Estimating the greenhouse gas impact of advice and designs

Three practical approaches for the environment and engineering sectors

September 2024

Summary

This paper presents three practical methods for environmental and engineering professionals to estimate greenhouse gases in their designs and advice. It was created by a Pledge To Net Zero working group, which aims to reduce greenhouse gases quickly in these sectors.

The main reason for carrying out this work is that the designs and advice which the environmental and engineering sectors provide to our clients represents the largest greenhouse gas impact. However, these emissions are not effectively included in current Science Based Targets from our sector because they fall outside the boundaries of the Greenhouse Gas Protocol for Scope 3 emissions. There is a need for consistent methods to estimate these emissions, to support effective action is in support of the UN Race to Zero campaign's report: *CATALYSING CLIMATE ACTION: The role of professional service providers in realizing a net-zero future* which launched in September 2024.

This report sets out three methods for environment and engineering sector firms to estimate the greenhouse gas impact of their work, each with different levels of detail and purposes:

1. **Fast Assessment based on Fee:** Classify the percentage of fees earned in a year that support, are neutral, or work against a net zero transition. This quick method helps assess corporate alignment with net zero goals and is based on an approach used by the Scottish Government.
2. **Project Portfolio Estimate based on Fee / Design activity:** Estimate total carbon emissions from a project and allocate these based on the fee or the specific activity being carried out. Advised emissions are allocated by fee percentage, while designed emissions are based on the project element delivered. A representative sample of projects is assessed and extrapolated to provide an annual carbon number. This method is thorough but simple enough for a company-wide estimate.
3. **Attribution based on Project Whole Life Carbon:** Conduct a detailed project assessment and allocate whole-life greenhouse gas emissions across all parties and stages of project delivery based on the extent of influence. It acknowledges that environmental and engineering consultants are not the only influencers, with asset owners, financiers, designers, builders and operators also playing roles. This method is the most thorough and best for estimating carbon emissions of larger projects.

We welcome feedback on this paper – both on content and also next steps. Please share thoughts with Pledge To Net Zero **here**.

There are three main reasons for this guide

This paper has been produced by a working group convened through 2024 by Pledge To Net Zero, the environmental sector's programme to take fast action on greenhouse gas emissions in our industry. We wanted to work together for three reasons:

1. Buildings, infrastructure, and construction sectors account for over half of all greenhouse gas emissions released into the atmosphere each year globally. Consequently, professional services firms have a significant role to play in addressing the climate emergency through the work we deliver. While decarbonisation of services is occurring today, there is no standardized approach to measure impact and report on progress. There is also currently no consensus on the treatment of emissions from advice and designs using the Greenhouse Gas Protocol, and these emissions largely fall outside the boundary of Science Based Targets.
2. A number of firms in our sector have made commitments to reduce carbon in designs and advice. This paper provides guidance on how firms can measure progress in a consistent way.
3. The UN Race to Zero campaign's report: *CATALYSING CLIMATE ACTION: The role of professional service providers in realizing a net-zero future* includes a commitment to track and monitor progress to net zero in professional services providers' advice.

Other professional services sectors, such as the legal and advertising sectors, have produced, or are producing guidelines for their advice.

We established five outcomes for this guide

ACTIONABLE

Help our sector understand its carbon impact in advice and design to support a net-zero transition.

CONSISTENT

Provide a consistent method for estimating the carbon impacts of designs and advice from consultancies.

RELEVANT

Estimate carbon in a way that is tangible and relevant to the advice given by our people and projects.

INCLUSIVE

Offer a balanced perspective, including both high-carbon and low-carbon projects.

SCALABLE

Develop an approach that is easy for firms of any size to follow and complements existing data gathering and best practices.

Estimating greenhouse gas emissions should drive faster action towards net zero

With nearly every country committing to be net zero by 2050 we have just 25 years to deliver a decarbonised economy. There is no merit in spending a long time discussing a methodology which will be transient.

A quest for perfection will hamper rather than support net zero.

There is no single ‘right’ answer to measuring emissions from designs and advice. We should expect that any greenhouse gas methodology will evolve as knowledge and understanding improves.

