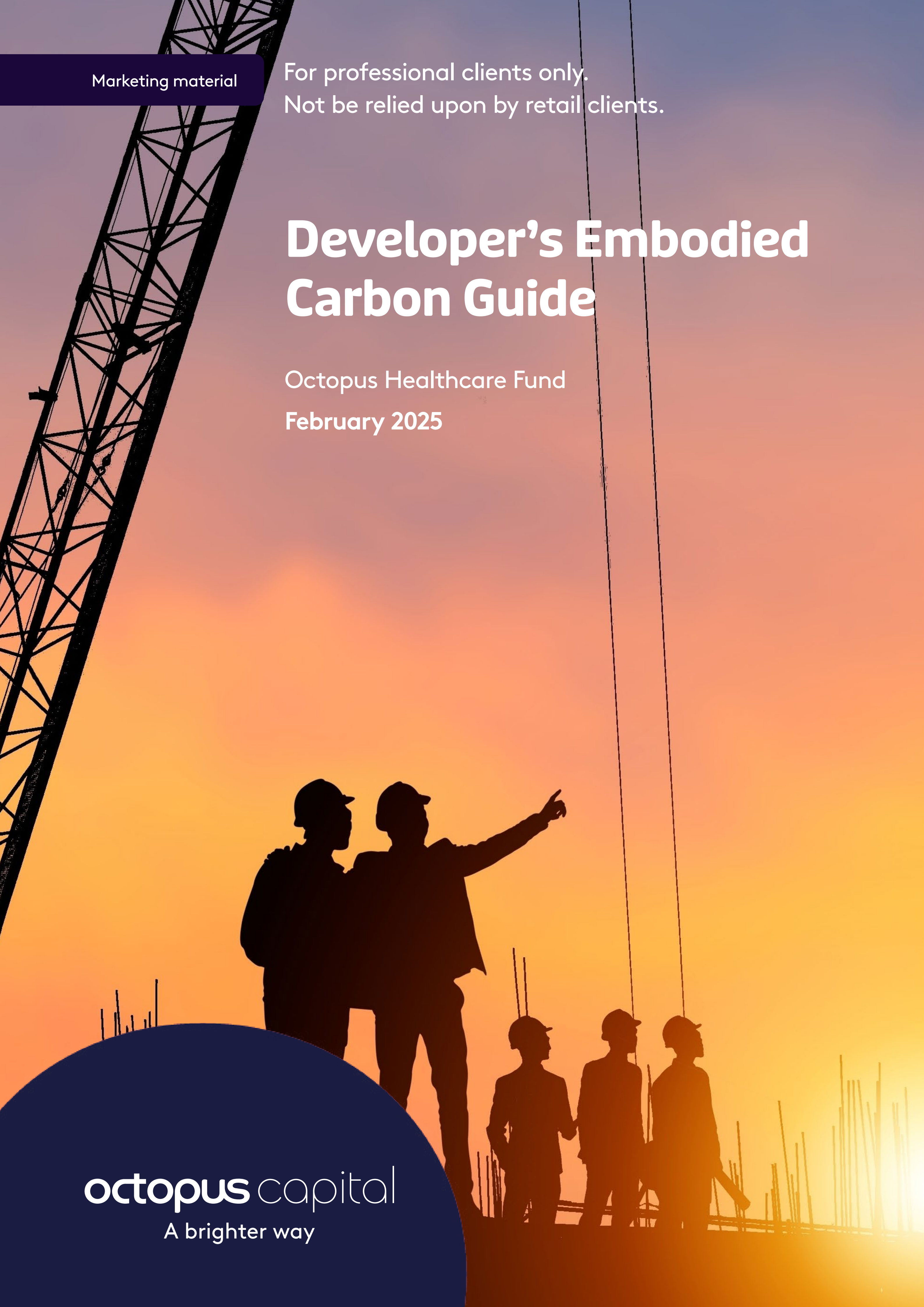

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Developer's Embodied Carbon Guide

Octopus Healthcare Fund

February 2025

octopus capital
A brighter way

Disclaimer:

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No offer:

Contents

Prepared by:

envision

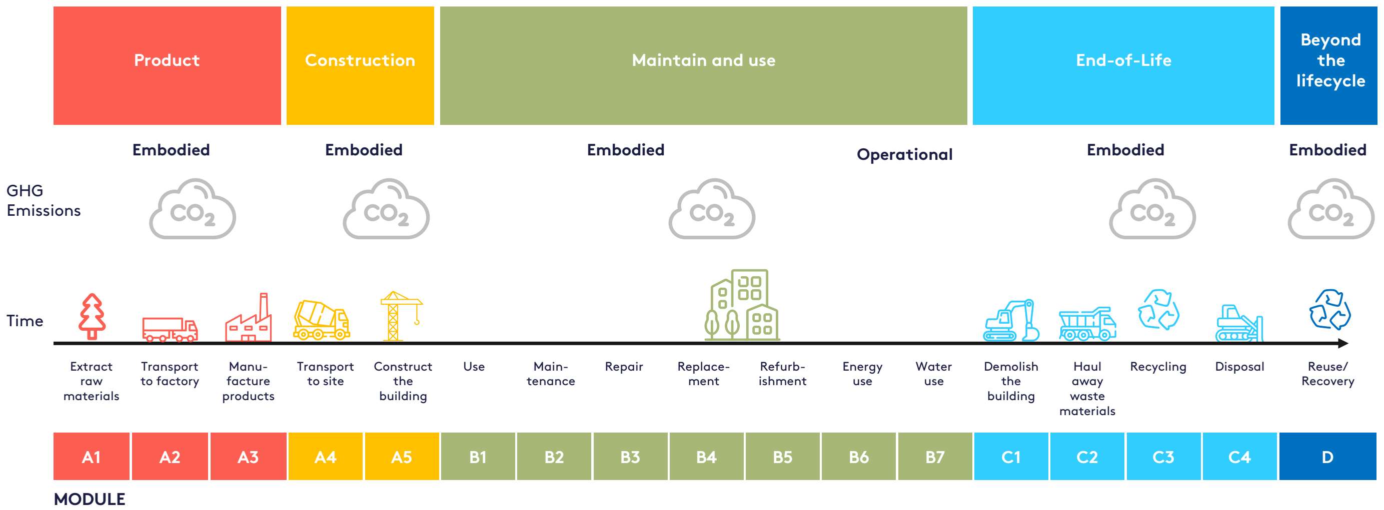
Figures based on analysis in August 2024, carbon impacts are subject to change in the future.

