



Whole life carbon assessments

A guide for clients



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Introduction

The built environment contributes 39% of global energy-related carbon emissions, meaning it is vital the sector reduces carbon emissions in order to combat the global climate crisis. But how can we address this issue if there isn't even a standardised way of measuring how much each built asset is contributing to the problem?

This is why RICS published [Whole life carbon assessment for the built environment](#), which provides the methodology for carrying out whole life carbon assessments (WLCA) for built environment projects and assets. This methodology marks a revolutionary change in carbon measurement practices: instead of only considering carbon emissions during construction, it considers all stages of a built asset, from its conception and design to construction, operation and eventual decommissioning. This includes:

- 1 **embodied carbon emissions**, which refer to the emissions associated with material production, transportation, construction, maintenance and end-of-life processes, and
- 2 **operational carbon emissions**, which result from energy consumption and water use during the asset's life.

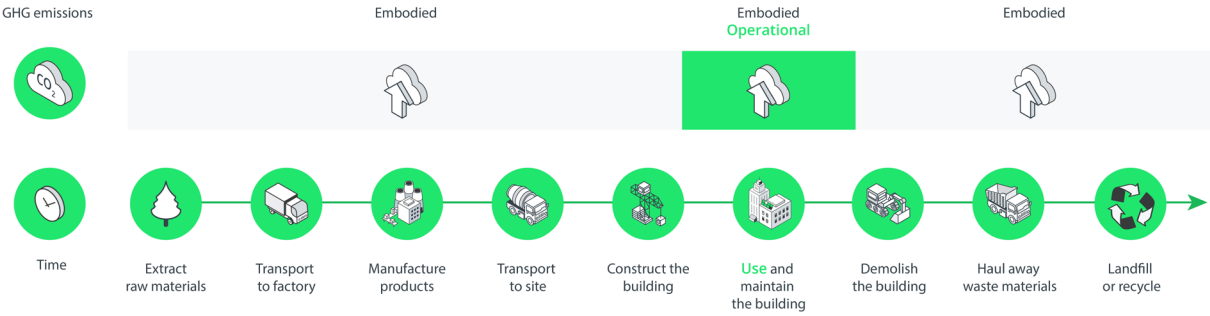
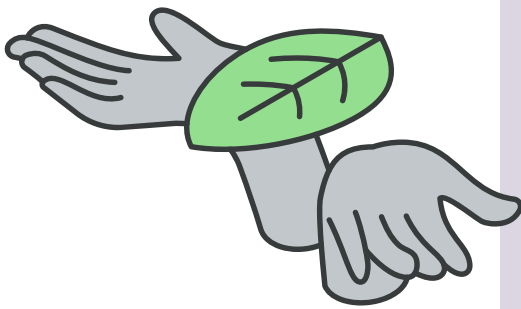


Figure 1: Carbon emissions over the life cycle of a built asset

By providing a comprehensive and consistent approach, the methodology in the RICS standard empowers built environment professionals to make informed decisions that will help mitigate climate change and promote sustainability.

Why do I need a WLCA?

WLCAs provide insights into regulatory compliance, risk mitigation and long-term cost efficiency over the whole life cycle of a built asset and beyond. Clients can benefit significantly from an assessment by using it to optimise the environmental and financial performance of their assets, meet regulatory requirements and ensure they are well-positioned for future sustainability challenges. Some of the benefits of a WLCA are listed here.



Environmental impact

- Allows emissions from built assets to be compared using a common assessment framework.
- Promotes efficient use of resources and encourages a whole-of-life approach.
- Provides guidance on how to reduce embodied emissions.

Cost efficiency

- Helps clients identify cost-effective solutions for reducing emissions over the long term.
- Provides insights into the environmental impact of different materials.
- Identifies opportunities for energy efficiency.



