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Taking operational carbon seriously

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The need to not just slow but ultimately reverse climate change cannot be understated. There is good reason that the light being shone on net zero has never been brighter, and the sense of urgency has never been greater.

The UK Government itself has introduced a new Net Zero Council which will support industry to help cut their emissions and develop greener practices. The transition to a net-zero economy is at a critical stage. Large companies face mounting pressure to eradicate carbon emissions from their supply chains, operations, and products and services. NHS England has also established 'green plan' with a target of becoming net zero by 2040, with the goal of achieving an 80% reduction by 2028–2032.

Recent climactic events have offered a glimpse into the potential impacts the world could be subjected to if things do not change.

From flooding and wildfires to droughts and hurricanes in all corners of the planet, it's important that we also look closer to home. England had its eighth driest February this year in a series which goes back to 1836, and its driest since 1993, with on average just 15.3mm of rain falling in the month. July 2022 was also the driest July in England since 1911 and the second driest since records began in 1836. Here we are in June 2023, and there's already talk of UK hosepipe bans this summer.

The time for action is now. To make the changes, deep collaboration spanning public and private spheres is required that leaves no stone unturned. Here, the built environment, rightfully, should be placed under the microscope. Indeed, in the UK, the building sector accounts for approximately 25% of all greenhouse gas emissions.

Property developers, owners, occupiers and policy makers therefore must determine the most effective means to reduce the emissions associated with the construction and performance of buildings.

Following November 2022's COP27 summit, several statements were issued concerning the UK's shift to renewable energy, financing to address climate change, and safeguarding forests and wildlife.

Embodied versus operational carbon

Critically, this will require a binary plan aimed at reducing the two major strands of carbon emissions involved in the built environment.

First, we have embodied carbon, the emissions associated with producing materials.

Think about all the various components that make up a building – doors, bricks, flooring, windows. Each of these are created using raw materials which need to be extracted and refined with manufacturing processes, before being transported on site and installed. Combined, the energy emitted throughout this lifecycle adds up to give us the embodied carbon associated with a material.

In the case of buildings, we also need to consider the emissions from the construction materials and the building process, as well as all the fixtures and fittings. Embodied carbon additionally covers emissions associated with deconstructing and disposing of components at the end of their useful life.

Indeed, addressing embodied carbon is becoming increasingly important. By 2050, more than two-thirds of the world population will live in urban areas. Therefore, architects and developers must find ways to reduce the carbon emissions involved in the design and construction of new builds.

This isn't the only concern, however. Equally, what is often overlooked is the ongoing environmental impact of our current building stock, and this is where focus on operational carbon enters the conversation.

Operational carbon is recognised as the amount of carbon emitted during the operational phase of a building, including emissions created from the use, management, or maintenance of a building.

Think about the energy needed to keep our buildings warm, cool, ventilated, lighted and powered.These utilities are needed on a daily basis, demanding the use of fuels such as electricity, natural gas, oil, wood and more.

Addressing operational carbon with collaboration

Critically, operational carbon accounts for 28% of all global greenhouse gas emissions, compared to the 11% stemming from embodied carbon. Not only that, but eight in 10 of the buildings that will be standing in 2050 have already been built.

In this sense, decarbonising the current building stock is just as important – if not more so – as ensuring that new buildings are created and operated sustainably. So, how can this be achieved?

The obvious and traditional approach is to invest in improving energy performance. Insulation solutions such as double (or even triple) glazing can help to reduce the energy output required to maintain optimum temperatures, while heat pumps and hydrogen-conducive boilers are increasingly entering the fray as

energy efficient alternatives to traditional heating solutions.

From switching to LED lighting to investing in smart building management tools and sensors to adjust heating, cooling and lighting output automatically in accordance with building occupancy, there are plenty of solutions available. However, it is not always necessary to spend large sums to achieve major sustainability gains.

Instead, it is possible to fulfil key objectives by working together to share ideas and make better use of what already exists.By establishing open and honest relationships in which all parties are pulling in the same direction towards a shared vision, much can be achieved. More businesses are developing Carbon Transition Plans. However, and alarmingly, a recent study by the World Benchmarking Alliance (WBA) and CDP has revealed that over 50% of major companies in the global construction and property development industry have failed to establish climate transition strategies. The study evaluated 50 companies involved in various building-related sectors and analysed their performance and targets concerning climate-related issues.

Here, many forums and associations exist to stimulate conversations and collective innovation. Let's Go Zero is a prime example, the body being established to unite those schools and support them in striving for better, fairer, zero carbon future.

Further, we're also seeing increasing numbers of schemes such as the government-backed Smart Export Guarantees (SEG) emerging. Here, renewable energy producers can feed back unused electricity into the grid and receive payment as a result.

One of our schemes at a health centre is achieving just that. There is an opportunity for occupants to get a return on investment in renewable technology from reduced energy bills, but there's also an incentive to continue to minimise consumption in order to receive higher payments from the grid. Based upon a Smart Export Guarantee (SEG) price of 5p/kWh, our customer will receive £200 per annum. The cost of the export meter is £1400 + VAT, meaning a seven-year return for them.

Corporate power purchase agreements (CPPAs) are another option, enabling businesses to agree contracts to purchase renewable electricity directly from a specific producer with fixed costs for long periods.

Ultimately, the point is that major investment isn't necessary to make massive improvements in respective of emissions in the built environment.

By working together, sharing ideas and embracing deep collaboration across the entire value chain, we can achieve the radical transformation needed in the way buildings are designed, built, occupied, and deconstructed, and take strides towards the sustainable future that our planet and future generations are reliant upon.