Curtins

OUR COMMITMENT TO REDUCE CARBON

REV 00 I NOVEMBER 2023

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01 MESSAGE FROM ROB

We are acutely aware and working to reduce the statistic that 49% of annual carbon emissions in the UK and Ireland are attributed to buildings (LETI, 2020). We know that the construction industry has a responsibility to reduce these emissions and it's something we are taking extremely seriously.

This is why we work so hard to make positive changes ourselves, whilst leading and collaborating with others to maximise our impact.

Our actions to date have been clear, purposeful and grounded in data. We have utilised our extensive skills as engineers to build a bespoke carbon database that allows us to analyse the embodied carbon emissions in our projects. With this data, we have set meaningful targets for reduction.

Approaching our carbon impact holistically, we have also collaborated with industry professionals to understand our impact as a business and lead our clients in sustainable design choices.

We are on a mission to reach net carbon zero via a pathway of reduction and our targets reflect this.

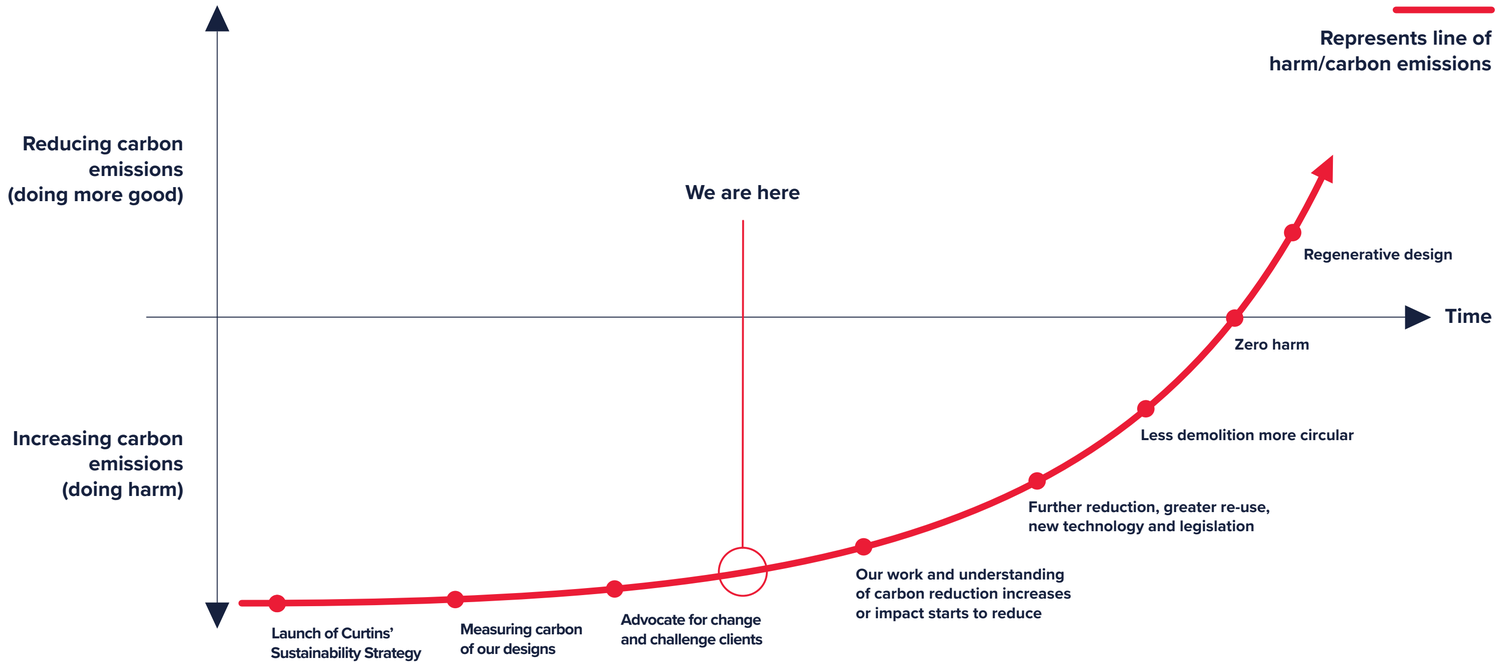
We hope that through the transparency and clarity of this report, you will understand how fundamental operating sustainably is to Curtins. In the actions outlined in these few pages, we illustrate how Curtins works to build a better future for one another and the communities we serve, because, above all, the positive legacy we leave truly matters.

Rob Melling
Chief Executive

02 SUSTAINABLE DESIGN AT CURTINS

This graph shows our progression our initial actions to reduce our carbon impact in the launch of our sustainability strategy in 2019, through the challenging final goal of regenerative design.

In the last few years, we have progressed along the curve and are beginning to reduce our carbon impact through efficient and clever design. We need to continue this progress and begin to think beyond carbon within our work to include circular economy and regenerative principles.



03 THE EMBODIED CARBON DATABASE

Launched in July 2022, our Embodied Carbon Database presently allows us to enter and analyse live carbon data from our structural design projects. In just 4 months, we reached our target data upload of 100 projects and have since rapidly grown the database, providing increasingly high-quality samples of data.