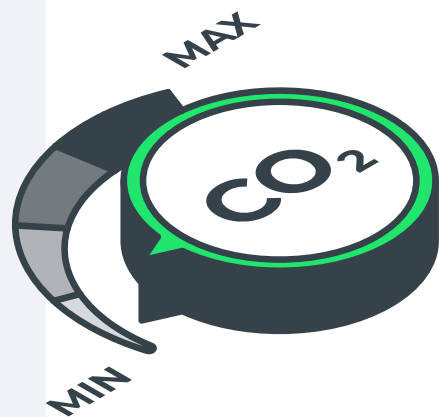


Regulatory compliance

- Carbon disclosure programs require the reporting of carbon emissions associated with products and services in response to climate change concerns.
- Government procurement policies may require compliance with environmental standards; WLCAs can provide evidence for this.
- Green building certification programs, including LEED and BREEAM, may require WLCAs to evaluate the environmental performance of buildings.

Stakeholder and client expectations

- Stakeholders want to see sustainable practices and commitment to improvement.
- Clients and end users expect transparent and accessible information on the environmental impact of products and services.
- Clients are expected to incorporate life cycle thinking, from the extraction of raw materials to the built asset's end-of-life stage, into their decision-making processes.



Who else will use the WLCA?

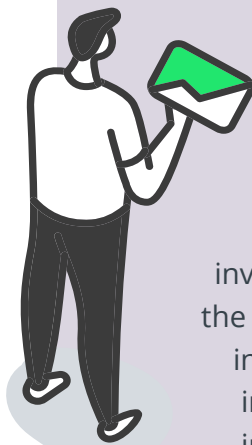
Governments and policymakers

WLCAs are essential for governments and policymakers when developing and implementing environmental regulations, standards and policies, providing them with valuable insights into environmental sustainability. This information can then be used to make informed decisions about sustainable practices, emissions reduction and resource management.



Investors and developers

Investors and financial institutions increasingly consider environmental factors in their investment decisions. WLCAs provide insights into the sustainability of a company's portfolio of projects and assets. They help investors make informed decisions when assessing the risks and opportunities associated with their investments. With the information WLCAs provide, investors can incorporate environmental factors into their investment strategies and contribute towards a more sustainable future for all.



Designers, architects and engineers

Professionals involved in designing and engineering built assets can use WLCAs to assess the environmental impact of different design choices they make.



The process

Undertaking a WLCA involves following a structured method for measuring the carbon footprint of a built asset throughout its life cycle. WLCAs are broken down into the following steps.

1 Define the scope

The WLCA must have a clearly defined scope, outlining all boundaries, system limits and specific components to be considered. This includes a comprehensive evaluation of materials, construction, operation, maintenance and end-of-life aspects.

2 Gather project/asset data

Collect data from drawings, manufacturer specifications, models, EPDs and other pertinent data for the project/asset necessary for the assessment.

3 Appoint an assessor to carry out the WLCA

Appoint a competent professional to carry out the WLCA. Consider experience, qualifications, track record and knowledge of relevant industries or sectors.

4 Review and present the assessment

It's essential to have a consistent reporting system in place. That's where the International Cost Management Standard ([ICMS 3](#)) comes into play, providing a standardised taxonomy that enables the presentation of construction life cycle costs and carbon emissions on a global level. Following this approach during the early stages of design helps to identify options with lower carbon footprints.

The asset section of the [Built Environment Carbon Database](#) provides a free-to-use platform to report the results of a WLCA in line with the RICS standard. Reporting WLCA results is crucial to decarbonisation efforts because:

- it allows the production of more accurate benchmarks, against which future WLCAs can be compared
- it provides a robust reference for policymakers intending to regulate carbon emissions
- it promotes data transparency across the industry, and
- it enables easy access to granular data that feeds into environmental, social and governance (ESG) reporting frameworks.

5 Continuous assessment

A WLCA's findings make it possible to identify opportunities for improvement and guide decisions that can reduce the overall carbon footprint. WLCAs can be used to implement changes, then monitor the effectiveness of these measures over time.

As a project progresses, the accuracy of the data used improves at each stage, and this in turn provides the opportunity to reduce carbon emissions. By influencing the choices and decisions made at earlier stages, WLCAs help decrease overall carbon emissions.

Good decisions made early in the life of an asset have a greater impact on reducing carbon, as Figure 2 shows.

