiatives include the Industrial Decarbonisation Strategy which sets a goal to cut industry emissions by around two-thirds from 2018 to 2035. The strategy identifies the need to decarbonise industry and buildings together with steps to move towards low carbon technologies and other reduction activities which are all underpinned by the measurement of energy and GHG performance.
- 2.2 MOD has developed a comprehensive approach to emissions baselining to enable Defence to identify the full breadth of climate change, sustainability risks and opportunities. This uses a Financial Year 19/20 baseline and is intended to increase the credibility of Defence reporting and to provide the basis for incorporating emissions impact into decision making.
- 2.3 MOD suppliers have a critical role to play, as it is estimated (based on spend based calculations) that two thirds of Defence's overall GHG emissions are from the supply chain (forming a major part of MOD's Scope 3). Analysis by suppliers indicates a similar profile within their own GHG footprints. This Code of Practice is a shared document with industry to provide high level guidance to encourage consistency through all layers of the Defence supply chain, in the expectation that suppliers are taking the necessary steps to measure GHG emissions.
- 2.4 It is important to consider that supplier approaches will vary according to the nature of their activities and that some Small to Medium-sized Enterprises (SME)s may not have the same resources to support GHG reporting requirements as larger companies.

3. Purpose of this document

- 3.1 Emissions reporting is a complex area and this document is intended to aid organisations across the Defence ecosystem by providing guidance for measuring greenhouse gas (GHG) emissions. By working together in an open and transparent manner, we can encourage a consistent approach in order to strengthen reporting and reduce emissions. This will increase credibility and trust in the commitment by the Defence Sector to drive towards Net-Zero and reduce the risk of real or perceived "greenwashing".
- 3.2 The Code of Practice sets out sector-specific guidance for GHG measurement covering the main aspects of Defence including Scope 3 emissions. Guidance for specific Scope 3 emission categories is provided at Annex A.
- 3.3 This Code covers all areas of Defence acquisition and support including Products, Systems and Services (PSS) as well as infrastructure and estates. The aim is not to replicate existing guidance and requirements, but to signpost the best practice that is applicable - including the Greenhouse Gas Protocol (GHG Protocol). This Code is not intended to be used as a formal contracting requirement.

- 3.4 Over the last decade many organisations have been systematically capturing data for measuring and reporting Scope 1 and 2 GHG emissions. But with increased focus on Net-Zero, this has grown to include Scope 3 emissions, and a need not just for reduction targets but plans to achieve the legislative requirement of Net-Zero by 2050. Since 2021, organisations that wish to bid for UK government contracts above the specified threshold will need to report their organisational emissions data (Scope 1, Scope 2 and a number of Scope 3 categories) and reduction plans to satisfy PPN 6/21 in the PQQ process- [Procurement Policy Note 06/21: Taking account of Carbon Reduction Plans in the procurement of major government contracts - GOV.UK \(www.gov.uk\)](#) – see Section 10.
- 3.5 We believe this can only be achieved effectively through collaboration and sharing good practice. While transparency about our collective footprint is important, the goal of capturing data is to know enough to create effective reduction plans, targeting those areas that need attention and demonstrating our commitment to reduce.

4. Best practice in guidance

- 4.1 The way Defence organisations report GHG emissions is consistent with the internationally recognised GHG Protocol Corporate Standard which splits emissions into direct and indirect emissions under Scopes 1, 2 and 3, with reporting in the form of Carbon dioxide equivalent (CO₂e). Scope 3 is the most challenging area to report and is more difficult to abate. The GHG Protocol Corporate Standard is primarily a tool for capturing and reporting emissions. However, measuring and managing ‘value chain’ emissions is essential to reduce reliance on embodied materials, energy use, processes in service use of equipment, and infrastructure (which create GHG emissions).
- 4.2 Through our conversations, it is clear the GHG Protocol Corporate Standard is the globally recognised primary source for guidance; <https://ghgprotocol.org/>. The Scope 3 technical guide provides technical guidance for calculating Scope 3 emissions. <https://GHGprotocol.org/Scope-3technical-calculation-guidance>
- 4.3 The Scope 3 Evaluator is a web-based tool from the GHG Protocol that provides companies with a way to understand their Scope 3 emissions including the 15 Scope 3 categories, regardless of size or type of organisation. (It should be noted that the information in the calculator is a little out of date, but it is still acknowledged as one of the most useful tools available). <https://GHGprotocol.org/Scope-3-evaluator>
- 4.4 Further guidance for addressing some of the most relevant emissions categories included in the 15 Scope 3 emissions areas identified in the GHG protocol may be added to the Code of Practice in future. For example, the intention is to develop Defence specific aspects e.g. Ordnance, Munitions and Explosives (OME).

- 4.5 Some organisations have indicated that using Publicly Available Specification (PAS) 2060 to demonstrate 'carbon neutrality' is beneficial and there are also a number of ISO standards (e.g. ISO 14001, and ISO 50001) which can support environmental management processes and data. There are a number of standards – none solve all measurement requirements but are a useful starting point.
- 4.6 Many Defence suppliers have operations and/or supply chain across different countries and there is a need to reconcile UK GHG emissions reporting requirements alongside the different obligations in other countries. For example, emissions factors vary depending on country.
- 4.7 Recommendations:
- It is recommended that organisations start with the guidance in the GHG Protocol Corporate Standard and the Scope 3 technical guide.
 - Be open and transparent in the methodology and any assumptions used, to help stakeholders understand the approach being taken.
 - It is recommended that organisations follow the GHG principles including relevance, completeness and accuracy.
 - While capturing and reporting emissions is clearly important, it is a significant undertaking and a balance should be struck so that resource can also be invested in developing effective emissions' reduction plans.