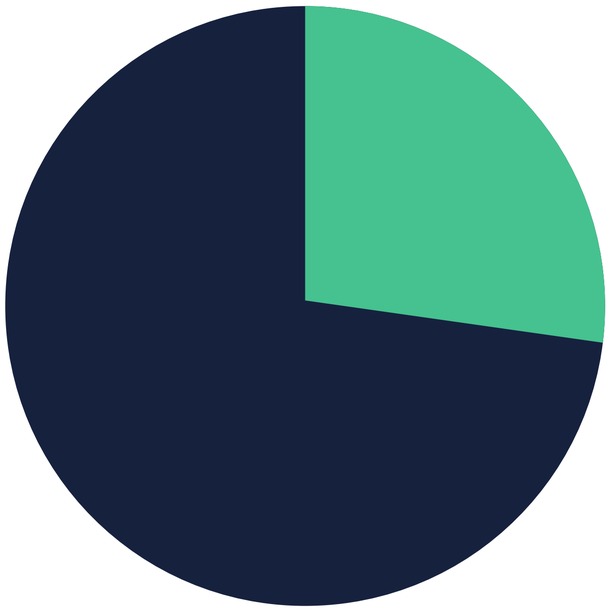
Currently our carbon database results include structural design projects at construction stage (a building's superstructure typically equates to 74% of the average embodied carbon), whilst we work to add in civil engineering analysis.

The extracted data illustrated represent '**upfront carbon**' only. This is the manufacture of materials, transport to site and then any associated construction emissions. The calculation uses industry standard embodied carbon factors which allow for an average consumption of material manufacture types and where possible project specific EPDs.

The current average is approximately **340kg of CO_2e/m^2** for superstructure and substructure at construction, which is a SCORS Rating E.

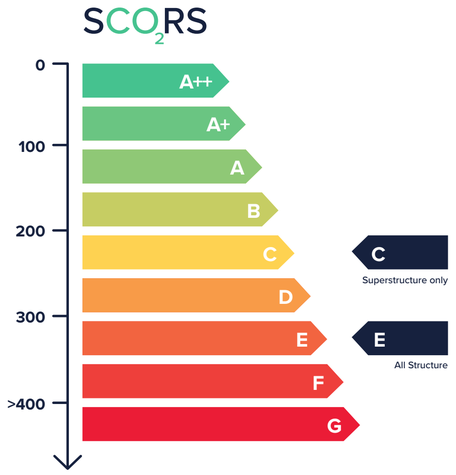
The running total of carbon on the database is over **150,000** tonnes of carbon.

