

Viewpoint

Racing to zero: isn't it time you committed to emission reduction targets?

Buro Happold and WSP UK have committed to reducing the carbon emissions of their designs by 50% by 2030. In this article, Sarah Prichard and David Leversha set out the rationale for this target, explain how they plan to achieve this, and encourage other firms to join them in setting an ambitious agenda for governments to follow as we approach the COP26 climate summit.

For many of us, the climate emergency appears so enormous that it feels an almost insurmountable challenge, and we wonder how we can make a difference. However, if everyone played a small part, we could shift the dial and make net zero a reality.

What if engineers pledged to reduce the embodied or operational carbon in our future designs? Both WSP UK and Buro Happold independently have made very public commitments to do this. Why don't you join us?

Our commitments

WSP UK has committed to being net zero in its operations by 2025 and to reduce whole-life carbon emissions associated with its designs and advice by 50% by 2030, from a 2020 benchmark. Both commitments are in line with a 1.5°C trajectory under the Science Based Targets initiative.

In a survey, 82% of WSP UK's key clients were supportive of an ambitious commitment to drive aggressive whole-life carbon reductions on their projects. Additionally, WSP UK has joined the SteelZero global initiative to specify steel with reduced embodied carbon, while supporting manufacturers with science-based carbon reduction targets in line with commitments under the Paris Agreement.

Buro Happold's three targets are equally ambitious. In line with science-based targets to limit warming to 1.5°C, Buro Happold became net zero in its worldwide operations in April 2021, and aims to reduce its own global operational carbon emissions by 21% by 2025.

In its global design work, all new-build projects will be designed to achieve net-zero carbon in operation by 2030; and it has also committed to reducing the embodied carbon intensity of all new buildings, major retrofits and infrastructure projects by 50% by 2030, to be achieved by focusing on incremental year-on-year improvements and collaboration across the supply chain.

Why 50% by 2030?

These challenging commitments are an essential catalyst for change. Fifty per cent is a stretch target and will require a paradigm shift, coupled with a concerted effort from leaders, work winners and technical staff. Governance changes, enhanced R&D, skills development, technical measurement and project benchmarks are being implemented to make this possible. By setting targets and committing to regular reporting, we will hold ourselves accountable to our people and the wider industry.

Many ask why the 50% target? While it is aligned to the IPCC's Carbon Budget and the UNFCCC's Climate Action Pathways, it exceeds the current 'Race to Zero' pledge. Both firms could spend another couple of years determining the perfect ambition, but this could be time wasted. The challenge is akin to a marathon: the only goal that matters is the finish line – reaching net zero. Interim milestones, including 2030, are vitally important to generate immediate action.

As trusted advisers to our clients, managing risk, cost, time and quality KPIs are fundamental tasks on any project. As signatories to the Structural Engineers' Declaration (www.structuralengineersdeclare.com), both firms have effectively elevated carbon to be a fifth KPI.

To meet the UK government's legal obligation for net zero by 2050 (with a new interim goal of 78% reduction by 2035 announced in April), we call on all engineers to urgently drive real, environmentally focused change into their business and projects at all levels. We need to do the right thing, right now.

How can this be achieved?

In response to the climate emergency, our focus should be tilted towards existing technologies, rather than relying on technological advances which may not be realised in time. While many R&D initiatives to help the decarbonisation of our material supply chain are detailed in the UK FIRES *Absolute Zero* report, even implementing these will barely get us to the decarbonisation curve required to deliver the Paris Agreement.

We would not promote to our clients a project programme reliant on unproven technology, and similarly we will not advance decarbonisation strategies hoping for innovation to save the day. The risk of failure is too high!

Considering the benefits of building reuse and repurposing to deal with embodied carbon should be the first step on many projects and is consistent with the IStructE *Design for Zero* guidance, which focuses on using less 'stuff' (Figure 1).

Where appropriate, we will work with clients

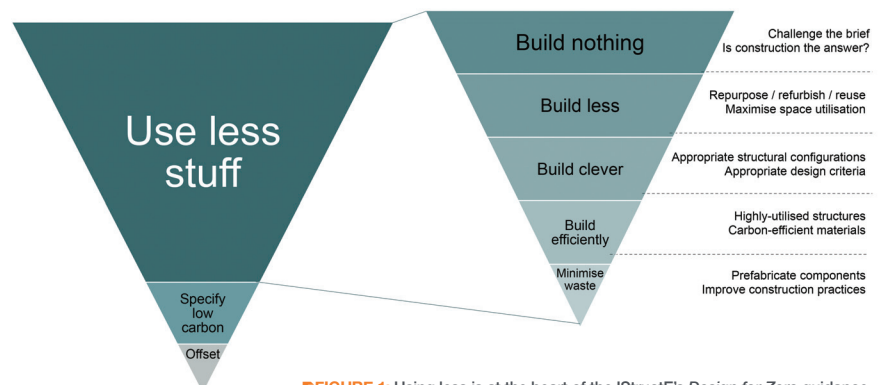


FIGURE 1: Using less is at the heart of the IStructE's *Design for Zero* guidance

and stakeholders to actively consider a 'build nothing' approach, followed by building less, and then only building what cannot be done without (homes, hospitals, infrastructure, educational facilities, etc.), and finally realising this in the best way possible.

