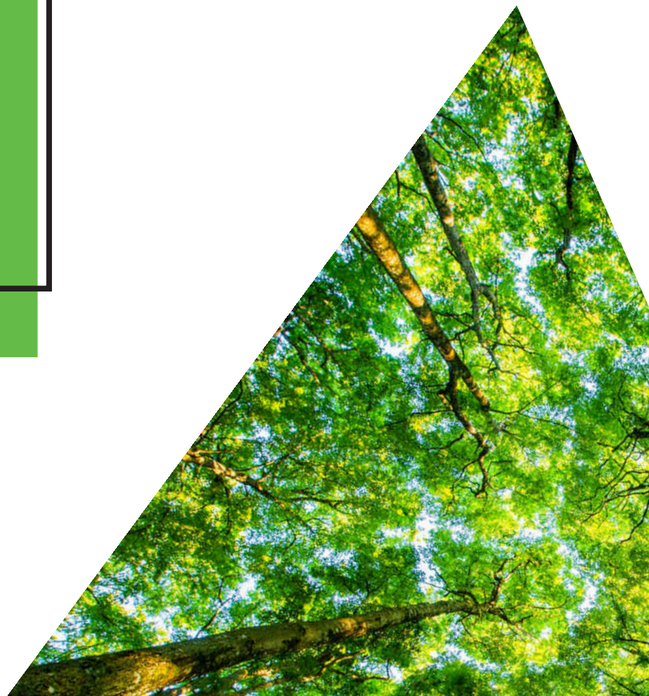
AES
Sustainability
Consultants

A GUIDE TO

WHOLE LIFE CARBON ASSESSMENTS

GREATER LONDON AUTHORITY



ABOUT US

AES Sustainability Consultants based in Devon, with over 54 consultants working collaboratively with clients and project teams across the UK to provide planning and development advice that delivers unparalleled cost-certainty and value for the construction industry. AES provide a wide range of sustainability services covering the whole life cycle of a development, always striving to add value and simplify the process across all service offerings for our clients.

What do we offer?

A comprehensive package of sustainability services that has national coverage.

- Sustainability / Energy Statements
- Energy Modelling (SAP/SBEM)
- BREEAM Sustainability Service
- Home Quality Mark
- Air Leakage Testing
- Thermographic Surveys
- Sound Testing
- Post Occupancy Evaluations
- Retrofit and MEES Assessments
- Overheating and Thermal Comfort
- Life Cycle Assessments
- Daylight Assessment for BREEAM

TALK TO US TODAY

Find out more about AES Sustainability Consultants and how you could benefit

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+ Email us at info@aessc.co.uk

AES Sustainability Consultants

OUR TEAM

Claire Stone

Claire specialises in energy efficient building services and renewable technology integration. Claire has worked on a range of projects including industrial, defence, education and residential. Claire also has experience in different modelling processes, including IES and overheating.

Katie Townley

Prior to joining AES Katie was a BREEAM Assessor and Accredited Professional who also has experience of undertaking both DREAM and LEED, and GLA assessments working on a range of projects including multi-residential, industrial, and bespoke developments.

Dora Rebola

Dora has worked as an architect in the building industry for several years before a transition to sustainable consultancy. She specialises in Sustainability Certification, Life Cycle Assessment, Life Cycle Costing, and GLA Assessments, for both international and UK based projects.