5. Sources for emissions factors

- 5.1 There are various sources for converting different environmental data into CO₂e emissions, the primary source is the UK conversion factors published by BEIS [Government conversion factors for company reporting of greenhouse gas emissions - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/government-conversion-factors-for-company-reporting-of-greenhouse-gas-emissions) These are generally updated annually to reflect further decarbonisation of the grid.
- 5.2 Emission factors are a substantive element of the GHG emissions calculation and so where practicable, there are benefits in the sector using the same approach for consistency.
- 5.3 Many organisations will also be calculating aspects of their footprint from overseas and can assess in-country emissions in a similar way.
- 5.4 Recommendations:
- Use the latest BEIS figures for UK as the principle authoritative source.
 - Quote the source of any alternative emissions factors being used. Use an authoritative source.
 - Signpost to any international emissions factors being used.
 - If emissions factors are not available for a specific GHG source, be transparent in the approach taken.

6. Data collection and maturity

- 6.1 The data required to capture full GHG emissions is substantive, and for many organisations, Scope 3, is a relative recent addition. The Defence industry needs to continue to work together to improve the use of the different methodologies as our knowledge of GHG foot-printing evolves.
- 6.2 Products and services are recognised as one of the most challenging aspects. There are a number of approaches which can be used to measure different activities including (see Fig 1.1 of Category 1 - Technical Guidance for Calculating Scope 3 Emissions):
- 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).
 - Average-data method – estimates emissions for goods and services by collecting data on the mass (e.g., kilograms or pounds), or other relevant units of goods or services purchased and multiplying by the relevant secondary (e.g., industry average) emission factors (e.g., average emissions per unit of good or service)
 - Hybrid method – uses a combination of supplier-specific activity data (where available) and secondary data to fill the gaps.
 - Supplier-specific method – collects product-level cradle-to-gate GHG inventory data from goods or services suppliers.
- 6.3 The same foot-printing methodology is not necessarily applicable to all the different types of companies operating in a diverse sector such as Defence.
- 6.4 For an organisation to report its Scope 3 emissions accurately there is a need for GHG reporting for most, if not all, of the contracts it places with its suppliers. The climate change aspects of ITTs (within the Environmental or Sustainability sections) should address the capability or service requirement for emissions reporting and seek collaborative and innovative ways to reduce the PSS footprint. Initially each organisation will need to decide the level of data they are able to capture for their initial assessment and then consider a pathway to more accurate capture, assuming more accurate data will aid in creating more effective reduction plans. Applying a spend based approach may be sufficient to deliver a successful reduction strategy. However, there are significant limitations in that spend, and changes in cost are not necessarily related directly to the GHG footprint of the PSS. Supplier-specific methodologies can be used to obtain a more accurate comparison between similar products and services. The reporting effort should be proportional to the size and Scope of the contract.
- 6.5 It is important to focus on the areas where the biggest reductions can be achieved. Also, as our understanding of GHG foot-printing evolves it is important to continue to evaluate the different methods available in order to improve the accuracy of measuring emission's performance. It will be important for organisations and their suppliers to work together to determine the best approach in each case.

- 6.6 Collecting data across a programme or portfolio requires careful consideration. For example, there may be significant inconsistencies in the way the emissions are declared across different types of PSS. Particularly for many Defence applications the emissions estimate in the design phase do not always match what happens once the equipment is in-service. There are also security sensitivities on making some data public. Close co-operation will be needed to develop more effective measurement techniques and to improve guidance.
- 6.7 A systems level approach may be beneficial in taking a systematic view of the emissions related to a particular output or an organisation's approach. This should assist in identifying any potential gaps with the contributions to overall emissions.
- 6.8 Recommendations.
- Be transparent in the data being used.
 - Consider your data maturity pathway.
 - Focus on those aspects of your footprint that are largest or most material and can help drive the biggest reductions (noting for some industry suppliers this could be outside of the UK defence work).
 - Create good estimates of through life emissions within contract requirements and use as the basis for supplier Scope calculations.

7. Carbon Calculators

- 7.1 We are increasingly calculating GHG emissions to demonstrate progress against targets, make decisions and place requirements in contracts so it is important that we have a common understanding and consistency of approach for the Defence sector.
- 7.2 There are a growing number of off-the-shelf solutions, and many organisations are developing in-house tools, so this short annex provides some high-level guidance for selecting a carbon calculation tool.
- 7.3 Purpose. Before selecting a carbon calculator, it is important to be clear on the subject and scope of the calculation (eg project, or organisation), how the results of the calculation will be used, and assumptions / factors to be used in the calculation.
- 7.4 Methodology / Standards. It is also important to understand which methodology / standards are supported by an off-the-shelf carbon calculator (e.g. Greenhouse Gas (GHG) Protocol Corporate Standard, GHG Protocol Product Standard) and ensure that these are consistent with the purpose of the calculation and / or contractual requirements
- 7.5 Taxonomy. A carbon calculator is based on three elements which enable GHG emissions (usually kg or tonnes CO₂e) to be calculated:
- Source: information (across Scopes 1, 2 and 3 such as electricity, type of fuel, purchased goods)
 - Amount: for example, miles driven, litres of fuel, amount spent with a supplier

- Emission factors e.g. BEIS (see section 5)

7.6 A calculator can be a “simple” spreadsheet or a more complex proprietary tool.

7.7 (Shadow) Cost of Carbon. Some organisations are building an internal cost of carbon (for example typically £50/tonne) to help create internal carbon budgets.

7.8 Carbon Decision Tools also exist to help use GHG emissions as part of business cases (e.g. comparing the emissions from different solutions).

7.9 Recommended principles:

- **CONSISTENCY**: Calculators should be based on recognised methodology and up-to-date emissions factors as described in this guide - where they deviate this should be explained.
- **TRANSPARENCY**: Where calculators are used to measure progress, assumptions (e.g. methodology and emissions factors) should be agreed and outputs shared with partners/customer.
- **ACCESSIBILITY**: We need to ensure that all organisations across Defence can access good quality calculators; cost should not be a barrier to measuring and managing GHG emissions. We should avoid mandating the use of specific calculators, unless we are providing them.
- **MATERIALITY**: Factors and assumptions must be relevant or significant to the calculation. The output of the calculation should be sufficiently detailed (but no more) to support the purpose of the calculation.
- **DATA INTEGRITY**: Organisations undertaking carbon calculations must ensure the quality of and be ready to be held to account for the result of the calculation.