Average of Curtins' construction embodied carbon $kgCO_2e/m^2$

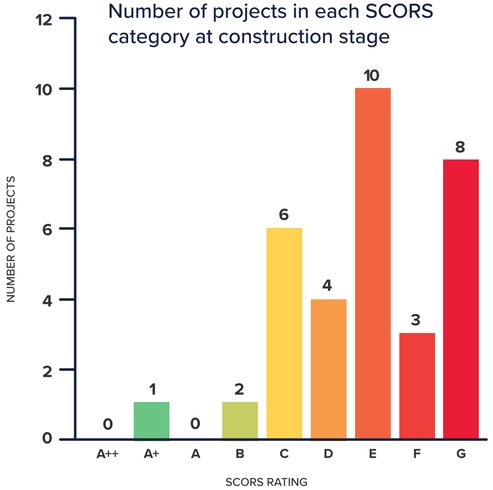


74% Average carbon value of super structure

26% Average carbon value of substructure



Number of projects in each SCORS category at construction stage



04 SETTING REALISTIC AND ACHIEVABLE REDUCTION TARGETS

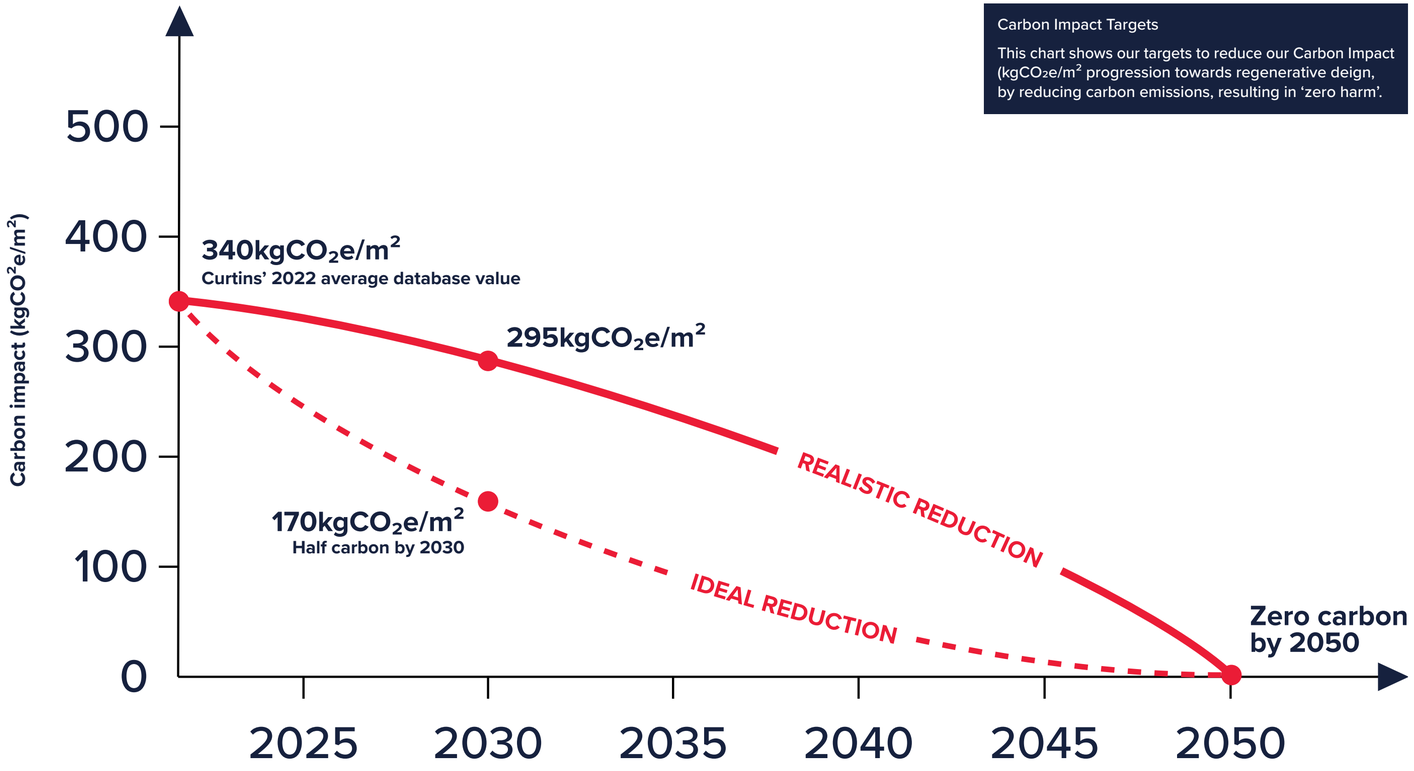
We believe that setting targets that are realistic has a greater impact than committing to idealistic targets that are unachievable. We want our reduction in emissions to follow a realistic downward reduction trajectory **without the need to use 'off-setting' methods**.

As one part of the built lifecycle, we can influence superstructure design choices. But in order to achieve zero carbon, the industry as a whole need to work together to make significant impacts in the design and construction process.

Our realistic reduction targets are the minimum we expect to achieve by 2050, which will be continually reviewed for betterment as innovation, regulation and new technology is introduced into the industry.

The graph opposite shows our journey towards Zero Carbon. Our target is to reduce our current project carbon impact of 340kgCO_2e/m^2 (SCORS Rating E) to 295kgCO_2e/m^2 (SCORS Rating D) by 2030 - this equates to a 2% reduction year on year, with a 15% reduction by 2030.

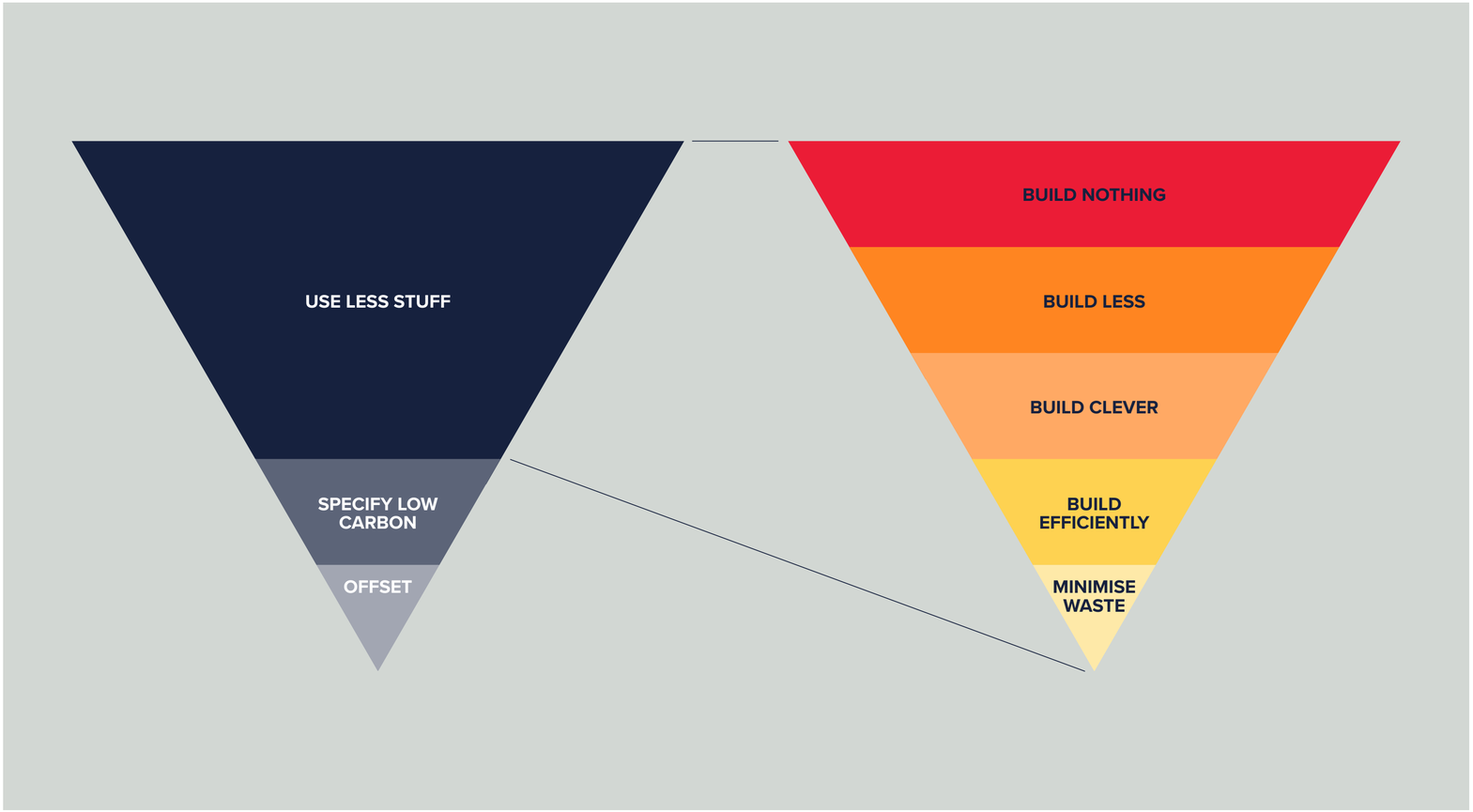
This is a realistic reduction that follows a downward trend typically achievable in the industry in the absence of embodied carbon legislation.