Background

What is whole life carbon in the built environment?

Carbon is emitted throughout a building's lifecycle, from the raw materials used in construction, through to the electricity used to run the building, right up until the demolition and end-of-life treatment of the building's materials. The life-cycle is split into modules to represent each stage of a building's life.

Lifecycle stages[1]



Definitions

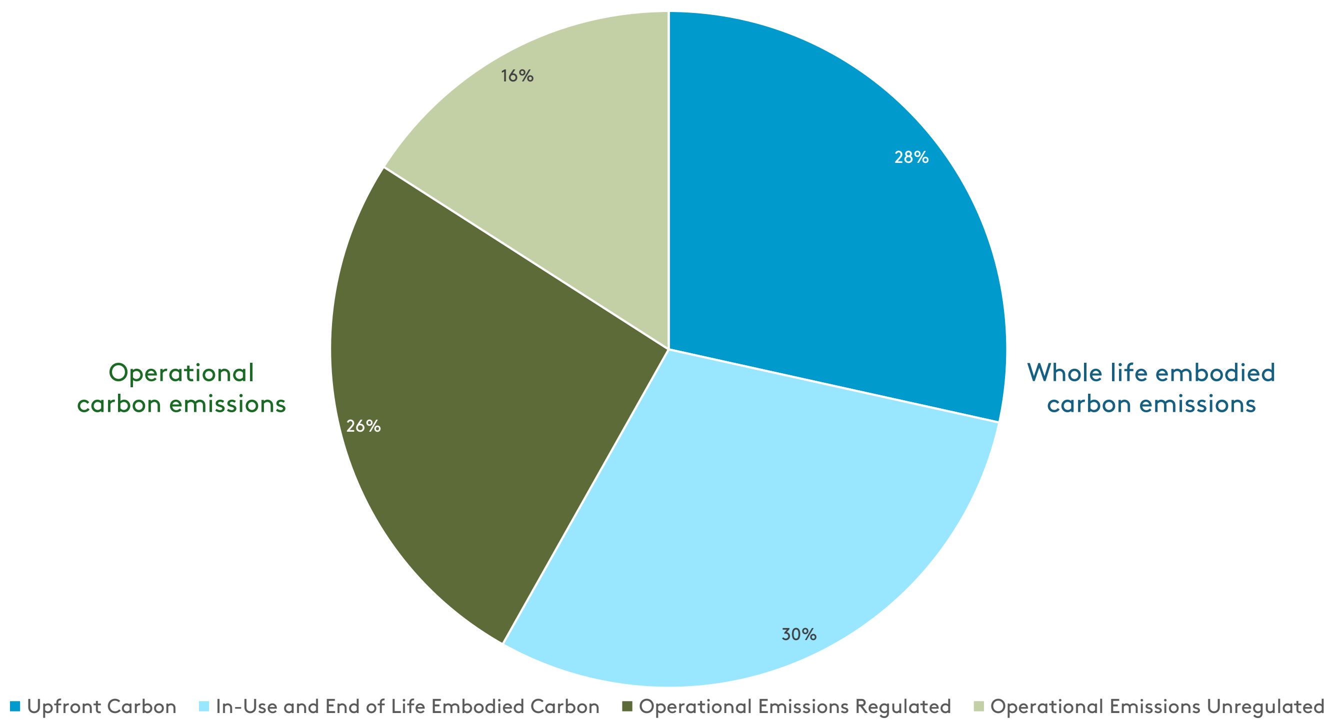
Upfront Embodied Carbon		Whole Life Embodied Carbon	
A1-A5	Carbon emissions associated with materials and construction processes up to practical completion	A-C *excludes B6-B7	Total embodied carbon emissions associated with materials and construction processes; including repair, replacement and end-of-life; **over the life cycle of an asset**
Operational Carbon		**Whole Life Carbon**	
B6-B7	Carbon emissions resulting from energy and water consumption in the day-to-day running of abuilding	A-C	The sum total of all asset related GHG emissions and removals, **both operational and embodied**, over the life cycle of an asset, including end-of-life

[1] Data source: New Buildings Institute, BS EN 15978 2011.

Why is it important?

The built environment is responsible for up to **40%**[1] of UK carbon emissions. These carbon impacts are mostly attributable to either operational or embodied carbon emissions. Currently, embodied carbon is associated with over half of a building's impact - and this will only continue to increase as there is a larger movement to electrification as the grid further decarbonises.

Operational versus Embodied Carbon Impact



[1] Government Commercial Function, Promoting Net Zero Carbon and Sustainability in Construction, as of September 2022.

OHF Targets & Developer Requirements

OHF is committed to decarbonising the built environment

Octopus Healthcare Fund ('OHF') is committed to decarbonising the built environment and following a whole life carbon approach. OHF aims for all newly developed assets to be net zero by 2030. Any remaining emissions will be fully offset through high-quality carbon sequestration projects.

In order to help define how these targets will be achieved, an additional interim target for embodied carbon has been set for the end of 2025.

Requirement:
All new developments to reach the embodied carbon target at practical completion.

