

Towards a Net Zero Carbon Future: A Global Perspective

Amy Twist

BGEN Ltd

Dr Aaron Steven Yeardley

Dr Gareth Davies

Tunley Environmental

Abstract

Humanity has seen drastic increases in quality of life since the onset of the industrial revolution. This is in large, due to the usage of fossil fuels. However, this also released significant greenhouse gas emissions into the atmosphere which subsequently increased the average global temperature. This phenomenon is known as climate change or global warming. Climate change has serious implications for our planet and if not prevented will cause catastrophic devastation, massively outweighing the recent increases gained in quality of life. Herein, we present key information related to the path to reducing the overall release of these Greenhouse Gas (GHG) emissions to zero, commonly referred to as Net Zero Carbon. An essential part of which is identification and measurement of carbon emissions for industry activities. This quantification enables pinpoint reduction of the highest emissions sources by implementing developing or improved technologies, then allowing reductions in GHG emissions. After this point the remaining emissions must be offset using viable processes so that the overall emissions are truly Net Zero. We adopt and apply the most widely recognised standards for quantifying and reporting of emissions in all sectors.

Keywords: business carbon assessment, WLCA, RICS, Paris Agreement, Carbon, Emissions, Net Zero, Sustainability, The GHG Protocol

The Push for Net Zero Carbon

Climate change is no longer a distant theory, but a pressing reality. As the world continues to grapple with the escalating effects of global warming, the necessity for Net Zero Carbon has become evident.

For example, In the UK, June 2023 was recorded by the MET Office as the hottest June since records began in 1884 [1]. Similarly, July 2024 was noted as the Earth's hottest month on record, where the average global temperature was 1.21°C above the 20th Century average [2]. This all provides evidence of the rapidly accelerating pace of climate change.

The notion of Net Zero Carbon revolves around balancing the amount of emitted greenhouse gases with the amount removed from the atmosphere. This delicate equilibrium is vital to halt global temperatures from rising above the critical threshold of 1.5 °C, a limit established by

climate scientists to prevent catastrophic environmental changes.

The Global Commitment Towards Net Zero Carbon

The transition to a Net Zero future has gained global momentum, with nearly 200 countries committing to the Paris Agreement's goals. This pact aims to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. This global commitment underpins the urgency of achieving Net Zero Carbon emissions by the mid-21st century to mitigate the worst impacts of climate change.

Tackling the Current Crises

Addressing the climate crisis requires a multi-pronged approach. Firstly, we need to transition from fossil fuels to renewable energy sources such as wind, solar, and hydro. Secondly, governments need to enact strong climate policies that incentivise green practices and



penalise heavy polluters. Furthermore, businesses should integrate sustainability into their business models, while individuals should make more climate conscious lifestyle choices.

The Role of Carbon Management Plans in Emission Reduction

To effectively reduce carbon emissions, a comprehensive carbon management plan for qualifying industry activities is an essential tool. These plans involve implementing measures to mitigate the emissions associated with materials, technologies, transportation, and suppliers, among others. By adopting sustainable practices, optimising logistics, and promoting responsible consumption, projects can significantly reduce their overall carbon footprint. This not only benefits the environment but also enhances business reputation and aligns with global sustainability goals.

These plans, designed to systematically reduce carbon emissions, often utilise industry benchmarks such as the RICS Whole Life Carbon Assessment (WLCA) standard.

The WLCA standard is a comprehensive approach to estimate carbon emissions throughout the lifecycle of a constructed or replaced asset, encompassing embodied, operational, and end user carbon. This standard offers a long-term perspective on both cost and carbon considerations, making it an essential tool for financial decision-makers. Furthermore, the WLCA aligns with existing carbon standards and is set to be utilised extensively in the UK to meet the Net Zero Carbon Building Standard.

Implementing carbon management strategies requires a clear understanding of the WLCA. A complete WLCA should account for all life cycle stages, including carbon removal. This comprehensive view enables businesses to reduce their carbon footprint, aligning themselves with global efforts towards a Net Zero Carbon future.

How the Tunley and BGEN Partnership is helping clients reduce emissions.

The Tunley and BGEN partnership combine carbon management and engineering expertise to deliver sustainable solutions for businesses. A number of projects have been successfully completed, including a major project replacing old fluorescent lighting with new LED lighting in a vast manufacturing facility. A comprehensive carbon management plan and accompanying WLCA was completed at the design stage, adhering to ISO 14040 and ISO 14044 standards. The assessment evaluated embodied carbon emissions from raw materials and operational emissions from annual electricity usage. This lighting upgrade will significantly enhance lighting levels, reduce electricity costs, and lower Scope 2 GHG emissions.

Results: The new system will save approximately 32.9 t CO_{2e} and £27,774 per year in energy costs.

Carbon management plans, when used in conjunction with standards, like the WLCA, offer a practical pathway for businesses to reduce their carbon footprint, aligning themselves with global efforts towards a Net Zero Carbon future.

Conclusion

The path to a brighter and colder future is clear. First and foremost, the carbon emissions of products, services, businesses, and construction projects can be quantified following rigorous internationally recognised standards such as The Greenhouse Gas Protocol and the RICS Whole Life Carbon Assessment. This quantification is an essential tool in our arsenal, fighting against climate change enabling measured and specific reductions in carbon emissions by identifying hotspots. However, to be successful these practices must be not only adopted but embraced by businesses worldwide, who have the power to make real reductions and achieve Net Zero Carbon globally.