Tightening regulation and taxation to rebalance the equation towards repurposing our existing building stock may be necessary, while specifying low-carbon materials, future flexibility, and design for deconstruction wherever possible.

Our collective R&D budgets are required to find solutions to decarbonise global materials and supply chains to allow future construction around the globe.

Focusing on embodied carbon

Design engineers have two parts of the equation to consider – operational and embodied carbon. In the last 30 years, we have made significant progress on dealing with operational carbon in the buildings we design via the 'lean, mean, green' strategy, which utilises a 'fabric-first' approach.

WSP and Buro Happold are committed to focusing on embodied carbon to move towards our 2030 targets, and structural engineers are well placed to lead this. First, we can actively drive the briefing and concept design stages, ensuring reuse where possible, and then influencing the building form and orientation to enable a low-carbon solution to emerge.

Second, we will improve the material specification to reduce embodied carbon in concrete, steel, facades and other building elements, being leaner and encouraging evolution in the material options, and working with companies which have verified decarbonisation strategies.

Third, we will actively engage with clients to help them understand the benefits of a low-carbon and climate-resilient future. Many clients want to help but don't know where to start. In the CDM Regulations, a designer's first responsibility is to ensure that the client understands their duties (as we can't always expect lay clients to be experts in construction safety). If a similar duty was now placed on engineers with regards to carbon, it could significantly shift the dial and help even reticent clients to contribute. To meet our 2030 goals, we will strive to act as though this duty has already been imposed.

The legal requirement of net zero means those industries and processes that have not decarbonised are likely to have reduced value long before 2050. Pension funds, investors and insurance companies are increasingly focused on investments with better environmental, sustainability and governance (ESG) credentials. Thus, it is in clients' long-term interests to deliver low-carbon projects, as they provide long-term valuation resilience.

Setting the future agenda

The Covid-19 pandemic was a major threat to

“ WE CALL ON ALL ENGINEERS TO URGENTLY DRIVE REAL, ENVIRONMENTALLY FOCUSED CHANGE INTO THEIR BUSINESS AND PROJECTS

world health, safety and prosperity. Swift, decisive action was taken by governments as a failure to act would have had immediate and quantifiable outcomes. The climate emergency is undoubtedly a greater existential threat but, while governments have understood this, action has been slower and less decisive than that taken to stem the pandemic.

After a catastrophe, government often steps in to set industry regulations, and designers comply with varying degrees of willingness. The opposite is happening now. The UK construction industry is setting the agenda by creating targets for itself and willing the government to lend its support and create a challenging and level playing field.

In June 2019, the UK became the first major economy to legislate to end its contribution to global warming by 2050, committing to all greenhouse gas emissions being net zero by then. However, limited progress has been made in defining how this will be achieved, or what the stages are on the journey. We propose the following measures to assist:

- Government procurement should require clear net-zero outcomes from development which consider the health and wellbeing of present and future generations – true value rather than lowest cost – and favour reuse and refurbishment of existing building stock.
- Tax reform should incentivise building refurbishment or repurposing over demolition and new build. The tax could be offset by one on imported construction materials, to incentivise local sourcing, or a carbon-based material tax to incentivise better material selection and efficient design.
- The Building Regulations should effectively limit embodied carbon, in the same way that Approved Document L limits operational energy.
- The principles of the circular economy, including calculation and measurement of the embodied carbon in existing building elements, should be embedded into construction. Radio-frequency identification (RFID) tags, material passports and building component buy-back schemes would encourage reuse and help clients and engineers to focus on reusing carbon.
- R&D should be focused on both marginal gains and transformational innovations which are required for medium- and longer-term

objectives. Decarbonising the production of cement and steel will be vital to reduce embodied carbon, but will need major government investment as well as passionate structural engineers. In collaboration with the IStructE, and under the umbrella of Engineers Declare, WSP and Buro Happold are sharing historic concrete mix designs to assist research in this area.

- The above innovations could be drawn together under a single government department for dealing with the climate emergency, with a Chief Adviser for Construction focused on a built environment that will support long-term health, safety and prosperity.

The UK is a leading innovator, and its engineers are among the best in the world. These suggestions can support the UK government as a world leader in our post-Brexit future, and are also every bit as relevant to countries across the globe as we all target net zero. COP26 is *the* best opportunity for governments around the world to show bold ambition with a definitive plan of action and interventions.

The climate emergency is undoubtedly an existential threat. As engineers, we are in a great position to help deal with this, and many of us chose the profession because we wanted to create a better world.

Buro Happold and WSP have set challenging targets while supporting the IStructE, ACE, UKGBC, CLC and others to influence the direction and speed of travel in order to achieve net zero. We encourage you all to get involved in a personal and professional capacity as the climate emergency is the biggest and most important challenge of our time!



Sarah Prichard

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David Leversha

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