Construction Leadership Council

ConstructZERO
The Construction Industry's Zero carbon change programme

BURO HAPPOLD

CONSTRUCTION LEADERSHIP COUNCIL CONSTRUCTZERO

Buro Happold Business Champion

PART ONE

Questions to the business leader: Sarah Prichard – UK Managing Director, Buro Happold

- Why is making progress on Net Zero important to your business?

Buro Happold has always had a philosophy around touching the earth lightly, and this has really come to the fore in the last few years as we all recognised the challenges of the Climate Emergency. We were in the vanguard in the development of the Engineers Declare and Construction Declares in 2019, and have recognised it as fundamental to how our partnership and business should operate, and support our clients to develop their awareness of the Climate Emergency, the path to Net Zero. We publish an annual Sustainability Report which documents our progress and ambitions. Buro Happold is committed to regularly reporting and holding ourselves accountable to our people and the wider industry. We are on a route map to net zero carbon through the following targets:

1. Reduce our own operational carbon emissions by 21% by 2025 and aim to be net zero carbon from April 2021 by offsetting residual emissions.
2. Design all new build projects to be net zero carbon in operation by 2030.
3. Reduce embodied carbon intensity of all new buildings, major retrofits and infrastructure projects by 50% by 2030.

The climate crisis presents our greatest challenge and opportunity as we strive to deliver solutions with a sense of economy for our people, our planet and its resources. Engineers and consultants in the built environment, such as Buro Happold, have a major role to play in achieving this.

- Which of the 9 priorities are more relevant to your business and clients and why?
- What are doing to make progress against the relevant priorities (of the 9) in the short and long-term? (could include targets or milestones).

Buro Happold already recognises the effort that will be required to meet our net zero targets, and work is already underway in the firm on most of these. There are brief notes against each one below, illustrating that we are actually working in all of these areas, and illustrating some examples. In many cases, greater detail can be found in our Sustainability Report.

	ConstructZero Priorities	**BH Response**
TRANSPORT		
1	Accelerating the shift of the construction workforce to zero emission vehicles and onsite plant.	Whilst Buro Happold is not responsible for onsite plant, it recognises the need to ensure that our staff (as part of the greater construction workforce) are travelling to work and for work in a sustainable manner. We have an annual audit of our travel methods, promoting lower carbon options, and from 1st May this year will be offsetting all carbon associated with travel to and for work in order to operate at net zero.

		In our UK business, we have set carbon budgets (with the financial ones) and will be looking to reduce these year on year. All of our pool vehicles are electric, and we promote both cycling and walking, with facilities provided for colleagues and visitors. Our progress against these targets is provided in our Sustainability report.
2	Maximising use of Modern Methods of Construction and improved onsite logistics, reducing waste and transport to sites.	Buro Happold is, as a consultant, promoting the use of MMC to reduce waste and promote efficiency. With the CIH we are working on developing tools to integrate different components and assist with their configuration, and in the rapid prototyping of alternative solutions to help clients make sensible decisions about the design choices they can make. We have targeted this as an investment area for our next business year (starting May 1st). We are also developing work around the Circular Economy in order to minimise overall waste in the built environment.
3	Championing developments and infrastructure investments that both enable connectivity with low carbon modes of transport and design to incorporate readiness for zero emission vehicles.	We believe that transport and travel need to be designed on our projects to optimise connectivity while also minimising the impact on the environment. This is fundamental to the work of our Mobility team, and our sector experts in Aviation and Rail. As an example, we bid two net zero airports within the last year, created an airports net zero capability statement and position on aviation. We are currently seeing the development of the next stage in low/zero carbon flight options including electric and hydrogen powered aircraft. Development of competing aviation systems is currently underway, but Buro Happold does not want to wait for the aircraft designs to be ready, but instead push ahead on a masterplan proposition for airports to be resilient and ready for lower carbon flight options.
BUILDINGS		
4	Work with Government to deliver retrofitting to improve energy efficiency of the existing housing stock.	We appreciate the challenges faced by the UK in retrofitting its existing housing stock. We have done some pilot work in determining deep retrofit of housing to make it operate as net zero, and are keen to support ongoing developments in this area. In October 2019, Sarah Prichard presented at the C40 World Mayors Summit in Copenhagen on the topic of 'Towards Net Zero Carbon Homes'.

