

More than 70 countries and 1,200 companies have committed to achieving net-zero emissions by 2050, according to the United Nations. The goal of net zero is to cut carbon emissions to curb climate change to protect the planet and future generations. Human-caused emissions of carbon dioxide and other greenhouse gases are a primary driver of climate change - which, if humans want to mitigate climate impacts to the ecosystem, must be addressed from all perspectives, across all industries.

WHAT IS EMBODIED CARBON?

Embodied carbon in the context of the architecture, engineering, and construction (AEC) industry refers to the greenhouse gas (GHG) emissions released into the atmosphere during the upfront activities necessary to construct or renovate buildings and infrastructure. Reported as carbon-equivalent emissions (CO₂e), the total accounting of GHGs emitted during the build phase is called embodied carbon because the environmental impacts associated with building activities are locked in place prior to building operation.

Embodied carbon includes all the upfront activities that are part of construction, as well as any kind of renovation - replacing a roof, fitting-out a tenant space, or simply replacing carpet or repainting - activities that also generate GHG emissions. Before the building systems are operating, a carbon footprint has been formed.

OPERATIONAL CARBON

Energy from fuel-burning activities during building operations can be converted to the metric of operational carbon. Operational carbon, therefore, is the amount of GHG emissions released during the operational, or in-use, phase of a building; for example, it can be calculated from energy bills and



the built world is transparency of the environmental impact of materials and processes used in all upstream activities. Providing transparent data, with measured and verified environmental impact, gives AEC professionals the opportunity to make better decisions about how and with what they're building. For example, embodied carbon can be reduced by comparing data for building products and choosing lower embodied carbon products or carbon-sequestering materials. Furthermore, if AEC professionals demand more transparent data - asking manufacturers to report metrics and measurement of environmental impact, for example - they could drive change and foster industry transformation, ultimately accelerating decarbonization of the AEC industry.

2. Implement Design-Optimization Tools

There are many resources available to help AEC professionals understand the environmental impact of building materials and compare material data sources to make informed decisions. There are design optimization tools specific to product and material data, which can aid an AEC professional in exploring, onal





About the Author

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About the Article

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