CO_2 2.Low carbon

Company-wide carbon targets: overcoming barriers to progress

Setting company-wide carbon targets for projects is an effective way to bring about behavioural change within a firm, leading to widespread carbon accounting and reductions across a firm's portfolio. This report summarises a roundtable held to discuss barriers and opportunities for setting targets within firms.

Introduction

A roundtable discussion between industry leaders, facilitated by the Institution of Structural Engineers, was held in early October 2021 to discuss the topic of project carbon targets across firms. The meeting was held with the aim of learning from each other's experiences, and searching for common ground around level of ambition, process and metrics.

The invited firms represented a broad spectrum of structural engineering – from eight employees up to 18 000, and covering project types from bridges to buildings. The following firms were represented: Aecom, Arup, Atkins, BDP, Buro Happold, Eckersley O'Callaghan, Elliott Wood, Expedition Engineering, Foster + Partners, Integral Engineering, Laing O'Rourke, PJCE, Price & Myers, Ramboll, Robert Bird, Structure Workshop, Walsh, WSP.

Attendees committed to individual actions that included working to mandate a requirement to calculate carbon on every project, and setting project-specific carbon targets on every project. Other commitments are listed at the end of this article.

This note shares some of the learning outcomes of the roundtable, with the aim of encouraging other firms to set their own targets. While the conversation focused on the UK market, many of the lessons and discussions are relevant to members around the world.

Why set targets?

Participants expressed a range of views on the need to set targets, although the most prevalent view was that targets need to be set in order to drive behavioural change, as setting targets for every project would lead to:

- →I project teams calculating carbon on every project
- →I a greater drive towards finding carbon reductions in designs
- →I questioning what sorts of projects to bid for in the first place.

Others saw targets as an indication of ambition, knowing that failure to meet targets was possible, but would still result in industry progress in the meantime.

And some were clear that if they were to set targets, they would also need to meet them, and so would want to create a route map setting out how they were going to get there (with some allowance for 'faith in the unknown').

Progress

Nearly half of the firms in attendance had set carbon targets on all of their projects **(Figure 1)**. Less than a quarter had no targets or carbon calculation requirements in place at all, and the remainder fell somewhere between the two extremes. It was noted that attendees from firms without targets were pushing discussion on the topic within leadership of their firms.

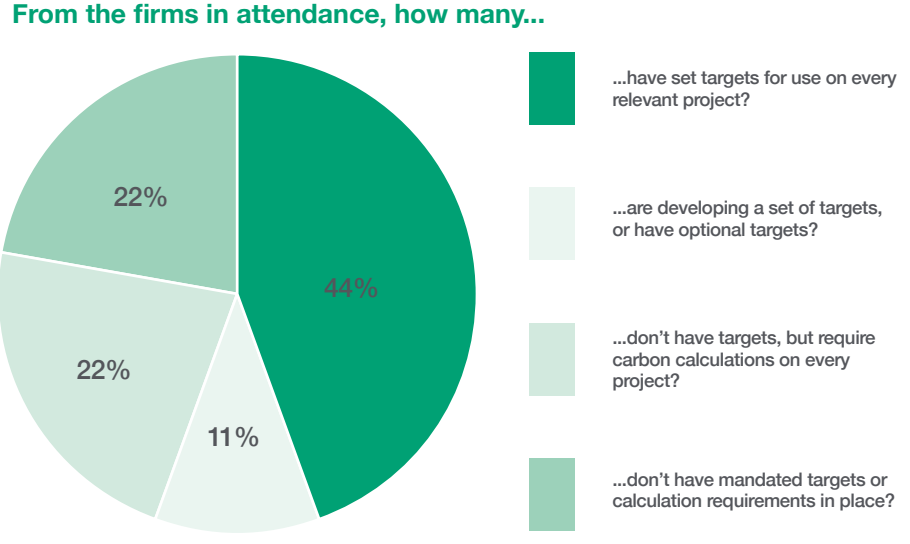
Within the firms which had set a target, the level of ambition of these targets required change in the way they run their business, although no one felt that this went as far as a fundamental reset of their services offered. There were a range of different approaches to the sorts of targets firms set, including:

- →I targets across the firm's portfolio, e.g. 50% reduction in designed emissions by 2030 (vs 2021 levels)
- →I project-specific stretching targets, e.g. aiming for SCORS B rating for all projects designed today
- →I project baselines, e.g. no projects will achieve worse than a SCORS E rating, from today
- →I net-zero targets, e.g. all projects to achieve net zero through accredited offsetting.

