

ESBEM Seminar: Accelerating adoption of UK low environmental impact construction materials

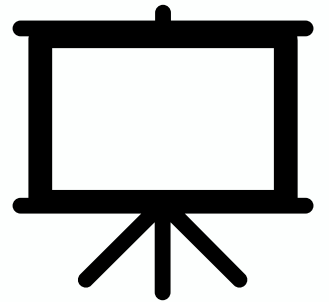
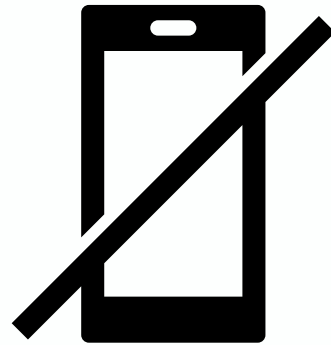
**09:30 - 16:30, 22 January 2026
Birmingham**



**Innovate
UK**

**Business
Connect**

Housekeeping



Innovate
UK

Business
Connect

Event Welcome



Neil Appleton

Knowledge Transfer Manager
Innovate UK Business Connect



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About Us

Innovate UK Business Connect exists to connect innovators with new partners and new opportunities beyond their existing thinking – accelerating ambitious ideas into real-world solutions.



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Our Purpose & Vision

We are part of Innovate UK, the UK's innovation agency.

We create diverse connections to drive positive change.

To establish a network of innovators so powerful its ideas will change the world.



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Emergent Sustainable Built Environment Materials – INNOVATION NETWORK

Ambition

- ✓ Drive adoption of UK low environmental impact construction materials

Technologies

- ✓ Bio-based
- ✓ Valorised Waste
- ✓ Reused and repurposed materials & products

Tools

- ✓ Knowledge sharing
- ✓ Network building
- ✓ Enabling Collaboration
- ✓ Collaborative problem solving
- ✓ Support
- ✓ Online connection finder



Understanding barriers and blockers



Testing, Certification and Acceptance

- ✓ 50 Support calls
- ✓ 100 B2B Collaborations brokered
- ✓ 8 competitions / opportunities socialised

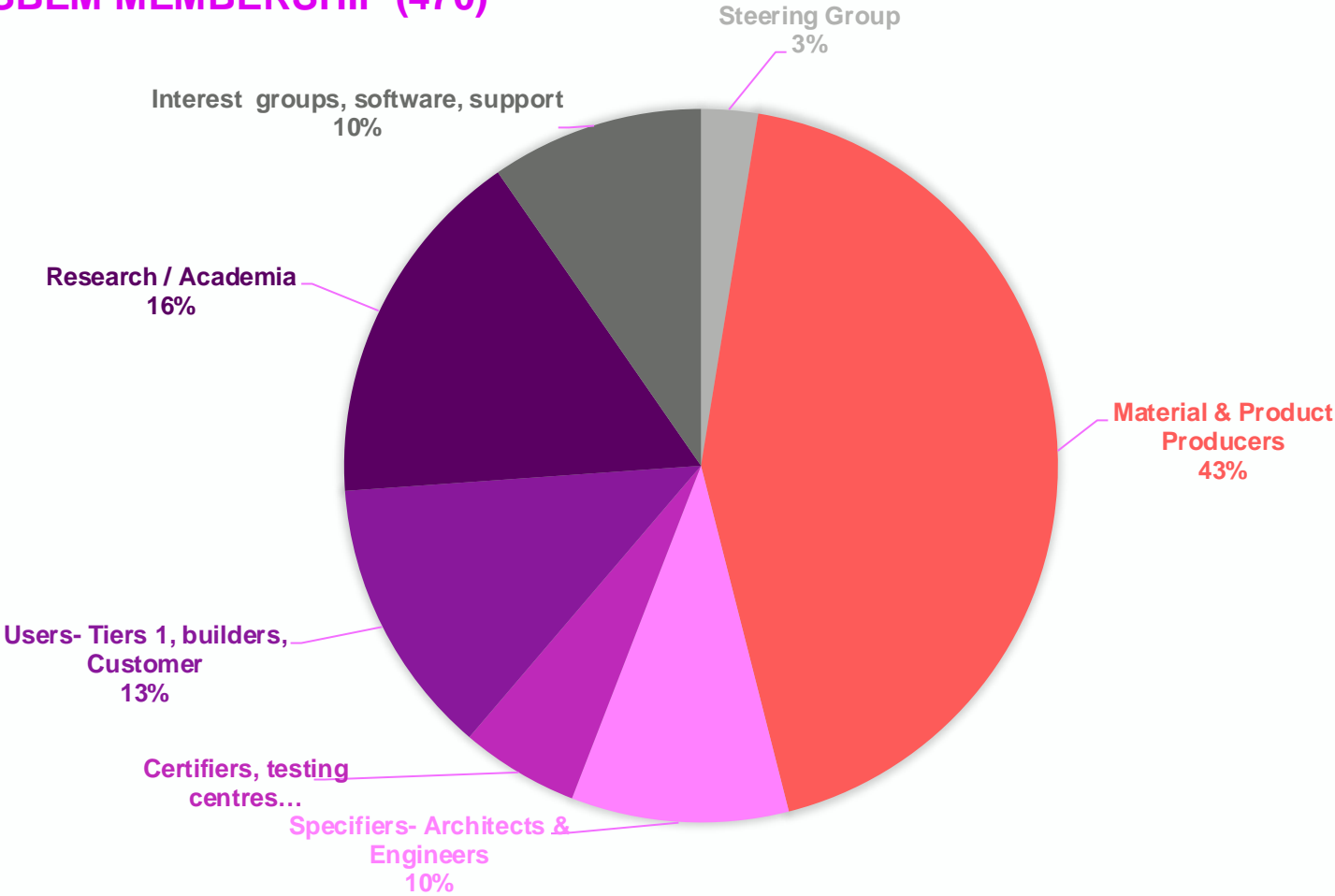


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Emergent Sustainable Built Environment Materials – INNOVATION NETWORK

ESBEM MEMBERSHIP (470)



Your day at a glance



Tabletop
Exhibitors



Networking
Breaks



I want to
meet sheet



Lean on us
to connect

Session	Featuring
Keynote – Net Zero Buildings Standard	Will Arnold
Panel Session- Customer Pull	Reef & Partners, Sustainable Ventures, ASBP, ARUP, Barefoot Architects
Elevator Pitches	
Networking Lunch	
Elevator Pitches	
Panel Session- Accelerating Adoption	Cullinan Studio, Useful Simple Trust, Architype, UKGBC
Tea Break	
Unlocking Technology Innovation	HVMC, CPC, Innovate UK Business Growth, Bangor University



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Missed a key contact?

neil.appleton@iukbc.org.uk

Keynote: Landscape for Change



Will Arnold

Head of Sustainable Materials
Useful Simple Trust



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UK Net Zero Carbon Buildings Standard

Demanding a difference

22 January 2026



Will Arnold

FIStructE HonFCABE CEnv CEng

NZCBS Technical Steering Group Member

- Embodied Carbon Lead
- Version 1 Technical Author

UST Head of Sustainable Materials

(+ Part Z, Bath University, ex-IStructE etc.)

Theory...



...into practice

Useful Simple
Trust



What is the Standard?



UK Net Zero Carbon
Buildings Standard



I wonder what's
for dinner...

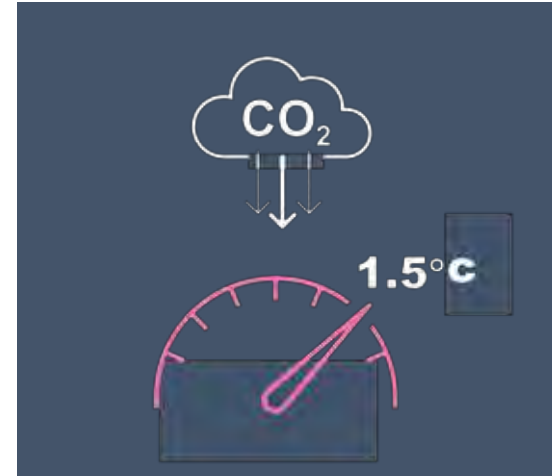
UK Net Zero Carbon Buildings Standard



Rule book



Carbon & energy



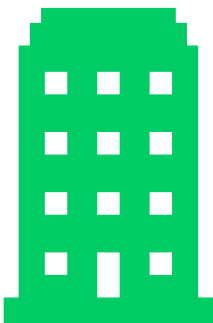
Science-led



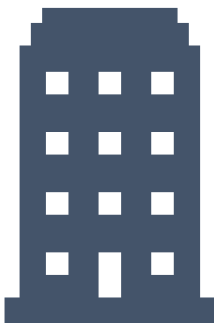
Industry-driven



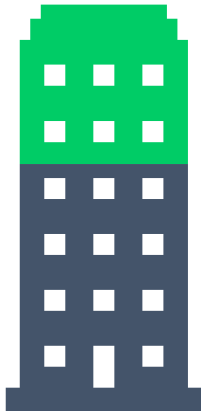
Scope



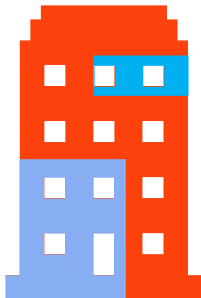
New buildings



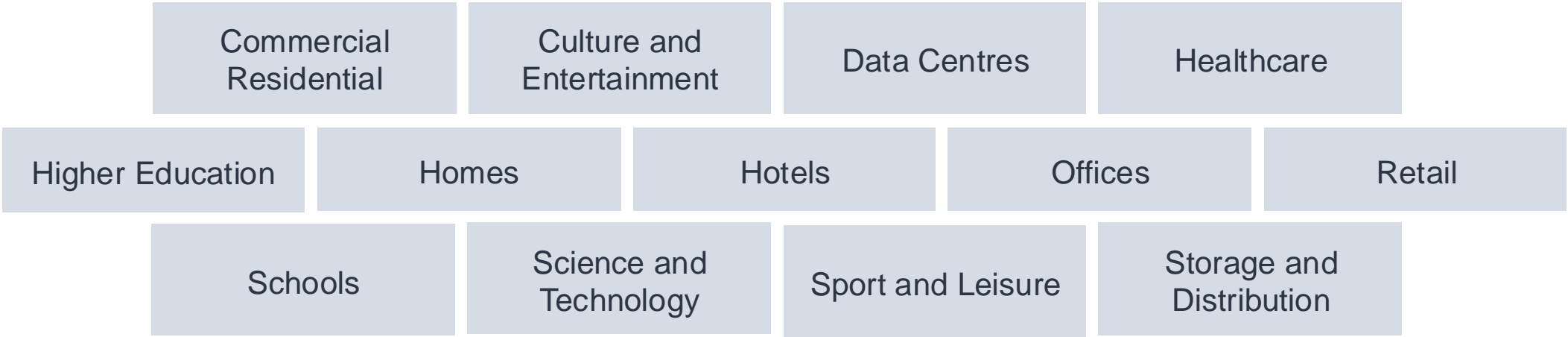
Existing buildings,
retrofits, refits



Extensions



Mixed-use
buildings



Requirements



Limits:



