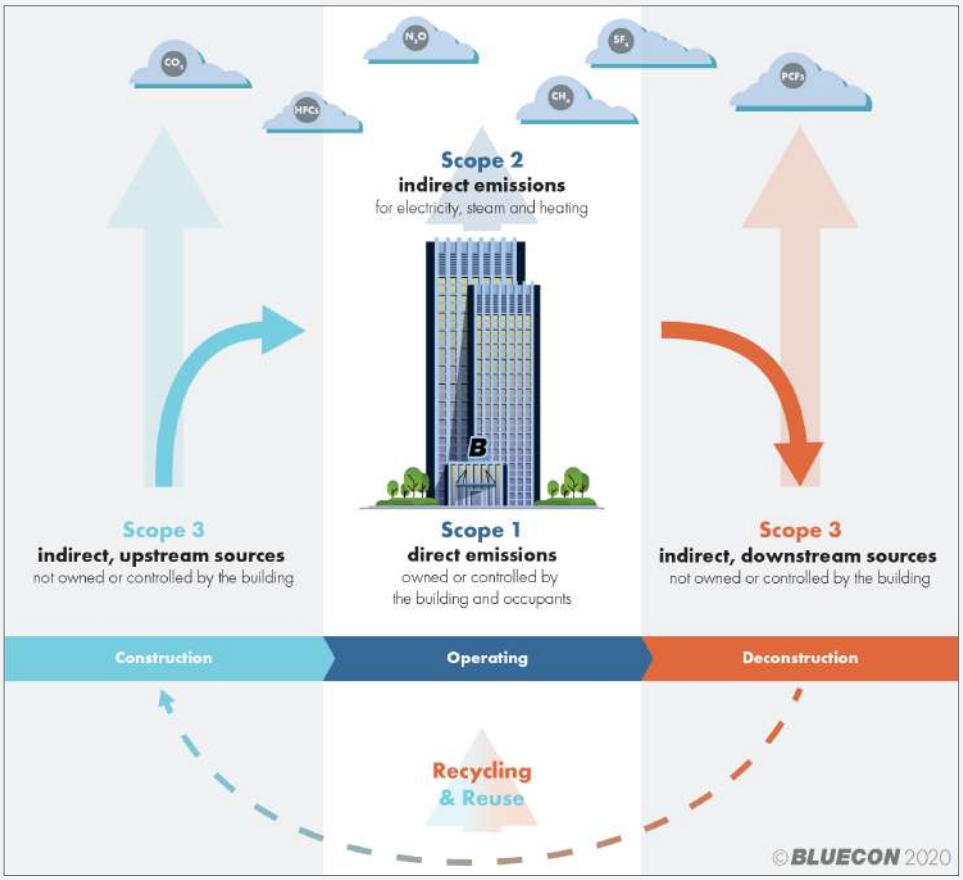
Embodied carbon in Real Estate according to Scope 3 of the GHG Protocol (Greenhouse Gas Protocol)

Since 2015, energy optimisation has been taking place throughout existing properties and new construction projects on the basis of the Paris Agreement and the guidelines derived from it. By means of these energy optimizations, the direct emissions of the building as well as the energy consumption are being reduced, i.e. they take place within Scope 1&2 according to the specifications of the GHG Protocol (see diagram "Emissions of a property according to Scope 1,2&3 according to GHG Protocol").

In an existing portfolio, for example, energy metering is automated by the installation of integrated meter concepts and the refurbishment of the building technology is initiated as part of refurbishments.
The portfolios are streamlined in the direction to achieve CO^2-neutral operation.
By taking embodied carbon into account a new perspective on the emissions of a property is created. Within Scope 3 of the GHG Protocol, emissions that arise during production, transport and recycling and the use of building materials after the end of the property's life cycle are recorded and evaluated.

This extension of the perspective to Scope 1,2&3 shows that restorative measures which have a positive impact on the emissions balance when the emissions are assessed only according to Scope 1&2 can lead to an increase in the total emissions of a property when embodied carbon is also considered within Scope 3. These measures can therefore have a negative impact on the greenhouse gas emissions of the asset.



Emissions of a property according to Scope 1,2&3 according to GHG Protocol

Embodied carbon in Real Estate in regards to Scope 3 of the GHG Protocol (Greenhouse Gas Protocol)

Put into practice, the example of replacing a ventilation unit within an existing property, would mean the following;

The replacement of a ventilation system in an existing building with a new, energy-saving ventilation device reduces the energy consumption, i.e. the emission of greenhouse gases of the existing building - the refurbishment measure has a positive (reducing) effect on the direct emissions as well as the energy consumption of this property - i.e. the emissions within Scope 1&2 of the GHG Protocol.

This approach according to Scope 1&2 doesn't recoginze the high energy consumption and the resulting greenhouse gas emissions which are incurred for the production, the transport and the assembly of the new ventilation system, as well as the disassembly and recycling of the old and the new ventilation system.

The additional emissions generated during the production, the transport and the assembly of the new ventilation system, as well as the disassembly and recycling of the old and the new ventilation system are called Embodied Carbon (Scope 3 GHG Protocol). The Lifecycle Assessment calculates the embodied carbon emissions versus the emission savings that occur during the operation of the technical installation that is to be replaced – for this example the new ventilation unit.

When comparing the LCA of the replacement of the ventilation system as a whole with the LCA of the refurbishment of the old ventilation unit by replacing relevant installation parts on site (e.g. fans, frequency converters, etc.), the latter may be the preferred option with regard to the emissions balance. The preferred option could also be more economically viable when these emissions are taxed.

When considering restorative measures in existing buildings to decrease greenhouse gas emissions, a detailed LCA of the measures might be helpful to compare the overall environmental impact in all areas (Scope 1,2&3 GHG Protocol) before deciding which measure to implement.
This will secure reduction of the greenhouse gas emissions in the long run.

About us

BLUECON is an innovative real estate consultant from Germany, Frankfurt am Main. We support our customers around the globe in the construction and real estate industry with planning, consulting and management services along the entire value chain of real estate and have made it our business to make new and existing properties futureproof.

We make #realestate #futureproof.

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