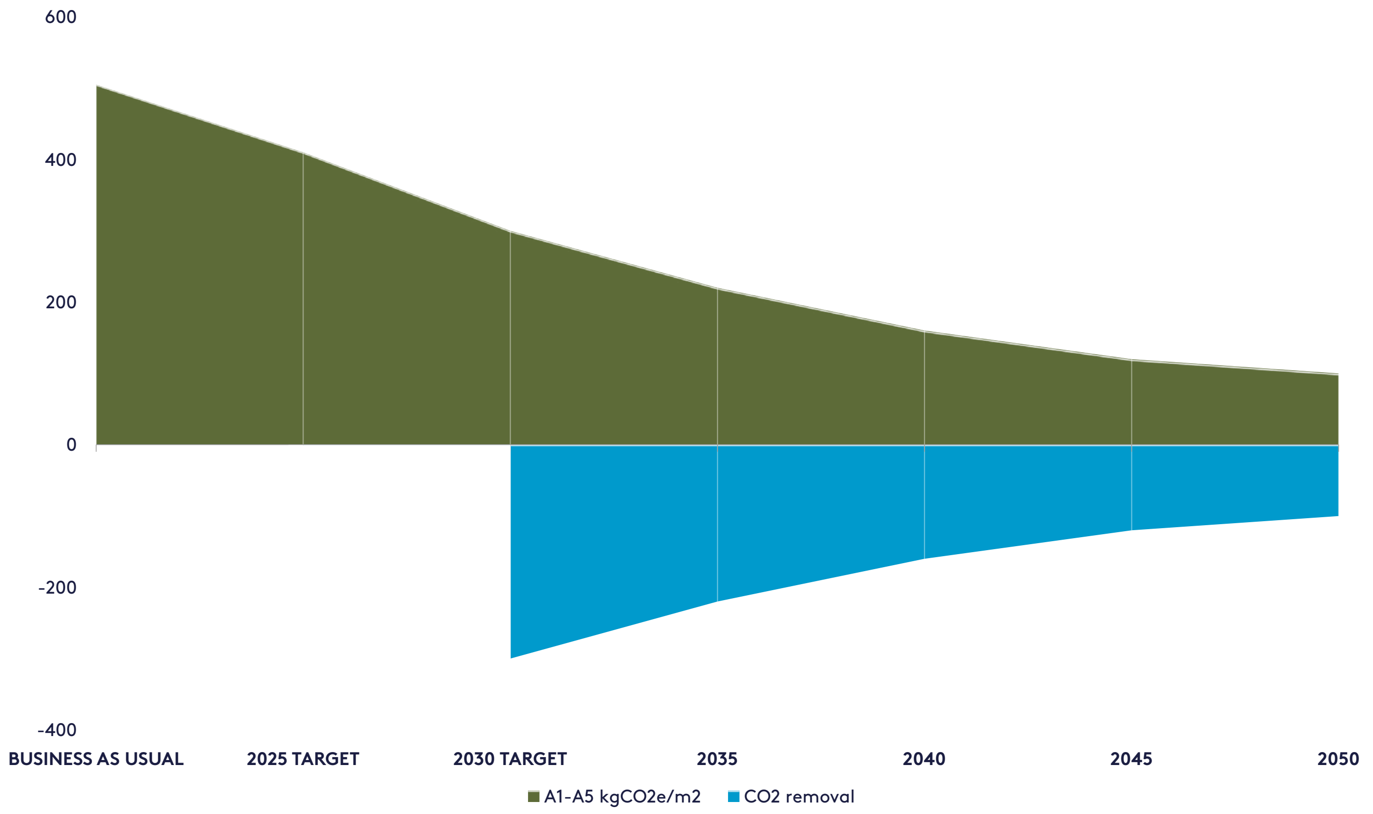
OHF Care Home Embodied Carbon Targets

	Minimum target (2025)	Future target (2030)
Upfront Carbon (A1-A5)	Mandatory	
	410	300
Whole Life Embodied Carbon (A-C *excluding B6-B7)	Optional	
	810	620

If there is a justifiable reason for not meeting the target, any remaining emissions are to be offset through UK high-quality carbon sequestration projects.

As there is currently no industry recognised target for embodied carbon of care homes – Envision, on behalf of OHF, has undertaken a benchmark exercise of portfolio assets. This has provided a greater understanding of the whole life carbon impact of these buildings – specifically focussing on the embodied carbon – to ensure the 2030 target can be achieved.

OHF Embodied Carbon Reduction Trajectory



Assessment Requirements

OHF requires a Whole Life-Cycle Carbon Assessment (WLCA) to be undertaken and updated at various stages of the design process. This WLCA should be in accordance with the RICS Professional Standard 'Whole Life Carbon Assessment for the Built Environment' (v2). A reporting template has been provided in Appendix II which is required to be completed and submitted to OHF at each stage.

	RIBA 0-2	RIBA 3-4	RIBA 5-6
Requirement	• Initial WLCA to be undertaken based on 'baseline' design. • This will inform early design strategy and structure solution pre-planning. It is expected that developers will have undertaken this pre-planning and prior to engaging OHF for funding.	• Update WLCA to include optimised quantities and specifications based on detailed design reflecting contractor proposals and their supply chain. • This will inform the tender specification for the contractor. Any specific low carbon products should be included within the tender documents, through either building element level embodied carbon limits or product specifications.	• As-Built WLCA to be undertaken and results to be submitted in Embodied Carbon Reporting Template. • WLCA to be third-party verified upon practical completion. • Monitoring and reporting as per Green Book Tracker Tool.
Key considerations	• Consideration of different design strategies to be implemented to reduce embodied carbon: – Focus is to be on high-level design choices (i.e. frame type, foundation solution, cladding options etc). – Early consideration should be given to low carbon material solutions, in particular highlighting key areas of the design that may be impacted (i.e. floor to floor height, build-ups, u-values etc).	• Consideration of material specification to reduce embodied carbon. – Focus is to be on material selection, contact suppliers to confirm details of low carbon product options and specifications. • Consider whole life and circular economy impacts of design choices and material selection. • Work on optimising the design to reduce material quantities where possible.	• Ensure procurement is aligned with sustainability strategy. • Track carbon impacts of all building elements: – Accurate As-Built material quantities. – Environmental Product Declarations (EPDs) provided by all suppliers. – Track on-site construction emissions, including transportation impacts, energy use, water use, fuel use and waste.

Embodied Carbon Reduction Strategies

To help achieve the embodied carbon targets, OHF has been investigating a variety of carbon reduction strategies that can be implemented within care home design and construction. The two key aspects of embodied carbon reduction include **reducing overall material quantities** and **specifying low carbon material solutions**. OHF has summarised the primary embodied carbon reduction strategies that are applicable to typical care home construction. These are split into design strategies, which are higher level and are typically considered at an earlier stage of design, and material strategies, which are more detailed and have been quantified based on a typical care home construction. It should be noted that these strategies are a non-exhaustive list and OHF recommends having a lifecycle assessment specialist on the design team to help assist with recommending and implementing project specific strategies.