Upfront carbon



Operational energy



Fossil fuel free



District heating and cooling networks



Refrigerants



Heating delivered

Targets:



On-site renewable electricity generation

Optional:



Offsetting & renewable electricity procurement

Reporting:



Life cycle embodied carbon



Operational water use



Electricity demand



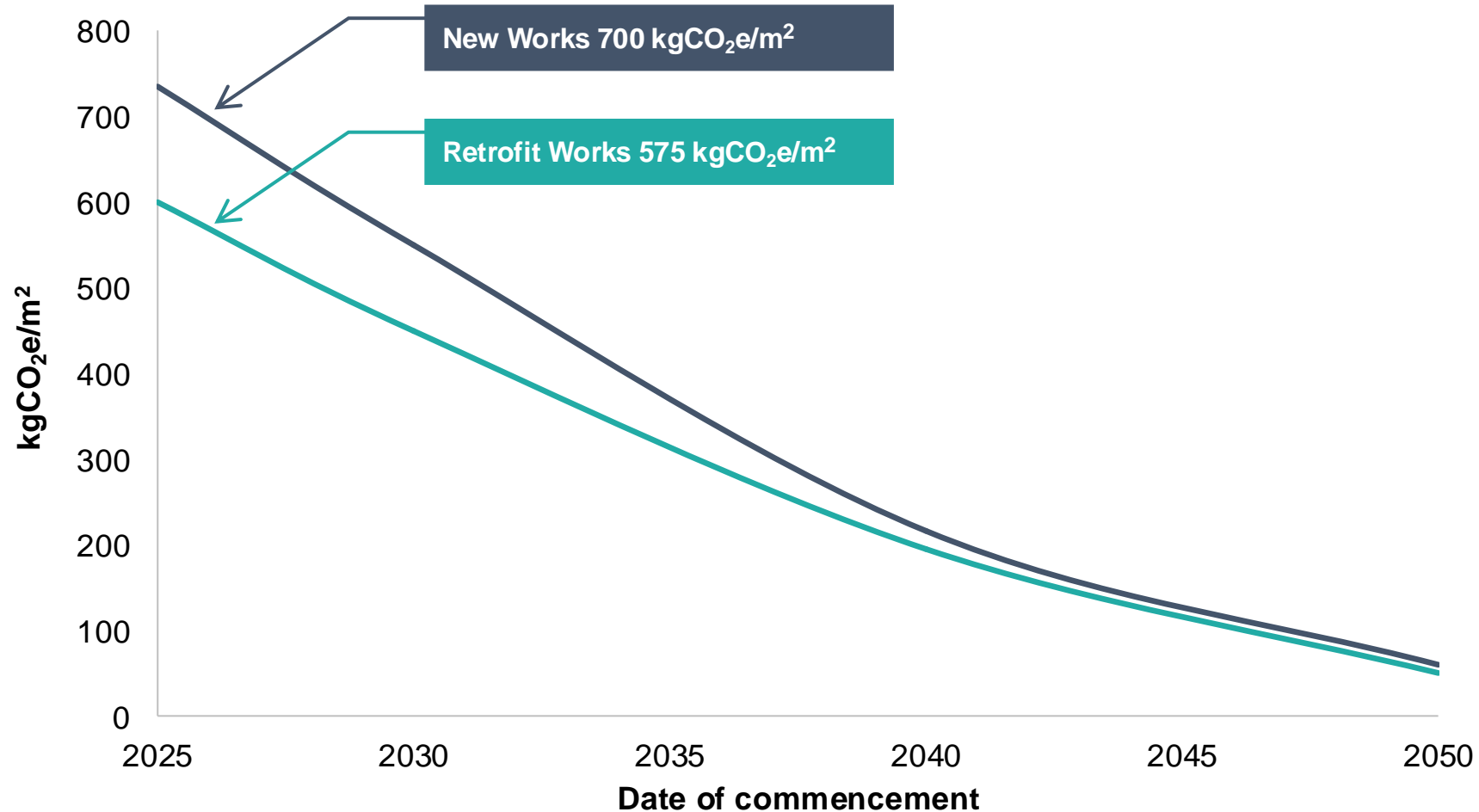
Heating and cooling delivered

A materials revolution



UK Net Zero Carbon
Buildings Standard

Upfront carbon limits (offices)



(Limits taken from Pilot rev2 and subject to change for Version 1)

Industry decarbonisation plans

Ideas so far...

Evolving the 'big five'



concrete.org.uk/fingertips/dd51-calcined-clay/



istructe.org/resources/guidance/the-role-of-scrap-in-steel-decarbonisation/

Reclaimed materials



Tan House footbridge ©Glen Crouch



Castlefield Viaduct



Lower Thames Crossing, Useful Studio and Expedition Engineering.