		We are working with the GLA to help them understand the technical, practical and legislative challenges around undertaking retrofit work on buildings of all types which will be used to directly deal with this challenge.
5	Scale up industry capability to deliver low carbon heat solutions in buildings, supporting heat pump deployment, trials of hydrogen heating systems and heat networks.	Buro Happold consistently works with its clients to promote low carbon heat solutions in buildings and on campus scale projects. We help clients unlock sites though innovative solutions and the deployment of heat pumps on a building and site wide scale. Buro Happold are working on several innovative projects that use low carbon heat, from the use of thermal spring water to heat Bath Abbey to the use of deep mine water in County Durham to provide low carb heating to new homes, this is an area of focus for our business.
6	Enhancing the energy performance of new and existing buildings through higher operational energy efficiency standards and better building energy performance monitoring.	In 2021 Buro Happold won CIBSE's coveted 'Building Performance Consultancy of the Year' for the fourth year running highlighting our commitment to verifying operational energy use of our projects and closing any performance gaps. We became Pioneering Delivery Partners for the new NABERS UK Design for Performance scheme, with a number of projects underway targeting net zero. Staff training in energy and building performance has included Passivhaus, advanced simulation, ILFI and Ecodistricts. In our own operations, we have conducted energy audits of our global office portfolio and have a number of refurbishment projects completed or underway. Our aim is to reduce absolute CO2 emissions (Scope 1, 2 & 3) following Science Based Targets aligned to the 1.5 degree scenario, as well as electrify our portfolio.
CONSTRUCTION ACTIVITY		
7	Implementing carbon measurement, to support our construction projects in making quantifiable decisions to remove carbon.	As noted above, we are committed to implementing carbon measurement on all projects we design, both new build and retrofit. Our in-house building performance dashboard has been created to report on modelled and measured energy consumption, operational carbon and embodied carbon for all projects. It is being rolled out during 2021. The firm has ambitious targets around driving down in use

		and embodied carbon in its work within the next 10 years.
8	Become world leaders in designing out carbon, developing the capability of our designers and construction professionals to develop designs in line with circular economy - reducing embedded and operational carbon, shifting commercial models to incentivise and reward measurable carbon reductions.	Buro Happold has recognised the need to lead in the engineering response to Net Zero and the Climate Emergency, as we work to create a sustainable and equitable future for people, places and planet. The full details of this are provided in our Sustainability report. Our colleagues at all levels in the organisation are endeavouring to share our knowledge with fellow engineers, clients and wider society. This can be seen in our involvement with C40 Cities, The Aldersgate Group, Construction Declares, the Association of Consulting Engineers (ACE) the Institution of Structural Engineers, CIBSE, to name but a few (particularly UK-centric cases). This involves speaking engagements, publishing and helping in research. Our current marketing campaign Re:boot involves a series of webinars and masterclasses where we are share our knowledge (and that of collaborators) in the area of reuse and repurposing building and assets, to help drive development of the Circular Economy. Internally, we have regular knowledge share sessions to disseminate best practice projects, such as the 'Living Building Challenge', achieving net positive energy and net positive water, measured in operation.
9	Support development of innovative low carbon materials (prioritising concrete and steel), as well as advancing low carbon solutions for manufacturing production processes and distribution.	Buro Happold work with universities and research bodies to support research programmes and mentor researchers to help expedite new low carbon technologies application. These programmes include research into zero carbon concrete (Imperial) and the use of reduced concrete volumes through optimised formwork design (Universities of Bath, Cambridge and Dundee in the Automating COncrete ConstRuctioN research project, known as ACORN). Our commitment to drive low carbon solutions has seen BuroHappold undertake a full comparative study of the embodied carbon associated with a range of standard building typologies (published in The Structural Engineer) and have used this to inform our approach to responding to all new design briefs.

