



AES
Sustainability
Consultants

A GUIDE TO LIFE CYCLE COSTING



ABOUT US

AES Sustainability Consultants are 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

+ Call us on 01884 242 050
+ Email us at info@aessc.co.uk



BREEAM CREDIT AREAS AND ASSOCIATED SERVICES

1. Energy Assessments (SAP/SBEM):

- Ene 01 - Reduction of Energy Use & Carbon Emissions
- Ene 04 - Low Carbon Design (Passive Design & LZC Feasibility Study)

2. Overheating/Thermal Comfort:

- Hea 04 - Thermal Comfort
- Ene 04 - Low Carbon Design (Passive Design)

3. LCA:

- Mat 01 - Environmental Impacts from Construction Products - Building LCA
- Mat 02 - Life Cycle Cost and Service Life Planning

4. LZC:

- Ene 04 - Low Carbon Design (LZC Feasibility Study)

5. Daylighting analysis:

- Hea 01 - Visual Comfort (Daylighting and View Out))

6. Air Leakage Testing:

- Ene 01 - Reduction of Energy Use & Carbon Emissions
- Man 04 - Commissioning & Handover (Testing & Inspecting Building Fabric)

7. Thermographic Surveys:

- Man 04 - Commissioning & Handover (Testing & Inspecting Building Fabric)

8. Sound Testing:

- Hea 05 - Acoustic Performance
- Pol 05 - Reduction of Noise Pollution

9. Passive Design Analysis:

- Ene 04 - Low Carbon Design (Passive Design)

10. BREEAM AP

- Man 01 Project & Design (BREEAM AP - Concept & Developed Design)
- Man 03 Responsible Construction Practices (BREEAM AP - Site)

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.