Tan House footbridge ©Glen Crouch



Duncan Creek Bridge, Kansas, USA. ©Robert Elder



Relocated Bridge ©Acrow

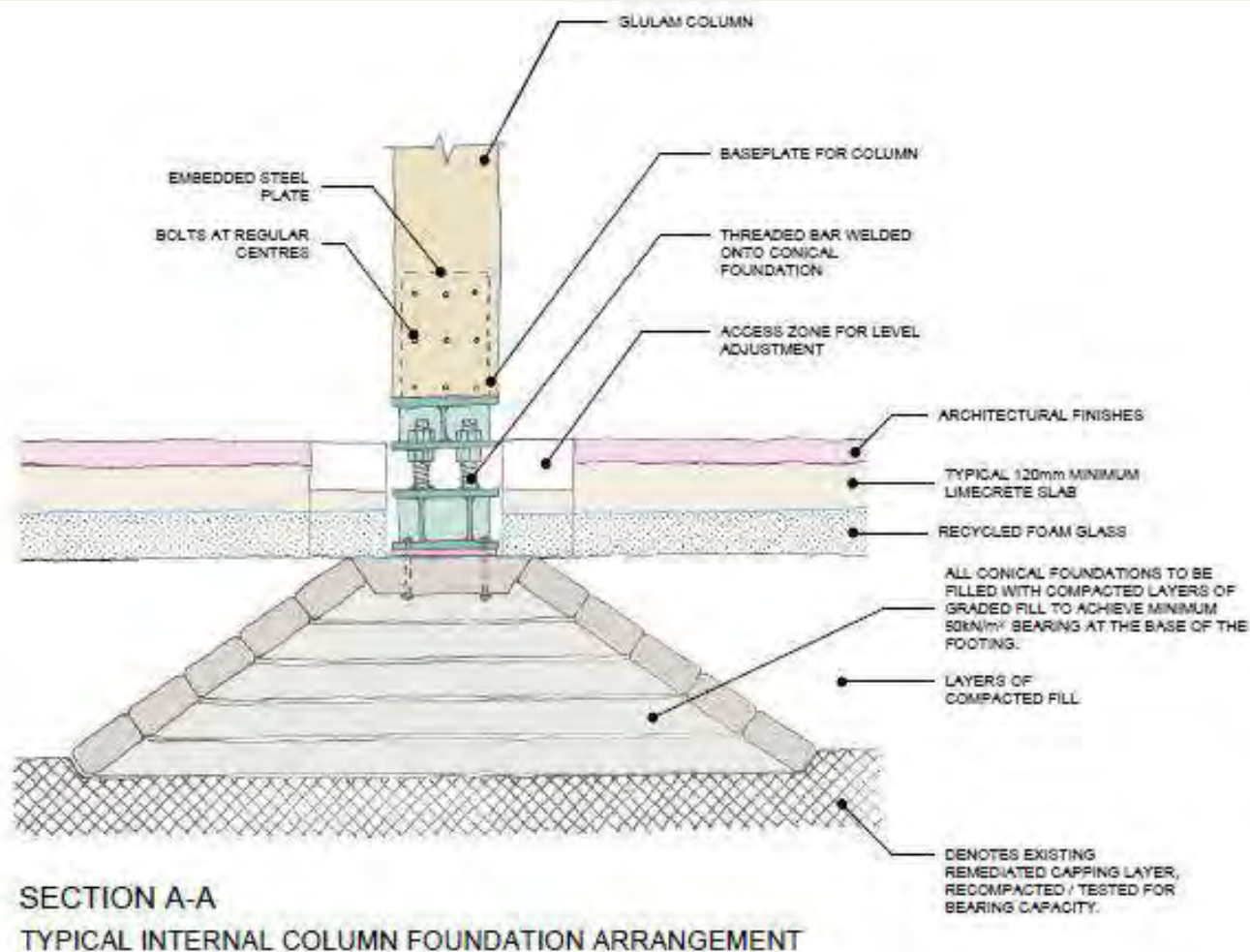
Alternative materials



globalgeneration.org.uk/our-gardens/triangle-site



New building elements



Net Zero Carbon Housing



easthemel.co.uk/westwick-row



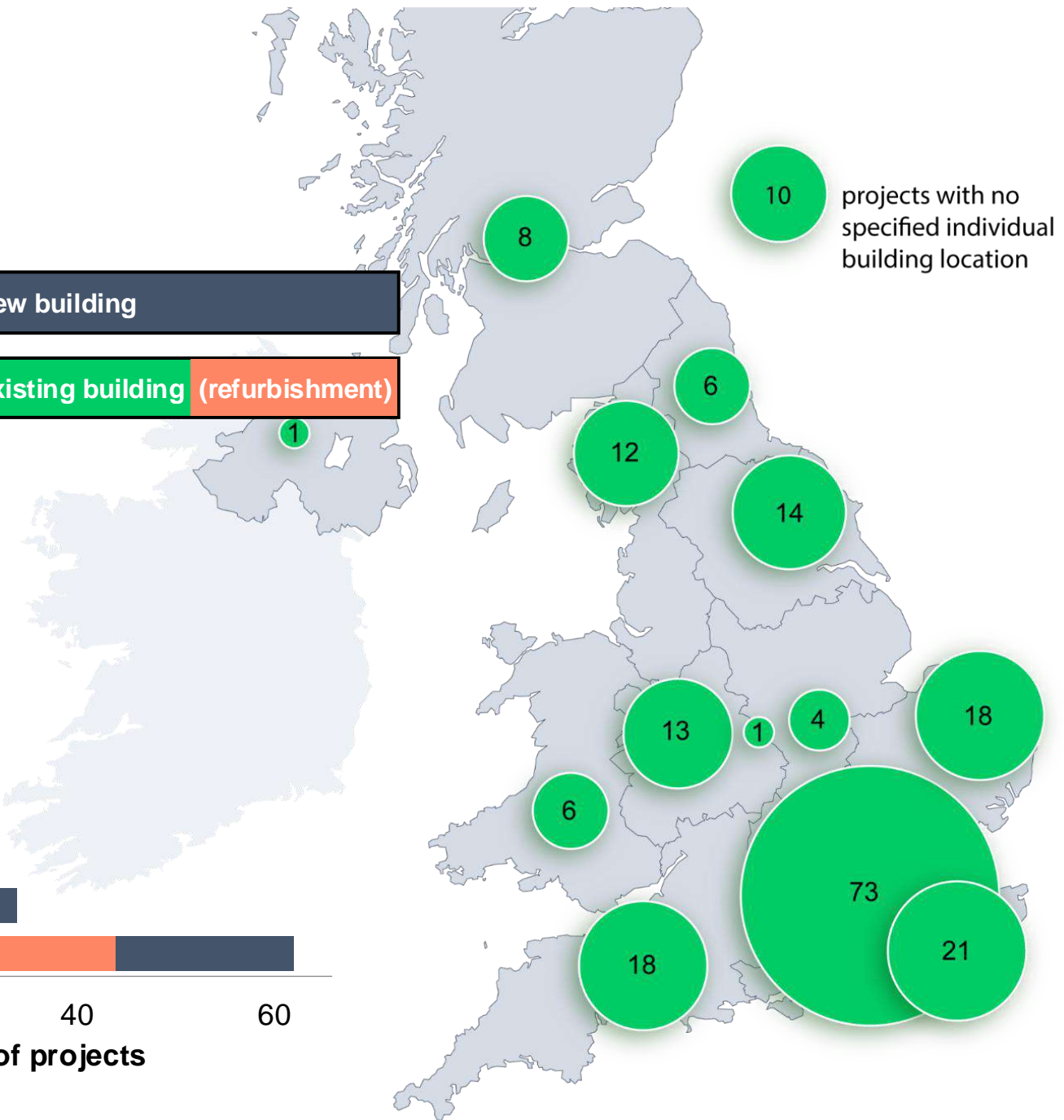
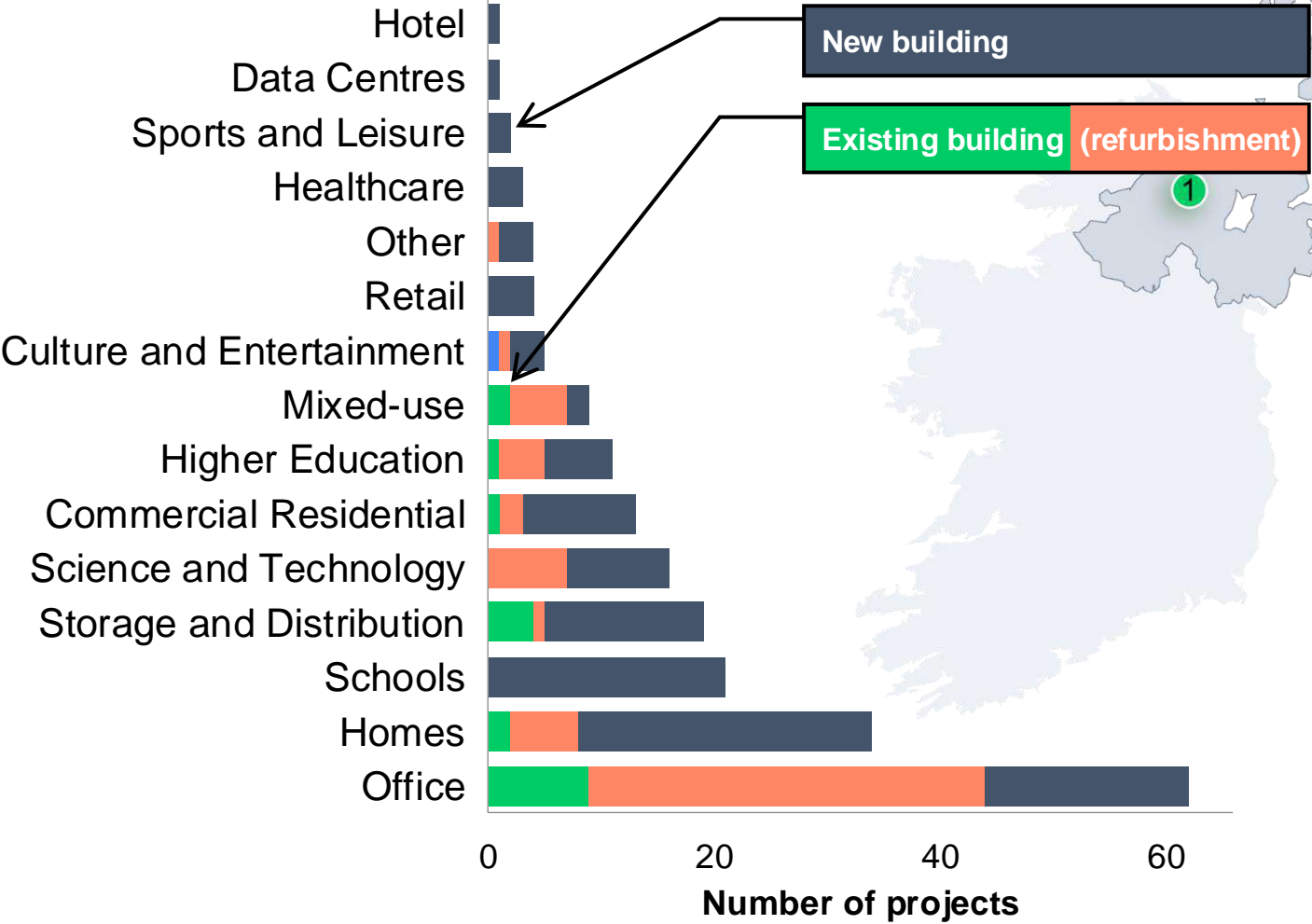
wearetown.co.uk/projects/westwickrow/

What next?

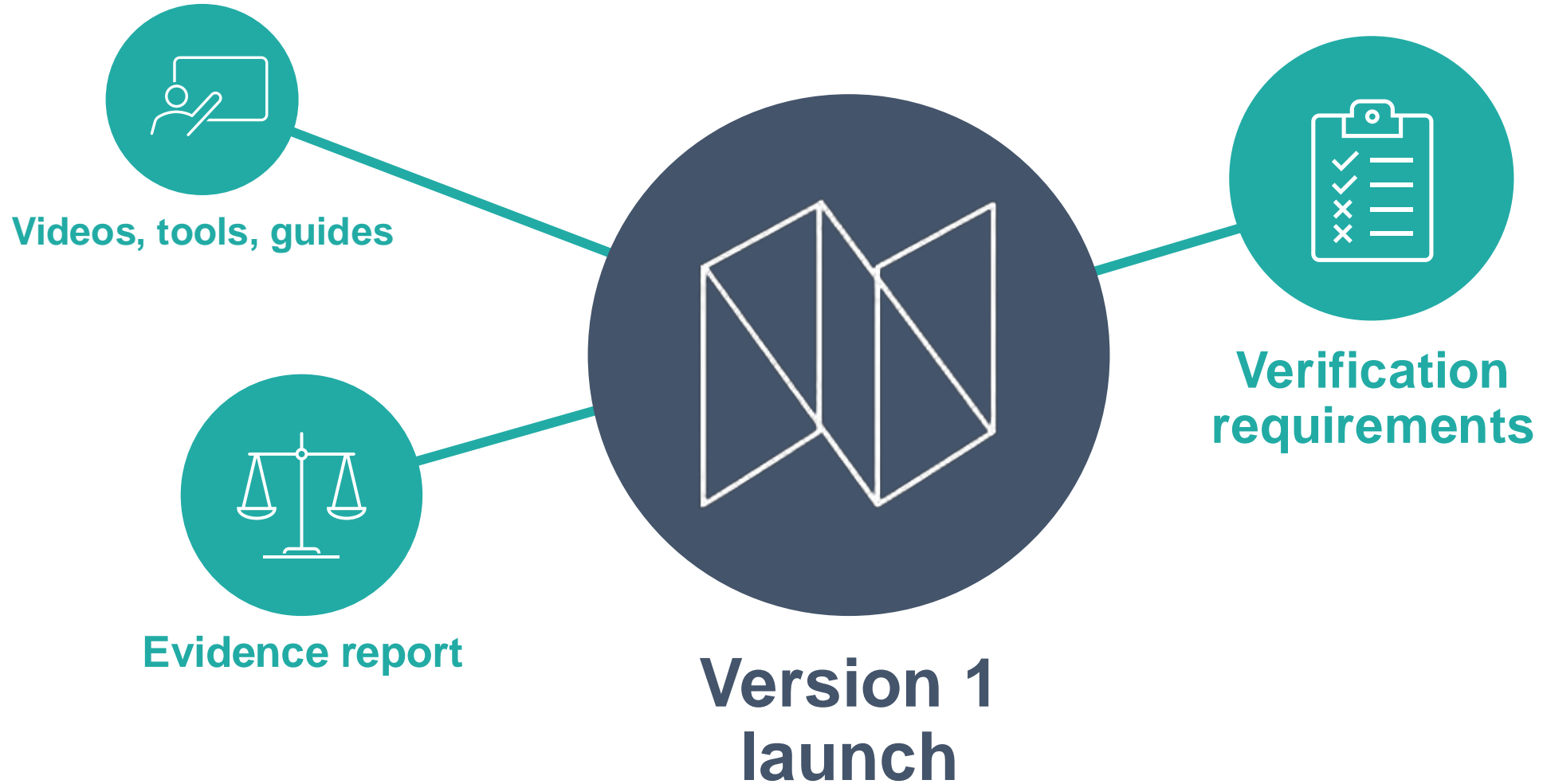


UK Net Zero Carbon
Buildings Standard

Pilot Testing 2025



Coming soon





Could we do this differently?

