

# Embodied Carbon Guidance for Social Housing Q & A

Woodknowledge Wales has created guidance on Embodied Carbon reduction for social housing developers, their consultants and contractors. The guidance contains advice on how to make assessments, available tools and benchmarks for comparison. This briefing paper is designed for strategic leadership teams to highlight the key content of the guidance in the form of a series of questions and answers.

## What are the different measures of the carbon for housing?

For a home, Embodied Carbon is the total carbon emissions associated with the construction materials. It includes all the emissions from the extraction, manufacture, transport and installation of the materials and products needed to construct a home (the Upfront Carbon). It also includes emissions from maintenance, refurbishment, and at the end of life, deconstruction, waste processing and disposal.

## Is it the same as Whole Life Carbon?

No. The Whole Life Carbon of a home includes both Embodied Carbon and Operational Carbon (e.g. heating and lighting) over its lifetime. Understanding the relationship between both helps to know the best way of reducing carbon emissions throughout the building lifecycle – that's why Embodied Carbon is being increasingly measured. A Low Carbon home is one that optimises the use of resources to build it **and** to use it over its lifetime.

## Why is it important? Embodied Carbon emissions can represent between 50% and 70% of the emissions of a home across its life cycle.

Its relative importance is increasing as the UK's electricity grid decarbonises and Operational Carbon emissions reduce. At the same time, if the number of additional homes per year matches the estimates of housing need, we will see between 6,700 and 9,700 new homes built in Wales<sup>1</sup>, which will increase Embodied Carbon. Embodied Carbon savings made during the design and construction of a home are delivered immediately, rather than at some point in the future.



## Why should we reduce Embodied Carbon?

Buildings play a vital role in meeting our climate change obligations, and in Wales, Embodied Carbon accounts for 6% of overall CO<sub>2</sub> emissions. The Welsh Government wants all public bodies to be carbon neutral by 2030 and, at the time of writing, most local authorities in Wales have declared a climate emergency. Most of the construction sector is committing to the Net Zero Carbon agenda. Assessing Embodied Carbon will help the sector understand its overall carbon footprint and highlight where reductions can be made. It may also assist in attracting alternative sources of finance such as green bonds. There is also a strong link between Embodied Carbon and the creation of a more Circular Economy.

<sup>1</sup> <https://gov.wales/sites/default/files/statistics-and-research/2019-06/new-house-building-april-2018-to-march-2019-995.pdf>



### What are the economic benefits for reducing Embodied Carbon?

Targeting Embodied Carbon can help address the whole life costs of a home, especially when future running costs may be more of a concern than initial build costs. For instance, investing in more durable materials will mean less replacement over time, with less Embodied Carbon. This also equates to lower life cycle costs and less tenant disruption. Reducing Embodied Carbon can mean less cost when compared to the cost of solutions for saving Operational Carbon and savings can often be achieved over a shorter period.

### How can Embodied Carbon be reduced?

Building elements such as the foundations and structure represent the biggest contribution to Embodied Carbon, largely due to the amount of materials they use. Therefore, considering low Embodied Carbon materials such as timber, or increasing the recycled content of materials, will have a positive impact. Timber also has an advantage over other materials as it can store CO<sub>2</sub> removed from the atmosphere during the tree's growth. Designing 'leaner' homes by minimising the quantity of materials used to build them will reduce Embodied Carbon. Designing for future use - adaptability and flexibility - will increase a home's lifespan and minimise the need for new homes in future. Building with deconstruction in mind will enhance the reuse of construction materials.

### Is it difficult to measure Embodied Carbon?

No, and the earlier Embodied Carbon is considered, the greater the ability to reduce it. Assessments can be in the form of a checklist, simple building analysis or a full building life cycle assessment. It is recommended that a 'cradle to grave' assessment is undertaken. There are many tools available to assess Embodied Carbon. Assessments can be done in-house or procured from the design team or a specialist consultant. There are several standards which should be met, including the RICS Professional Statement on Whole Life Carbon<sup>2</sup>.



### Can targets and benchmarks be set?

Yes, benchmarks (at building or element level) are a useful way to check performance. Woodknowledge Wales has produced benchmarks which can be used as targets for the reduction of Embodied and Upfront Carbon.

### Who needs to be involved in reducing Embodied Carbon?

Everyone has a responsibility to reduce Embodied Carbon and there needs to be commitment across an organisation to address it, together with an engaged supply chain. Leadership teams should champion and facilitate the reduction of Embodied Carbon in the homes they create.

### Is procurement important?

Yes, it's key as it presents an opportunity for measuring, reducing, and managing Whole Life Carbon. At an organisational level, a carbon policy including Embodied and Operational Carbon from housing activities should be agreed, with requirements for reducing Upfront and Embodied Carbon included in project briefs. Performance outcomes can be set in documentation and responsibility for monitoring/measuring Embodied Carbon included at every stage of a building's life cycle.

<sup>2</sup> RICS (2017) Whole Life Carbon assessment for the built environment. 1st Edition. London: RICS. Available at: [www.rics.org](http://www.rics.org) (Accessed: 2 November 2018).

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