Design Strategies

Build less

- Design utilising shallow foundations where ground conditions allow.
- Use simple wall and roof build-ups to avoid additional material being required.
- Carry out audit of materials on-site for potential reuse / circular economy purposes.
- Look to optimise spatial efficiency and expose services where possible to reduce finishes required.

Build light

- Reduce material quantities before relying on low carbon specification.
- Consider alternative frame strategies for a lightweight superstructure.
- Consider incorporating / increasing use of timber in roof or internal walls if full timber frame is not feasible.
- Review structural loadings, utilisations and spans – optimise where possible and avoid overdesigning.

Build wise

- Know where your carbon has the biggest impact – review 'hotspots' by building element and focus efforts on these areas.
- Specify carpet tiles rather than broadloom or sheet carpet to reduce installation and maintenance waste.
- Review alternatives to PVS based carpet tile and vinyl.
- Consider designing to standard heights / widths to reduce waste on-site.
- Consider replacement cycles and longevity of building services and finishes.

Build low carbon

- Reduce use of cold-rolled steel within design which has a higher embodied carbon associated with it than hot-rolled.
- Design systems to reduce quantity of refrigerant and specify refrigerant with a lower Global Warming Potential (GWP).
- Specify low-carbon, natural, re-used or recycled materials from responsible sources wherever possible.
  - Give preference to products that have an EPD available.

Build for the future

- Design for disassembly and circular economy at end of life, specifically consider:
  - Lime mortar for bricks to help with ease of reuse/disassembly.
  - Specify polyester powder coated (PPC) finish for aluminium window frames (as opposed to anodised) to increase recyclability at end of life.
- Design for durability, flexibility and adaptability – consider potential future uses (i.e. soft spots, load bearing wall placement, etc).

Build collaboratively

- Work with design team to get accurate material quantities and ensure all building elements are captured.
- Engage with suppliers to ensure product availability, cost considerations and design impacts are accounted for.
- Report carbon data and lessons learned to help improve on future projects.

Material strategies

The table provides a list of reduction strategies specific to care homes based on the benchmarking exercise that was undertaken. These have each been selected as feasible carbon reduction strategies that have been proven to be implemented within typical care home construction. These represent estimations of upfront embodied carbon savings that could be achieved through implementation of these strategies, It should be noted that no all options need to selected, and some are mutually exclusive - this is provided to help with early-stage carbon strategies specific to care homes. Further information on embodied carbon of key materials, including concrete, steel and insulation, can be found in Appendix I.

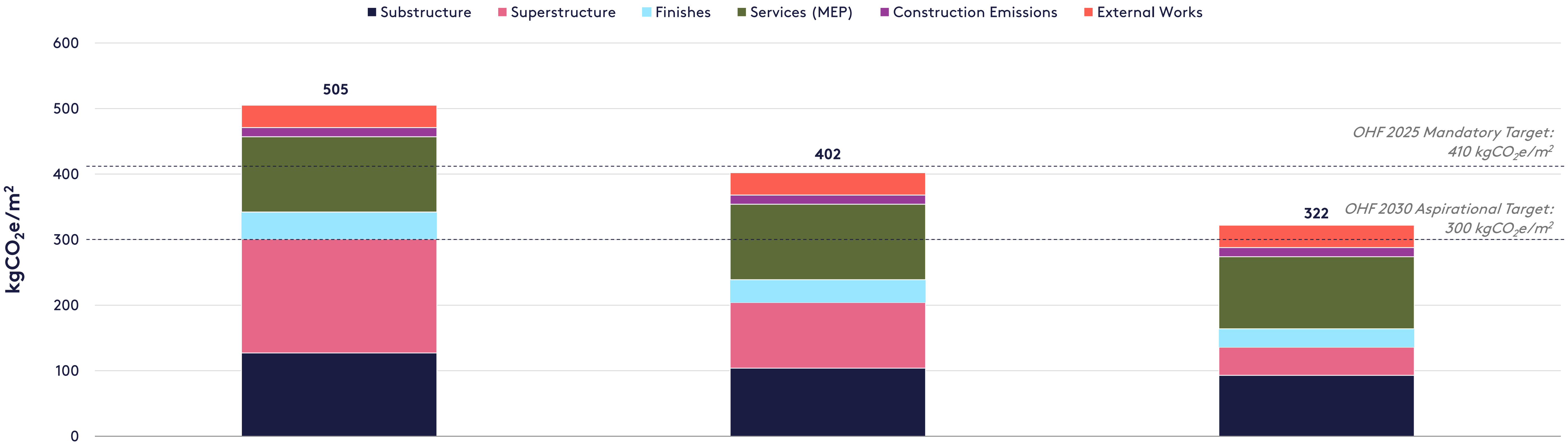
Care Home Embodied Carbon reduction strategies for building materials