Thank you

 www.nzcbuildings.co.uk

 will.a@usefulsimple.co.uk

 www.linkedin.com/in/willarnoldengineer



Panel Session: Customer Pull



**Sebastian
Maher**

Development & Design Manager
Reef + Partners



**James
Byrne**

Partner
Sustainable Ventures



**Debbie
Ward**

Director Reuse & Circular
Economy
ASBP



**Emily
Walport**

Associate
ARUP



**Rob
Hankey**

Technical Director
Barefoot Architects



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The Tribeca Block

A Case Study for Low Environmental Impact Material Innovation





Reef + Partners

We build vibrant places where science, healthcare, and innovation thrive.

Tribeca, London



The Macro Strategic Shift

From Mitigation to Leadership in
Sustainable Development

The Flight to Quality

Radical Circularity

Ethical Value Creation

reef+partners



Protecting Asset Value

The Commercial Imperative for ESG-Driven Development

The Green Premium

Lender Demand

Risk Mitigation

reef+partners



The Opportunity

How a Shared Vision with the Architects Ignited the Project

The Architect's Challenge

Taking a Calculated Risk

A Strong Relationship

reef+partners



Our Innovation

The Tribeca Block

84% Reduction in
Embodied Carbon

when compared to traditional fired
clay masonry.

3,650m² of
Earth Block Walls

Used across the development to line
basement walls in lieu of non-circular
materials.

100% Recyclable



So, what do clients need to accelerate more
innovations like the Tribeca Block?

The Return on Innovation

Moving from "Saving the Planet" to
"Enhancing the Value Proposition"

Beyond Compliance

A Strong Way to Win New Work

The Reputation Multiplier

reef+partners



Compliance & Trust

A lot of Paperwork

1. Close The Insurance Gap

2. Overcome The Certification Hurdle

3. Address Fire & Safety Challenges



Client's Brief

What is Required for Widespread Adoption?

1. Certainty is Currency

Clients need the testing data and certification that allow lenders and insurers to say "Yes" without a risk premium.

2. Sell the "Total Value"

Don't just sell "Carbon"; sell the air quality, the thermal comfort, and the future-proofed liquidity of the asset.

3. Collaboration

Widespread adoption requires an architect with the passion to push boundaries and a developer willing to provide the site to prove the concept.



Thank you





Sustainable Workspaces Design Guide

Overview of Sustainable Ventures.

A unique, integrated Ecosystem

We've always said we're on the side of the entrepreneur - they're at the heart of everything we do.

Since 2011, we've created Europe's largest cluster of climate tech and cleantech startups through venture support, workspaces, investment and commercialisation services.

6 of our last 10 investments have been with female founders.

40+

Acceleration
Programmes

95%

Diversity
Index

>1,000

Startups in
Ecosystem

59

Investments

£16M

Invested

>£1.2bn

Funds raised by
members

Welcome to
the home of
climate tech.

Our Vision

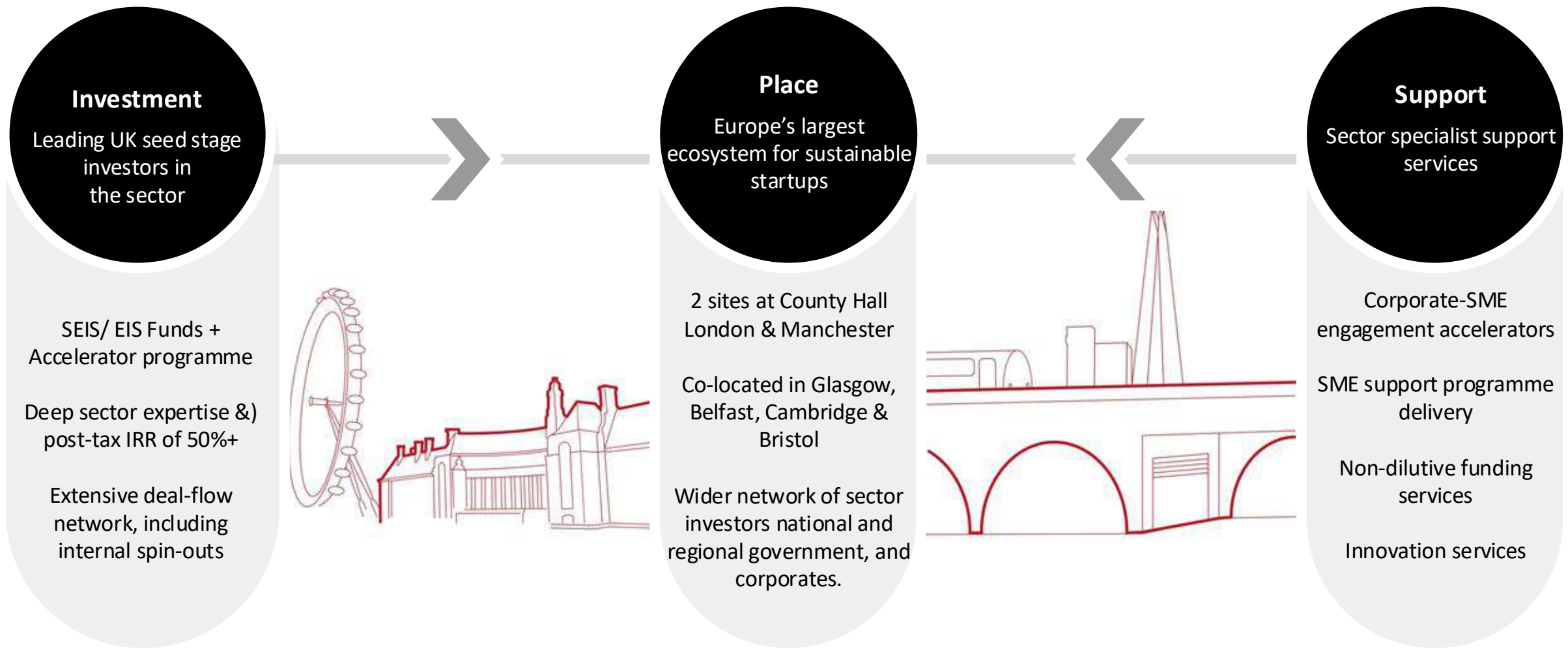
A world in which climate change and resource scarcity are addressed by commercial solutions.

Our Mission

Building the world's most impactful climate tech ecosystem by 2030.

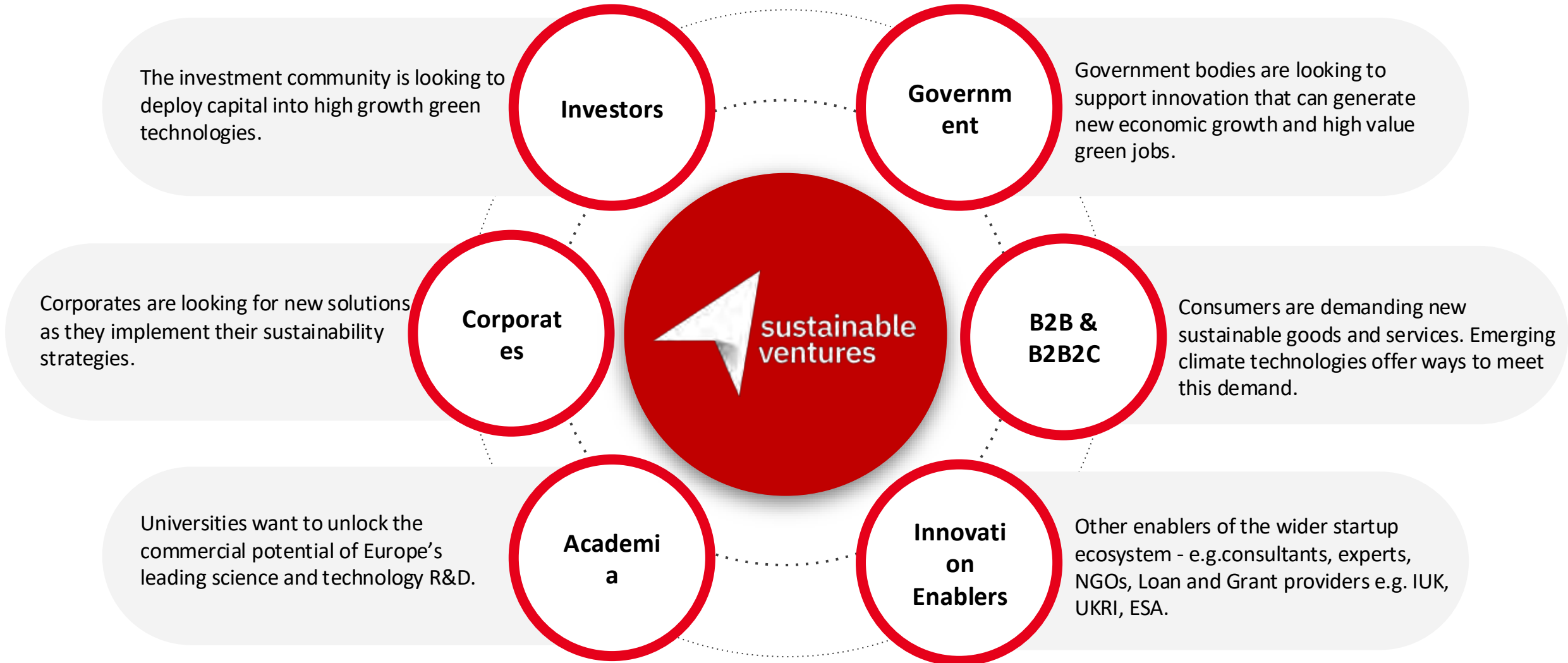
The growth partner for Climate Technology.

We have over a decade of experience engaging, supporting and accelerating climate tech startups.