05 THE CARBON REDUCTION TOOLS WE USE AT CURTINS

Our approach to measuring and mitigating the embodied carbon through our design activities is to offer low carbon solutions for consideration against other key drivers and risks.

Our overarching principle as a business is to ‘use less’, build clever and efficiently, as seen in the image to the right - an adaptation from Pas 2080 Net Zero Design Hierarchy.



05 THE CARBON REDUCTION TOOLS WE USE AT CURTINS

We have developed bespoke digital tools to measure embodied carbon across the RIBA design stages. These digital tools are also integrated into our BIM Level 2 Kitemark accredited processes.

The toolkit was launched to create a journey:

WE LEARN FROM THE LIBRARY

↓

WE USE THE CALCULATOR TO MEASURE AND REDUCE THE CARBON IN OUR PROJECTS

↓

WE SHARE THE RESULTS INTO OUR CARBON DATABASE TO ANALYSE THE CARBON OUR PROJECTS ARE CREATING ACROSS THE BUSINESS

↓

THIS ALLOWS US TO SET REDUCTION TARGETS

CarbonToolkit

A forever growing resource which evolves with us as a business and industry.

- Keep up to date with the latest legislation, industry targets and innovation
- Analyse carbon content of different solutions
- Visually present carbon hotspots on REVIT models, SCORS rating
- Present carbon ratings on drawings

BENEFITS AND ADDED VALUE

- Visual quantitative data allows client to make informed decisions on embodied carbon
- Carbon content can be assessed alongside cost and programme considerations

RESOURCE LIBRARY

- Library of industry sustainable resources to enable our staff to support clients on carbon reduction.

CARBON CALCULATOR

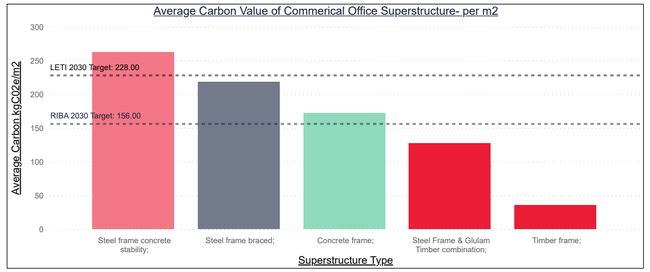
- Quantitative data
- Visually highlights carbon hotspots
- Embedded within our REVIT models
- Structural, civil and enabling works resource
- Design option appraisal

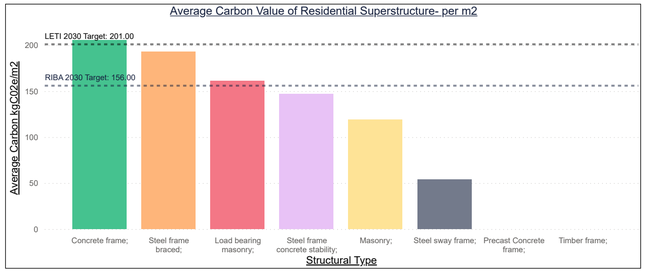
CARBON DATABASE

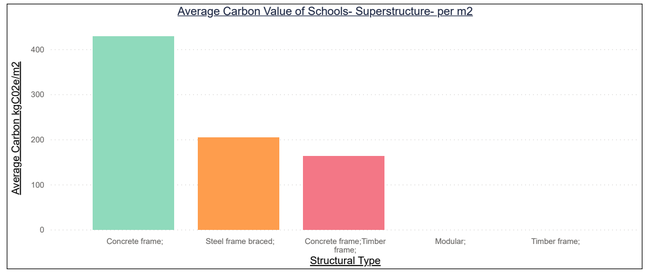
- Record of embodied carbon in our projects
- Set carbon reduction targets as a business and on projects
- Benchmark against industry targets
- Advise clients on progress and trends