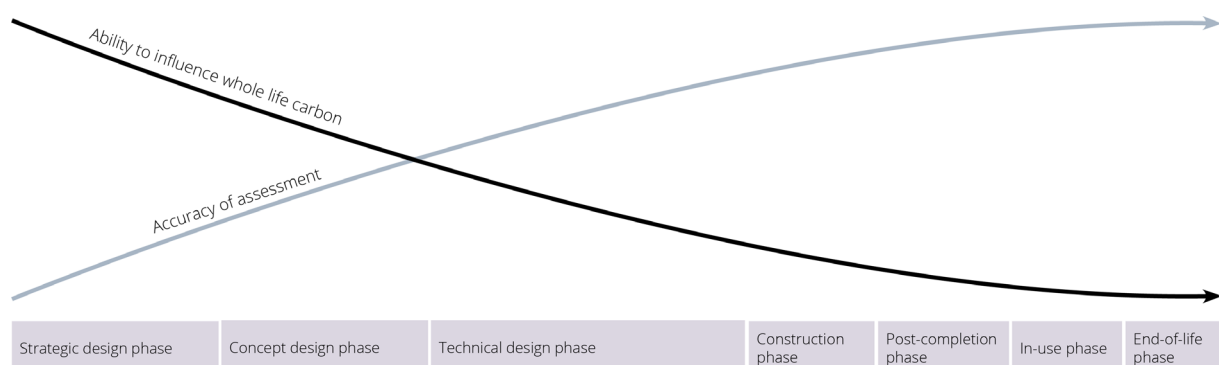


Figure 2: The ability to reduce whole life carbon decreases as the project progresses

What is my responsibility?

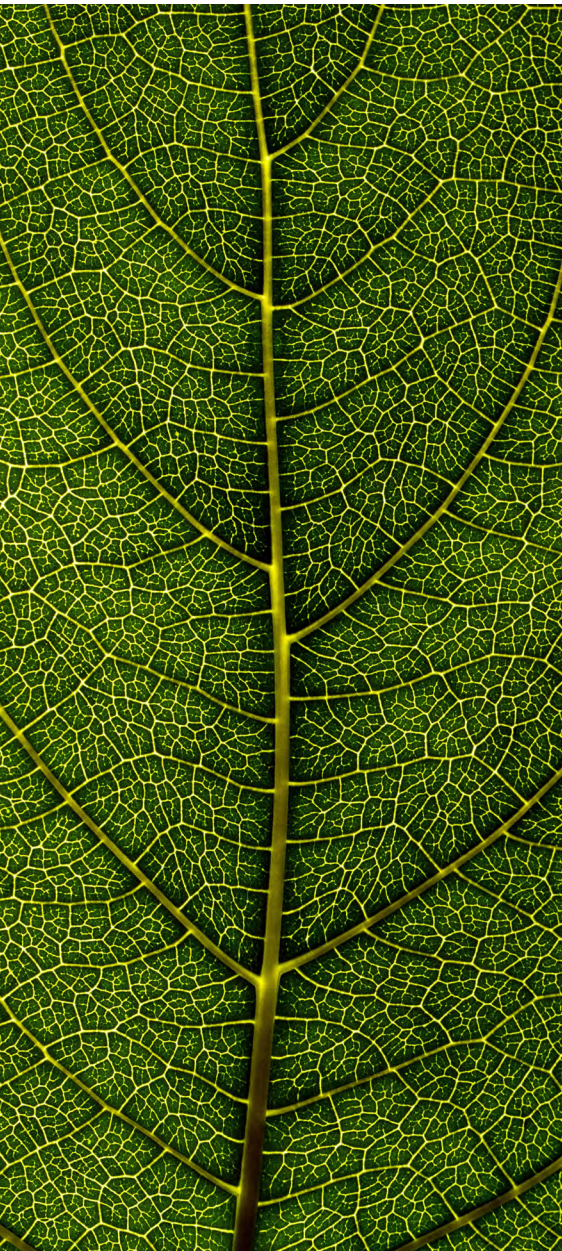
The client is responsible for ensuring the assessor is given relevant information throughout the entire life cycle. This is crucial for a thorough assessment, and sharing it promptly is essential for effective decision-making.