Action should always be the main focus, not measurement. Overly complicated and time consuming methodologies will distract from action.

Therefore the aim of this work has been to provide emissions estimation options that can enable designers and advisors to understand how best to start reducing emissions related to their work.

Our sector already quantifies greenhouse gas emissions of many projects. This is especially relevant for designs and can potentially be applied for advised emissions

Methodologies used by our sector today

Methodology	Scope	Strengths	Weaknesses
PAS2080	Carbon management framework for the built environment	Specifically covers designs and advice in the built environment	A system of best practices without specific guidance on how to complete that measurement
RICS Professional Standard: Whole Life Carbon Assessment for the Built Environment	Whole life carbon assessment for built environment projects *Examples - Design of buildings, ground / groundwater remediation schemes, infrastructure projects*	Consistent terminology Well used by built environment sector already Data already provided for larger projects	No attribution between different parts of a project team Less relevant to advice and/or non-built environment schemes Does not cover projects which reduce greenhouse gas emissions
Environmental Impact Assessment as part of planning for large schemes	Estimates whole life greenhouse emissions across construction and operation for larger schemes *Examples – Environmental assessments for all large infrastructure projects*	Gives a whole life carbon number for large schemes which often make up the bulk of our sector's work Data already exists and is produced at early stage in projects	No attribution between different parts of a project team Not applicable for projects which don't require Environmental Assessments
UK Net Zero Carbon Buildings Standard	Buildings wishing to demonstrate alignment with a 1.5C trajectory	Builds on RICS Standard by adding further specificity and consistency Sets 1.5C-aligned carbon limits for designs	Buildings-only Still at Pilot stage

Other advisory sectors have also developed methodologies to estimate greenhouse gas emission

Other approaches which could be relevant to the environment and engineering sectors

Methodology	Scope	Strengths	Weaknesses
GHG Accounting and Reporting for the Financial Sector	The Partnership for Carbon Accounting Financials (PCAF) provides guidance for financial institutions to measure and disclose the greenhouse gas (GHG) emissions associated with their lending and investment activities, known as financed emissions	A consistent approach well used across the finance industry Relatively simple approach Includes emissions factors for different sectors to save the need for detailed measurement of every project	Not directly relevant to our sector as it is largely based around finance, but gives a framework for advised emissions. Some investors have larger influence than others, yet influence is directly attributed to financial input regardless
Net Zero Lawyers Alliance	Guidance for commercial lawyers on assessing the impact of their work.	Gives a simple classification of consistent with net zero or inconsistent with net zero	Qualitative assessment only

Principles - Greenhouse gas impacts of design and advice should be estimated using the principles established by GHG Protocol

- **Completeness** – estimations should cover all of a company's designs and advice.
- **Consistency** – methodologies should be consistently applied.
- **Relevance** – The data provided should support decision making of internal and external users.
- **Accuracy** – Data should enable users to make decisions with reasonable confidence.
- **Transparency** – data should be disclosed in an open way.

Additional principles for environment and engineering advisory firms

- **Attribution** – the company's share of emissions shall be proportionate to the work it carries out on a project.
- **Appropriate** – estimation should be sufficiently detailed to meet these commitments, but not to a level which means all the focus is on measuring rather than reducing emissions.

While our sector is encouraged to disclose the carbon in its design and advice, this is not mandated for Pledge To Net Zero members. Where data is reported, however, this should be done in a way which supports the principles above.

We set out three practical approaches to estimating our sector's climate impact

OPTION 1

Fast Assessment based on Fee

Classify the percentage of fees earned in a year that support, are neutral, or work against a net zero transition. This quick method helps assess company alignment with net zero goals and is based on an approach used by the Scottish Government.