	Material	Element	Specification	tCO_2e	$kgCO_2e/m$	Wider project impacts[1]
Structural	Concrete	Foundations	Locally sourced ready-mix concrete (within 10-20 km)	-7	-2	Minimal
			Shallow foundation design with optimised quantities	-217	-58	Minimal
			Supplementary Cemetitious Materials (SCMs) content (20-30%)	-64	-17	Minimal
			Increased SCM content (20-50%) or low carbon concrete mix (i.e. Holcim EcoPact, Hanson Ecocrete)	-105	-28	Moderate
			High SCM content (50-70%) or low carbon concrete mix (i.e. Holcim EcoPact, Hanson Ecocrete)	-142	-38	Significant
		Walls	In concrete block walls, consider the use of low carbon blockwork (i.e. CCP Greenbloc)	-56	-15	Minimal
		Ground floor	In beam & block ground floor, consider the use of low carbon blockwork (i.e. CCP Greenbloc)	-26	-7	Minimal
		Upper floors	Consider the use of low carbon precast planks (i.e. Greenbloc - Precast)	-67	-18	Moderate
	Steel	Substructure	Reinforcement with 100% recycled content produced in EAF	-15	-4	Minimal
		Superstructure	Consider sourcing Green Steel from EAF with renewable energy sources (i.e. Arcelor Mittal XCarb Steel)	-75	-20	Significant
			Source steel primarily from EAF production streams to increase overall recycled content to 90%	-52	-14	Moderate
	Timber	Roof	Consider timeber frame roof structure	-67	-18*	Minimal
		Internal Walls	Consider swapping blockwork walls for timber frame	-45	-12*	Minimal
Envelope	Facade	Cladding	Consider recycled or reclaimed brickwork or low carbon alternative (i.e. KBriq, Façadeclick)	-30	-8	Moderate
		Purlins / Steel studs	Consider Metsec Decarb steel on steel stud internal walls or cladding rails/purlins where applicable	-4	-1**	Moderate
		Windows	Consider high recycled content in aluminium frame	-7	-2	Moderate
			Consider a combination of timber/aluminium framed windows (i.e. Aluprof)	-15	-4*	Significant
	Insulation	Walls / Roof / Floors	Use naturally sourced insulation (Glass or Mineral wool)	-82	-22	Moderate
			Use naturally sourced insulation (Cork, Woodfibre, Straw, Hemp etc)	-101	-27	Significant
Finishes	Flooring	Carpet	Specify carpet with high recycled plastic content, especially in nylon face fibre , whilst retaining impervious requirements	-11	-3	Minimal
		Vinyl	Consider linoleum or cork flooring for reduced carbon and biogenic benefits	-4	-1*	Moderate
		Screed	Consider calcium sulphate screed instead of traditional cement screed	-15	-4	Moderate
	Walls	Gypsum	Use lightweight boards	-7	-2	Minimal
			Consider the use of lower carbon products (i.e. Honext, Fermacell)	-19	-5	Moderate
		Paint	Consider using recycled paint or lower carbon paint product (i.e. Graphenstone)	-4	-1	Minimal
MEP	Services	Equipment	Consider sourcing regionally or nationally for equipment (less than ~500km)	-19	-5	Moderate
	Refrigerant	Heating / Cooling	Consider a lower GWP refrigerant (i.e. R744 or R32)[2]	-348	-93	Moderate

[1] General high-level guidance on the wider impact of each carbon reduction strategy on design, cost and/or programme - rated as minimal, moderate or significant impact. Each strategy should be investigated based on the project specific design considerations and supply chain.
[2] R744 and R32 are both refrigerants used in air conditioning systems, they have different environmental impacts and properties
* Significant Biogenic Carbon Impact, not shown here. ** Minimal impact due to minimal steel stud walls in baseline, this impact would be increased if design included more steel studs. culations based on number of assets.

The following chart highlights two routes for reducing embodied carbon using minimal wider impact reduction strategies and moderate wider impact reduction strategies to achieve the 2025 target. The 'Minimal' impact option has selected reduction strategies that are typically seen to be implemented with minimal impact on the design, budget and programme of a typical care home construction, with a 'Moderate' impact route also highlighted.

Care Home Embodied Carbon reduction routes



Baseline

- Brick & Block structure
- Concrete flat roof
- Precast plank upper floors
- PIR insulation
- Beam & block ground floor
- 0% SCM content in shallow concrete foundations
- 60% recycled content in structural steel

(Typical range for business as usual from benchmarking exercise 400-500 $kgCO_2e/m^2$)

Minimal wider impact reduction strategies

- Brick & low embodied carbon blocks
- Timber roof structure and internal walls
- Precast plank upper floors
- Glass or Mineral wool insulation
- Beam & low embodied carbon block ground floor
- 30% SCM content in shallow concrete foundations
- Locally sourced concrete
- 60% recycled content in structural steel
- 100% Recycled Content EAF Reinforcement
- High recycled plastic content in carpet
- Lightweight gypsum boards and recycled paint

Moderate wider impact reduction strategies

- Reclaimed brick & low embodied carbon blocks
- Timber roof structure and internal walls
- Low embodied carbon precast plank upper floors
- Cork, Wood fibre or Hemp insulation
- Beam & low embodied carbon block ground floor
- 50% SCM content in shallow concrete foundations
- Locally sourced concrete
- Green Steel from EAF for structural steel elements
- 100% Recycled Content EAF Reinforcement
- High recycled plastic content in carpet
- Linoleum or cork flooring
- Calcium Sulphate Screed
- Low carbon gypsum boards and recycled paint

Whole Life Carbon and Wider Considerations

This guide is focused heavily on the upfront carbon impact of materials, with mandatory targets in place for A1-A5 only. However, it is important to consider the whole life cycle of a building to measure the true impacts of the design and to achieve the aspiration target set by OHF. This includes consideration of the repair and replacement cycles of certain materials, along with what happens with them at the end of life. Other considerations include biogenic impacts, construction emissions, and designing for circularity.

Due to a lack of data available within industry on whole life embodied carbon impacts, these emissions can be more difficult to estimate or guarantee but nonetheless need to be considered and tracked. OHF has included optional whole life embodied carbon targets which are encouraged for design teams to meet; however, it is recognised that current modelling practices involve numerous estimations to predict these emissions and therefore the importance is placed on proper tracking. Some high level principles for reducing whole life embodied carbon have been provided below, however new strategies should be considered as more data becomes available.

Whole Life Embodied Carbon Reduction Principles

Refrigerant

- Design systems to reduce quantity of refrigerant
- Refrigerant with a lower GWP (R32 or R744)

Durable Finishes

- Consider replacement cycles when selecting finishes – design for longevity
- Consider eliminating finishes where not needed (i.e. by exposing services)
- Create operational maintenance strategy with care home operator to ensure design choices are carried through

End of Life

- Design for disassembly and circularity of materials
- Specify lime mortar for brickwork to help with ease of disassembly

Construction Emissions

- Undertake a pre-demolition audit of the existing site to identify material reuse/recyclability
- Reduce fossil fuels and waste used on-site
- Ensure you are tracking on site emissions including transportation of materials to/from site, energy use, water use, fuel use and waste

Biogenic Carbon

Biogenic carbon refers to the carbon that is stored in, sequestered, and released by organic matter.

If the timber materials are not reused at the end of the building's life cycle, then the biogenic carbon will be re-released back into the atmosphere, resulting in a net zero biogenic carbon balance. Even though biogenic carbon would re-enter the atmosphere when the material is deconstructed and disposed/incinerated, there is still value in using carbon sequestering materials and reducing the emissions in the early stages of the life cycle, as carbon emitted now is more impactful than carbon emitted in the future.

Circular Economy

BA circular economy is a new economic model that stands in opposition to the current linear economy. Within a linear economy, materials are mined, manufactured, used and then disposed. A circular economy seeks to keep resources in use and retain their value.

