

## Services – life cycle assessment (LCA)

In circumstances where clients are not yet ready to produce an Environmental Product Declaration, we can perform an LCA instead.

The reasons for doing this can vary from client to client, but most commonly it is to understand where the main environmental impacts are coming from ('hotspots').

This type of LCA is referred to as an attributional LCA and this can be used to advise clients where investment is best made in order to reduce the environmental burdens associated with a product, process, or service.

We can also future-proof an LCA, by (for example) examining the effect of future grid decarbonisation on the environmental impacts. This type of LCA is called a consequential LCA.

Many enterprises are now working out strategies for a path to net zero and carbon footprinting is a useful tool for measuring progress, but LCA looks at the bigger picture and considers many different types of environmental impact. Sometimes reducing an environmental burden in one category can lead to a problem in other areas. However, a note of caution is required here, in that not all environmental characterisation factors are as reliable as others. This is where the expertise of an LCA practitioner is invaluable.

A metric that is of particular value, is embodied energy, which can be used as an overall proxy for many different types of environmental burden (in our opinion, much more reliable than other ways of aggregating environmental data into a single metric).

The embodied energy of a material or product used in a structure or product is often defined as the primary energy used in the manufacture, which includes all of the energy used in the production, as well as the primary energy used in the transport of materials and goods required for the production process. This definition relates to the initial embodied energy, which is related to the cradle to factory gate stage (modules A1-A3, EN 15804) of the product life cycle. In some definitions, the transport to construction site (A4) and the energy used on site for the erection or installation of the product (A5) is also included. The units used are generally MJ per unit mass, or volume, or per defined functional unit, although some workers report this as kWh (= 3.6 MJ). Transport of materials to site can have a major impact on the embodied energy of construction materials. Unfortunately, there is quite some confusion around this topic!

A much-debated topic is the issue of using timber buildings as a long-term store of atmospheric carbon in the built environment. There is no agreed mechanism within LCA to account for the issue of time of storage in harvested wood products (HWPs) although there have been many attempts to do this. EN 15804 states that although atmospheric carbon storage can be included in EPDs of products such as wood, this can only be done if the whole life cycle is included and the emissions of atmospheric carbon are included for later parts of the life cycle, irrespective of the actual final fate of the product. It is essential that an LCA study deals with and reports on GWP and stored atmospheric carbon separately, even if the final result is reported as a sum of these two.