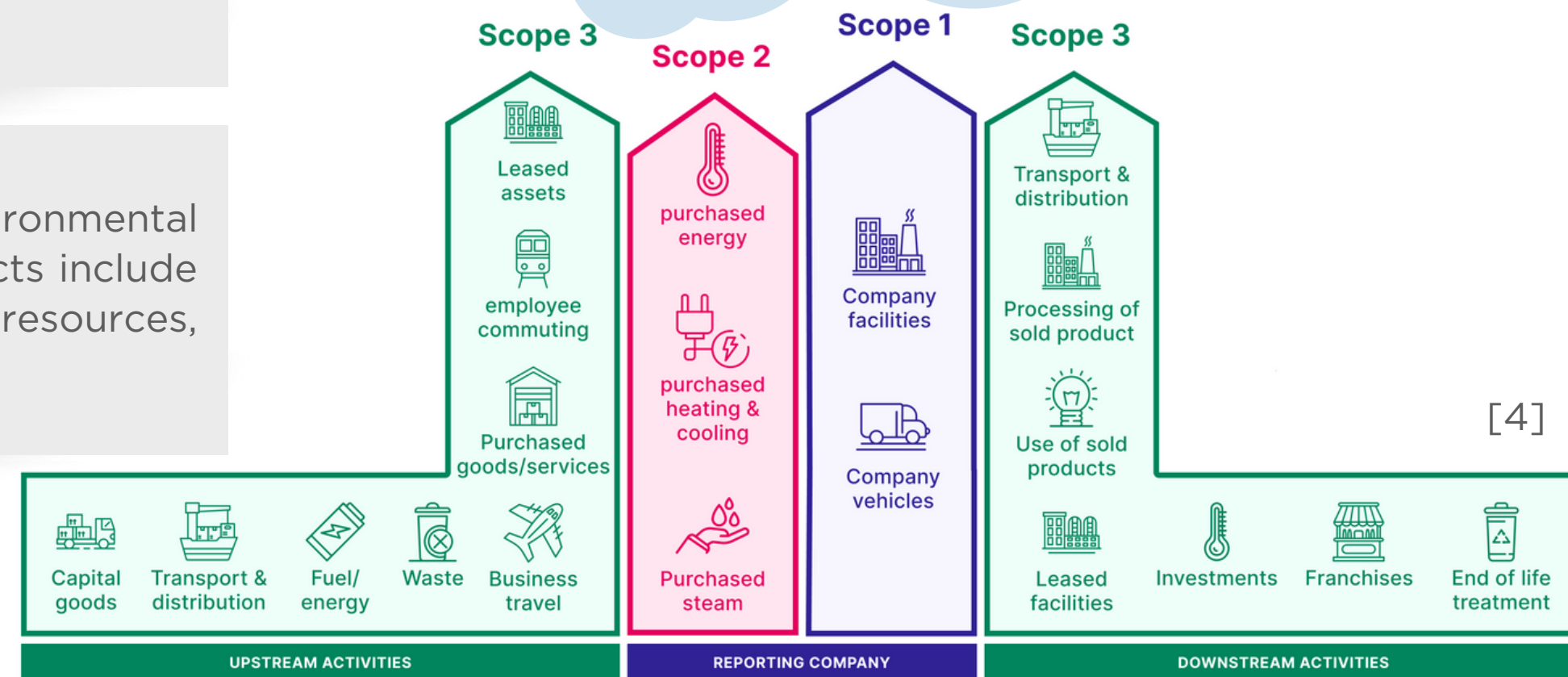
ABSTRACT

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].

Life Cycle Costing (LCC) helps to conduct a detailed cost analysis of a project at the earliest stages, and can identify priority areas that need improvement in the baseline design, including the consideration of sometimes cheaper and more sustainable alternatives.

In order to create an environmentally conscious building, the environmental impacts of its entire service life must be known. Environmental impacts include emissions into the environment and the varying consumptions of resources, including land use, distribution and processing [3].”

Emissions

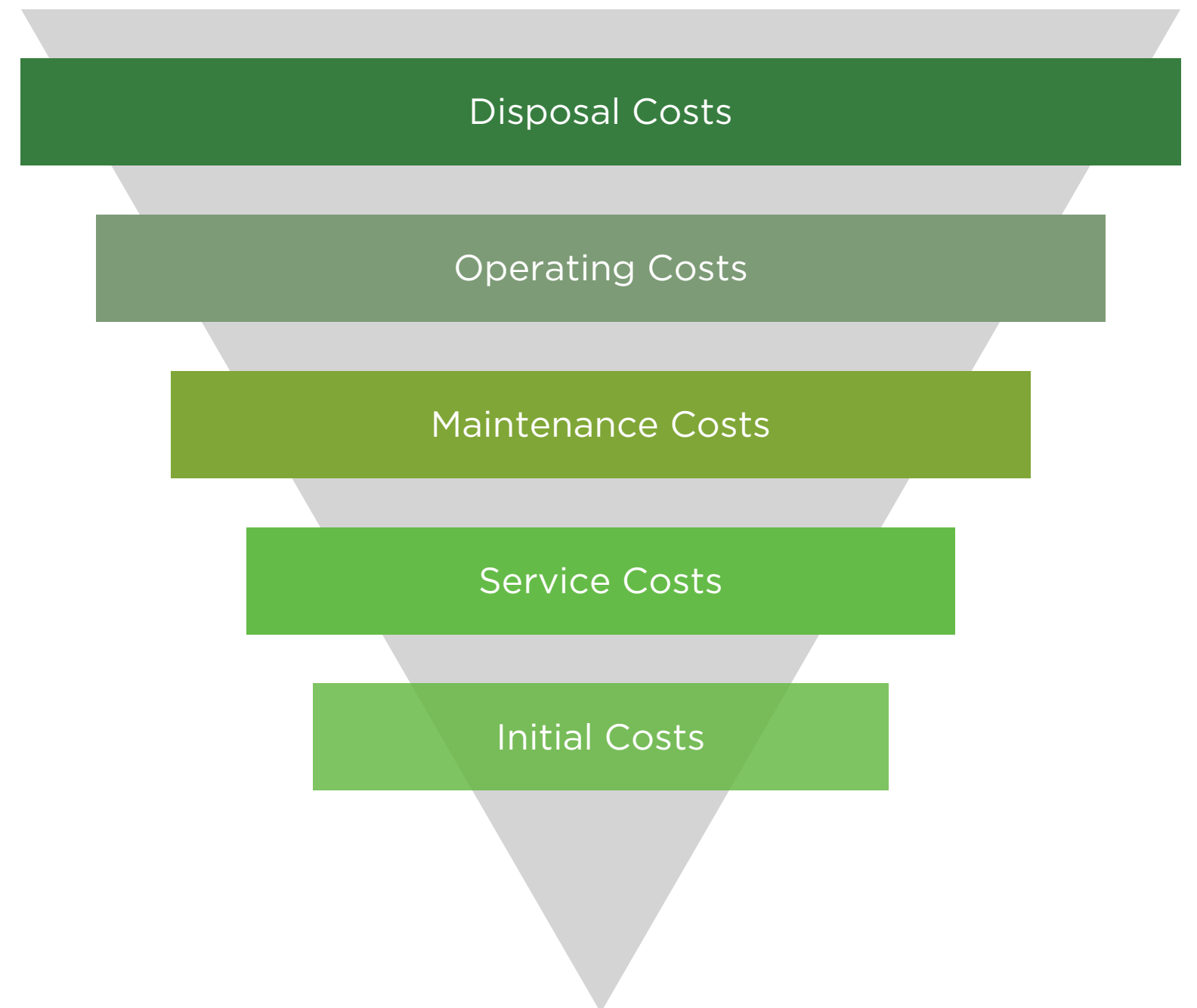




WHAT IS A LIFE CYCLE COST ANALYSIS?