OPTION 2

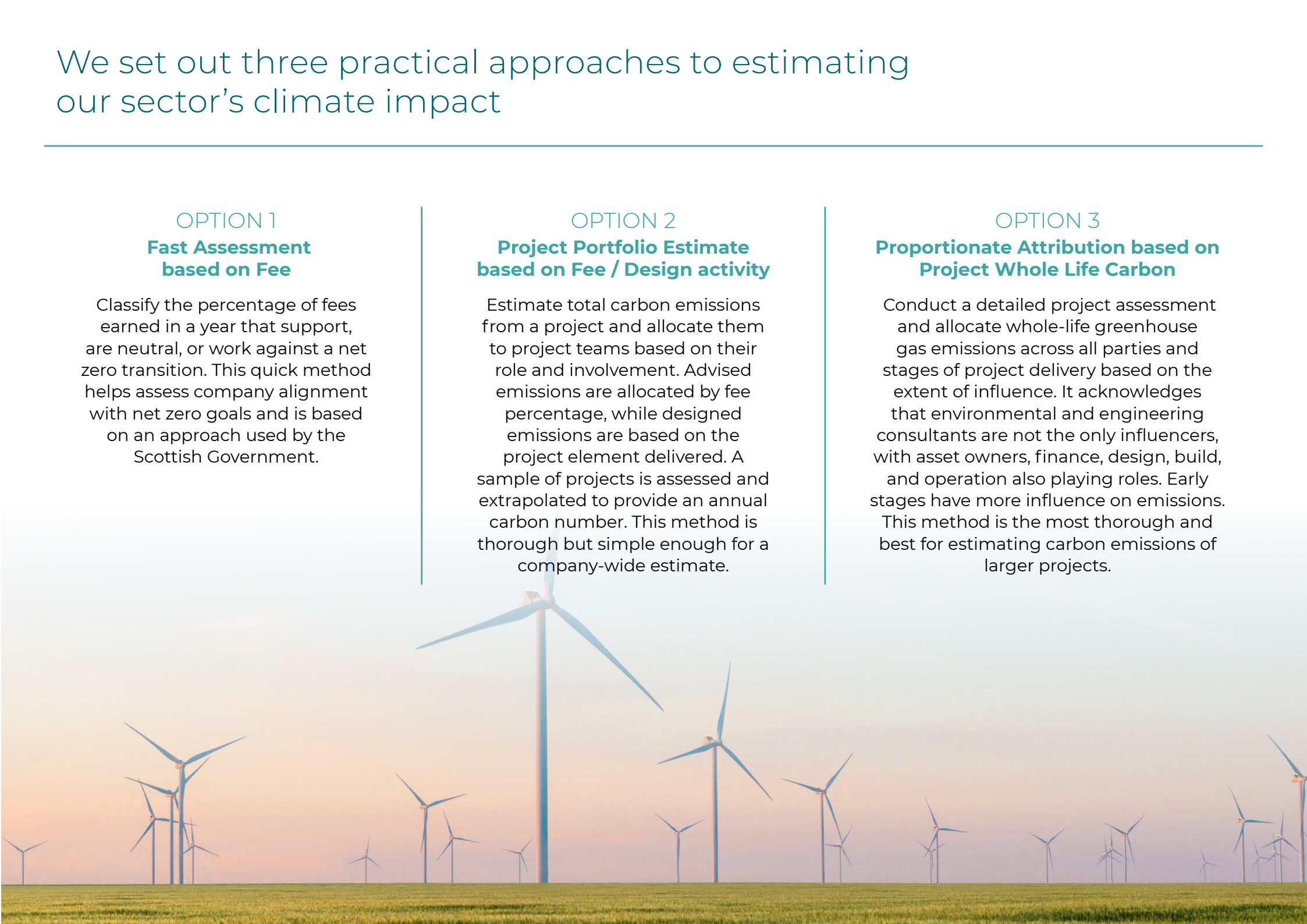
Project Portfolio Estimate based on Fee / Design activity

Estimate total carbon emissions from a project and allocate them to project teams based on their role and involvement. Advised emissions are allocated by fee percentage, while designed emissions are based on the project element delivered. A sample of projects is assessed and extrapolated to provide an annual carbon number. This method is thorough but simple enough for a company-wide estimate.