Barriers and solutions

The majority of the workshop was spent discussing barriers to setting targets, and sharing ideas for ways in which these barriers could be overcome **(Table 1)**. It was noted that some barriers fall outside the control of individual firms (e.g. carbon regulation, design codes, industry databases, supply chain decarbonisation), but that these do not excuse inaction within firms.

Regardless of barriers, and the level of control that we have over them, it



↘**FIGURE 1:** Target-setting progress among attendees

TABLE 1: Barriers and potential solutions discussed during workshop

Barriers	Possible solutions
Commercial issues	
Increased resource required within firms. Both in terms of resource needs in order to calculate and design for carbon on all projects, and the additional upfront resource needed to gather historical carbon data in order to set targets scaled against a baseline. Note that this was a prevalent issue across all sizes of firms.	Consensus was that behavioural change is required, requiring uplift in resource until it has become normalised. Some spoke about having made such a transition within a year, with carbon accounting now normalised on all projects. One attendee noted after the meeting that the market continues to evolve rapidly, and that clients are asking for lower-carbon results more quickly and are looking for engineers who can deliver on this.
Concern about losing competitive advantage and being undercut. If lower-carbon projects come with a price premium, or perceived premium, this can be detrimental in a competitive tender process. Examples of such concerns include increased design fees, or an expected/perceived increase in construction cost.	Some argued the opposite to this barrier, and they found that upskilling around carbon was giving them a competitive advantage. Often lower-carbon solutions are cheaper due to material savings (e.g. smaller column grids, or more direct load paths), and savings potential can be demonstrated during a tender process.
Data and methods	
Lack of publicly available benchmarking data, leading to inappropriate targets. Guidance on residential and commercial projects exists cross-industry, but with little detail. There is a particular lack of data for typologies where the sample size is small (e.g. stadia). Many firms are collecting their own data, but this can be patchy, as it isn't always a standard part of the engineer's scope yet.	Globally, free-to-use carbon databases are growing in popularity. In the UK, the Built Environment Carbon Database **(www.becd.co.uk)** is due to launch in mid-2022, and the Institution encourages its UK members to use the BECD to share data on their projects. In the USA, the EC3 has been growing for some time, and many are reporting their project data through the SE2050 commitment's database. The Climate Emergency Task Group (CETG) will consider what more can be done to help members to add data (and add detail to existing data), and how to encourage more sharing between firms.
Lack of sharing – where data is being collected by firms, it is often not shared with others.	
A lack of consistency around methods and assumptions hinders target setting and carbon calculations, as there is a lack of comparability across projects or firms.	This barrier should not prevent engineers from tracking carbon and monitoring against targets. However when doing so, they should be clear about what level of accuracy/consistency they are working with, and should be able to account for this when making decisions and communicating with others. Agreement that better use could be made of BIM to add consistency – modelling more thoroughly and embedding carbon within the model. In the UK, an update will be made to the RICS Professional Statement[1] in the first half of 2022, to add more direction to parts of the statement that currently lead to inconsistency.
Range of projects	
Most firms have a **broad portfolio of work.** Where this is particularly varied, data for any single typology can be scarce and very project-specific. Most firms do not know how their as-designed emissions vary between sectors, again creating difficulty in deciding where to focus to have the biggest impact.	Companies which had already set goals, or imposed a requirement to calculate carbon on every project, had since gained an understanding of the magnitude of carbon emissions from each sector, average values, ranges, etc. This also helped identify which sectors within their portfolio was most impactful, where their efforts could be concentrated going forwards.
Overall industry emissions split between sectors is also not understood, meaning that the industry is focusing on all sectors together, rather than the handful of sectors that may have the biggest impact.	Again, the use of free-to-access databases (such as the BECD in the UK) is needed in order to gather the data required to determine a sectoral breakdown, and so members are encouraged to share data with these databases. It is also noted that firms' own sectoral breakdown can still be determined in-house, and used to direct the focus within each firm
$kgCO_2e/m^2$ is recommended as the metric for all project types, but **may be inappropriate** for some typologies (e.g. stadia, which could be measured in $kgCO_2e$/seat)	Again, more data will enable a better understanding of this. Specific to the UK, a recommendation has been made to the BECD development team to consider what additional data should be requested for new project entries in order to enable different metrics to be used in outputs later on.
Early involvement	
Structural engineers have **insufficient control over the achievability of project targets** if they are unable to make recommendations during project briefing and concept design stages.	The CETG will consider what can be done to educate more widely across the industry on the benefits of early engineer engagement. The goal should be to show how bringing engineers on board earlier enables greater carbon savings, along with appropriate target setting. Referral to existing sources of information may be a quick win (such as guides by LETI[2] and the UKGBC[3] in the UK).