8. Organisational boundaries

8.1 It is inevitable that by capturing and reporting Scope 3 emissions in different organisations, it will lead to “double accounting” of the same emissions. This is an issue if calculating the emissions of the entire sector but, it is more important to show emissions have been accounted for, so that organisations at different points in the value chain can develop shared ownership and work together to identify measures for reduction.

8.2 This also includes circumstances where it is necessary to measure GHG emissions on shared sites and other shared boundaries between different organisations. The Scope 3 emissions related to the in-service use of a product should not be considered as part of the organisational declaration if the use is by another organisation. However, the in-service aspects will need to be considered as part of any contract specific social values consideration (SV is explained in section 11).

8.3 Recommendations:

- Where possible, customers should take care to specify detail about planned in service use of equipment and this can then be used as the assumption for calculation of the supplier’s Scope 3 emissions (category 11 – See Annex A) and the customers Scope 3 emissions (category 4).

- Customers and suppliers should consider where primary opportunity and responsibility sits between the organisations.

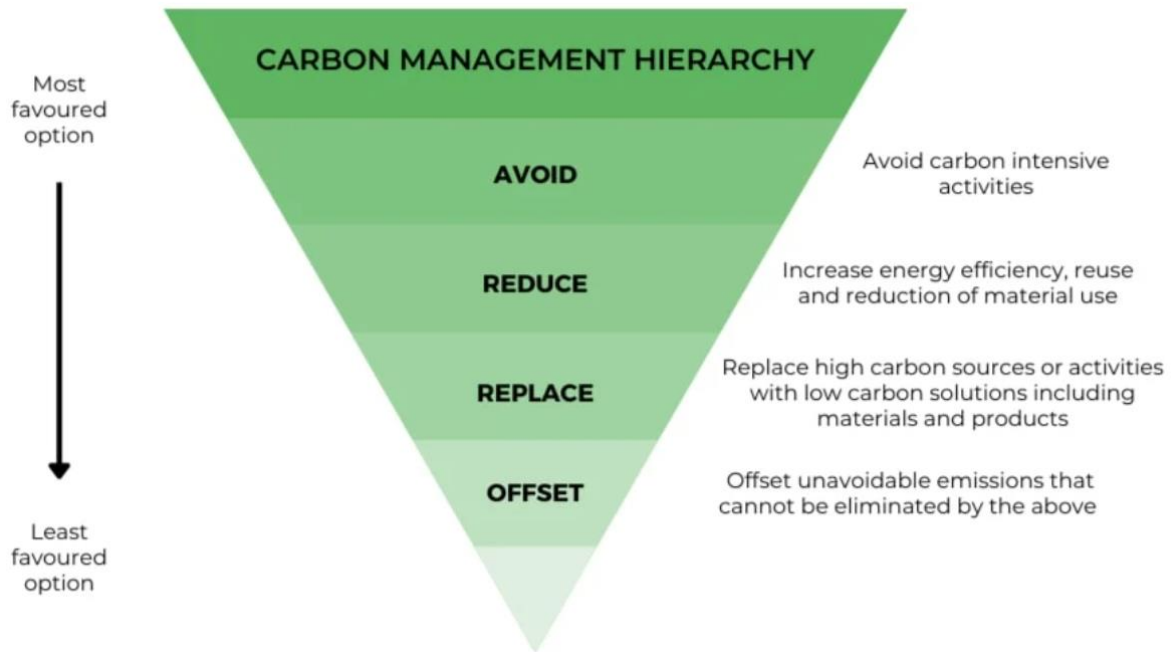
9. Incentivisation

- 9.1 A wide range of measures are being considered by MOD to reduce the GHG footprint of products and services throughout their lifecycle. This includes investigating potential incentives for low carbon options as part of contract decision making, in situations where it is appropriate. Tier 1 suppliers should consider how this could flow down into the supply chain.
- 9.2 Organisations across the sector could consider other incentive mechanisms such as the implementation of an internal “cost of carbon” to inform decision making and investment. In addition, evidence for supporting addressing greenhouse gas reduction within employee performance management and leadership incentive schemes could be considered.

10. Offsetting

- 10.1 It is generally agreed that organisations should prioritise taking all possible actions to reduce emissions first, and only then consider offsetting.
- 10.2 Offsets are discrete GHG reductions used by organisations to compensate for (i.e., offset) GHG emissions elsewhere in their operations². This can include internal projects that reduce GHGs such as carbon sequestration, and the purchasing of carbon ‘credits’ through investment in certified external carbon offsetting programmes.
- 10.3 Offsetting, including carbon sequestration, should be considered as a viable approach to ameliorate residual GHG emission following reduction activities. This avoids the risk that offsetting can lead to negative behaviour such as ‘greenwashing’ and potentially undermine efforts to reduce emissions at source. So, while there are often good reasons for offsetting, under the mitigation hierarchy, this should be regarded as a final option as shown below.

² See [ghg-protocol-revised.pdf \(ghgprotocol.org\)](#)



10.4 It is anticipated that there are future technology and process solutions to address emissions which may not be currently available and so offsetting can form an interim solution as part of a long-term strategy to address more difficult technology challenges.

10.5 It is important that organisations provide clear information on any offsetting activities on a case-by-case basis, and they are transparent about which measures have been used and the reasons are fully explained. Care should also be taken that any offsetting claims are independently validated and any contracting out or carbon credits is via a reputable source.

11. Alignment with PPN 06/21 (Carbon Reduction Plans)

11.1 The UK Government's focus on GHG emissions measurement and reduction is starting to be included in public procurement in two principal ways, as part of supplier selection checks that organisations have published GHG reduction plans, and as part of the Contract Award evaluating Social Value (including GHG reduction) when evaluating Tenderers' proposals.

11.2 In June 2021, the UK cabinet office issued PPN06/21 requiring organisations to publish a carbon reduction plan. Minor updates to terminology are anticipated in late 2024 under the New Procurement Act 2023:

<https://www.gov.uk/government/publications/procurement-policy-note-0621-taking-account-of-carbon-reduction-plans-in-the-procurement-of-major-government-contracts>

11.3 The PPN is a requirement for bidding for PCR and DSPCR contracts of £5m pa³.

³ As of 28 Oct 2024 PCR and DSPCR will be replaced by the new Procurement Act 2023. The new Act will be referred to in Commercial Policy as PA 2023.