Cece Koczias

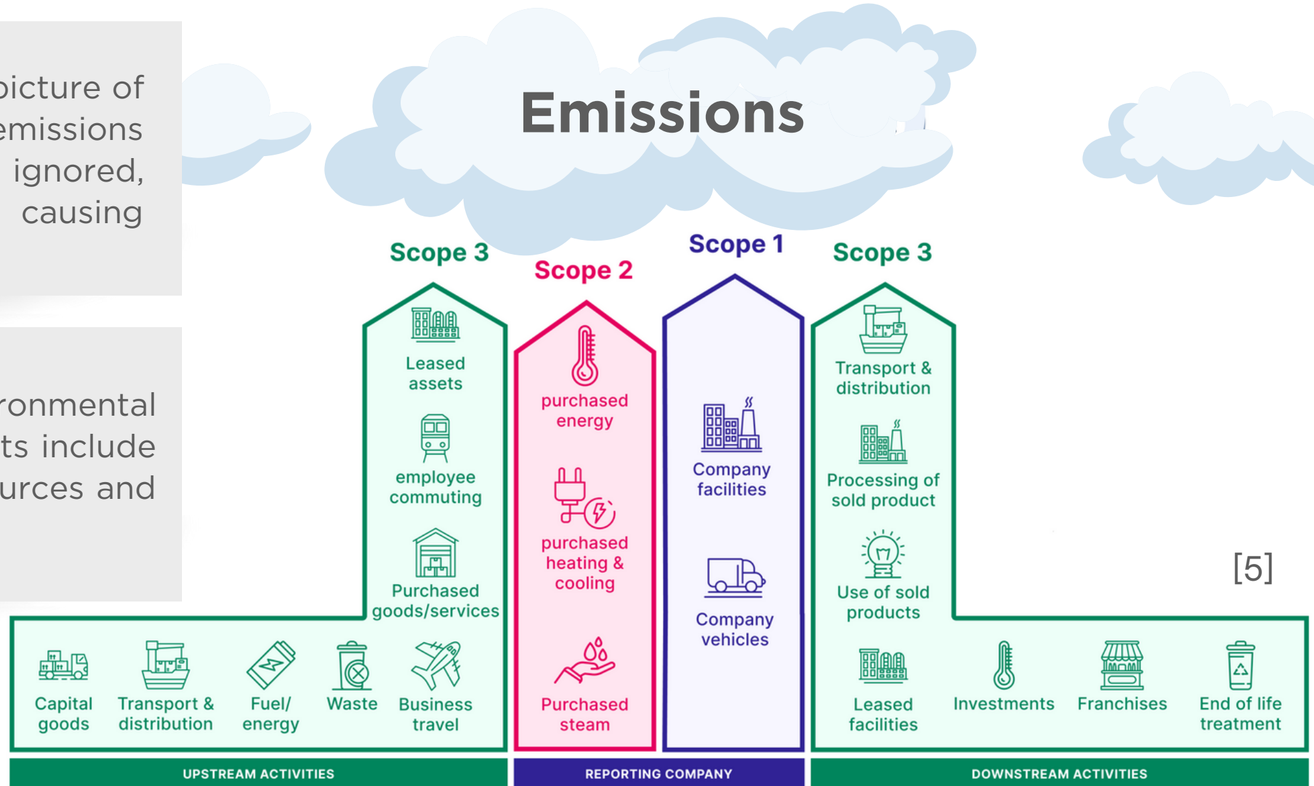
Cece has worked as a sustainability consultant, working on projects all over the UK, completing over 25 projects. She is trained to conduct Life Cycle Assessments, Whole Life Carbon Assessments, Life Cycle Costing and DREAM Assessments.

ABSTRACT

The construction sector is responsible for up to 50% of the global carbon dioxide emissions [1]. In the United Kingdom buildings and infrastructure contribute 25% to the total UK greenhouse gas emissions. If the transportation (vehicle emissions) is included within the scope of the built environment, the total share of the UK emissions increases to 42% [2].

Whole Life Carbon Assessments are an essential tool to provide a true picture of a building's total carbon emissions over its entire life cycle. Embodied emissions are less discernible than operational emissions and have been largely ignored, yet embodied carbon is an equally important emission source causing environmental degradation [3].

In order to create an environmentally conscious building, the environmental impacts of it's entire service life must be known. Environmental impacts include emissions into the environment and the varying consumptions of resources and land use, distribution and processing [4]."