OPTION 3

Proportionate Attribution based on Project Whole Life Carbon

Conduct a detailed project assessment and allocate whole-life greenhouse gas emissions across all parties and stages of project delivery based on the extent of influence. It acknowledges that environmental and engineering consultants are not the only influencers, with asset owners, finance, design, build, and operation also playing roles. Early stages have more influence on emissions. This method is the most thorough and best for estimating carbon emissions of larger projects.



Option 1: Fast Assessment based on Fee - allocate project fees into work which supports or works against the net zero economy.

For simple, high level assessment of impact we recommend a simple classification of work into whether this supports the net zero transition, works against the net zero transition or is neutral, i.e. no measurable influence in either direction. This model is used by the Scottish Government and is also considered by the Net Zero Lawyers Alliance.

A three stage approach

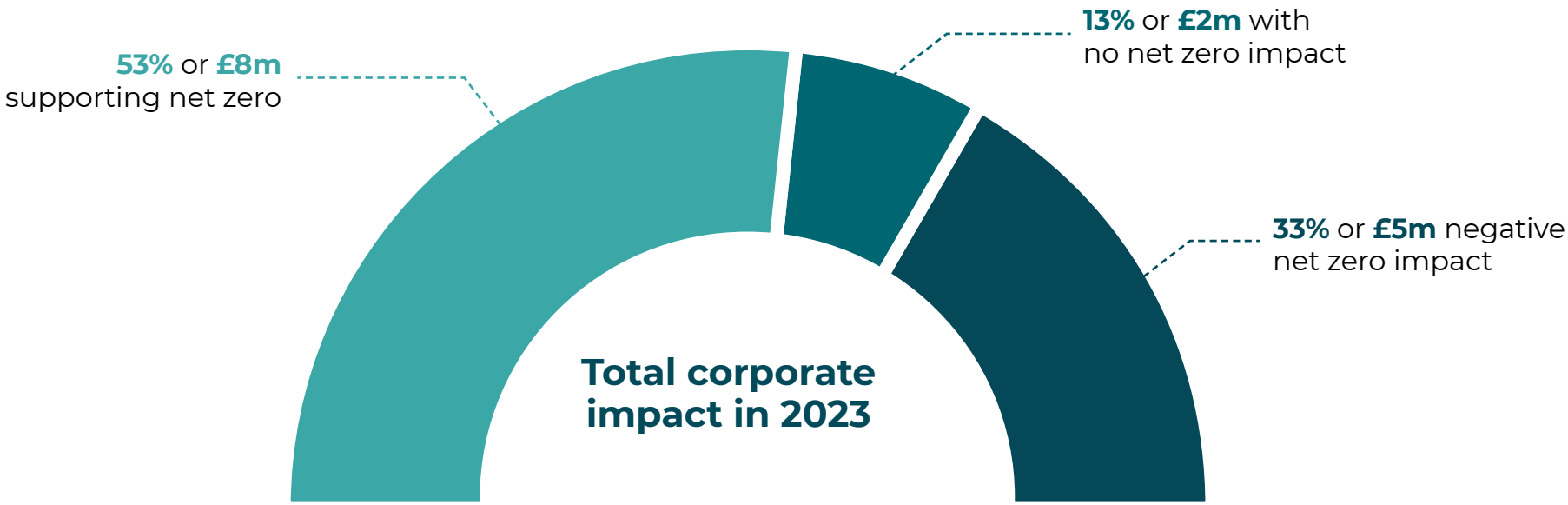
1. Identify the project being worked on, the ultimate purpose of the project and the project revenue.
2. Agree if the ultimate project will support a net zero economy by 2050, will have no measurable impact, or if it will work against a net zero by 2050 economy, such as the examples in the table below.
3. Sum the revenues from all projects in each of the three categories.