11.4 The PPN requires a high-level commitment and is currently in Phase 1. This Phase 1 is limited to only 5 aspects of Scope 3. It is suggested that organisations take a more comprehensive view at this stage as Phase 2 will see the GHG Reduction plan requirements increase.

12. Alignment with PPN 06/20 (Social Value)

12.1 The UK Cabinet Office introduced in PPN 06/20 the Social Value Model for all central government procurement under the Public Contract Regulations from January 2021 and the MOD has extended this to all procurements under the Defence & Security Public Contract Regulations from June 2021.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/921437/PPN-06_20-Taking-Account-of-Social-Value-in-the-Award-of-CentralGovernment-Contracts.pdf

12.2 The policy requires a minimum of 10% of the total award criteria to be applied to Social Value criteria set out within the Social Value Model. The Model has five themes one of which is “Fighting climate change”. Tenderers are required to submit qualitative evidence that addresses the award criteria to show amongst other things the additional environmental benefits that will result from the award of the Contract(s).

13. Review arrangements and further information

13.1 The Code of Practice has been developed jointly between MOD and industry via the DSF.

13.2 MOD and industry are invited to follow the guidance and recommendations within this Code of Practice although It is not a formal contract requirement.

13.3 The code will be reviewed periodically to reflect evolving good practice together with future changes to standards and regulatory requirements. Amendments will be identified in the revisions annex.

13.4 The Code will be published on the DSF Defence Share site - [Communications and Updates - Defence Suppliers Forum Portal - Defence Share \(mod.uk\)](#)- and the Defence Sourcing Portal.

13.5 A number of industry collaboration Fora (eg he ADS Sustainability working group) have ongoing programmes to help member organisations develop their understanding of sustainability requirements including GHG emissions reporting. These Fora are invited to use, promote and provide feedback on the Code.

Annex A – Scope 3 Emission Guidance

1. Introduction

- 1.1 This Annex provides an overview of Scope 3 emissions for reporting organisations. The following guidance has been developed by workshops facilitated by the DSF CC&S Working Group to explore Scope 3 emission categories and will be added to on a category-by-category basis. For reference, the Scope 3 emission categories defined by the GHG Protocol are:

Category	Description
1	Purchased Goods and Services
2	Capital Goods
3	Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2
4	Upstream Transportation and Distribution
5	Waste Generated in Operations
6	Business Travel
7	Employee Commuting
8	Upstream Leased Assets
9	Downstream Transportation and Distribution
10	Processing of Sold Products
11	Use of Sold Products
12	End-of-Life Treatment of Sold Assets
13	Downstream Leased Assets
14	Franchises
15	Investments

- 1.2 This guidance is intended to help simplify the allocation of Scope 3 emissions across the value chain and allow us all to apply this in a consistent way but that also best suits our organisation. This guidance is not intended to be a formal process as each organisation will have its own specific nuances that will need to be considered.

2. Category 1 – Purchased Goods and Services

- 2.1 This category includes all upstream (cradle-to-gate⁴) emissions from the production of “products” purchased or acquired by the reporting organisation in the reporting year; where “products” includes both goods (tangible) and services (intangible).
- 2.2 For most organisations, Category 1 accounts for between 70 – 95% of their entire emissions (Scopes 1-3) and includes emissions from all purchased goods and services not otherwise included in the other categories of upstream scope 3 emissions e.g. capital goods (Category 2) transport (Category 4) and waste (Category 5).

⁴ Including extraction, production, and transportation of products to the Purchaser's gate

- 2.3 In a perfect world, to fully account for these emissions, we would have our supply chains fully mapped and be able to request product specific data from each supplier in our supply chains. For many of us however, we are on the journey to understanding our supply chains and carbon footprints, so there is still significant work to be done.
- 2.4 Data Sources. Where possible, supplier specific data sources should be used. However In lieu of supplier specific data, secondary data can serve as an excellent starting point to simply quantify category 1 emissions until supplier specific data becomes available. These estimates and proxies can then help to prioritise areas that present a material impact to your Category 1 footprint.

Primary: Supplier Specific

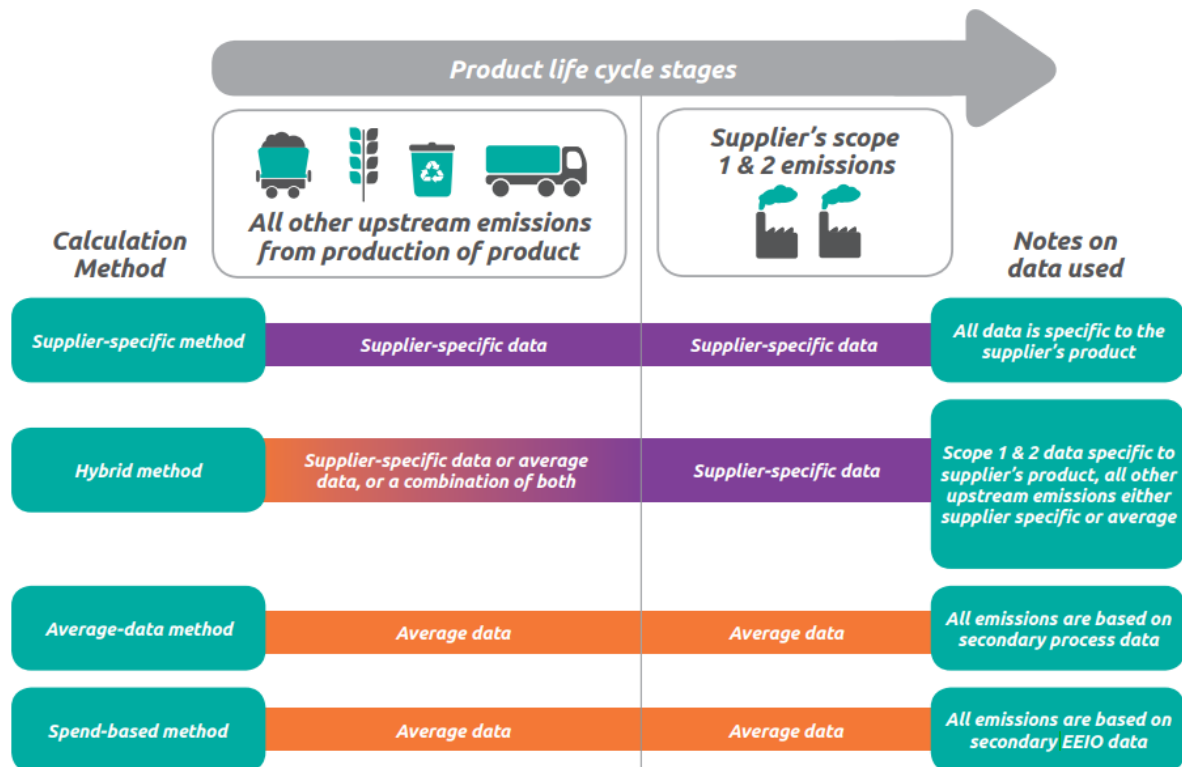
- Product carbon footprint: cradle-to-gate emissions data from suppliers calculated using site specific data
- Life cycle assessments: site specific energy use (Scopes1&2) data from suppliers
- Hybrid: using a combination of supplier-specific activity data (where available) and secondary data (estimates or averages) to fill the gaps when supplier-specific data is not available.