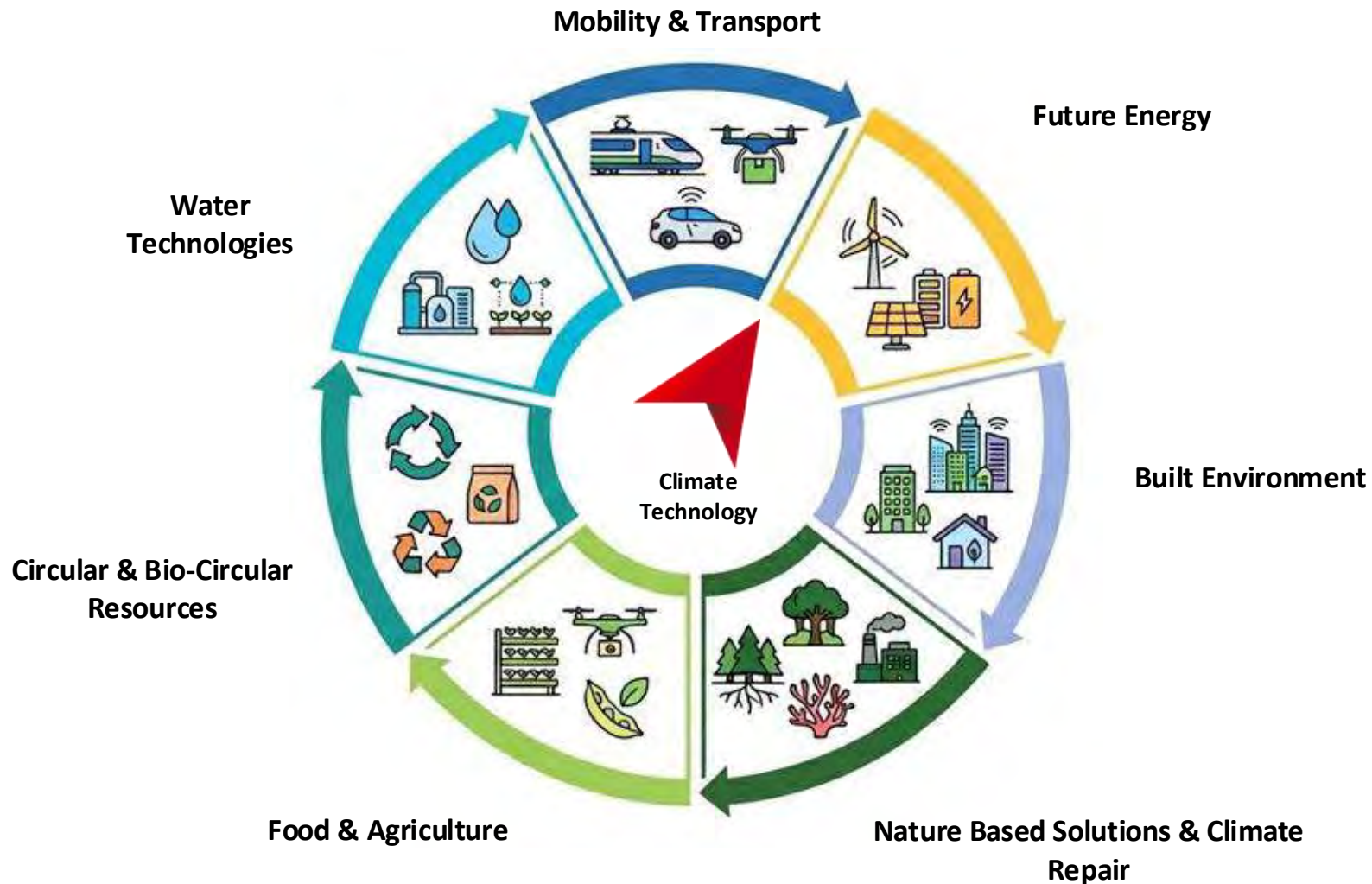
Orchestrating the Innovation Ecosystem.

Sustainable Ventures brings together and connects key stakeholders in the sustainability transition.



We have supported >1000 Climate Tech startup/scale up businesses to date.

A few examples:



Expanding our community and workspace solutions across the UK to accelerate startup growth.



LONDON



MANCHESTER



GLASGOW*



BRISTOL

BELFAST

UK flagship climate tech hub in a showcase retrofit, iconic County Hall building. Currently occupies 5th floor with 3rd floor to open in Q4 2025 (tbc)

Brand new climate tech hub opened in retrofitted, iconic Renold building. Part of major regeneration creating the innovation district in central Manchester.

01 / RETROFIT STRATEGY

SV Workspace Objectives

Community:

The most important principle for SV is bringing people together to address climate change and resource scarcity. All decisions are focussed on creating the most frequent and meaningful interactions to drive the curation of an authentic community.

Design:

Visible demonstration of pragmatic commercial sustainability, which provides an aesthetic/functional environment that embodies the authentic purpose of our ecosystem.

Platform:

Each element of the workspace must tell a narrative that supports ecosystem members to demonstrate to their guests and expose their innovation to other guests.

Usage:

Layout, utility, operations, membership is structured specifically for high growth, young, innovative organisations, that work in highly flexible organisational models.

Resources:

To accelerate solutions to climate change, the workspace design and operations act to draw in expertise and capital from external parties and members.



01 / RETROFIT STRATEGY



REUSE/ADAPTATION

Existing buildings are the largest depositories of embodied energy - demolition and re-construction should only ever be considered as a last resort. Instead, emphasis needs to be placed on the careful and creative adaptation of existing buildings to ensure longevity.

How can the existing features be utilised in a way that means using as little additional resource as possible?



DEMOUNTABLE

A key aspect of sustainability is flexibility. The design strategy should enable disassembly so that future adaptations and different space layouts are possible.

Walls, joinery and furniture should be designed to be disassembled and reconstructed elsewhere. This will ensure longer lifespan of all materials and flexibility for future uses.



MEANWHILE USE

Utilising space which would otherwise sit empty enables businesses to adapt and occupy without needing to create new space or carry out a fit-out which will be demolished within a short time-frame.

A low-impact philosophy will ensure less waste and improve flexibility of each space.



FOCUSED COSTS

Expenditure should be considered and applied to the right areas which bring most impact.

For example, background repairs can be reduced to essential works to allow expenditure to focus on moments of peak interaction.

02 / LOOK and FEEL



03 / SPACE TYPES

THE HUB

The welcome space should showcase tenant products whilst demonstrating Sustainable Workspaces' values and ethos.

The most important function of the space is to concentrate members into a single key space which reflects the values of SV - functional design which ensures real community and engaging atmosphere from the moment guests enter the space. Curated F&B should be physically central and critical to this space. A range of seating should be provided which encourages different types of collaborative working to drive people to work together in this area. The Hub should be situated to ensure maximum interaction and efficiency of space. Spaces should be flexible in layout, with allowance for fixed modular booth seating.

Technical requirements:

Seating (fixed and loose), tables,
planting, turnstiles for security, lighting,
storage, bins, acoustic treatments, white
goods
(coffee machine, drinks fridge, sinks for
food prep and hand washing, ice machine)
with associated power and services



04 / MATERIALS

The design strategy should prioritise these design principles in the following order:

1. CELEBRATE THE EXISTING



2. RECLAIMED



3. NATURAL MATERIALS



4. RECYCLED



04 / MATERIALS



Existing facade line 'feature'

1. CELEBRATE THE EXISTING

Existing treatments and finishes should be left in place where possible with little additional finish and celebrated. This can be done with directional lighting and framing with surrounding finishes which compliment the existing condition.



Exposed masonry and limited plaster infill



Existing paint finishes

04 / MATERIALS



Existing Condition

The Renold Building has several features that should be preserved. Repairs should be limited only where required e.g. holes from demolition.



High-level glazing

Concrete form-work

Original wood flooring

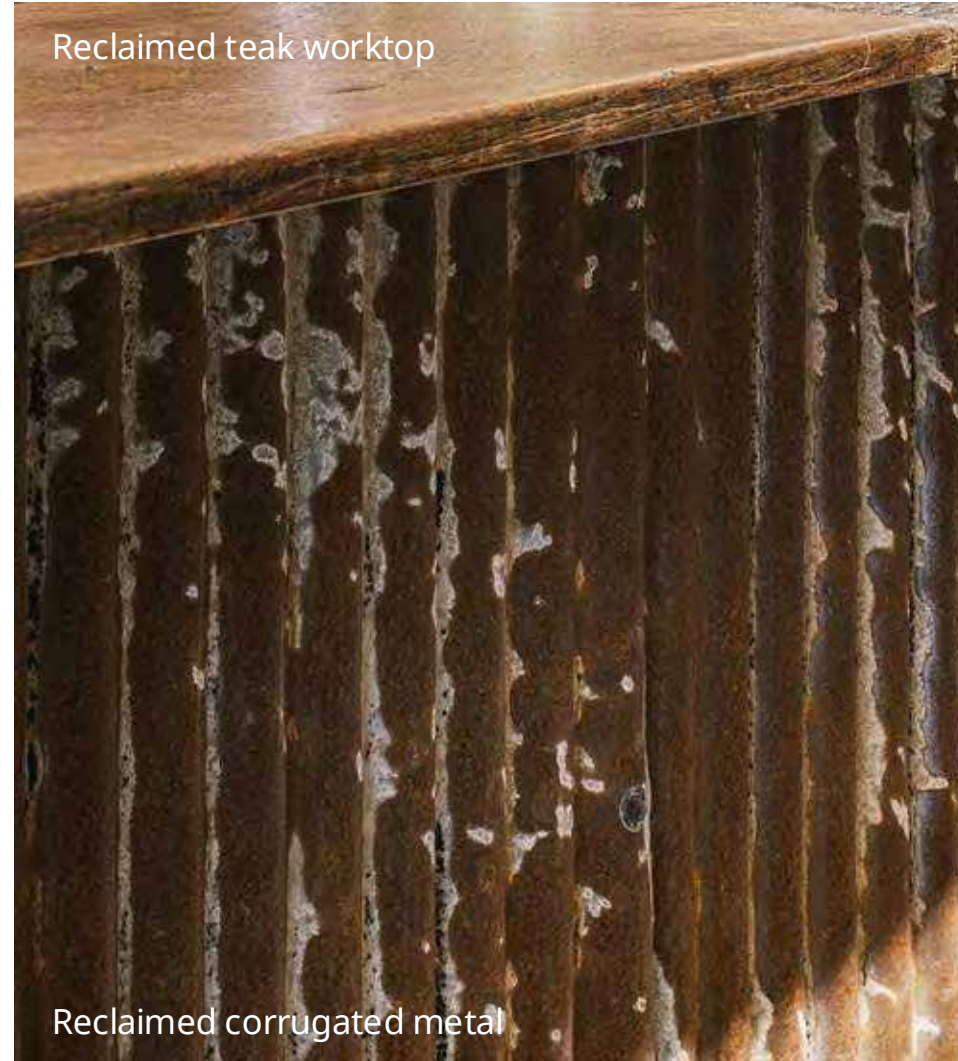
04 / MATERIALS



Reclaimed gym
flooring



Reclaimed teak
worktop



Reclaimed teak worktop

Reclaimed corrugated metal

2. RECLAIMED

Where new materials are required, the first port of call should be reclaimed materials. What can be salvaged from the existing site? Are there any local salvage yards which collate construction waste? What materials can be re-purposed for a new use? An example of this is the kitchen island at County Hall - which has a worktop from an old school science lab.

