

# Understanding carbon factors – new guides available

**Jo Spencer** of Arup introduces a series of short guides that will help practitioners understand the origins of carbon factors for key materials.

At Arup, the BIPAS (Buildings and Infrastructure Priority Actions for Sustainability) team is a multidisciplinary group of engineers, funded via the firm's internal investment programme. We carry out research and create resources relating to sustainability, primarily for use within Arup, but shared externally when appropriate. Our objective is to address those areas that engineers engage with on a daily basis, to enable them to address sustainability in an informed and effective manner.

These guides are intended to help practising engineers understand the origins of carbon factors for three key construction materials: steel, timber and concrete. As engineers, we need to understand how the carbon factors we use are determined, as well as the global impact of our decisions.

The documents provide a snapshot of the industry, highlighting carbon hotspots, as well as the major opportunities for each material that will help us on the path to net zero. The guides will be updated periodically to reflect industry changes.

In line with our Construction Declares commitments, Arup has published these guides externally via the Institution of Structural Engineers, to reach a wider audience, and to promote discussion.

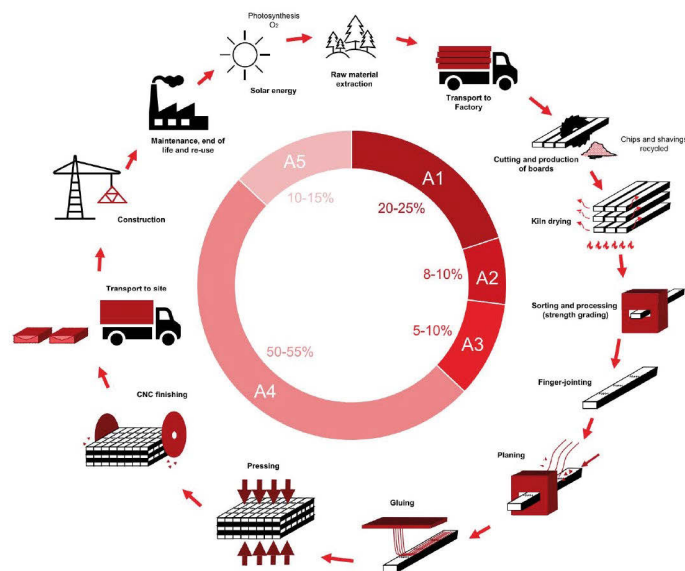
## What is covered?

### Steel

- | The differences between production in a blast oxygen furnace and an electric arc furnace.
- | Fabrication processes and considerations.
- | Implications of steel reuse and recycling.

### Timber

- | The complexities of sustainable forestry and the importance of biodiversity.
- | Embodied carbon associated with adhesives in both cross-laminated timber



(CLT) and glued laminated timber (glulam).

- | Approaches to sequestration, and the effect this has on carbon calculations.

### Concrete

- | Procurement and sourcing of cement and options for replacements.
- | Formwork assumptions and the impact on carbon rates.
- | Embodied carbon ranges for cement and cementitious materials.

## Route to net zero

The route to net zero is different for each material. For example, for concrete there is a heavy reliance on carbon capture becoming mainstream, and severe constraints when it comes to making the right choice for cement replacements. The key for all materials, however, is simply to use less.

## Get the guides

The three current guides can be accessed free of charge at [www.istructe.org/resources/guidance/arup-material-guides/](http://www.istructe.org/resources/guidance/arup-material-guides/). Arup will be producing further guides to add to this suite.

If you have any comments on the guides or would like to make suggestions for future revisions, please contact **Jo Spencer CEng, MICE** ([jo.spencer@arup.com](mailto:jo.spencer@arup.com)).

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