Lack of regulation	
Unanimous agreement at the roundtable that the industry needs regulation requiring embodied carbon assessment and limits. This would provide a level playing field, tackling some concerns around competitive disadvantages described in the 'internal barriers' section above. Regulation could also be used to identify stretch targets if written in a way that indicates how it will ratchet down over time, encouraging clients to go beyond regulation, and adding a competitive advantage to those firms which are able to design lower-carbon buildings.	It was noted that there was unanimous support at the roundtable for the Part Z initiative that is leading the push for UK regulation on embodied carbon, which the Institution supports. Firms not aware of Part Z are encouraged to visit **www.part-z.uk** and ask their own senior leadership to add their formal support. Feedback on the proposed document itself is also welcome. The CETG is happy to speak to members outside the UK who would like to learn more about the initiative.
Design and design codes	
Codes of practice are **overly conservative**, and do nothing to prevent conscious overdesign by engineers. While there is some flexibility within the Eurocodes (and there will be more in the next generation), there is **no 'best practice' guidance on load reduction** that engineers can follow and rely on during or following design.	Safety factors (covered in national annexes) could be updated relatively quickly, and the CETG will work with the Eurocode committee to target this update. The CETG will also look at whether best practice guidance on the topic can be developed to enable more immediate steps to be taken on projects.
Designing for serviceability leads to the addition of material not required for safety.	Consensus that if serviceability is dictating the sizing of elements, the structural configuration is suboptimal. Engineers should focus on strength-based design, and strongly advocate for structural configurations that enable this (refer to *Design for zero*[4]).
Over-design still happens consistently across the industry – the MEICON survey[5] from 2018 was quoted as showing that, on average, by their own admission, **engineers add a 25% 'sleep at night' factor to their designs.**	Avoiding this 25% through precise design gets us halfway towards the 2030 50% reduction target that many firms are working towards.

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was highlighted that, as professional engineers, we have a responsibility to do what we can to drive down the emissions of our work – and that there are reputational risks to firms not doing this. Exemplar firms should be leading the way to drive the change needed across the industry.

Finally, it was noted that a holistic approach is needed to reduce total whole-life carbon on projects, as well as feeding into wider sustainability objectives such as biodiversity, resilience, and raising communities out of poverty. We shouldn't act in isolation as structural designers, but strive for total sustainability through collaboration, and set targets in the context of other disciplines to make them meaningful.

Next steps

The workshop concluded with the individuals present making commitments that included:

- →I mandating the need to calculate carbon on every project
- →I setting project-specific targets unique to each project, at the start of the firm's involvement in the design
- →I setting informal targets within local teams to push progress, while waiting for the firm's overall corporate target
- →I publicly supporting industry targets such as those set out by WGBSD, World GBC, etc.
- →I creating a '50% carbon reduction' roadmap, utilising quick wins, deeper change, and faith in the unknown
- →I driving better conversations between client, consultant and contractor on the topic of carbon
- →I advocating for the regulation of embodied carbon to government.

Summary

Many of those present have already set company-wide carbon targets, and it is inevitable that many more will join them in 2022. While there are many perceived barriers to making such commitments, firms can make significant steps today that will lead to the behavioural change required to reduce the carbon associated with all of our designs.

We thank the attendees for giving their time to attend the roundtable, and for committing to continue to push for change within their firms and across the industry.

This report has been prepared by the IStructE Climate Emergency Task Group (CETG). To contact the CETG about any aspect of this report, email **climateemergency@istructe.org**.

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