04 / MATERIALS



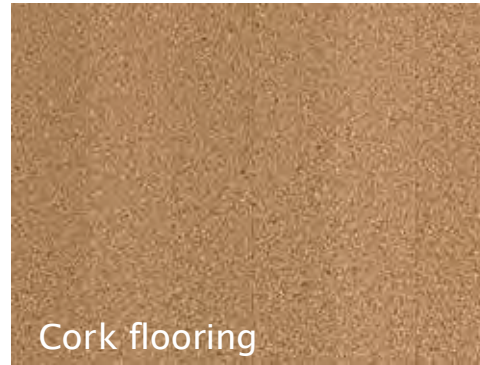
3. NATURAL MATERIALS

Recyclable and/or natural materials mean less waste at the end of a material's lifespan. Timber is a carbon negative material that can be re-purposed at the end of its life.

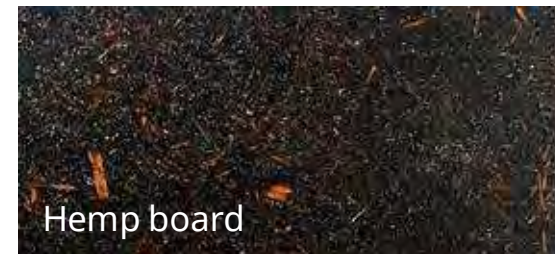
Mycelium has high thermal properties and could replace synthetic materials commonly used for acoustics. Waste such as fruit peel, coffee chaff and cocoa husks can be made into solid boards and are naturally carbon negative.



04 / MATERIALS



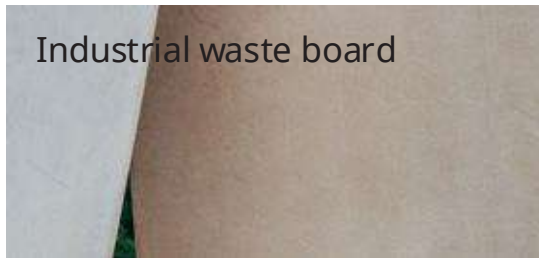
Natural materials such as cork are carbon sequestering. Sheep's wool insulation is a more natural alternative to synthetic materials which may be used within walls as insulation. Ecoboard is agricultural waste made into a carbon negative board which has similar structural properties to MDF or OSB.



04 / MATERIALS



Construction waste terrazzo

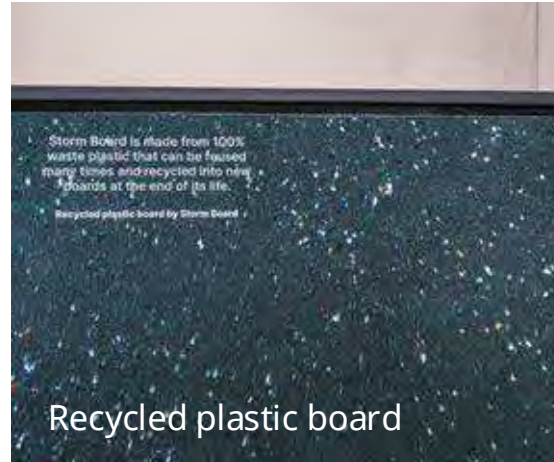


Industrial waste board

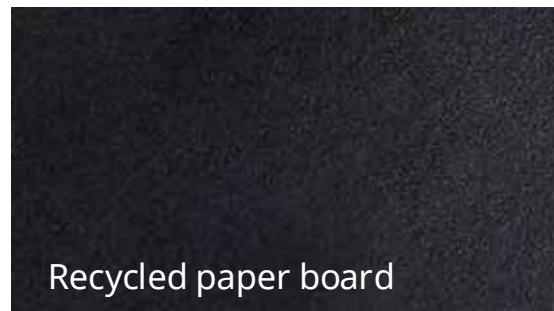
4. RECYCLED

Materials should be chosen for their sustainability credentials and suitability for the application. Materials which have been taken from waste instead of raw materials sometimes contain less embodied carbon.

Examples include Granby Rock (a terrazzo made from construction waste) and **i-Did's** recycled textile felt.



Recycled plastic board



Recycled paper board

Board

Waste plastic and paper offer an alternative substitute for MDF which is more harmful for the environment.



Recycled fabric



Recycled fabric

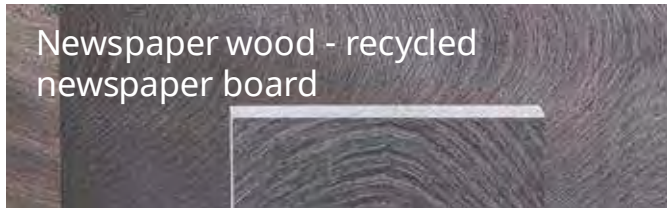


Recycled textile felt

Fabrics

Waste can be used to create materials such as textiles and plastic from the ocean which have high performance, aligning commercial applications with sustainability interests.

04 / MATERIALS



Material suppliers are using all kinds of waste streams to create materials, such as single use coffee cups from the streets of London (above), discarded shellfish turned into ceramic tiles and recycled glass bottles turned into terrazzo.

Ideally these waste streams should be sourced as locally as possible to minimise carbon consumption from transportation.



04 / DESIGN RULES



Epoxy resin with high VOC content



No/Low VOCs

Materials with a high Volatile Organic Compounds such as epoxy resins or certain paints contain highly toxic chemicals and can impact indoor air quality as well as emit toxic fumes during installation. The use of PVC within services and pipework should also be avoided.



No new plastics

Any sort of additional finish which contains plastics and is therefore difficult to recycle or reuse safely should be avoided at all costs. Laminate finishes are not necessary and waste additional resource. Only use recycled plastics where appropriate eg. for worktops which can be easily recycled.



Gypsum plasterboard is highly wasteful



MDF has carbon intensive process and is not easily recyclable

Low carbon processes

MDF and gypsum board should not be used because of their high carbon consumption through production. Specifically gypsum board is unable to be recycled or used again once demolished. Wood-fibre board, eco-board and hemp board are all viable alternatives.

05 / FURNITURE



RECLAIMED/REFURBISHED

Sourcing second hand furniture has significant benefits in terms of cost and embodied carbon. Sites such as Vinterior offer pre-loved furniture which is in good condition, but recovering armchairs and sofas can give a new lease of life to items in poor condition.



05 / FURNITURE

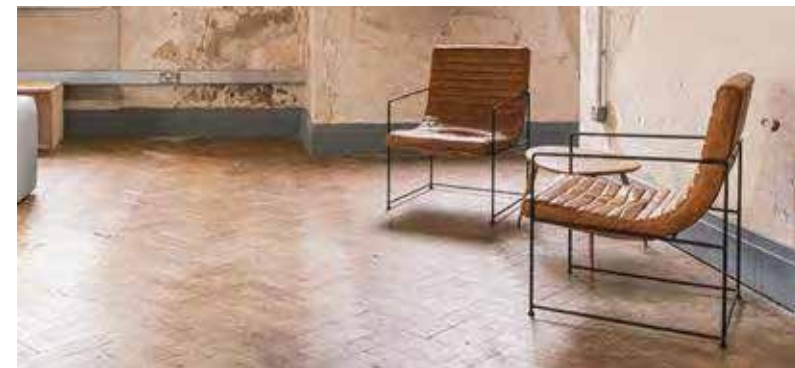


RESPONSIBLE SOURCES/SIMPLE DESIGN

If reclaimed is not suitable or possible, suppliers can offer sustainable furniture using sustainably sourced materials such as FSC certified wood or recycled textile coverings.

Materials should be robust and come with sustainable certification such as *EU EcoLabel* or *Greenguard*.

Suppliers such as Nkuku make simple furniture from ethical, sustainable sources which can be taken apart and re-purposed easily.



06 / JOINERY



DEMOUNTABLE/MOVABLE

Scaffold desks are quickly assembled/disassembled and adapted to differing sizes based on desk requirements.

Mechanical fixings enable joinery and walls to be de-constructed and used again or reverted to base materials at end of use.

Castors offer additional layout flexibility and can be locked in place.



06 / JOINERY



MODULAR

Modular units of joinery can provide seating or enable future flexibility and relocation.

Fixings should be simple to undo and take apart.



06 / JOINERY - WALLS

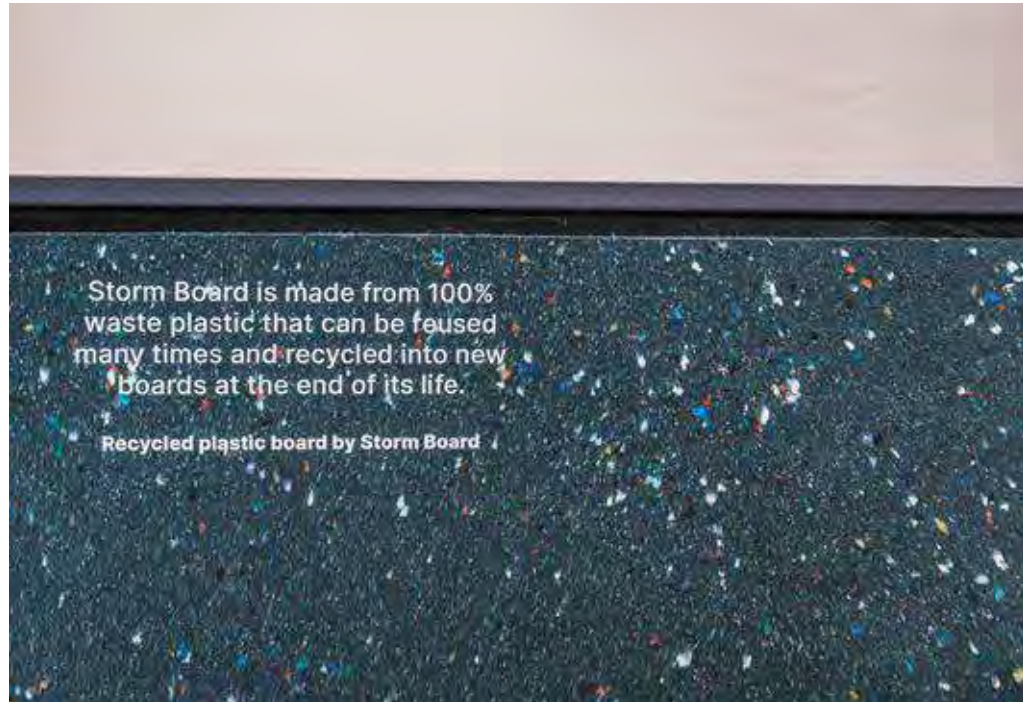


MODULAR PARTITION WALLS

Modular partitions and space dividers enable further flexibility within the space. U-Build have created a modular plywood wall system which can be de-constructed as boxes or disassembled for the raw material to be used for another purpose. FAAY's agricultural waste modular system comes in set sizes up to a height of 3.5m.