Example projects which support a net zero by 2050 economy	Example projects which have no influence on net zero transition	Example projects which do not support a net zero by 2050 economy
• Developing and delivering infrastructure net zero strategies • Designing a methane capture plant at a closed leaky landfill or capping closed gas wells • Designing and project management for a building retrofit and electrification scheme • Ecology surveys in support of a planning application for an offshore wind farm	• Due diligence audits ahead of a property transaction • Monitoring of the quality of water discharges *Note that few projects are likely to fall into this category - most of our work has an impact one way or the other*	• Ecology surveys in support of applications for new fossil fuel extraction • Providing logistics advice for the construction of a new diesel-powered rail line • Designing a new building that will include a fossil fuel based heating system

Advantages of this approach	Challenges to this approach
• Simple and rapid • Low level of effort • Gives an overall view of the percentage of a firm's revenue which is ultimately supporting a net zero economy. This is especially helpful for the environmental sector where some work – while environmental focussed – can ultimately support high carbon development.	• No estimation of actual carbon emissions • Classification of some projects is subjective

How would this work in practice? Worked example

Classified as	Project example
1. £5m of work in 2023 (comprising ecology surveys, front end engineering advice, planning design) supporting the planning permission for an offshore wind farm	**£5m supporting net zero**
2. £5m of work in 2023 (comprising ecology surveys, front end engineering advice, planning design) supporting the life extension of an existing gas field	**£5m negative net zero impact**
3. £2m of technical and environmental due diligence of an office portfolio ahead of proposed sale as a going concern.	**£2m with no net zero impact**
4. £2m of remediation work supporting the safe closure of a redundant oil refinery	**£2m supporting net zero**
5. £1m work for national government supporting a national net zero industrial strategy	**£1m supporting net zero**



Option 2: Project Portfolio Estimate based on Fee / Design activity - use existing greenhouse gas data and allocate this between teams working on a project.

This second approach estimates a carbon impact from projects and aims to attribute a share of these between the design teams depending on the role that they take. For advised emissions the allocation is based on a fee percentage.

For designed emissions the allocation is made based on the whole life carbon impact of the specific element being designed. Designed and advised emissions could be added together, but carbon impact and carbon saving projects would not be netted off.

For Advised Emissions

- **Step 1 - Identify three data points on a representative sample of projects**
  1. Whole life greenhouse gas impact from the scheme. Consider emissions from the scheme as a whole and out to 2050. Consider projects which have a carbon impact and a carbon saving separately.
  2. The total cost of delivering the project
  3. Consultant fee in year
- **Step 2 – Allocate emissions based on consultant's share of the total fee to deliver the project**

$$\text{Attributed advised savings} = \sum \frac{\$ \text{ Consultant fee in year}}{\text{Total cost of delivering project}} \times \text{whole life ghg emissions from the project}$$

- **Step 3 – Sum total greenhouse gases across all advised emissions** Record projects with carbon impact and those with a carbon saving separately. Do not net the two off.
- **Step 4 - Extrapolate to all advised emissions across all projects**

For Designed Emissions

- **Step 1 – Identify the activities on a project that are in the designer's control and influence**
- **Step 2 - Calculate the whole life greenhouse gas emissions for the elements in the design team's influence** Do not include elements that lie outside the control of the consultant.
- **Step 3 – Sum total greenhouse gases across all designed emissions**
- **Step 4 Extrapolate to all designed emissions based the representative sample of projects.**

Advantages of this approach

- Gives a carbon estimate which could give an annual figure
- Can be applied company wide
- Is relatively simple
- Uses data which is widely prepared and available already
- For advised emissions follows a similar format to that used for finance
- For designed emissions follows a similar format to that used across the industry today

Challenges to this approach

- For advised emissions uses fee as a surrogate for impact. More evidence is needed to show that fee is proportionate to impact. Further the majority of the cost of a new development is not in the advisory part, but in the construction.
- Some projects do not easily split between design or advised emissions
- Assumes that by the time of design that the core project is established
- Allocating designed emissions between years for multi year projects could be challenging
- Assigning responsibilities for other disciplines' carbon attribution could be controversial

How would this work in practice? Worked example

Examples for Advised Emissions

1. **£5m of work in 2023 supporting the planning permission for an offshore wind farm**
   Carbon impact of delivery & operation 500k tonnes 2025-2050
   Capital cost to deliver project £2bn

   attribution
   (£5m / £2bn) X 500,000 tonnes = **1250 tonnes CO_{2e} allocated**
   Note – The carbon saved from replacing high carbon power is outside the boundary of this scope, but this was a point for further review by the group.