The key CE principles, which should be a fundamental part of the building design process, are:

- Building in layers
- Designing out waste
- Designing for longevity
- Designing for adaptability or flexibility
- Designing for disassembly
- Using materials that can be reused and recycled

Appendix I

Additional Material Considerations

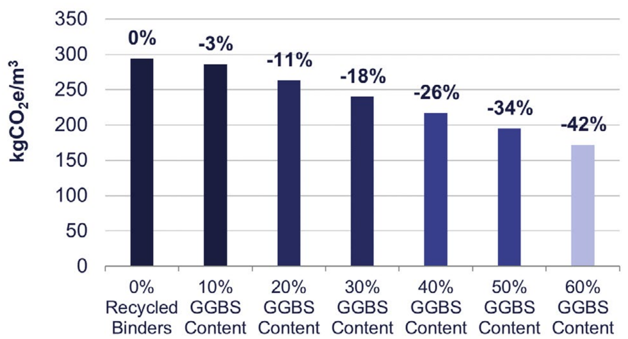
Concrete

To reduce the embodied carbon emissions associated with concrete the primary strategy would be to increase the content of supplementary cementitious materials (SCMs), such as ground granulated blast-furnace slag (GGBS) or Fly Ash, to reduce the overall cement content and in turn, will help reduce the emissions.

> It should be noted that the there is a **GGBS shortage globally** and therefore supply / availability should be considered before specifying, and it is suggested that alternative cement replacement options be pursued if available.

Historically, SCMs have been used to achieve various performance requirements, however, as they are by-products of other industries, they are also known to help with reducing emissions associated with concrete. The primary drawback of cement replacement is that it increases the curing time of the concrete and therefore the age at which it reaches its required strength. As such it is commonplace to have differing amounts in different structural elements i.e. foundations, walls, floors and columns.

Carbon reduction for different cement replacement levels



Higher levels of SCM content is typically accepted in foundations as they usually take a longer time to be loaded to their design levels and therefore the implications on curing time have minimal impact on programme.

> If utilising GGBS, a **50% replacement level is seen as acceptable in the foundations**. In other areas, such as floor slabs, a 30% GGBS content is typically achievable with minimal impact on programme.

The following is some further information on SCM content which should be considered when designing concrete mixes.

- GGBS is considered superior to fly ash due to the similarity of its composition to Portland Cement (allowing for a greater percentage of cement replacement), and its uniformity in comparison to fly ash (resulting in greater consistency of the concrete properties). The typical replacement range of fly ash is between 20% to 40% and for GGBS is between 30% to 80%.
- SCMs typically increase curing times, and their increased use will likely result in a requirement to maintain formwork in place for longer durations, which has the potential to impact the construction schedule. It is recommended that the engineer specify a 56-day strength instead of 28-day to allow the use of SCMs and to coordinate closely with the owner and contractor. It is also recommended to coordinate with a local concrete supplier prior to construction to develop and test an appropriate mix design, as required.
- The quantity of SCM content in a standard concrete mix is dependent on the time of year that the concrete is poured, i.e. higher SCM content can be achieved if the concrete is poured in the summer months.
- Portland Limestone (GUL) Cement may be utilised as a substitute for General Use Portland Cement (GU) in all concrete structural elements and achieve up to 5%-10% savings in Global Warming Potential (GWP) compared to mixes with GU cement.

Steel

Structural steel and steel reinforcement made with scrap metal has lower embodied carbon than steel made from virgin materials. Additionally, it is estimated that electric arc furnaces (EAF) produce about half of the carbon emissions that blast furnace – basic oxygen furnaces (BF-BOF) do (Source: ASCE/SEI). Since EAFs process more recycled content (up to 98%) than BF-BOFs (between 25%-60%), specifying and procuring steel produced in an EAF with a high recycled content can achieve embodied carbon reductions in the structure. There are a lot of nuances in the supply chain when it comes to low-embodied carbon steel, and it is recommended to engage a steel manufacturer early in design to determine which low-carbon options are available and feasible.

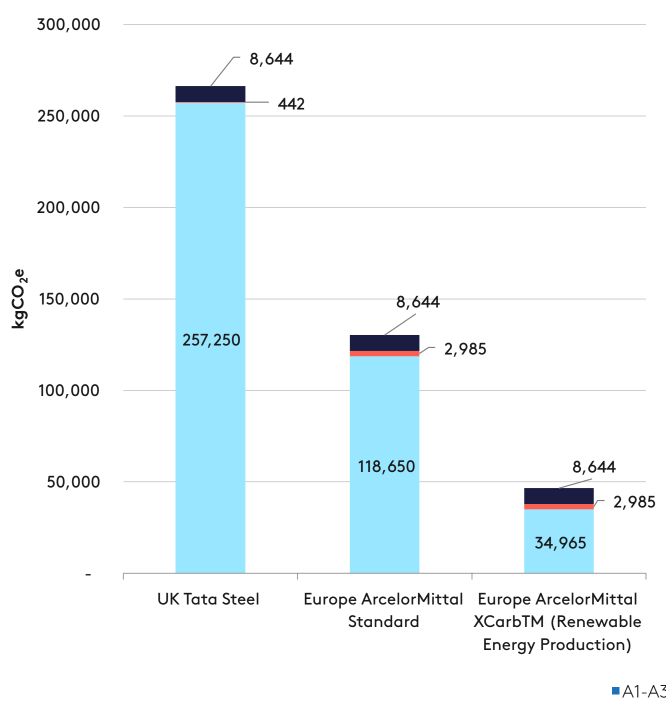
Within the UK, the steel supply chain is traditionally based on the BF-BOF method, however there are more EAFs becoming available. Within mainland Europe, there are far more options for steel manufactured by an EAF on a cleaner energy grid, which lowers the embodied carbon significantly. The carbon impact of higher transport emissions versus lower product stage emissions should be considered when making procurement decisions.

A comparison has been done between typical products and EPDs available on the market and shown in the below graphs.