The type of information needed at each stage is shown in Table 1.

| Development phase | Information needed | Source of data |
|-------------------|--|--|
| Early design | 2D drawings and 3D models/BIM | Benchmark data – asset level benchmarking |
| Technical design | Quantities from BIM 3D/ BIM/BoQs/cost plan | EPDs, modelling |
| Construction | Tender document, construction drawings | Material specification data, EPDs |
| Post-completion | As-built drawings | Actual data – as-built material quantities |

Table 1: Types of information needed at each phase





Who do I need to contact?

When clients are trying to find experts or organisations to assist with their projects, it is essential they communicate:

- their precise requirements
- the scale of the project and
- any industry-specific factors that may impact it.

Clients should consider using an RICS professional who can adapt their knowledge and skills to suit specific needs, and offer valuable insights to improve the sustainability of the project or asset. This will ensure the client receives the best possible assistance and advice to make their project successful.

Professionals who work in fields such as quantity surveying, cost consultancy, building surveying, design, engineering and ESG consultancy can use the RICS standard to measure and manage carbon emissions reliably and consistently. This enables them to provide practical and dependable emissions management solutions to their clients.

What can I do with the completed WCLA?

After completing a WCLA, there are a number of things you can do with the findings to integrate sustainability into your decision-making processes. Here are some key steps to consider.

- 1 Identify opportunities for improvement:** review the WCLA results to identify the areas with the highest carbon emissions and opportunities for improvement, focusing on the life cycle stages or components that contribute significantly to the overall carbon footprint.
- 2 Set sustainability goals:** it is important to set clear and measurable sustainability goals based on the findings of a WCLA. These goals should include reducing overall carbon emissions, improving energy efficiency and minimising the environmental impact of specific products or processes.
- 3 Incorporate findings into decision-making:** use the WCLA results to inform decision-making processes during all phases. Consider the environmental impact when making choices related to materials, processes, suppliers and other aspects of your project.
- 4 Explore sustainable practices and innovations:** It is important to explore and implement sustainable practices and innovations for high-emission areas identified by the WCLA. This may include adopting eco-friendly materials, improving energy efficiency or redesigning processes to reduce carbon emissions.
- 5 Collaborate with suppliers and partners:** Collaborate with suppliers and business partners to implement sustainable practices across the supply chain. Encourage the adoption of environmentally-friendly materials, energy-efficient processes and responsible sourcing.
- 6 Monitor and evaluate progress:** Establish a framework for monitoring and evaluating progress towards set sustainability goals. Regularly assess and report on key performance indicators over the life cycle of the built asset.
- 7 Certification programmes:** Explore environmental certification programs within regions, or standards relevant to your country. Achieving certification can validate your commitment to sustainability; this may involve ongoing monitoring and reporting.

How often do I need to update the WLCA?