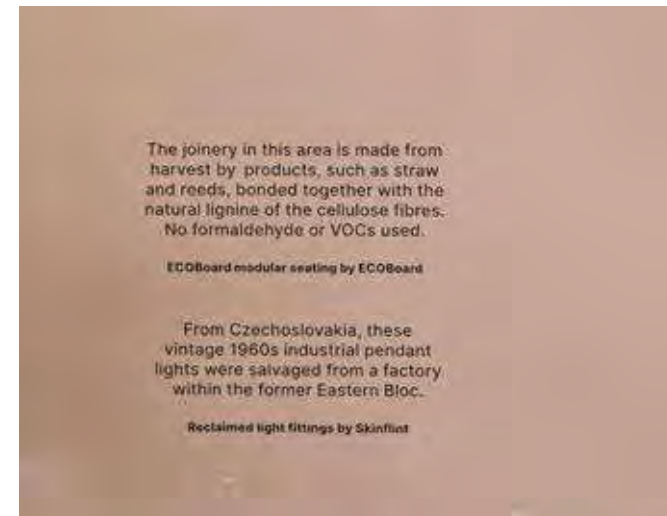
Walls should perform acoustically between offices to maintain privacy.

07 / BRANDING - NARRATIVE



STORYTELLING

Info-graphics throughout the space illuminate material choices to users - detailing waste stream sources, carbon performance data and material possibilities. This information contextualises the scheme and celebrates the client's commitment to sustainability, helping to inform everyday users about each material's history.



07 / BRANDING - MEMBERS/ECOSYSTEM



MEMBERS

SV's ecosystem is an important part of the space and members benefit from a network of climate tech businesses and start-ups to socialise with.



**ESBEM Seminar: Accelerating adoption of UK low
environmental impact construction materials**



Circular Buildings and Products

Debbie Ward
Director - Circular Economy & Reuse, ASBP

Who we are



**Not-for-profit, mission
led, sustainability
organisation**

**“To accelerate the transformation
to a healthy, low carbon built
environment by championing the
use of demonstrably sustainable
building products”**

What we do

**Share learning through events, lead on research
projects, create best practice guidance, foster
collaboration, influence policy and more.**



Participate in our research projects



Steel reuse, timber & biodiversity, natural materials
& retrofit

Join one of our specialist working groups



Reducing plastics, healthy paints & finishes, natural
fibre insulation

Join our network of over 160
members and partners

Download guidance and toolkits
on our website

DISRUPT
Delivering Innovative Steel ReUse Project

ZAP ZERO
AVOIDABLE
PACKAGING
waste
in construction



Register for an event



Get involved with the ASBP!

Enter our awards

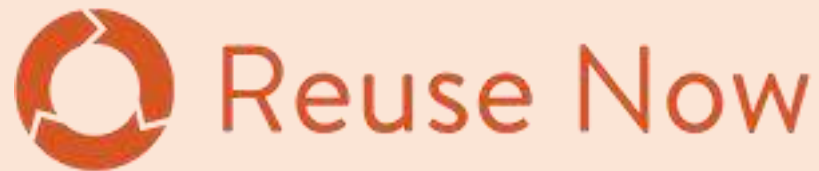


About Reuse Now

ASBP's Reuse Now campaign aims to encourage greater reuse of building materials within the construction industry and accelerate the transition to a more resource efficient, low carbon, circular economy as well encourage growth of low/zero carbon industries and supply chain models.

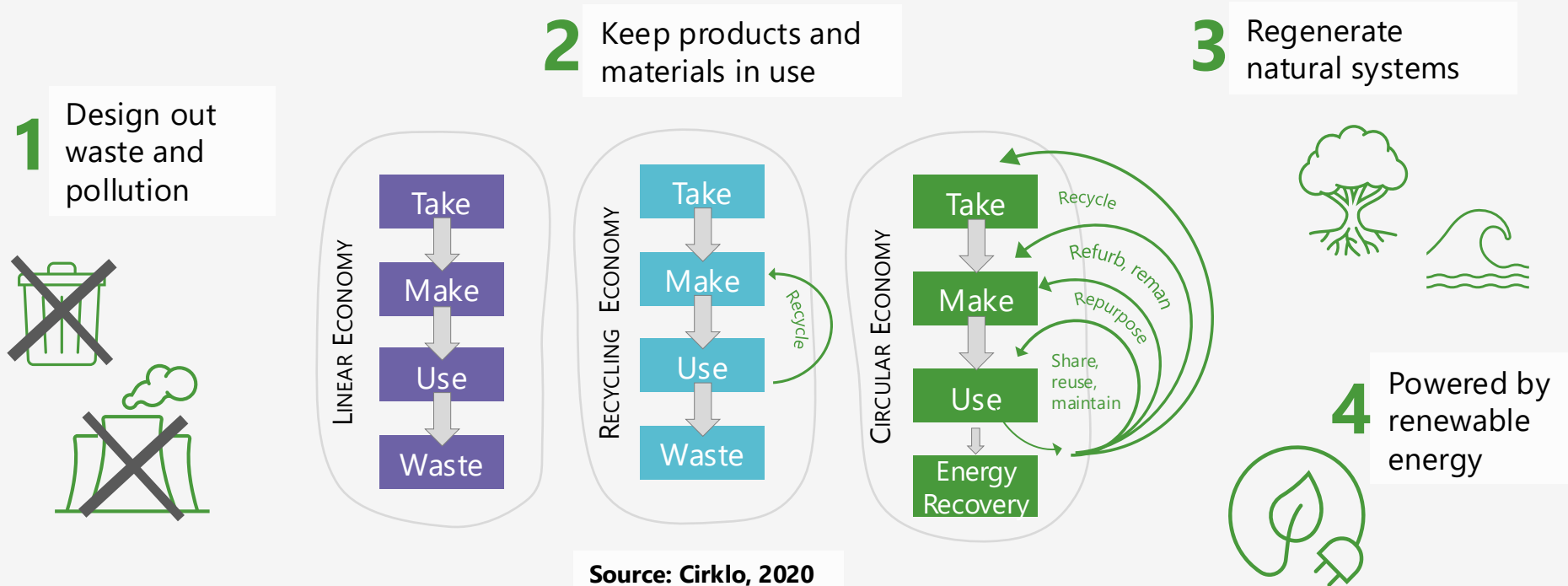
We are doing this through:

- Deep dives
- Events and social media
- Stakeholder mapping
- Online resources including blogs, case studies, and documents



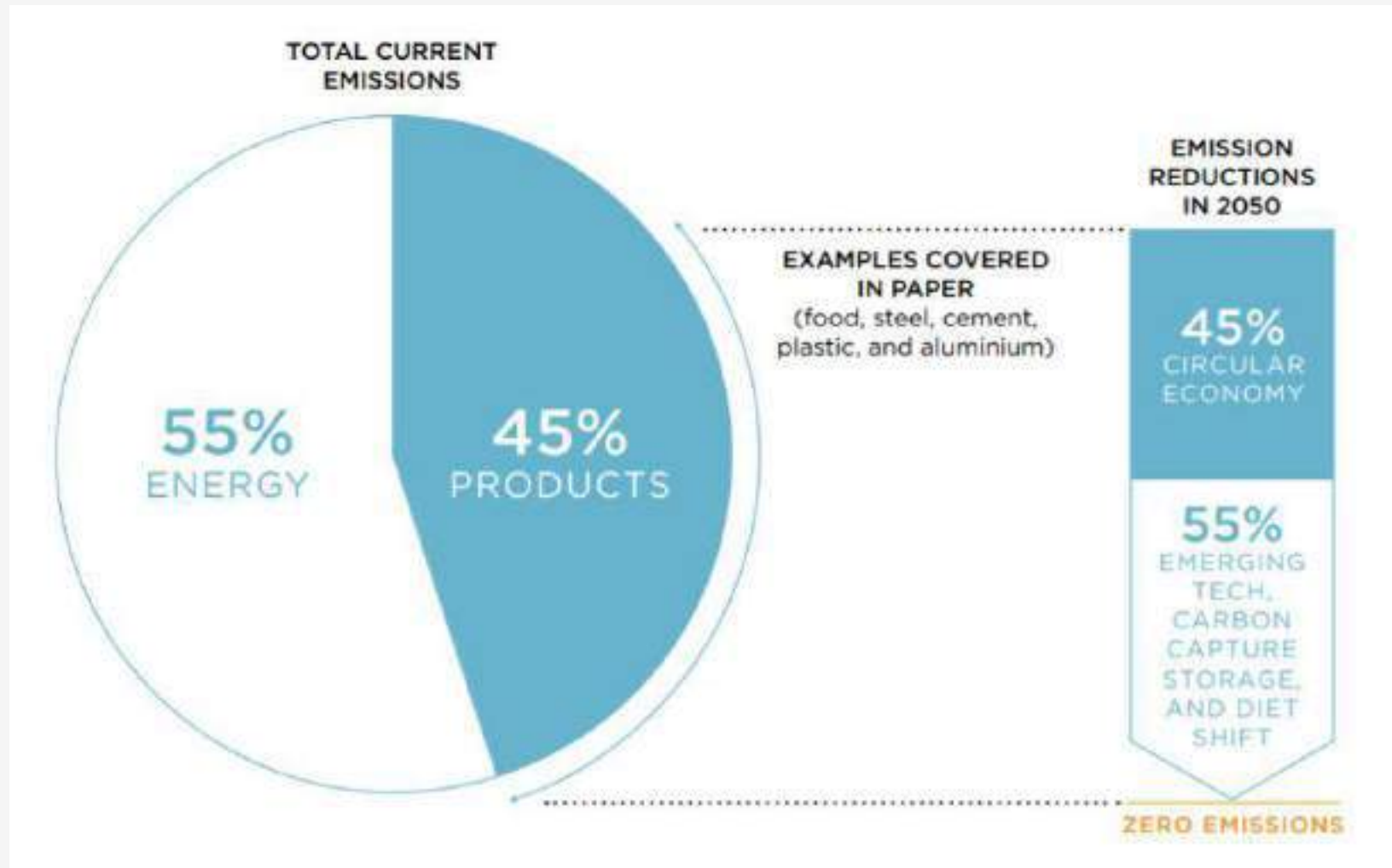
Sponsored by: Cleveland Steet & Tubes, Optima & Reusefully

What is the circular economy?