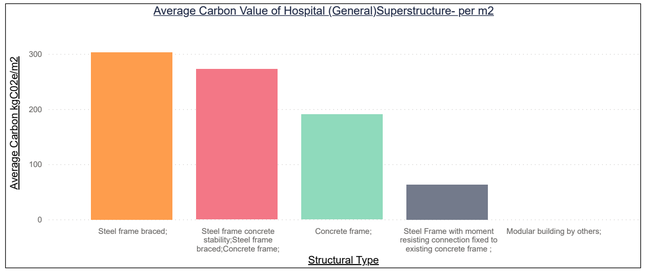
05 THE CARBON REDUCTION TOOLS WE USE AT CURTINS

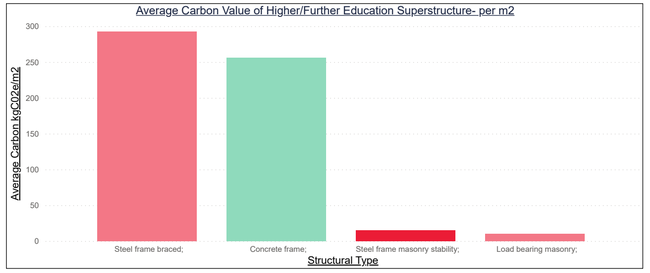
Our Carbon Database records the embodied carbon for all our projects. This database produces the data needed to analyse the carbon we create from our projects. From this we can set carbon targets and benchmark against the industry.

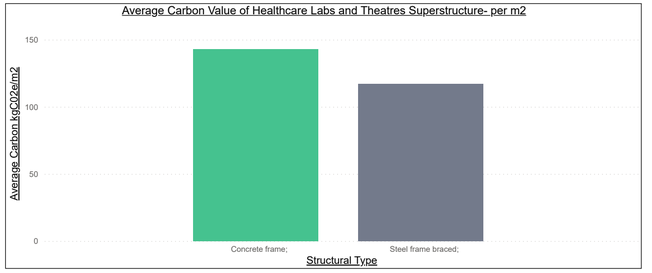












06 OUR CARBON CALCULATOR

To proactively manage and reduce our carbon impact through design we have created a carbon design calculator, used by all our specialist teams.

The calculator automatically develops the embodied carbon content of individual building components, using their intelligent attributes, to provide a total embodied carbon content for the structure - broken down into the life stages of the project (transport, construction, use stage and end of life).

By assessing different structural solutions, we consider the embodied carbon content of these solutions and use this as part of the assessment criteria when choosing structural materials.

We identify components of civil and structural elements that drive the embodied carbon content. The pie charts to the right show an emissions breakdown of the structural and civil elements and a comparison of different design options.

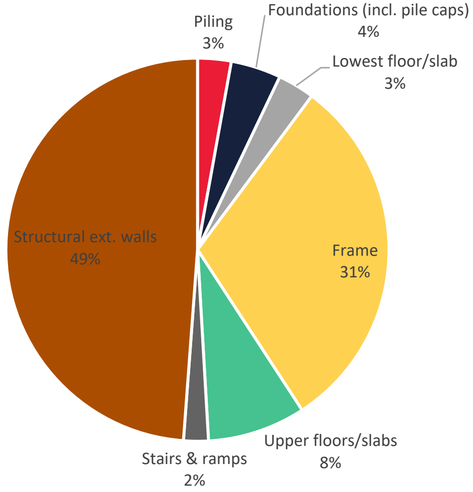
These tools enable us to help our clients make more informed design choices.

Extracts from our Embodied Carbon Summary

These examples show an emissions breakdown of the structural and civil elements and a comparison of different design options.

Project Title:	Test Scheme 1
Design Stage:	Stage 4- Technical Design
Scheme Reference:	Test Scheme 1
Project Engineer:	Niamh McCloskey
Total Carbon (tCO_2e):	5372
EC per m^2 ($kgCO_2e/m^2$):	189

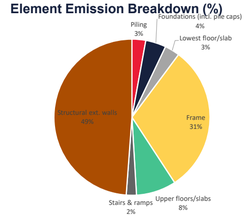
Element Emission Breakdown (%)



Embodied Carbon Calculator 1

Design Stage:	Stage 4- Technical Design
Scheme Reference:	Test Scheme 1
Project Engineer:	Niamh McCloskey
Total Carbon (tCO_2e):	189
EC per m^2 ($kgCO_2e/m^2$):	189
SCORS Rating:	B
SCORS Target:	Scheme does not meet target
LETI Target:	Scheme meets target
RIBA Target:	Scheme does not meet target

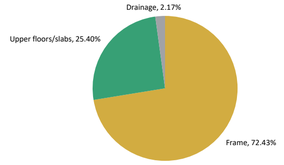
Element Emission Breakdown (%)



Embodied Carbon Calculator 2

Design Stage:	Stage 3- Spatial Coordination
Scheme Reference:	Test Scheme 2
Project Engineer:	Niamh McCloskey
Total Carbon (tCO_2e):	268
EC per m^2 ($kgCO_2e/m^2$):	268
SCORS Rating:	D
SCORS Target:	Scheme does not meet target
LETI Target:	Scheme does not meet target
RIBA Target:	Scheme does not meet target