- How have you helped your supply chain understand what is required against the 9 priorities?

Buro Happold believe that it is only by our all talking about the Climate Emergency that we will actually make the changes necessary to respond to it quickly…starting now. We work with collaborators and clients to share our knowledge and experience (Re:boot campaign) and reinforce that we can all work to make a difference. In the current year, we are encouraging our business leaders and work winners to have direct conversations with their clients on how we can improve the performance of the buildings we design, both in terms of embodied and in use carbon, so that they can make the right decisions and help us all to travel more quickly on this journey.

- As a business leader what do you think the biggest challenge is and how are you working to overcome it?

I, like many other senior colleagues at Buro Happold, believe that the biggest challenge is getting people to understand that we all need to do something, starting now, to contribute to stemming the challenges of climate change, if we are going to be able to meet our ambitions by 2050. We cannot rely on a magic bullet or innovative technology or materials that may appear some time in the future, we need to start acting now. We can all make a difference…on a personal level in our homes and communities; as engineers in the way that we design and construct buildings; in helping our clients understand the alternatives they can have which would involve less embodied or in use carbon, or even reusing an existing building; and through working with professional bodies, trade associations and other larger bodies focussed on climate change that will help us move the dial…together…and for the good of our people and planet.

- In your view what is the one innovation or change that is going to have the biggest impact on carbon or progress in our industry?

Collaboration and behaviour change are going to have the biggest impact. Pinning our hopes on a single (or multiple) game changing innovation/technologies is a very risky game. Buro Happold's ability to look holistically at our clients challenges and assemble the collaborations and teams necessary to help them reorganise / adapt and rebuild, is going to make the biggest immediate impact. Technology will support this through analysis of data evaluation of solutions etc.

PART TWO

Questions to the emerging leader: Natasha Watson – Senior Engineer, Buro Happold

- What do your peers and wider employees within your company think about the businesses' approach to Net Zero?

I am really pleased that we have made our pledges towards Net Zero, and I know that my colleagues are as well. Many of my peers worry about the Climate Emergency and know that the Built Environment has a large impact on carbon emissions and climate breakdown.

Net Zero Design is a fast-paced landscape with new findings, rules of thumb, assumptions, and guidance documentation developing each week. Our MEP and Sustainability colleagues are confident to discuss carbon emissions and reduction, however other disciplines are not as confident.

It is now up to management and champions to ensure that these goals are translated into tangible and measurable actions that can be completed by all levels in all disciplines. These actions should form part of our personal yearly objectives, our project objectives, and our discipline objectives that we have time to work on and can be measured on as well.

- How are the younger generation within your business engaged in this?

Many of our junior staff are extremely engaged in Net Zero activities on a personal level, having grown up with the Climate Change Act 2008 and the Signing of the Paris Agreement in 2015, as well as being aware of the carbon emissions associated with over-consumption in many areas of life such as air-travel and meat-eating.

However, our junior staff learn by example from our more experienced staff and may not feel comfortable calling out carbon-intensive behaviour if they don't feel that they will be backed up. Through training of our experienced staff to prioritise Net Zero Design actions and be vocal in their support, I believe our junior staff will be even more engaged.

- What more do you think your business could be doing against the 9 priorities?

TRANSPORT		
1	Accelerating the shift of the construction workforce to zero emission vehicles and onsite plant.	We should promote a hybrid of video calls and in-person meetings as standard to reduce the amount of travel required for regular meetings. Furthermore, we should learn from projects which held remote site-visits during lockdown so that we can change the face of our site-support roles as well. Although Buro Happold don't specify construction plant, through discussions with contractor colleagues who have also signed up to Construction Declares we can begin to understand