Life cycle cost analysis (LCC) is an objective method for measuring and managing the lifetime costs of any project or asset. In construction, it enables design options to be compared from a lifetime perspective to reduce overall costs, and help the decision-making process.

LCC provides a method of assessing the costs that occur throughout a building's lifespan, from construction, through use and maintenance, to end-of-life. It provides a more robust insight into long-term costs and savings compared to the usual Return on Investment based calculations [5].



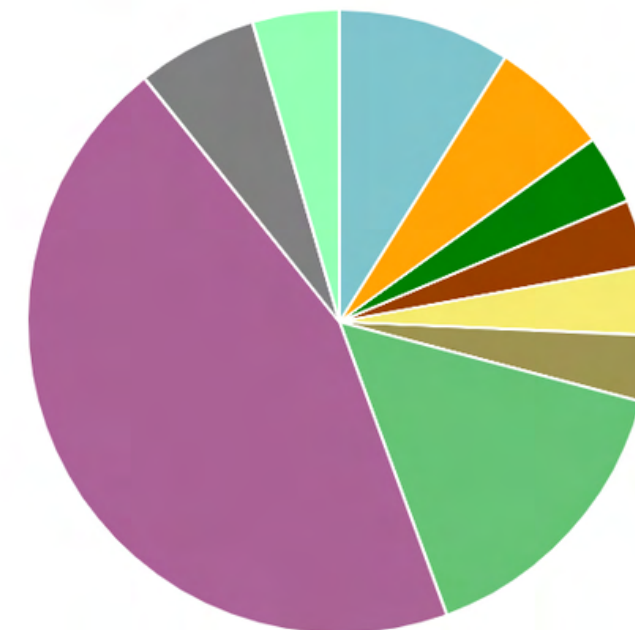
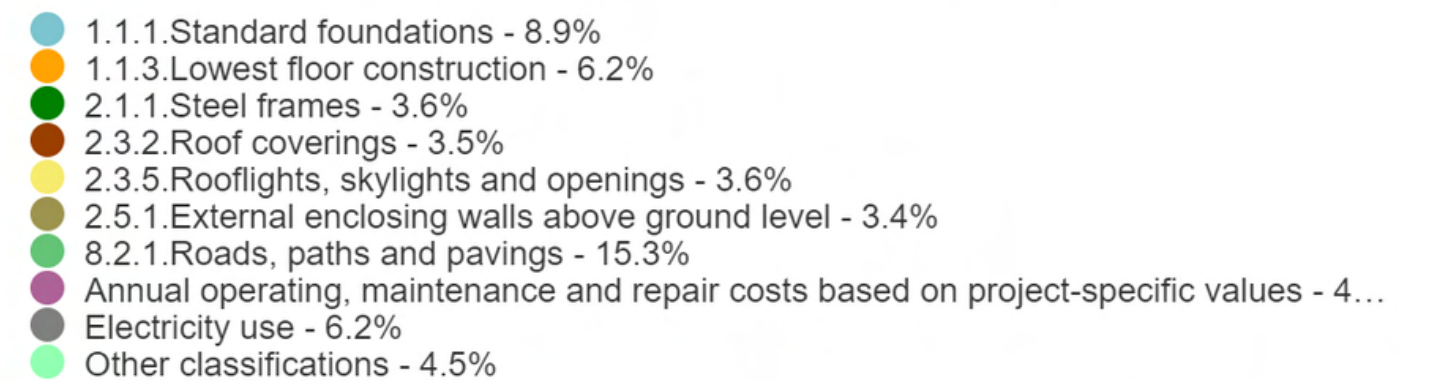
LCC AND BREEAM

Under BREEAM assessments, LCC is part of the Man O2 life cycle cost and service life planning credit. It can be worth a total of 4 credits, plus an additional 1 credit is available if alignment is conducted with the LCA study (credit Mat 01). The credits achievable are as follows:

- Elemental life cycle cost (LCC) (two credits)
- Component level life options appraisal (one credit)
- Capital cost reporting (one credit)

A Life Cycle Costing assessment is designed to deliver whole life value by encouraging the use of life cycle costing to improve design, specification, through-life maintenance and operation

Life-cycle cost, discounted with inflation £ - Classifications



ONE CLICK LCA

One Click LCA is a BREEAM compliant software, tailored to achieving the targeted BREEAM credits, 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.).