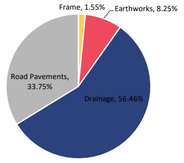
Element Emission Breakdown (%)



Embodied Carbon Calculator 3

Design Stage:	Stage 3- Spatial Coordination
Scheme Reference:	Test Scheme 3
Project Engineer:	Niamh McCloskey
Total Carbon (tCO_2e):	0
EC per m^2 ($kgCO_2e/m^2$):	0
SCORS Rating:	A++
SCORS Target:	Scheme meets target
LETI Target:	Scheme meets target
RIBA Target:	Scheme meets target

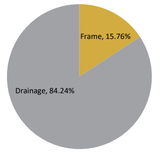
Element Emission Breakdown (%)



Embodied Carbon Calculator 4

Design Stage:	Stage 3- Spatial Coordination
Scheme Reference:	Test Scheme 4
Project Engineer:	Niamh McCloskey
Total Carbon (tCO_2e):	38
EC per m^2 ($kgCO_2e/m^2$):	38
SCORS Rating:	A++
SCORS Target:	Scheme meets target
LETI Target:	Scheme meets target
RIBA Target:	Scheme meets target

Element Emission Breakdown (%)



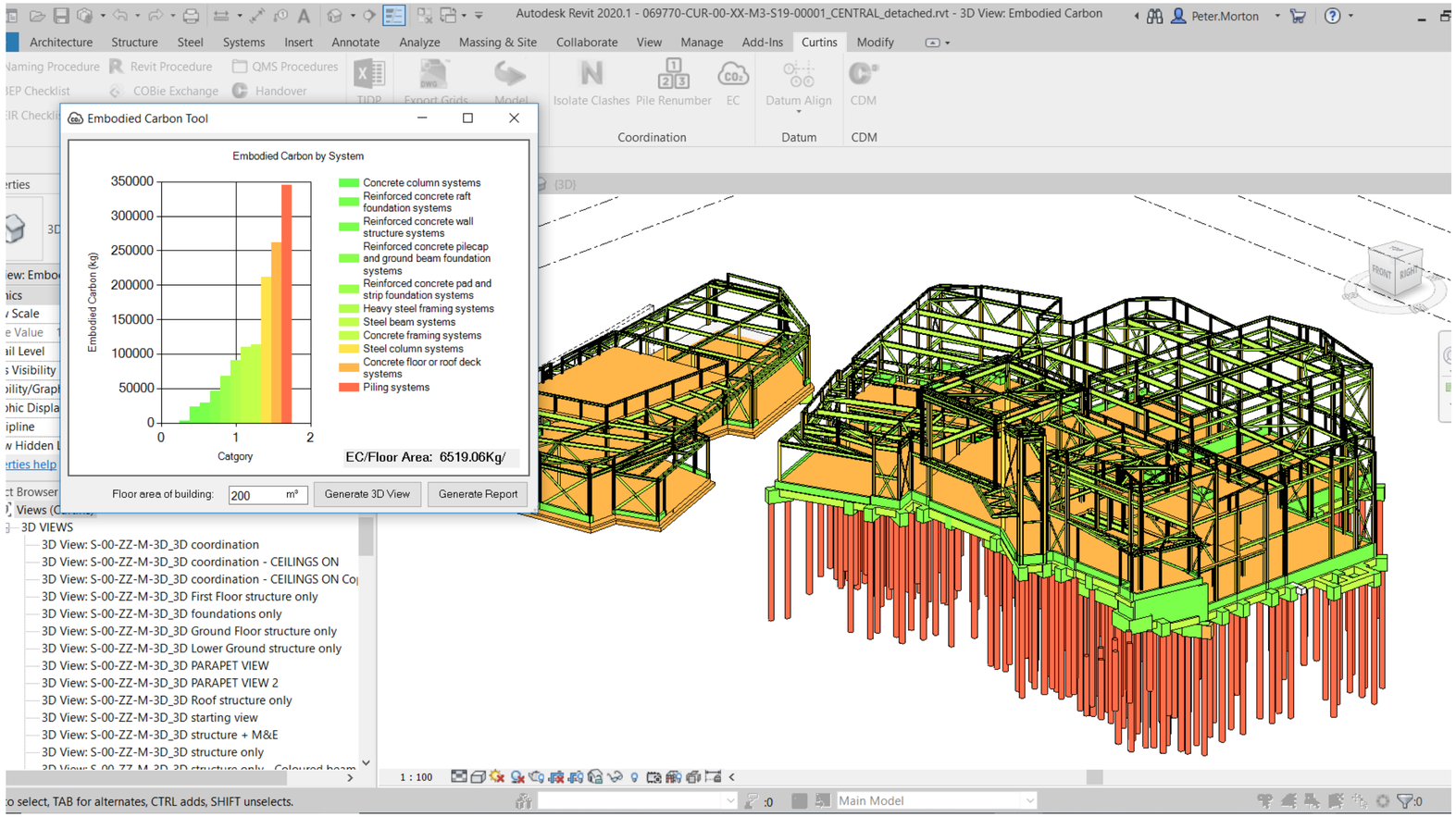
06 OUR CARBON CALCULATOR

The calculator is embedded within our Revit models, presenting the carbon hot spots visually. This allows our engineers to make informed decisions on where further engineering effort can be made during RIBA stages 3 & 4, to further enhance carbon reduction.