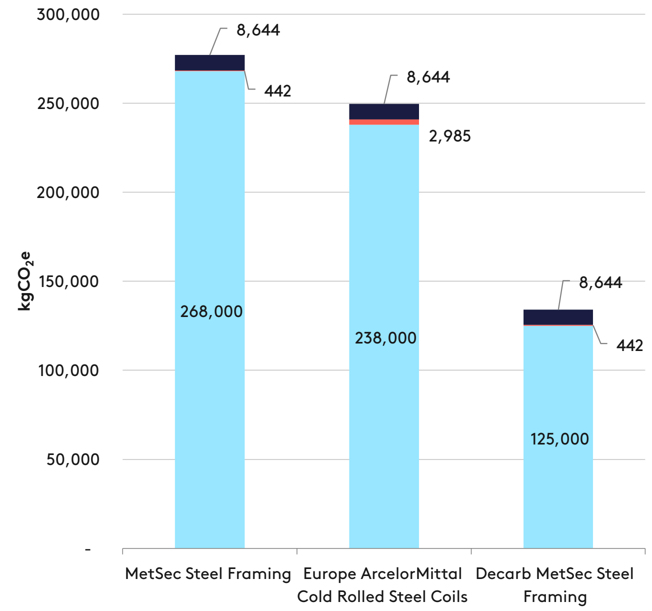
It is important to note that the percent of recycled content is variable and depends on the availability of scrap material, the product (i.e., wide-flange sections vs hollow sections, rebar, etc.), required chemical composition (i.e., grade of steel), and production route. Typically, cold rolled steel has a higher embodied impact than hot rolled steel.

As demonstrated above, the steel supply chain is very nuanced and there is a lot of complexity when it comes to specifying and designing with low-carbon structural steel. Sourcing 'green steel' typically involves prioritising EAF technology powered by renewable energy. Currently, ArcelorMittal XCarb is the main low-carbon structural steel product available on the market. MetSec also has a Decarb option for their structural steel framing products.

Hot rolled steel EPD comparison



Cold rolled steel EPD comparison



Insulation

Insulation decisions can greatly affect both the embodied carbon and the operational carbon of the building. There are many different insulation material types on the market, with varying thermal performance levels, so when trying to compare embodied carbon, several factors need to be considered to ensure you are comparing like-for-like and are making the right choice.

The main types of materials used for insulation:

Organic synthetic: Plastic, in the form of foam that has either been expanded or extruded

Mineral (including glass) fibre, in board, batt or sprayed form

Natural materials, in batt or sprayed form

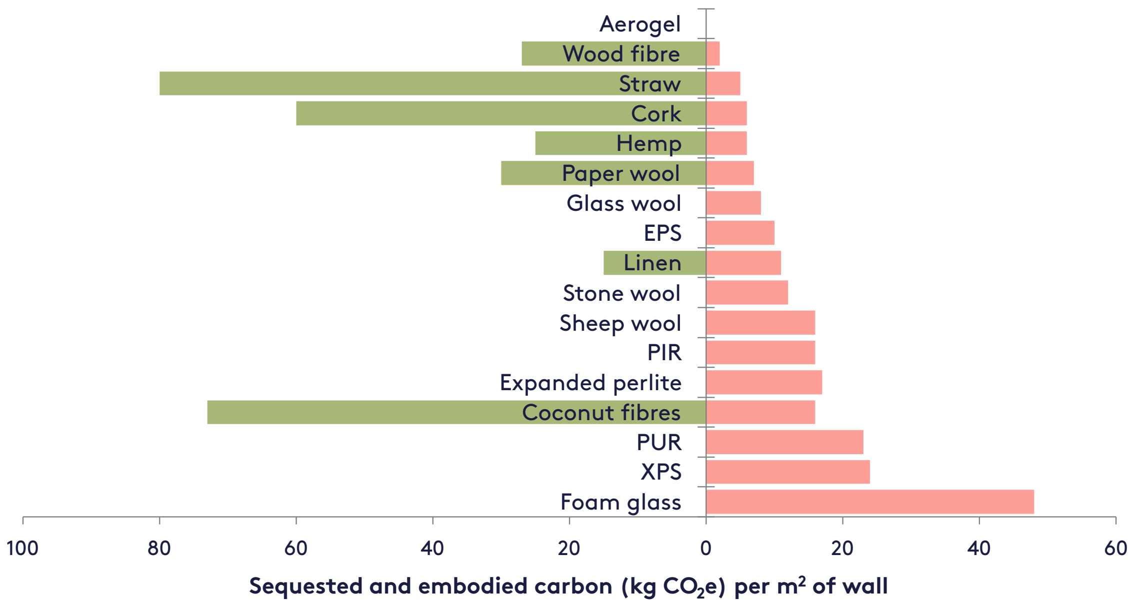
The type and thickness of the insulation should be selected to optimise both types of carbon emissions. Below is a list of general strategies to consider when reducing the embodied carbon of the insulation:

- Utilise natural insulating materials whenever possible;
- Consider biogenic impacts and benefits;
- Avoid the use of polyisocyanurate (PIR), extruded polystyrene (XPS) and expanded polystyrene (EPS) insulation. If any of these insulation types are required for a specific application, follow these guidelines:
- Substitute XPS roofing insulation with a PIR base layer and a rigid mineral wool board top layer to reduce the embodied carbon.
- For below-grade applications substitute XPS insulation with EPS.
- For spray foam applications, specify HFO closed-cell over HFC closed-cell.
- For applications where these insulations are necessary, it is advised to procure products from suppliers that are demonstrating their commitment to sustainability and discuss with the supplier on potential alternative solutions or available lower carbon products

Always compare different products based on the same performance requirements achieved, e.g. thermal conductivity (U-value) or acoustic performance (Rw). Due to the differing nature of materials, this will result in different thickness of insulation required for different insulation types. Fire resistance, strength and durability may also vary between types.

Insulation plays a key part in the fabric first approach to reducing operational energy, and it is therefore critical that attention is given to the detailing and installation of insulation as well as robust thermal bridging details in order to capitalise on its benefits. The below graph shows the embodied impact (A1-A3) of different insulating materials based on the same u-value per square metre of area.

Insulation sequestration and embodied carbon (A1-A3)[1]



[1]Source: LETI Low Embodied Carbon Specification and Procurement Guide - For Low and Net Zero Carbon Buildings.

Appendix II

Embodied Carbon Reporting Template

The following table is required to be completed and submitted to OHF at the completion of the WLCA at concept design, detailed design and as-built stages. An excel template is provided which is to be completed with the analysis results.