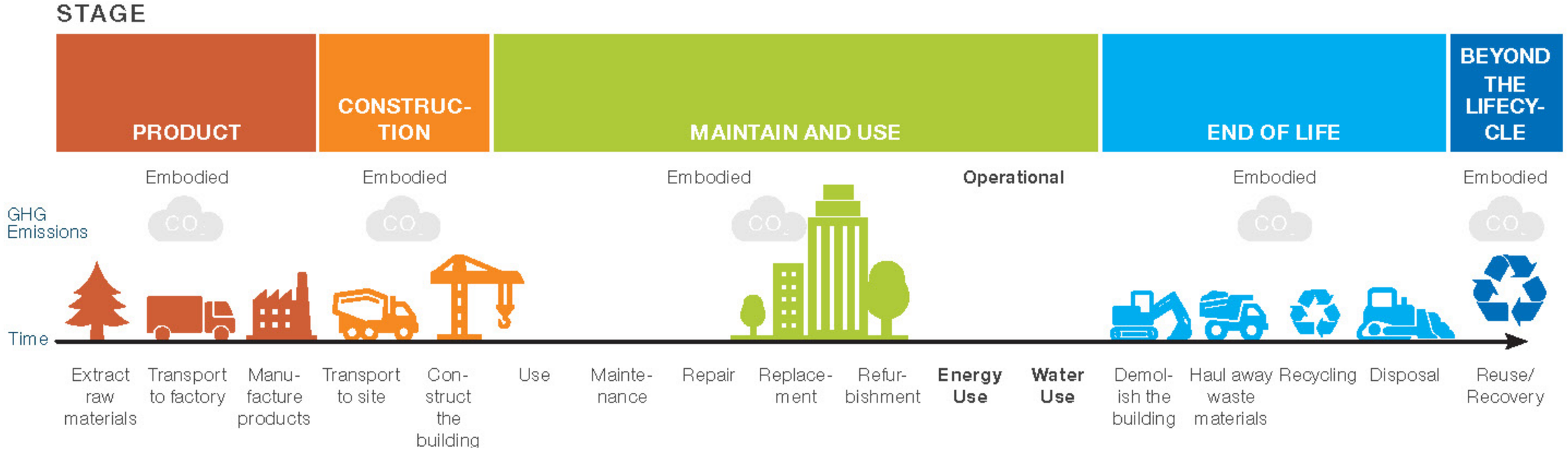


[5]

WHAT IS A WHOLE LIFE CARBON ASSESSMENT?

Whole Life Carbon (WLC) emissions are the total carbon emissions that result from the construction and use of a building over its entire life, including its demolition and disposal. The assessment is intended to capture a building's operational carbon emissions from both regulated and unregulated energy use, as well as its embodied carbon emissions.

Embodied carbon emissions include building materials, the construction process, as well as maintenance, repair and replacement. It even accounts for the eventual dismantling/demolition. The assessment can also provide potential savings from the reuse or recycling of components after the end of a building's useful life [6].



[3]

ELEMENTS INCLUDED

In a WLC assessment, the building elements are broken down according to the RICS New Rules of Measurement (NRM) classification system level 2 sub-elements. The unit of area measurement required is Gross Internal Area (GIA) m2. All floor areas should be measured in accordance with the RICS Property Measurement standards [6].

- Demolition
- 0 Facilitating Works
- 1 Substructure
- 2 Superstructure
- 3 Finishes
- 4 Fittings, furnishings and equipment (FFE)
- 5 Building services/MEP
- 6 Prefabricated buildings and building units
- 7 Work to existing building
- 8 External works

WLC AND GLA

AES Sustainability Consultants conduct WLC assessments in compliance with the London Plan 2021. The methodology follows the principles of BS EN 15978 and uses the Greater London Authority (GLA) guidance for assessment.

This is facilitated through the use of GLA approved One Click LCA software. Whole life-cycle carbon emission assessments are required for development proposals referable to the Mayor.

> **Reducing whole-life carbon emissions simultaneously contributes to limiting resource depletion and reducing pollution.**

Effective Now!
The new London Plan was formally adopted on 2 March 2021.

Which projects?
Any development of more than 150 residential units or buildings over 30 m in height and commercial buildings over 2500 m2 will need to comply.

Whole Life Carbon (WLC)
Policy SI2: Minimising greenhouse gas emissions requires WLC assessments.

Circular Economy
A Circular Economy Statement must be submitted alongside all referable proposals, under Policy SI7: Reducing Waste and supporting the Circular Economy.

One Click LCA® has the tools & GLA seal of approval.

One Click LCA

WHEN TO SUBMIT A WLC ASSESSMENT?

For planning applications that are referable to the Mayor, a WLC assessment should be submitted at the following stages:

- Pre-Application (where relevant)
- Planning application submission (i.e. RIBA sage 2/3)
- Post-construction (i.e. prior to occupation of the development. Generally, it would be expected that the assessment would be received three months post-construction)

1

A WLC assessment template has been developed that includes all of the information applicants will need to submit at each stage; it is available on the GLA's website.

2

The template should be completed and submitted as an Excel document to the GLA to ensure clarity and transparency. Please refer to section 3, which explains what is included in the assessment template at each stage, and gives further detail on submitting the template to the GLA.