The adjacent image shows how the carbon hotspots are displayed visually, so our engineers and our clients can easily see areas with scope for improvement.

Example of our Carbon Calculator embedded in Revit

This gives a quick visual of carbon hotspots.
Darker (red) colours indicate a high embodied content
Lighter (green) colours indicate a low content.



07 ASSESSING CARBON CONTENT AGAINST ‘EVERYDAY’ COMPARABLES

To provide our clients with an overall carbon content of the new building, we incorporate other design team’s model data into our carbon calculator.

The quantitative assessment calculator produces CO_2 data in $kgCO_2e/m^2$ and can be divided by the life of the building to get an embodied carbon equivalent impact per year.

The actual carbon quantities are incorporated within our RIBA reports and on our production drawings.

Providing carbon content ratings on our drawings easily highlights the actual carbon content of the building. These are based on SCORS ratings and depicted in a similar way to electrical appliance energy rating stickers. They are included to further raise awareness of the environmental impacts of the design decisions being made.

Within our summaries, we provide a ‘carbon equivalent’, so our clients can quickly compare the amount of carbon to everyday comparables.

The image on the right shows how we display the SCORS rating on our drawings, and whether these meet industry 2030 targets.

We enable our clients to consider whether to have a high embodied carbon frame with a low operational energy requirement, or a light structural frame that requires more heating and cooling.

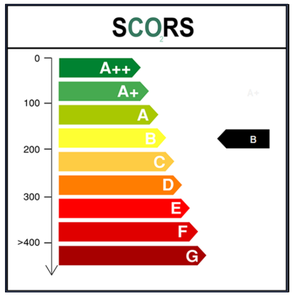
By assessing the embodied carbon content of different structural solutions and providing a reduction report to our clients, we enable clients to make informed design choices. Carbon content can be assessed alongside cost and programme considerations.

Providing carbon content ratings on our drawings easily highlights the actual carbon content of the building.

Extract from an Embodied Carbon Summary Revit drawing

Alongside embodied carbon content, clients and design team can also see the SCORS rating and ‘carbon equivalent’ of the building to inform design decisions.

Scheme Performance:



Scheme Performance against 2030 targets:

SCORS	137 $kgCO_2e/m^2$	Scheme does not meet target
RIBA	156 $kgCO_2e/m^2$	Scheme does not meet target
LETI	228 $kgCO_2e/m^2$	Scheme meets target

**Targets reference, IStructE Setting Carbon Targets Structural Carbon Rating Scheme, RIBA (2019) RIBA 2030 Climate Challenge [Online] Climate-action/RIBA-2030-Climate-Challenge.pdf London Energy Transformation Ir.* Available at: www.architecture.com/-/media/fi les/ *Embodied Carbon Factors used in the calculation as based on The Institution of Structural Engineer rs* A Brief Guide to Calculating Embodied Carbon V2.0 (2022), *ICE Database V3.0 and National Highways Carbon Tool.*

This Project has a Carbon Equivalent to:

5449 one-way flights from London to New York

423 peoples average personal carbon footprint per year

3606 average family homes being heated for a year

**equivalents based on UK data for 2022*

Lifecycle Carbon Breakdown:

79% Emissions from Product
17% Emissions from Transport
4% Emissions from Construction Waste

08 OUR BUSINESS EMISSIONS

As a business we recognise the cultural shift required to ensure we change the way we operate to reduce our carbon emissions. In 2022 we appointed an external consultant who have worked with us to develop a carbon reduction roadmap for our business emissions so that we achieve ESOS and PPN/0621 accreditation. These are nationally recognised measures of business carbon use using the GHG methodology for scope 1, 2 and partial scope 3 emissions.

