1.Get informed

Climate jargon buster

Grace Di Benedetto presents a short glossary of key sustainability terms that engineers are likely to encounter when reading climate guidance.

This article gives simple explanations of common sustainability terms that a structural engineer may come across. It has been developed with reference to existing industry definitions where possible. Where further explanation has been added, the definitions come from those used within Arup's Structural Engineering Sustainability Hub.

Concepts and systems

Lifecycle assessment (LCA)
A method to quantify the carbon emissions and other environmental impacts (such as acidification and air pollution) of assets or products over their whole lifecycle[1].

Lifecycle stages/modules
Each lifecycle module (A1, A2...) describes a distinct phase in the lifecycle of an asset, and modules are grouped into stages (e.g. product stage consists of Modules A1–A3). Refer to Figure 1 of BS EN 15804[2].

Environmental product declaration (EPD)
A third-party verified, standardised document that provides the environmental impact of a product, based on the data from an LCA.

Circular economy
A circular economy is based on the principles of designing out waste and pollution and keeping products and materials in use, e.g. refurbishment, reuse, design for adaptability/deconstruction[3].

Design for adaptability
Designing to support the continued use of an asset by allowing for and accommodating potential future adaptations[4].

Design for deconstruction (DfD)
Design decisions that increase the quality and quantity of materials that can be reused at the end of a building's life. Also known as design for disassembly[5].

Regenerative design
Design that achieves net positive impacts on health, society and the environment, often being inspired by the circular, low-energy systems that exist in nature.

Carbon

Greenhouse gas (GHG) emissions/ carbon emissions
Emissions of gasses including carbon dioxide, methane and water vapour that trap heat in the atmosphere. The global warming potential (GWP) of these gasses is measured in CO_2e (carbon dioxide equivalent).

Embodied carbon (EC)
The GHG emissions associated with materials and construction processes throughout the whole lifecycle of an asset (Modules A1–A5, B1–B5 and C1–C4)[6].

Operational carbon (OC)
The GHG emissions arising from all energy and water consumed by an asset in use, over its lifecycle (Modules B6 and B7)[6].

Upfront carbon
GHG emissions up to practical completion, excluding sequestration (Modules A1–A5)[6].

Whole-life carbon (WLC)
The total of all GHG emissions and removals, both operational and embodied, over the lifecycle of an asset, including its disposal (Modules A–C). Potential benefits or loads from future energy recovery, reuse and recycling are reported separately (Module D)[6].

Sequestration
The removal and long-term storage of CO_2 from the atmosphere in biomaterials such as timber. The carbon stored in these materials is known as biogenic carbon[7].

Carbon capture and storage (CCS)
Process to capture the CO_2 arising from fossil fuel combustion or industrial processes, transporting it to a storage site and storing it where it will not enter the atmosphere[8].

Targets

Net zero
A net-zero-carbon asset is one where the sum total of all asset-related GHG emissions, both operational and embodied, over its lifecycle including disposal (Modules A1–A5, B1–B7, C1–C4), plus offsets, equals zero. Minimising emissions should always be prioritised over offsetting[6].

Zero carbon
An asset, product or service that produces no carbon emissions and therefore no offsetting is required. Also known as carbon zero, absolute zero, or gross zero.

Climate positive
An activity that goes beyond net zero by achieving an overall reduction in GHGs in the atmosphere. Also referred to as carbon negative.

Science-based target
A target that is consistent with the pace recommended by climate scientists to limit the worst impacts of climate change[9].

Scope 1, 2 and 3 emissions
To classify the boundaries of an organisation's GHG emissions, three scopes are differentiated. Scope 1 covers direct emissions from owned or controlled sources. Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling. Scope 3 includes all other indirect emissions that occur in a company's value chain, e.g. business travel and the embodied carbon of built assets[10].

Carbon offsetting
The use of GHG emission reductions or removals to compensate for CO_2 emissions.

Materials

Recyclability
Indicates how easy a product is to separate into its material components and to convert into a new item. The term 'downcycling' is used where the resulting product is of a lower value than the original item. Conversely, 'upcycling' adds value to the item.

Reuse
To use a product again while largely maintaining its original form. Unlike recycling, reuse requires minimal reprocessing.

Recycled content (RC)
A measure of how much material within a product is from a non-virgin source.

Recycling rate (RR)
Indicates how much of a product is collected and returned to the manufacturing process. A high recycling rate reflects that the product is technically recyclable and that the market infrastructure exists for it to be reclaimed.

Acknowledgements

Many thanks to Will Arnold for his invaluable guidance in writing this article, and to our reviewers, Duncan Cox, John Orr, Natasha Watson, Orlando Gibbons and Penny Gowler.

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