		the current limitations of zero-emissions plant (maximum torque, maximum lifting capacities etc). We can then design projects with these limitations in mind.
2	Maximising use of Modern Methods of Construction and improved onsite logistics, reducing waste and transport to sites.	One of the key areas of MMC that I worry about is the doubling up of materials to ensure that the interfaces between the panellised units or volumetric units can adequately transfer loading and/or can provide appropriate MEP connections. A study on a lean design of a building in-situ compared to a lean design of a panelised and/or volumetric solution would be interesting to see. Investigating how Circular Economy principles can be implemented on new projects as well as projects that are to be disassembled is also an area I would like to see more work on.
3	Championing developments and infrastructure investments that both enable connectivity with low carbon modes of transport and design to incorporate readiness for zero emission vehicles.	I believe that the work we are doing within this area can be improved through ensuring that low carbon transport infrastructure is provided in an equitable way throughout a city; for example main commuter routes are important, but so are the routes of stay-at-home parents and care-givers. Routes in lower socio-economic areas also need to be added as it is the poorer members of cities that are more adversely affected by air pollution (https://airqualitynews.com/2019/06/19/poor-most-exposed-to-air-pollution-caused-by-rich-study-finds/)
BUILDINGS		
4	Work with Government to deliver retrofitting to improve energy efficiency of the existing housing stock.	I would like to see retrofitting financing solutions to be adapted depending on the nature of the home ownership and the socio-economic status of the home owner to ensure that the funds go to those most in need first. I would also like to see this group lobby for VAT reforms to promote refurbishment over new-build, as currently VAT is set as 20% in comparison to 5% for new build.
5	Scale up industry capability to deliver low carbon heat solutions in buildings, supporting heat pump deployment, trials of hydrogen	This scaling up also needs to work alongside fabric-first approaches and Passivhaus regulations, which can mitigate the amount of heating and cooling required by buildings in the first place.

	heating systems and heat networks.	
6	Enhancing the energy performance of new and existing buildings through higher operational energy efficiency standards and better building energy performance monitoring.	Again, this point will also need to consider the fabric-first approaches and Passivhaus regulations, which can mitigate the amount of heating and cooling required by buildings in the first place.
CONSTRUCTION ACTIVITY		
7	Implementing carbon measurement, to support our construction projects in making quantifiable decisions to remove carbon.	Our in-house building reporting dashboard should be built into our auditing process and other QA procedures to ensure that it becomes 'business as usual'.
8	Become world leaders in designing out carbon, developing the capability of our designers and construction professionals to develop designs in line with circular economy - reducing embedded and operational carbon, shifting commercial models to incentivise and reward measurable carbon reductions.	I believe that Buro Happold should strive to build the first Full Living Certified building in the UK, building on the knowledge of our colleagues in the US who have delivered the Santa Monica City Services Building and Hawai'I Prep Academy Energy Lab.
9	Support development of innovative low carbon materials (prioritising concrete and steel), as well as advancing low carbon solutions for manufacturing production processes and distribution.	I believe we are already doing a lot in this area, however I believe that there is a bright future for glu-laminated bamboo products and would be keen to see more development in this area; this is why I have signed up to be on the steering group for the upcoming IStructE guidance on designing with bamboo.

- A Youth Voice COP climate is being organised in Milan to bring together young people globally- what would be your key issue to raise?

Intersectional Environmentalism should be on the agenda. Intersectional Environmentalism is where the inequity of environmental degradation and carbon emissions is exposed and considered within the Climate Emergency movement. Air pollution, sea level rises, and extreme weather conditions adversely impact poorer people and should drive urgent change.

Additionally, the guidance that is being developed for Net Zero Carbon design in the Global North shouldn't be applied to the Global South as there is less likely to be good quality building stock that can be retrofitted.

- What do you do in your daily life/job that makes a difference?

I talk about Intersectional Environmentalism and embodied carbon every single day! I make it part of my everyday work and I ensure it is part of the everyday work of the engineers I supervise and mentor. I also straddle between being able to set strategy, but also see the real-world pressures of project delivery and day-to-day design work. This allows me to ensure that the strategy and the direct actions that people can implement work together and drive real and lasting change.