Secondary: Estimated or Average

- Average-data or Mass-based: estimate emissions for goods and services by collecting data on the mass e.g. units of emissions per mass of materials purchased converted in to tonnage
- Spend-based: estimate emissions per unit of currency spend based on taxonomy / category emissions factors

2.5 Recommendation:

- Supplier specific data provides a more accurate picture than £/\$ spent, so encourage your suppliers to calculate their own carbon footprint.



EEIO = Environmentally-Extended Input-Output

2.6 So what are the challenges? Our supply chains in defence can be large and very complex, with purchased goods and services coming from an extensive list of suppliers. This can make it hard to identify where to focus.

2.7 Where do we start?

Priorities

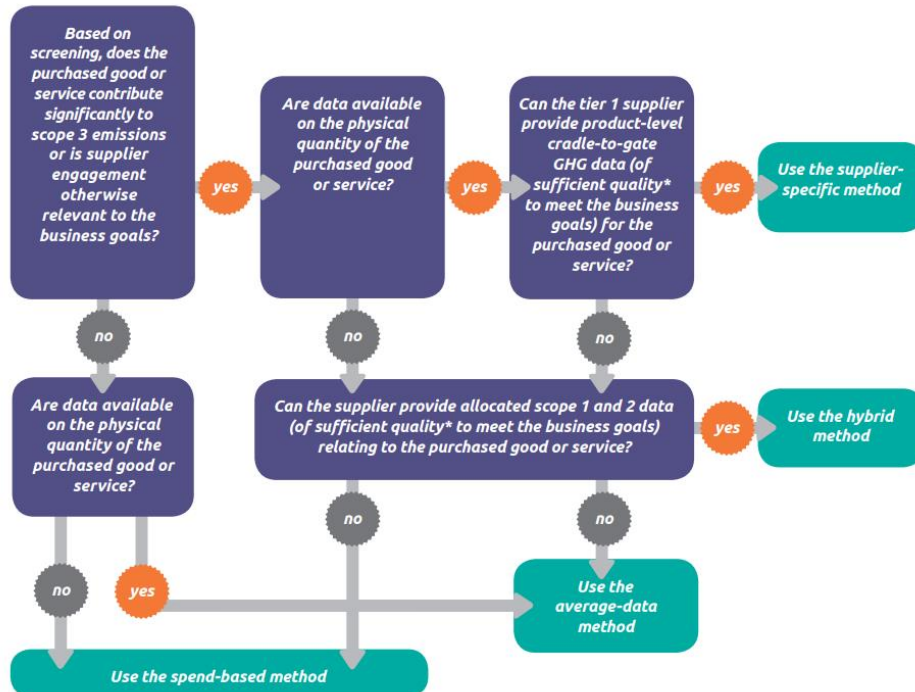
- Look at your spending: Where in your supply chain do you spend the most money?
 - Identify your top 10, 50 or 100 suppliers and start with them. You cannot do your entire supply base.
- Draw boundaries: Supply chains can have a long tail and you can't look at everything.
- Identify "hotspots": Identify your highest emitting categories - your largest emissions sources. These may provide the biggest opportunities for reductions.

What is the quality and the availability of the data that can be collected?

- Consider - can you collect emissions data through the supplier on-boarding appraisal and re-assessment process?
- Ask your suppliers if they have incorporated emissions reductions into their product roadmaps. Note: sectors such high tech (laptops and mobiles) are already creating Carbon Product Data Sheets.
- Use supplier strategic or quarterly business review agendas to introduce climate change topics such as carbon accounting and climate resilience.
- Host supplier innovation days to encourage engagement and collaboration with key stakeholders across the organisation to discuss reduction of emissions.
- Share your own approach and tools – lead by example or co-create.

- Do not overwhelm or bombard your suppliers with lots of emissions data requests. This is likely to have a negative effect and turn your suppliers off, rather than inspire and innovate them.

2.8 This decision tree can help:



2.9 Be Aware of:

Double accounting:

- Specific categories of upstream emissions are reported separately to enhance the transparency and consistency of Scope 3 reports from Category 2 through to Category 8. This also includes Scope 2 and the procurement of electricity utilities.

Greenwashing

- What are suppliers stating?
- Are they being transparent?
- Do they know the difference between carbon neutral and Net-Zero (ISO 14068) - are they actively reducing emissions or simply offsetting?

Inflation:

- When looking back at data to create a baseline, or re-calibrating for adjustments (e.g. after mergers, acquisitions or selling off), it is important to take account inflation data to convert market values between your baseline year and year of reporting.

Geography:

- Different regions and governments geographically have different emissions factors and currency that need to be considered.