2. **£5m of work in 2023 supporting the life extension of an existing gas field**
   Carbon impact of delivery and operation of the project 50m tonnes
   Capital cost to deliver £2bn

   attribution
   (£5m / £2bn) X 50m tonnes = **125,000 tonnes CO_{2e} allocated**

3. **£1m of work on a net zero strategy** that in total will cost £100m to deliver and deliver total greenhouse gas reductions of 500k tonnes between 2024 and 2050

   attribution
   (£1m / £100m) X 500,000 tonnes = **5,000 tonnes CO_{2e} allocated**
   Counted separately as carbon saving

4. **£1m of work on a due diligence project ahead of proposed sale as a going concern**
   No material greenhouse gas impact, so not included.

Examples for Designed Emissions

1. **Consultant leads the structural design of a new building.** Others lead on the mechanical, electrical, and other elements.

   Include
   Carbon impact in concrete and steel structure **5000 tonnes**
   Carbon impact of maintenance to 2050 **50 tonnes**
   The embodied carbon in the building structure

   Do not include
   Carbon in the design / operation of other elements of the building

2. **Consultant leads on the Mechanical and Electrical design of a new building** Others lead on the structures and other elements

   Include
   Carbon impact of the materials used in construction **100 tonnes**
   Carbon impact of the operation of the M&E system **2000 tonnes**
   The embodied carbon in the M&E and emissions from operation
   Note – Operation here would include greenhouse gas emissions from electricity /oil/gas use in the M&E system plus leakage of high gwp refrigerants if these are used. Electricity will decarbonise over time in line with national policies.

3. **Consultant carries out the detailed design of a motorway junction improvement**

   Include
   Carbon impact of concrete, steel, asphalt, and construction processes to execute the design, and maintenance of the junction to 2050 **2000 tonnes**

   Do not include
   Carbon emissions from the vehicles using the junction as by the time the detailed design is commissioned, the decision to upgrade the junction has already been taken.

Option 3: Attribution based on Project Whole Life Carbon - Allocate whole life project emissions between different parties and depending on their overall influence through a project life cycle

This method allocates responsibility for carbon emissions in proportion to the level of influence each stakeholder has during the planning, design, construction and operation of a built environment asset. It is based on principles and value chain member roles and responsibilities outlined in PAS 2080:23.

Method assumptions:

- Whole life carbon is estimated based on known factors at the planning/strategy phase, and will be refined throughout the project
- Value chain members could consist of more than one sub-group
- Proportional attribution is based on the potential to reduce emissions, rather than when emissions are actually being released into the environment
- Allocated emissions are a snapshot in time, and should be reported accordingly

Limitations:

- This method does not replace the need to develop time and cost-effective ways to maintain detailed carbon assessments at the project level
- This method does not directly reflect change in impacts coming from decisions made at the individual stakeholder level, rather, savings generated from decisions made are shared across the value chain

How it works:

1. Estimate whole life carbon emissions of the project/asset
2. Identify value chain groups/members involved
3. Develop allocation ratio:
   a. Carbon reduction potential for each lifecycle stage of the project/asset (= potential influence)
   b. Value chain member's relevant actions (= actual influence)
4. Calculate allocated emissions by value chain member:

   Allocated Emissions (CO_{2e}) = Whole Life Carbon Emissions (asset) x Allocation Ratio
5. Further allocate emissions based on scope of work
6. Extrapolate to all emissions across all projects based on a representative sample of projects

Advantages of this approach	Challenges to this approach
• Does not rely on fee as a surrogate for actual carbon emissions • Aligns with the PAS 2080 framework • Recognizes both potential influence based on asset lifecycle and the actual influence of stakeholder actions • Provides a single approach to estimating emissions, including avoided emissions • Is a potentially unifying methodology across all sectors	• It could be challenging to estimate whole life carbon emissions of the project/asset, especially for infrastructure projects • Assigning responsibilities for other value chain member's carbon attribution could be controversial • The method assumes a relatively simple group of stakeholders. Realities of a project may be more complex, which would make this method potentially cumbersome • It would likely be time consuming for larger firms to apply this method to a large project portfolio