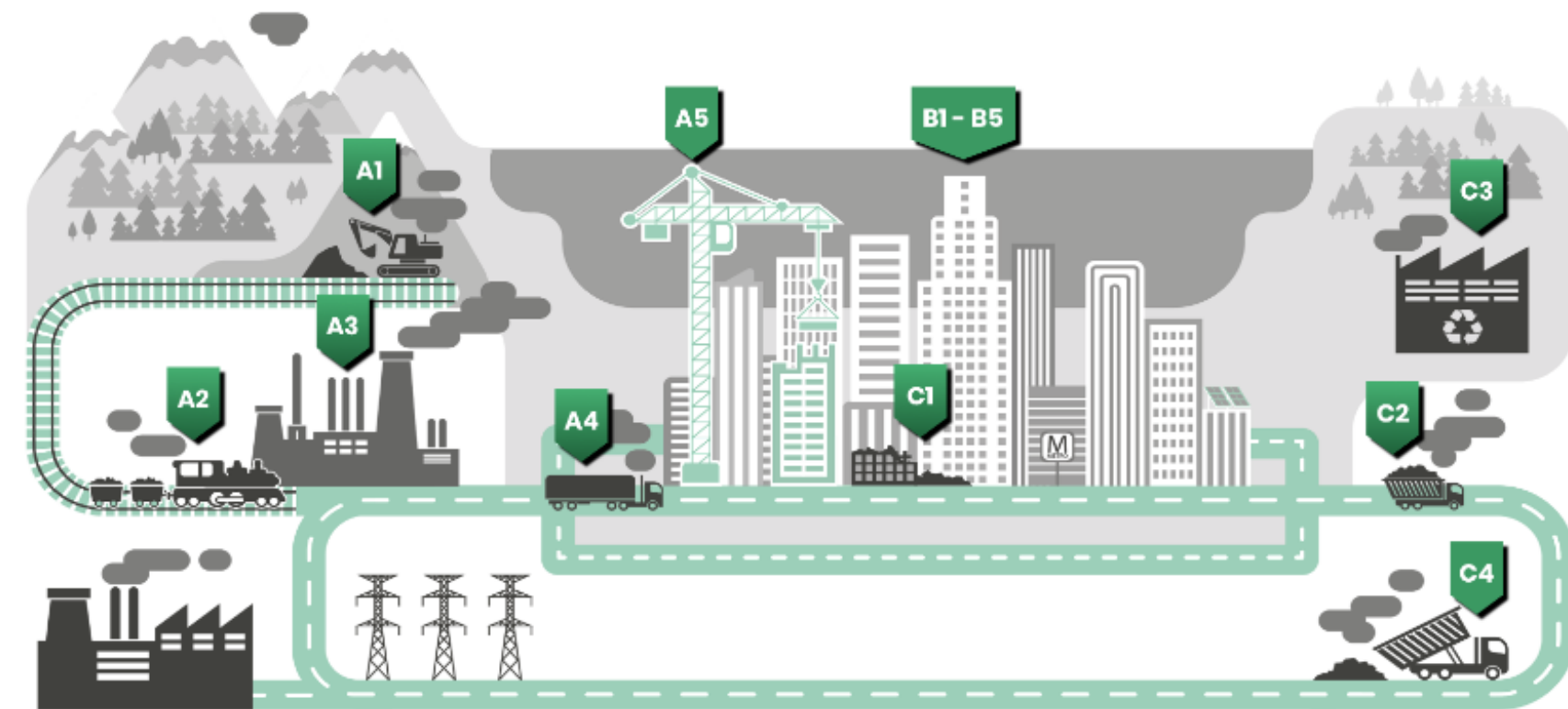


Module B6 and B7 also include provision and transport of all materials, energy and waste provisions, waste processing up to the end-of-waste state or disposal of final residues during this use stage.