ORE Embodied Carbon Reporting Table – RIBA 2

Key
Mandatory
Not applicable
Optional

All units to be $kgCO_2e$

		Biogenic Carbon	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6 (Electricity)	B6 (Fossil Fuels)	B7	C1	C2	C3	C4	D1	D2
Whole Asset	Site emissions - whole development																		
	Emissions associated with energy in-use and renewable generation																		
	Water in-use - building																		
	0.1 Demolition & Facilitating Works																		
Sub-structure	1.1 Foundations & Piling																		
	1.2 Basement & Retaining Walls																		
Super structure	2.1 Frame																		
	2.2 Upper floors																		
	2.3 Roof																		
	2.4 Stairs and ramps																		
	2.5 External envelope including roof finishes																		
	2.6 Windows and ext doors																		
	2.7 Internal walls and partitions																		
	2.8 Internal doors																		
Finishes	3.1 Wall Finishes																		
	3.2 Floor Finishes																		
	3.3 Ceiling Finishes																		
FF&E	4 FF&E																		
Building Services	5.1 Public Health																		
	5.2 Heating, Ventilation and Cooling (HVAC)																		
	5.3 Electrical insatllations																		
	5.4 On site renewable energy generation																		
	5.5 Systems including life safety, fuel installations, lift and conveyor installations, services equipment, disposal installations, specialist installations, builders work in connection with services																		
External Works	8 External works (within the site boundary)																		
	8 External works (outside the site boundary)																		
	Totals $kgCO_2e$																		

Appendix II (cont.)

ORE Embodied Carbon Reporting Table – RIBA 4

Mandatory
Not applicable
Optional

All units to be $kgCO_2e$

		Biogenic Carbon	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6 (Electricity)	B6 (Fossil Fuels)	B7	C1	C2	C3	C4	D1	D2
Whole Asset	Site emissions - whole development																		
	Emissions associated with energy in-use and renewable generation																		
	Water in-use - building																		
	0.1 Demolition & Facilitating Works																		
Sub-structure	1.1 Foundations & Piling																		
	1.2 Basement & Retaining Walls																		
Super structure	2.1 Frame																		
	2.2 Upper floors																		
	2.3 Roof																		
	2.4 Stairs and ramps																		
	2.5 External envelope including roof finishes																		
	2.6 Windows and ext doors																		
	2.7 Internal walls and partitions																		
	2.8 Internal doors																		
Finishes	3.1 Wall Finishes																		
	3.2 Floor Finishes																		
	3.3 Ceiling Finishes																		
FF&E	4 FF&E																		
Building Services	5.1 Public Health																		
	5.2 Heating, Ventilation and Cooling (HVAC)																		
	5.3 Electrical insatllations																		
	5.4 On site renewable energy generation																		
	5.5 Systems including life safety, fuel installations, lift and conveyor installations, services equipment, disposal installations, specialist installations, builders work in connection with services																		
External Works	8 External works (within the site boundary)																		
	8 External works (outside the site boundary)																		
	Totals $kgCO_2e$																		

Appendix II (cont.)

ORE Embodied Carbon Reporting Table – RIBA 6

Mandatory
Not applicable
Optional

All units to be $kgCO_2e$

		Biogenic Carbon	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6 (Electricity)	B6 (Fossil Fuels)	B7	C1	C2	C3	C4	D1	D2
Whole Asset	Site emissions - whole development																		
	Emissions associated with energy in-use and renewable generation																		
	Water in-use - building																		
	0.1 Demolition & Facilitating Works																		
Sub-structure	1.1 Foundations & Piling																		
	1.2 Basement & Retaining Walls																		
Super structure	2.1 Frame																		
	2.2 Upper floors																		
	2.3 Roof																		
	2.4 Stairs and ramps																		
	2.5 External envelope including roof finishes																		
	2.6 Windows and ext doors																		
	2.7 Internal walls and partitions																		
	2.8 Internal doors																		
Finishes	3.1 Wall Finishes																		
	3.2 Floor Finishes																		
	3.3 Ceiling Finishes																		
FF&E	4 FF&E																		
Building Services	5.1 Public Health																		
	5.2 Heating, Ventilation and Cooling (HVAC)																		
	5.3 Electrical insatllations																		
	5.4 On site renewable energy generation																		
	5.5 Systems including life safety, fuel installations, lift and conveyor installations, services equipment, disposal installations, specialist installations, builders work in connection with services																		
External Works	8 External works (within the site boundary)																		
	8 External works (outside the site boundary)																		
	Totals $kgCO_2e$																		

Risks and Warnings

Risks:

The value of an investment, and any income from it may fall as well as rise. Investors may not get back the full amount they invest. The fund will see investment risk concentrated in specific sectors, countries and currencies. This means the strategy will be more sensitive to any localised economic, market, political or regulatory events. Due to the nature of the underlying investments, investors will not be able to withdraw prior to the end of the term, and liquidity cannot be guaranteed. The fund will invest in projects under development or in development teams and, therefore will be exposed to certain risks, such as regulation of the permitting, taxes, failure rate of projects during the development, cost overruns, development delays, counterparty risks and others which may be outside our control. Returns achieved are reliant upon the performance of the fund's portfolio of healthcare businesses. Fluctuations in operating results may be due to a number of factors, including changes in the supply and demand for, and residual value of the assets, changes in operating expenses, defaults by counterparties, environmental factors and more. Portfolio assets will still be subject to the additional regulatory requirements of operating in the healthcare sector. Neither past performance nor any forecast should be considered a reliable indicator of future results or performance. In considering the information contained herein, prospective investors should bear in mind that the investment programme and methods and past performance of Octopus and any of its affiliates, is not necessarily indicative of the investment programme, methods or future results of the fund. The fund is not required by law to follow any standard methodology when calculating and representing performance data. Before making any investment decision, you should seek independent investment, legal, tax, accounting or other professional advice as appropriate. In making an investment decision, recipients must rely on their own examination of an investment and the terms of any offering and must make an independent determination of whether the interests meet their investment objectives and risk tolerance level. Any statement as to risks herein is not an exhaustive list. More detailed information on the specific risks of the fund will be available in the offer document on request

Warnings:

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