Different methodologies

- Different calculation methods achieve different results. See example below

Methodology	Pros	Cons
Spend Based (using US EEIO*) *US EEIO is 2018 rather than DEFRA table 13 which is 2011	<ul style="list-style-type: none"> • Spend based calculations acknowledge Scope 3 impacts and serve as a placeholder for supplier-specific information • Source data should be easy to pull from procurement or accounts payable • Factors are available for over 1800 scenarios and can be used beyond purchased goods and services 	<ul style="list-style-type: none"> • Spend based calculations are only a proxy for GHG emissions and can only be considered an estimate • The most current data set from US EEIO is based on 2018 USD\$ and does not account for impacts to pricing (i.e. discounts, inflation, scarcity) • Broad categorisation of industries may not account for supply chain nuances
Mass Based (using UK DEFRA)	<ul style="list-style-type: none"> • Mass based factors are specific to particular materials • DEFRA provides factors for primary and secondary sourced materials • Mass based calculations are not influenced by economic drivers 	<ul style="list-style-type: none"> • Factors are estimates based on average data and may not be representative of all supply chains • Limited availability of factors (only 72 provided by DEFRA) • Mass based purchasing data may be difficult to source and may require volume to mass conversions with an assumed density

- **Worked example** - If we were to calculate the emissions from a theoretical food products manufacturer, who purchased 50,000 PET plastic bottles to package their product in 2021, they would have spent \$20,000 for 2 tonnes of bottles. Using emission factors from the USEEIO and DEFRA resource libraries, we can compare the calculations and results:

Spend Based using US EEIO Source Data	Mass Based using UK DEFRA Source Data
Emissions Factor (EF) Source: USEEIO, 326160 Plastics bottle manufacturing – With Margins	Emissions Factor (EF) Source: DEFRA, Material Use, Plastics: PET (incl. forming), Primary Material
EF: 0.728 kg CO _{2e} /USD\$	EF: 4032.39 kg CO _{2e} /tonne
(\$20,000 USD) x (0.728 kg CO _{2e} /USD\$) = 14,560 kg CO_{2e}	(2 tonnes PET bottles) x (4032.39 kg CO _{2e} /tonne) = 8,065 kg CO_{2e}

3. Category 6 – Business Travel

- 3.1 This category includes emissions for the transportation of employees for business related activities arising from vehicles owned or operated by third parties including air, rail, tram, bus, car, other and modes, including employees using their own vehicles for business trips. Organisations may optionally include accommodation (e.g. hotel stays).

For leased assets, GHGP accounting must align with IFRS reporting standards to differentiate between Scope 2 and Scope 3 emissions.

- 3.2 Ideally, primary data from Travel Providers should be used. In lieu of such data, spend / fuel / distance-based calculation methods can be used. For the latter, consistency of data use should be prioritised.
- 3.3 Accuracy of business travel data can be impacted by booking methods used and enforcement of Business Travel Policies. For example, spend-based data is unreliable and may only be available via (indirect) expense submissions for travel booked on company or personal credit cards e.g. train tickets purchased directly at a train station or, a central London or very remote hotel would cost considerably more and therefore additional data would be required.
- 3.4 Employees need to understand the impact of their travel to make more environmentally friendly decisions. When selecting travel providers, ensure the provider / booking system gives the user and management teams visibility of CO2e emissions on travel options, including an estimate of emissions for different journey types.

Use behavioural nudges or prompts, such as positive reinforcement visualisations and / or gamification to encourage positive change rather than blocking travel options e.g. by taking a train instead of flying, “xx” tonnes of carbon would be saved. Additional benefits including the increased productivity potential of taking a train rather than driving can also be highlighted.

- 3.5 The approach needs to be financially viable, balancing carbon savings against affordability and safety, among other factors. It is important to consider the size of a company’s footprint from business travel in context to the rest of the total carbon footprint, and how much time and investment you are going to prioritise in the collection and analysis of accurate data. For example:

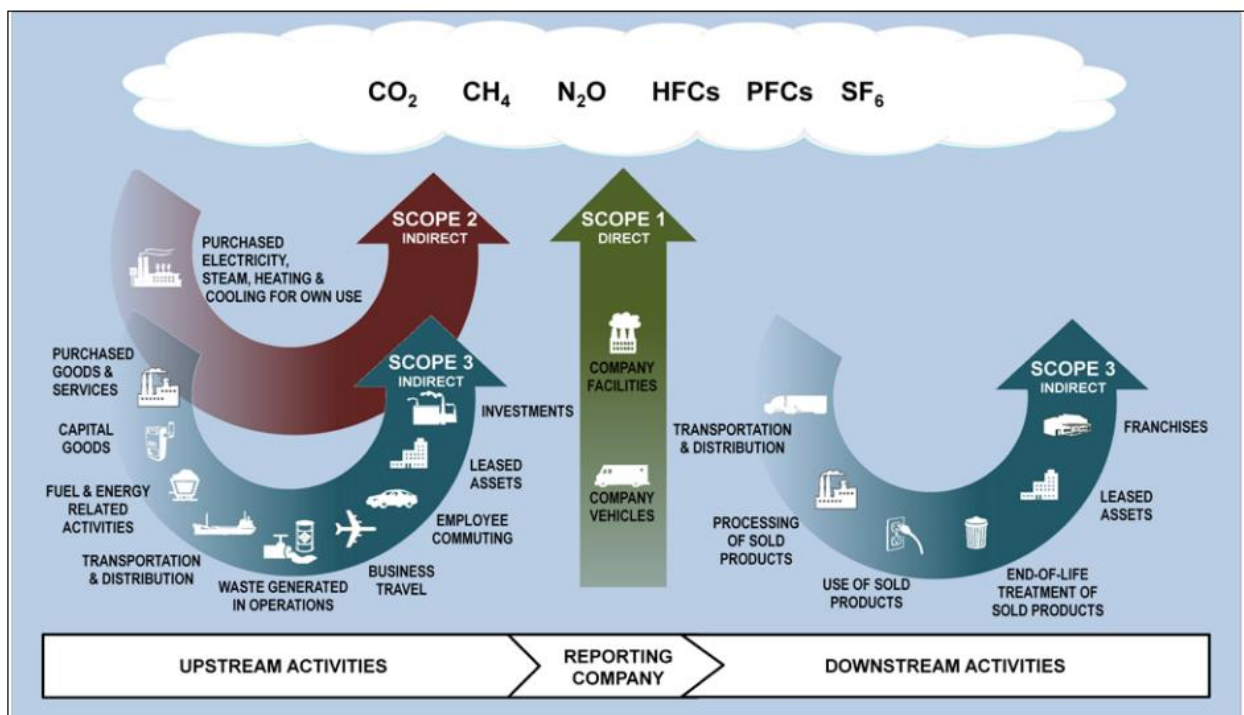
In a large manufacturing organisation, Business Travel could typically represent less than 3% of total emissions, with Categories such as Purchased Goods and Services or Sold Products representing a greater priority.