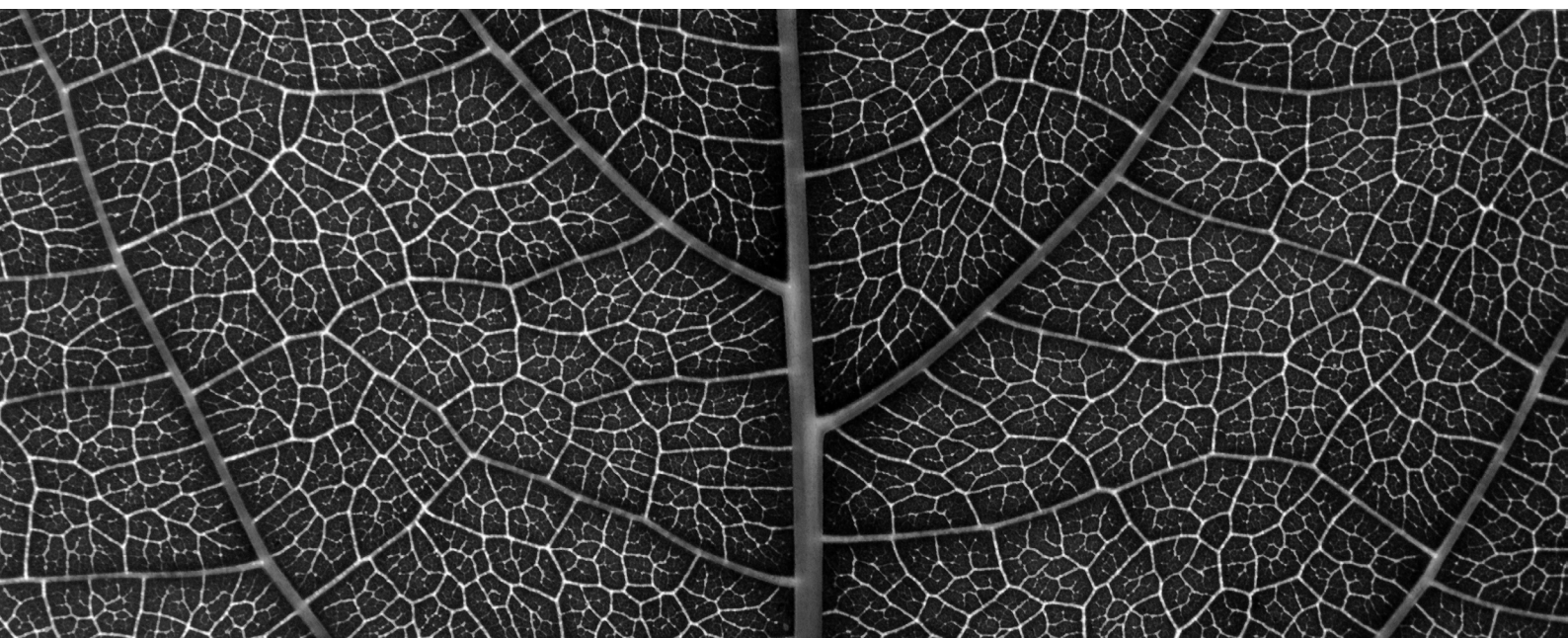
The frequency of updating a WLCA depends on several factors, including project nature, technology changes, industry best practices and relevant data source updates.

The RICS standard states that the assessment should be carried out at the following key project phases.

- **Concept design:** estimates during this phase allow stakeholders to explore various design options and materials, considering their carbon impact.
- **Technical design:** as the design becomes more refined, a more detailed WLCA can be performed to assess the embodied carbon of specific materials and construction methods.
- **Construction:** monitoring and optimising construction practices for carbon efficiency can contribute significantly to reducing the overall carbon footprint of the project.
- **Post-completion:** monitoring operational energy use and associated carbon emissions is crucial in understanding the ongoing impact of the built asset. This can include assessing the efficiency of energy systems, exploring renewable energy sources and implementing measures to enhance operational sustainability.
- **Decommissioning and demolition:** Assessing the carbon impact of decommissioning and demolition activities ensures that end-of-life processes are conducted in an environmentally responsible manner.
- **Major renovation or retrofitting:** If the project involves significant renovations or retrofitting, conducting WLCAs before and after these interventions provides insight into the effectiveness of the sustainability measures implemented and the overall impact on the building's carbon footprint.
- **Review and monitoring:** Regularly reviewing and updating a WLCA throughout the life cycle of the built asset allows for continuous improvement and adaptation to changing circumstances and technologies.

What's next?

- Check whether your project needs a WLCA. If it does, first define the assessment scope, including the system boundaries.
- Appoint an RICS-trained WLCA assessor; this ensures you will be provided with a competent assessment.
- Collect accurate and complete information from reliable sources, such as manufacturers, suppliers and industry databases.
- Conduct a WLCA and review the data to identify key variables that significantly influence carbon emissions. Explore the potential impact of these variables on the overall assessment.
- Integrate sustainability into project requirements, implement strategies and monitor progress with the design and construction teams.
- Monitor carbon performance over time and update the WLCA as new data becomes available, or as the project progresses through different life cycle stages.



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