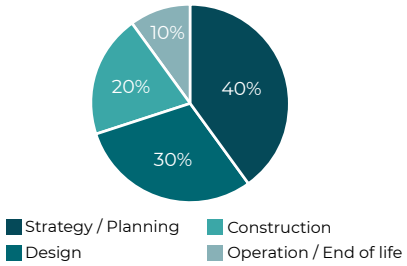
Worked Example: Project is a new building, where the AEC firm leads the structural design work

1. Estimate whole life carbon emissions of the project/asset: Whole life carbon emissions of the building is estimated to be **13,500,000 tCO_2e**

2. Identify value chain groups/members involved: **Asset owner, architect, designer, construction manager, construction suppliers and facility manager/operator**

3. Develop allocation ratio:
   a. Carbon reduction potential for each lifecycle stage of the project/asset (= potential influence)

Carbon reduction potential by lifecycle stage of project/asset



Value Chain Member	Relevant actions	Attribution %			
		Planning	Design	Construction	Operation
Asset owners and financiers	Financial contributions to each lifecycle stage	70%	50%	10%	30%
Architects and Designers (aka PSPs)	Design choices that impact material use and operational efficiency	30%	50%	10%	10%
Constructors and Suppliers	Construction activities including material sourcing and on-site emissions			80%	
Facility managers/ operators	Operating and maintenance during in use phase				60%

   b. Value chain member's control by lifecycle stage (= actual influence)

4. Calculate attributed emissions by value chain member:

Value Chain Member Attribution	Planning	Design	Construction	Operation	Total tCO_2e	%
Asset owners and financiers	2,835,000	2,025,000	405,000	405,000	5,670,000	42%
Architects and Designers (aka PSPs)	**1,215,000**	**2,025,000**	**405,000**	**135,000**	**3,780,000**	28%
Constructors and Suppliers	-	-	3,240,000	-	3,240,000	24%
Facility managers/ operators	-	-	-	810,000	810,000	6%
Total	4,050,000	4,050,000	4,050,000	1,350,000		

5. Calculate sub- attributed emissions based on scope of work

PSP Member Attribution	% Allocation	Total tCO2e
Architect	30%	1,134,000
Structural designer	**40%**	**1,512,000**
Other designers	30%	1,134,000

Next steps

1. Test methodologies in your operations.
2. Please provide feedback at **this link**, or through the QR code below, by end March 2025. Eight questions to answer are:
    1. Do you agree with the principles which we have established?
    2. Which of the three approaches is most useful to your organisation and why?
    3. Which approach gives the right balance between time to gather data and the robustness of the data itself?
    4. Which approach is most helpful to take action on cutting greenhouse gas emissions in your organisation and why?
    5. If you were to make specific changes to the methodologies what would you recommend?
    6. Do you have another approach which should be considered? Please describe it if yes
    7. How could we make the reporting of advised emissions easier?
    8. Should reporting of the greenhouse gas impact of advised emissions be mandatory? Why do you say this?
3. We will convene a further review of our approaches and recommendations based on this and agree next steps. This could be to work with other professional services sectors to agree a consistent methodology. We will also share our recommendations with existing reporting organisations such as SBTi and GHG Protocol.

Pledge To Net Zero is grateful to our working group members who have led and supported production of this document

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How our working group developed this paper

Our working group is made up of greenhouse gas specialists from across the environment and engineering sectors. We met on seven occasions through 2024 - developing common themes and principles and then evaluating and developing the three different approaches in this report. We worked on a collegiate basis, recognising that each of us has different views and perspectives and with a desire to have some clear recommendations produced in a timely manner. The content of this report represents the views of the working group, not necessarily that of each of our member companies.

Pledge to Net Zero is the environmental industry's global commitment, requiring science-based targets from its signatories to tackle greenhouse gas emissions within their organisations. Our 180 members have reduced greenhouse gas emissions by more than 1m tonnes from their baseline. Pledge To Net Zero initiative is a partner to the UN's Race to Zero campaign.

For more information and to join us visit www.pledgetonetzero.org

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