However, in a Consultancy based SME, Business Travel could be as high as 90% making it the biggest impact. Note: even when business travel is paid for under a customer contract, it still needs to be captured by the reporting company.

- 3.6 Company Business Travel and Expenses Policies should reference greenhouse gas emissions from travel to guide and direct decision making by employees. Policies may also need to consider how explicit what can be claimed as business travel and determine the materiality of journeys claimed. For instance, are employees able to expense and therefore count short low value journeys e.g. on the bus, underground or a tram. Consistency is more important than accuracy or granularity of data.

4. Category 7 – Employee Commuting

- 4.1 This category includes emissions for the transportation of employees between their home and place of work, arising from travel by car, bus, rail, tram, motorbike, bicycle, and walking. Reporting organisations may choose to include home working.
- 4.2 Note: it is important to correctly account for employee transportation across the value chain:



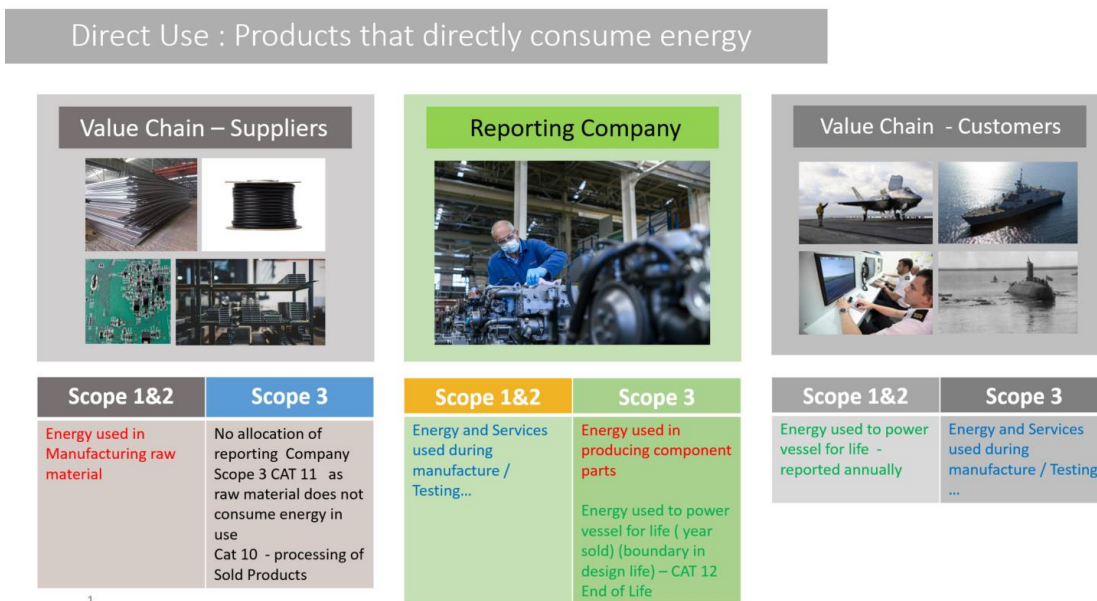
[ghg-protocol-scope-3-standard-executive-summary1.pdf \(ghgprotocol.org\)](https://www.ghgprotocol.org/ghg-protocol-scope-3-standard-executive-summary1.pdf)

- 4.3 Ideally, primary data from employees directly using self-reporting tools or applications and surveys should be used. However, this represents point in time data, and viability needs to be considered, alongside other constraints including GDPR. The required granularity of commuter data should be considered where it can add to the data quality and impact of decision making, for example by differentiating between the mileage emissions of staff driving electric vehicles compared to ICE vehicles.
- 4.4 In lieu of such data, assumptions can be made using anonymised point to point data “as the crow flies” from home to work addresses. Accuracy of commuting data can be impacted by assumptions, variability of hybrid working, method of commute and overestimating.
- 4.5 Both travel and commuting can be emotive categories to measure and influence, as they impact employees’ personal lives. Decision making is behavioural, usually based on convenience and / or choices (e.g. rural areas generally have little public transport) and value for money to the individual.

- 4.6 Consistency is more important than accuracy or granularity of data. Especially with Commuting, accuracy requires multiple factors to be addressed e.g. GDPR, simplicity and frequency of collection and multiple company sites.

5. Category 11 – Use of Sold Products

- 5.1 This category includes emissions from the use of **products and services** sold by the reporting company in the reporting year. A reporting company's Scope 3 emissions from Use of Sold products include the Scope 1 and Scope 2 emissions of end users.
- 5.2 The following examples describe three typical value chain scenarios and are considered from the perspective of the reporting company. They are:
- Scenario 1- Direct use: Products the directly consume energy in use.
 - Scenario 2 - Direct use: Sold Intermediate products (non-emission generating)
 - Scenario 3- Direct use: USE phase emissions form Sold intermediate products
- 5.3 Colour-coding of the various emission types has been used in the following diagrams to show the relationship between Scope 1&2 and Scope 3 emissions of organisations in the value chain. Note that some non-category 11 Scope 3 emissions are also described to aid understanding of relationships.



- 5.4 Scenario 1 assumes a traditional value chain comprising suppliers, manufactures and customer, where the reporting company is the main manufacturer.