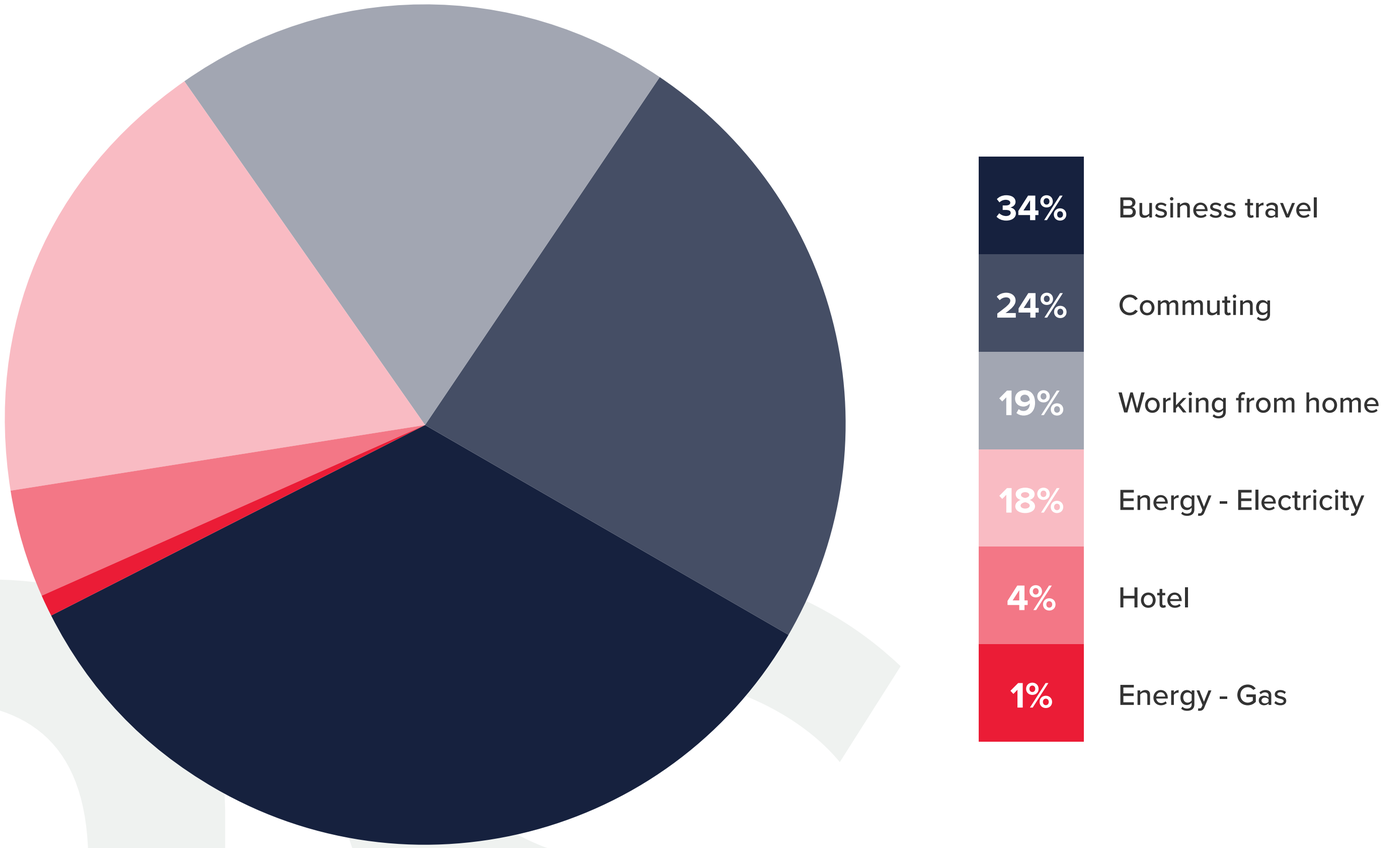
Since then, our team have gathered great quantities of data from our energy use, business travel and waste which, along with the huge response to our staff travel survey, has allowed us to calculate our baseline data. Our total carbon impact over the last year was around **375t – approximately 1t per employee.**

Our next part of the journey is setting out meaningful reduction measures which align with our business core values, those already in place include procuring only hybrid or electric vehicles and transitioning to renewable utility providers.

The biggest source of our emissions comes from our business travel and commuting.

(Almost 60% of the total impact).

The breakdown of Curtins' 375 tonnes of business emissions



09 OUR CULTURE

We foster a culture in which our people have a positive impact on our communities.

We are engaged with several national bodies through committee membership and speaking engagement. These include:

- Institution of Structural Engineers' Climate Change Task Group
- Association of Consulting Engineers' Net Zero Advocacy Group
- Institution of Civil Engineers
- Yorkshire & Humber Climate Action Pledge

The common objective is to change our industry and lobby Government to adopt new legislation, such as the UK Net Zero Buildings Standard and the Part Z of the Building Regulations.

We are collaborating with a broad range of partners who share our interests, including the Met Office (climate science), Akerlof and Construction Carbon (carbon consultancies), PCE Ltd (precast components with reduced carbon impact), Future we Want (training) and EMR / Cleveland Steel (recycled steel sections).

Together we learn, exchange ideas and gain the confidence to drive change at Curtins and beyond.

10 OUR PEOPLE

Our approach to sustainability is shaped by our people. We give them the tools, training and support to allow them to make a personal impact to carbon reduction.

Through the Curtins Academy training programme, all graduates complete a module on Sustainability in Construction, which represents around 20% of our employees.

This means our graduates understand their professional responsibilities to climate action and sustainability in construction through 100 hours a year in graduate development within sustainability.

We are also committed to quarterly CPDs on areas of Sustainability in Construction for all staff. These quarterly CPDs equate to a commitment of around 1,500 hours of training in Sustainability and Carbon Reduction, and follow trends in industry themes and our carbon database results.

Our employees continue to make an impact personally in their local environment. Through litter picks, charity clothes donations and the development of local community gardens, we encourage people to continue to recognise the impact we can have personally, through our business, and in our community projects.

11 IN SUMMARY

We will continue in our action plan to measure and reduce our carbon impact, collaborate with the industry to lobby for better government legislation and equip our people with the knowledge and skills to make informed decisions on carbon emissions. In doing so, we hope to positively track the path from being advocates for change to doing zero harm and eventually achieving regenerative design.

Thank **you**

Curtins | Building a better future