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

OUR PROCESSES

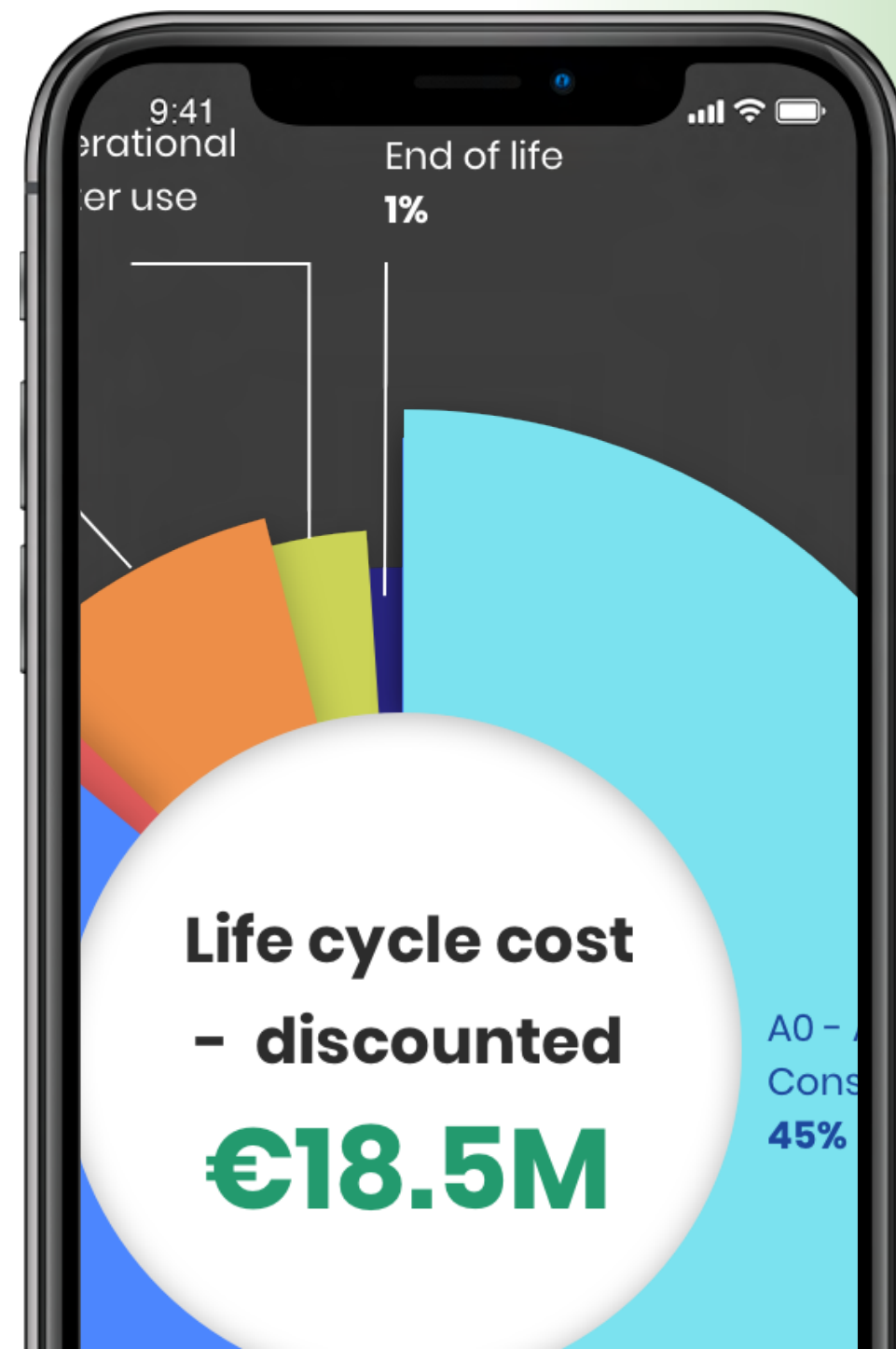
At AES Sustainability Consultants, the calculations are performed using the OneClick LCA calculation tool, which can assess life cycle cost impacts over set study periods determined by BREEAM/clients needs. The assessment methods conform with the standardised method of life cycle costing for construction procurement PD 156865: 2008.

Demonstrate using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence the building systems design and specification to minimise life cycle costs and maximise value.

Includes service life, maintenance and operation cost estimates.

Provides an indication of future replacement costs over a period of analysis (e.g. 20, 40 and 60 years)

With One Click LCA software, AES is able to provide accessible and detailed figures and calculations.



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] Sharma, A., Saxena, A., Sethi, M. and Shree, V., 2011. Life cycle assessment of buildings: a review. *Renewable and Sustainable Energy Reviews*
- [4] Circularise. 2022. Scope 1, 2, 3 emissions explained.
- [5] One Click LCA. 2023. Life cycle costing in construction.
- [6] One Click LCA. 2023. Decarbonizing construction.
- [7] One Click LCA. 2023. Automate building life cycle cost calculations