- 5.5 A few areas to be aware of in this example are:

- No allocation of the reporting company's Scope 3 to suppliers, as the materials and parts supplied do not produce emissions when in use.
- While the reporting company reports in-use emissions for the life of the product in the selling year (i.e. if an aircraft has an expected in-service life of 10 years, that the total in-use emissions over 10 years will be reported for each aircraft sold in reporting year), the customer will only report in use emissions annually for that reporting year.

Direct Use : Sold Intermediate Products (Non Emission generating)



2

- 5.6 Scenario 2 assumes the reporting company manufactures component parts of a larger product and those component parts do not generate emissions in use (e.g., the tail section of an aircraft) and sells these to a consolidating company for integration into a final product for onward sale to the end user.

Direct Use : USE phase emissions from Sold Intermediate products



3

- 5.7 Scenario 3 is a variation on scenario 2 with the main difference being that the reporting organisation in this case is the manufacturer of a component part that directly generates emissions while in use (e.g., an aircraft engine). The reporting organisation still sell their product to the consolidator for integrating into the final product (e.g., an aircraft) and onward sale to the end user. In this case there is an option for the reporting organisation to be allocated a portion of the in-use emission for the final product. The example above is based on the weight ratio of the component part / the overall weight of the final product, emissions per time in use and expected life of product to give a percentage of the lifetime emission to the reporting organisation. (Data used for example only)
- 5.8 As mentioned above, this is intended as an example only and each reporting organisation will have to apply to their own operating environment to establish their Cat 11 emissions. The goal is that each organisation in the value chain has a good understanding of their specific allocation of emissions. It should also be noted that this is only for the reporting organisation's emissions. Emissions are not "passed" from one organisation to another as allocation will be for each reporting organisation to determine for themselves.

5.9 Use of Sold Services

Sold services such as the undertaking and provision of Trials is not covered by the GHG Protocol. Accountability for embedded emissions is harder to establish between the Reporting Company and the Customer.

Things to consider:

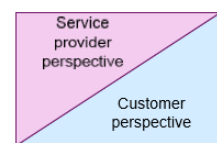
- Business Travel getting there (out of Scope – Category 6)

- Duration of the trial (days / weeks / months / years)
 - a) One off / frequency of trial(s) / use
 - b) How long is any asset being used for (8 hours a day?)
- Are any assets being used owned by the Reporting Company / Customer / 3rd party supplier?
- If loaned by a Customer, the emissions fall out of Scope
- Need to know the energy consumption of any assets used
- How many assets are being used in the trial?
- You will need an emissions factor or lifecycle carbon footprint. Are you able to access a carbon calculator?
- Calculating the “manpower hour” of the contractors / consultants involved

Assumptions for trial emissions footprint:

- Electricity and fuel used by reporting company assets (laptops, mobile phones, equipment e.g. transmitter / receivers):
- Reporting Company: Scope 3 Category 11 Sold Service
- Customer: Scope 3 Category 1 Purchased Service
- Reporting Company employee flights, accommodation and transportation to trial location:
- Reporting Company: Scope 3 Category 6 Business Travel
- Customer: Scope 3 Category 1 Purchased Service
- Electricity and fuel use on Reporting Company sites (visiting personnel, etc.)
- Reporting Company: Scopes 1 and 2
- Customer: Scope 3 Category 1 Purchased service
- Electricity and fuel use in Reporting Company assets not on 3rd party sites
- Reporting Customer: Scopes 1 and 2
- Customer: Scope 3 Category 1 Purchased service
- Electricity and fuel use in Customer assets not on 3rd party sites
- Reporting Company: N/A
- Customer: Scopes 1 and 2

	Service Provider Site	Customer Site	3 rd Party Site
Electricity & fuel use – Service Provider Asset	S1&2 ¹ S3 Cat 01	S3 Cat 11 S1&2 ¹	S3 Cat 11 S3 Cat 01
Electricity & fuel use – Customer Asset	S1&2 ¹ S3 Cat 01	N/A ² S1&2 ¹	N/A ² S3 Cat 01
Service Provider -Travel & Hotel	S3 Cat 06 S3 Cat 01	S3 Cat 06 S3 Cat 01	S3 Cat 06 S3 Cat 01



If a company sells a component that is part of a larger final product, it is only responsible for a portion of the final product emissions. A similar approach has been taken with the emissions for a sold service where assets are provided by other parties

¹Could also be S3 Cat 8 for leasehold sites

²Could be included in S3 Cat 11 – Indirect Use Phase

Annex B Summary of Resources:

Carbon Calculators

- [UK - SME Climate Hub \(businessclimatehub.org\)](https://businessclimatehub.org/)

Greenhouse Gas Protocol Corporate Standard:

[Chapter1.pdf \(ghgprotocol.org\)](https://ghgprotocol.org/Chapter1.pdf)

Science Base Targets Initiative:

[The Corporate Net-Zero Standard - Science Based Targets](https://sciencebasedtargets.org/)

Quantis Scope 3 Evaluator

<https://quantis-suite.com/Scope-3-Evaluator/>

UK GOV: DEFRA:

[DEFRA Table 13](https://www.gov.uk/government/publications/defra-table-13)

[Greenhouse gas reporting: conversion factors 2022 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022)

[UK - SME Climate Hub \(businessclimatehub.org\)](https://businessclimatehub.org/)

IAEG:

[IAEG - GHG Reporting Guidance](https://www.iaeg.com/ghg-reporting-guidance)

[GHG Reporting Guidance for the Aerospace Industry \(iaeg.com\)](https://www.iaeg.com/ghg-reporting-guidance-for-the-aerospace-industry)

US Environmental Protection Agency:

[US Environmentally-Extended Input-Output \(USEEIO\) Models | US EPA](https://www.epa.gov/ghg-reports/seeio-models)

Commuting and Homeworking additional guidance:

[The Carbon Emissions of Homeworking and Office Working - Circular Ecology](https://www.circular.ecology.com/articles/the-carbon-emissions-of-homeworking-and-office-working-2020)

[Greenhouse gas emissions under work from home vs. office: An activity-based individual-level accounting model - ScienceDirect](https://www.sciencedirect.com/science/article/pii/S0959652620300000)