Whole Life Carbon Assessment

Future Possibilities for New Clients

Whole life carbon is becoming a prominent aspect of the built environment, as the next step in reducing carbon emissions, through both the forthcoming revised London Plan and within building assessment schemes such as BREEAM.

**What is embodied carbon?**

Embodied carbon is the total greenhouse gas emissions arising from the extraction of raw materials, transport and the construction, together with end of life emissions of a built asset.

**What is operational carbon?**

Operational carbon is associated with energy consumption while the building is occupied. This includes regulated emissions (heating, cooling, ventilation and lighting) and unregulated emissions (e.g. IT equipment, cooking, and refrigeration appliances).

**Why is it important?**

Climate change is one of the greatest environmental challenges of our time. Global warming due to ‘human-generated’ greenhouse gas emissions to the atmosphere may have severe adverse environmental, social and financial effects around the world if temperature levels continue to rise.

The UK Government has set legally binding carbon reduction targets in the Climate Change Act 2008, which covers carbon emissions from a range of industries.

The government has also established Energy Savings Opportunity Scheme (ESOS). ESOS is an energy assessment and energy saving scheme which requires corporate monitoring and reporting of energy use. This is a mandatory scheme for large UK organisations.

More and more organizations are signing up to Science Based Targets, taking a progressive approach to measuring and reducing their carbon emissions. Additionally, some planning authorities are requesting embodied carbon information at the planning stage of major developments.

The built environment has so far been addressing mainly operational emissions via reduction targets in building regulations (Part L) as a way of achieving ‘zero carbon’ but has failed to account for the embodied carbon required to construct a building. A whole life carbon (WLC) approach identifies the overall carbon emitted from all the construction materials that make up a structure and the operational emissions in the day-to-day running of a building over its entire life.

**Why is it important for clients?**

Clients undertaking a holistic approach to whole life carbon will benefit in a number of ways:

- Cost-effective mitigation of carbon impacts in the built environment. In many cases, the low carbon option can also be the low cost option;
- Future-proofing of assets and added value. Setting ambitious targets and taking action now ensures an efficient and durable company in a future where resources become increasingly expensive and scarce, especially those coming from fossil fuels;
- Reduced maintenance and resource efficient design options. The use of low carbon, durable materials and products made of recycled content that are legally and locally sourced can have a direct impact on the decision-making processes and the project’s design. A climate change-resilient building has a longer life with reduced maintenance expenditure afterall;
- Corporate social responsibility and marketing advantage. An environmentally conscious company with forward thinking sustainability targets can attract more investment. Real Estate companies have a responsibility to ensure their tenants are not paying above the odds for floor space and most potential tenants are more likely to settle for a more sustainable building;
- Contribution to building assessment sustainability rating schemes. A whole life carbon approach can ensure that environmental quality is integrated in the development and operational processes in a robust and quantifiable manner;
- Increase innovation. The transition from a fossil-fuelled to a low-carbon economy will catalyse the development of new
technologies and practices. Companies with ambitious holistic targets will lead the way to innovative solutions;

- Corporate reporting. More and more international organizations and companies are now required to set carbon emission reduction targets and report in regular intervals. Measuring carbon allows owners and occupiers to easily understand and compare the carbon value of different buildings.

- The latest version of BREEAM (BREEAM 2018 New Construction) also requires detailed calculations of embodied and operational energy thereby standardising life cycle assessments to influence design. The key requirements are summarised below:
  - Embodied carbon impact: Credits Mat 01 & 02 Environmental impact of construction products;
  - Design and operational carbon impact: Credit Ene 01 Reduction of energy use and carbon emissions, which looks at both ‘as-designed’ and operational energy/carbon levels.

**How can Hilson Moran help?**

Hilson Moran’s expertise in carbon management can influence decision-making processes for tangible, lasting benefits.

- Hilson Moran has the skills and experience to provide a complete service when it comes to carbon accounting within the built environment. From the design of the building through to operation, we have the techniques and tools to allow meaningful analysis and practical advice on how to optimise the energy and carbon signature of our clients building stock that in turn will bring benefits in terms of operational costs, staff wellbeing and meeting corporate sustainability targets.

Hilson Moran can offer a holistic and economically driven approach to real estate carbon analysis.

Our services include:

- Developing a carbon brief (comprehensive greenhouse gas emissions inventory for the client). Early engagement with the client and the teams from stages 0 & 1 can have greater benefits in a project and implement early thinking of a whole life approach;
  - Production of tailor-made carbon strategies and performance goals to reduce environmental impacts of individual building through to masterplans;
  - Advice on low carbon material procurement and construction practices;
  - Whole life carbon assessment and reporting;
  - Conduct ESOS assessments for organizations (required every 4 years - phase 2 is underway);
  - Provide Post Occupancy Evaluation studies with market comparisons using BUS methodology;
  - BREEAM consultancy and embodied carbon calculations;
  - Assessment of operational energy performance through bespoke modelling or on-site monitoring of energy usage.

Hilson Moran’s work can help clients transform their properties to more attractive and future-resilient places for people to leave.

Typical scenarios to measure their whole life carbon are:

- Comparison of refurbishing or demolishing and rebuilding a building;
- Comparison of operational and embodied carbon through the building’s life cycle;
- Comparison of various low carbon construction materials and products;
- Comparison of various end-of-life scenarios for reuse, reprocessing or recycling (circular economy principles).

Figure 2 Total whole life carbon emissions breakdown for different building types Source RIBA Embodied and whole life carbon assessment for architects