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In the first of two articles on embodied carbon, **Stephen Finnegan** and **Mal Ashall** assess the potential impact of the new RICS methodology

Costing carbon

In 2010, the UK government's Low Carbon Construction Innovation and Growth Team report recommended that the Treasury *Green Book* require whole-life carbon appraisal of proposals before public funds are committed. In response, RICS developed a methodology to calculate the embodied carbon of construction materials.

After a 2012 information paper, a guidance note is due for release in April 2014 (see page 25) with a Code of Practice and Practice Statement likely to follow, on which this RICS guidance will become mandatory. Is this the precursor for placing a cost on carbon?

In the public sector, the Highways Agency and the Environment Agency already use this methodology to assess the embodied carbon of their schemes, while Brighton and Hove City Council is the first local authority in the UK to require an embodied carbon calculation for planning permission. In the private sector, Marks & Spencer and British Land have used the methodology, with many more firms likely to follow.



Can a building be called zero carbon if it only measures the operational impact? We think not

Lifetime use

Embodied carbon for a building refers to the manufacture, transport, construction, end-of-life of materials and products used in it. It represents the supply chain of every component over its full lifetime use.

In a typical commercial building, 80%-90% of the total carbon (over a 30-year operational life) is derived from the 'use' stage, with the remaining from the embodied supply chain stages. Given this relatively small residual percentage, why is RICS investigating embodied carbon? Well, with new houses required to be zero carbon by 2016 and commercial buildings by 2019, the operational carbon is effectively zero so the embodied carbon impact becomes much more significant. Low and zero carbon (LZC) technologies will play major roles in producing a zero carbon building, highlighting their importance. Moreover, if we can account for carbon, can we cost it?

Unfortunately, there is insufficient benchmarked information into this embodied supply chain impact, especially for LZC technologies. However, the European Standards Technical Committee is leading the way with its CEN/TC350 standards, which are used in the BRE *Green guide to specification* and subsequently support BREEAM and the Code for Sustainable Homes.

When the RICS guidance becomes mandatory, and industry starts gathering information on the operational and embodied

carbon of buildings, the effective use of the data to enable stakeholders to make informed decisions will be critical. One of the key questions will be who is responsible for managing this information? Currently, product manufacturers must declare information through Environmental Product Declarations, including the embodied carbon used in manufacture.

The longer-term goal must be to collate this information into comprehensive technical databases to ensure that industry can provide relevant and informed advice. The University of Bath and BRE have led the way, with the Inventory of Carbon and Energy and Environmental Profiles respectively. Such databases will inevitably be used in building information modelling (BIM) and create an opportunity to share information on best practice.

Carbon accounting

Detailed information and benchmarked data make it possible to account for carbon. This is the first stage in being able to produce truly sustainable zero carbon buildings.

This is very different from the UK government's current definition of a zero carbon building, which does not include embodied carbon and is purely based on operational impact. Furthermore, the use of Allowable Solutions for housing developers – with the option to 'offset' their carbon if they are unable to meet a zero carbon standard through Fabric Energy Efficiency Standards and the use of LZC technologies – is not ideal.

Can a building be called zero carbon if it only measures the operational impact? We think not. In 2011 the coalition government decided to reduce requirements and assess operational carbon only; fortunately, this has not limited research and development into life cycle thinking and the new RICS guidance should encourage a new era of data collection for industry use.

The new RICS guidance is certainly necessary. More detailed and benchmarked information is required and accounting for carbon is essential for true sustainable development to occur. However, the construction industry may be concerned that this information will be used to introduce new taxation, as happened when the EU Emissions Trading Scheme was expanded to include aviation. ●

Part two of this article will look at the embodied carbon included in sustainable technologies

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