3

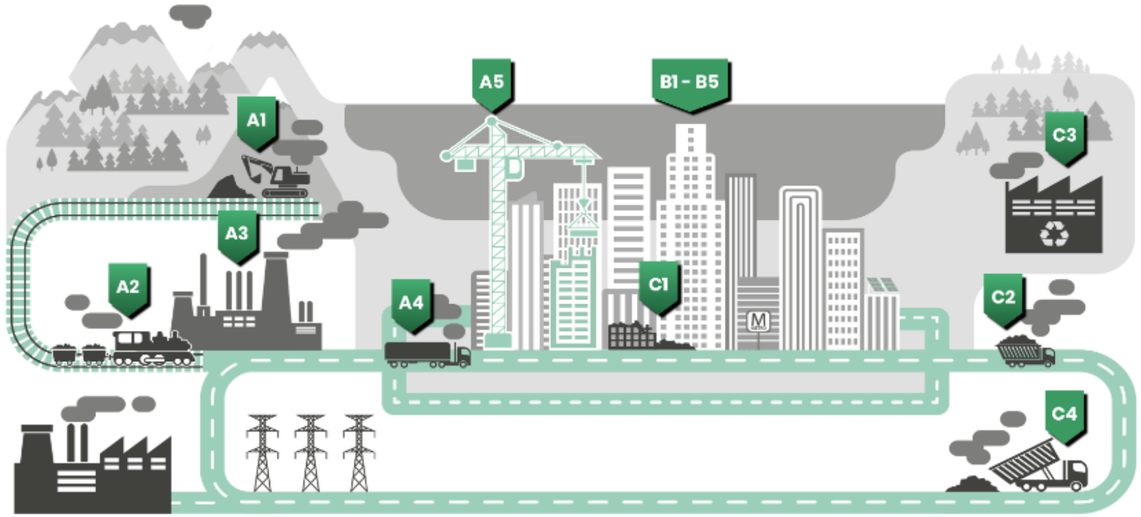
The assessment should be aligned with the project brief, and with the latest available cost plan for the scheme.

ONE CLICK LCA

One Click LCA is a GLA approved software, achieving the seal of approval of GLA standards, including life cycle stages, impact indicators, benchmarking, and more.

- Module A1 to A3 includes the provision of all materials, products and energy as well as waste processing up to the end of waste state or disposal of final residues during the product stage.
- Module A4 and A5 include impacts and aspects related to any losses during construction process stage (i.e. transport, installation, waste disposal and processing etc.).
- Module B6 and B7 also include provision and transport of all materials, energy and waste provisions, waste processing up to the end-of-waste state or disposal of final residues during this use stage.
- All C modules include provision and transport, provision of all materials, products and related energy and water use.

Sources of embodied carbon across the construction lifecycle



A1 - A3 Product stage
A1 Raw material extraction
A2 Transport to manufacturing site
A3 Manufacturing

A4 - A5 Construction stage
A4 Transport to construction site
A5 Installation / Assembly

B1 - B5 Use stage
B1 Use
B2 Maintenance
B3 Repair
B4 Replacement
B5 Refurbishment

C1 - C4 End of life stage
C1 Deconstruction & demolition
C2 Transport
C3 Waste processing
C4 Disposal

CASE STUDY: LAND AT BILLET ROAD

The development comprises a total of 149 new homes including blocks of flats, terraced and detached houses, of which 64.7% of the homes will be private, 14.2% shared ownership, and 21.1% affordable.

Involvement

Appointed at early Concept Design to undertake a Whole Life Cycle Carbon Emissions (WLCCE) Assessment to accompany an application for full planning permission in line with the London Plan 2021. The methodology followed the principles of BS EN 15978 and used the Greater London Authority (GLA) guidance for assessment.

Added Value

Undertaking a WLCCE assessment provides a full overview of the materials used in the construction of a building using science-based metrics, whilst also identifying opportunities for reducing lifetime emissions. It also helps to avoid any unintended consequences of focusing on operational emissions alone. AES encouraged the design team to understand, at concept design stage, the lifetime consequences of their design decisions and consider alternative design options that would deliver lower whole life-cycle carbon emissions.

REFERENCES

[1] Raynsford, N., 1999. The UK's approach to sustainable development in construction. Building Research & Information, 27(6), pp.419-423.

[2] UK GBC. 2023. Climate Change.

[3] New buildings institute. 2023. Embodied Carbon - Codes and Policy.

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[5] Circularise. 2022. Scope 1, 2, 3 emissions explained.

[6] Mayor of London. 2022. Whole Life-Cycle Carbon Assessments.

[7] One Click LCA. 2023. London calling: How to meet London Plan requirements

[8] One Click LCA. 2023. Decarbonizing construction.