A circular economy is restorative and regenerative by design, and aims to keep products, components, and materials looping at their highest utility and value at all times.

Why do we need to be more circular?



Switching to renewable energy plays a vital role in addressing climate change, but this alone will not be enough. **In order to achieve targets on climate, it is critical that we transform how we design, make, and use products and food.**

- Dame Ellen MacArthur -
Founder, Ellen MacArthur
Foundation

Circular economy principles for construction

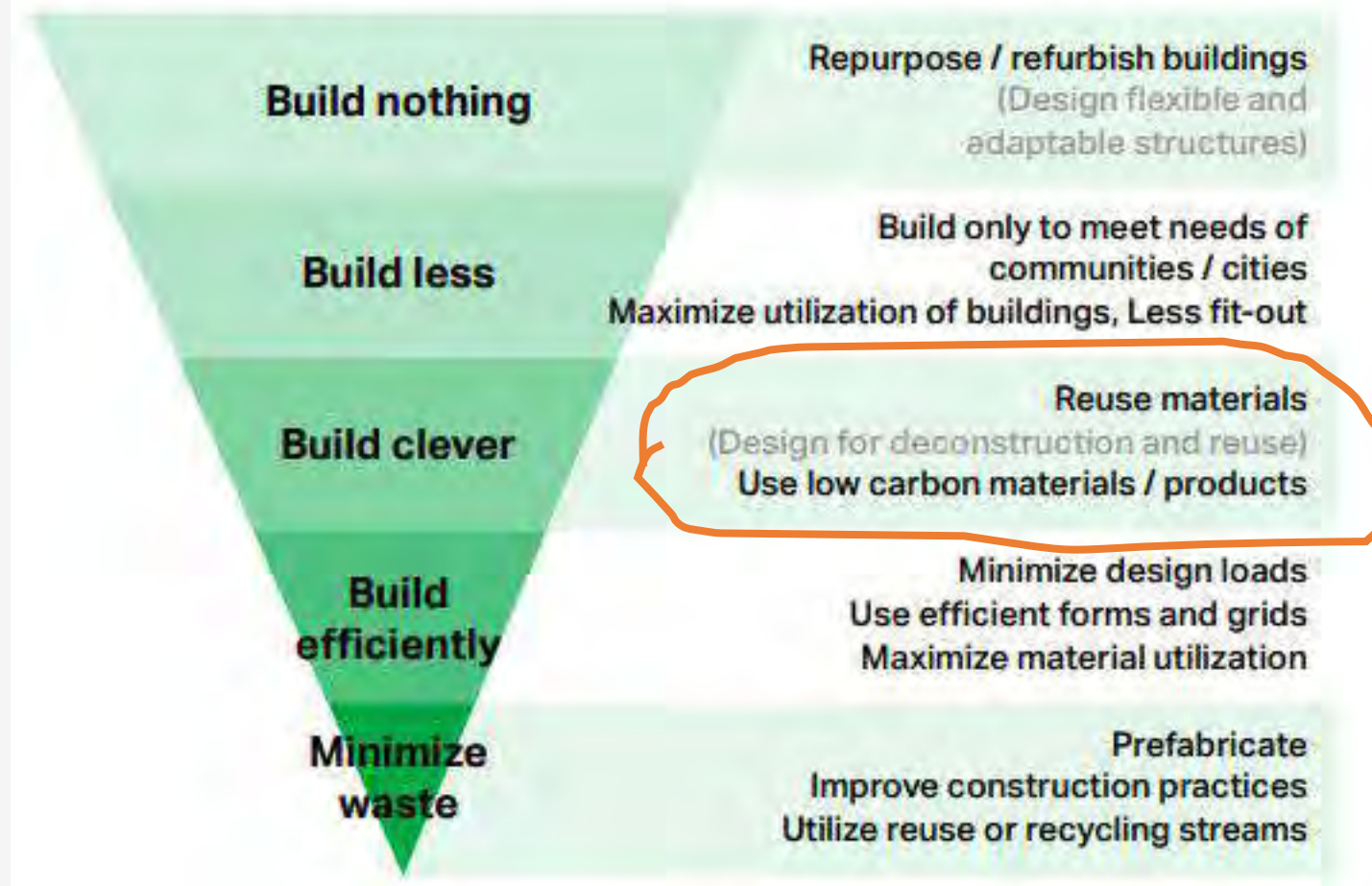


Circular Economy principles for construction:

1. Maximise reuse
2. Design for optimisation
3. Use standardisation
4. Products As A Service
5. Minimise impact and waste

Carbon Reduction & Circular Economy

Figure 9: Embodied carbon reduction strategy



Circular - by design

Unusual Rigging, Northampton



Triodos Bank, The Netherlands



The Hithe, London



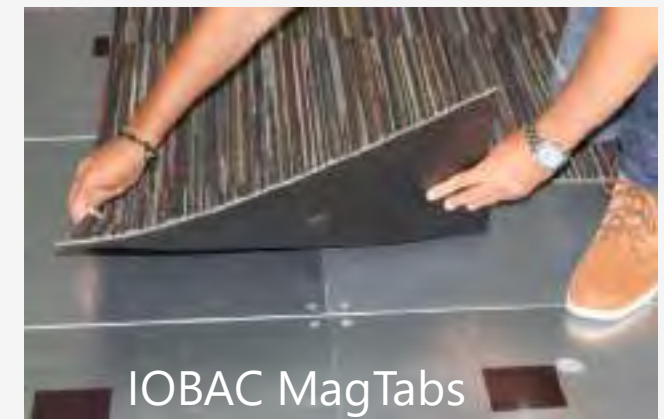
Circular - by design

Design for longevity, adaptability, flexibility, repair & maintenance, and disassembly – and subsequent reuse, repurpose, remanufacturing and recycling (keeping products at their highest value for as long as possible).

Design with intention – human centred design

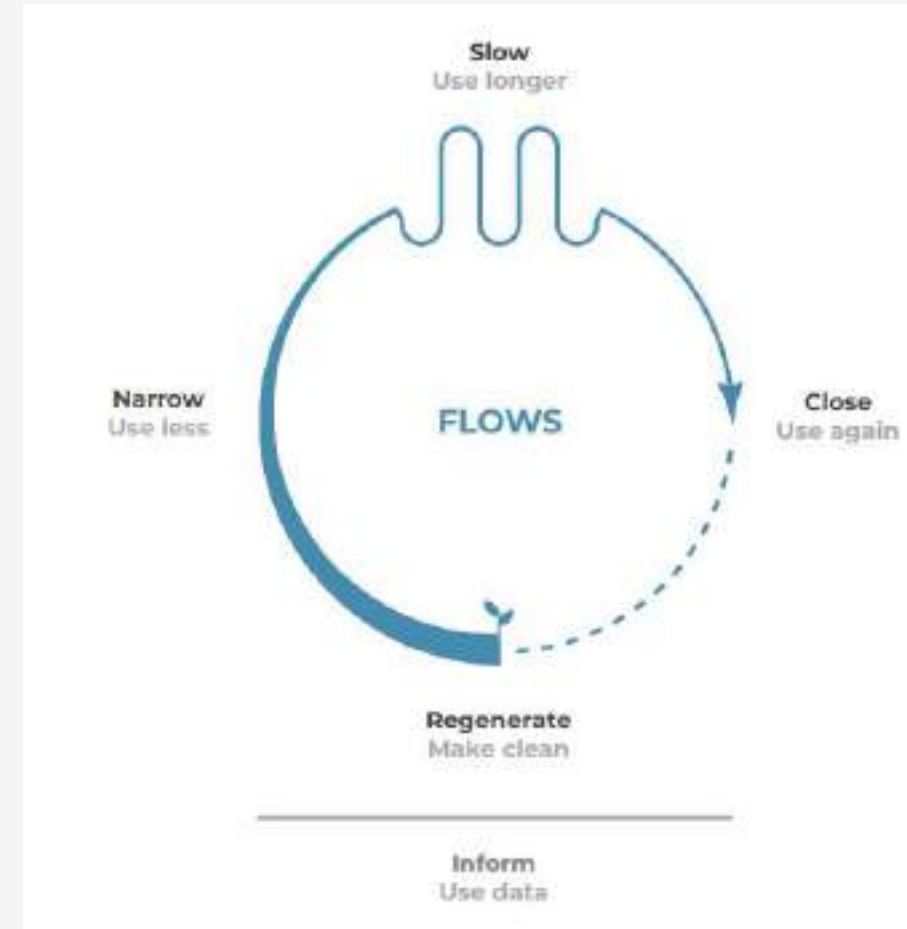
Design considerations

- Screw not glue – enabling disassembly
- Non-toxic materials – to support remanufacture and recycling
- Robust materials – maximum life extension
- Mono materials – to facilitate closed loop recycling at very end of life
- Low carbon materials
- Bio based/ renewable materials – regenerative opportunities
- Standardised components (less waste and easier to reuse)
- Modularisation – enabling elements to be easily upgraded and/or customised whilst maintaining majority of same components
- Servitisation – access not ownership
- Doing more with less – reducing volume of materials used



What circular strategies and practices could be applied to product and business model innovation?

- Use less
- Use longer
- Use again
- Keep/make clean



Circularity Deck

<https://www.circularitydeck.com/about>

Created by Jan Konietzko during his PhD Research at TU Delft

Circular - by design



Slow – Use longer

- Design for physical durability
- Design for ease of maintenance & repair
- Design for standardisation and compatibility
- Provide this product as a service

Close – Use again

- Design with recycled inputs
- Design components, where appropriate with one material
- Reuse and sell components and materials from discarded products
- Enable and incentivise product returns

Regenerate – Make clean

- Design with renewable materials
- Design with non-toxic materials
- Produce and process with renewable energy

Narrow – Use less

- Design products with low impact inputs
- Design light weight products
- Enable and incentivise consumers to use less
- Maximise capacity use of products

Inform – Use data

- Virtualise
- Use product-in-use data to design more circular products and services
- Track the condition, location and/or availability of the product
- Market, buy/sell circular products, components and materials through online platforms

Creating circularity



Steel



Timber



Concrete

Creating circularity



Bricks & Pavers



Raised access flooring



Partitions



Lighting



Debbie Ward
Director - Circular Economy & Reuse, ASBP
Director – The Rebuild Site
debbie.ward@asbp.org.uk
[linkedin.com/in/debbie-ward-b61580](https://www.linkedin.com/in/debbie-ward-b61580)

What do clients need and why?



Emily Walport

Associate | Materials consulting | Arup

Our purpose

To shape a better world

Through our work we create safe, resilient, and regenerative places that enable current and future generations to thrive.



Camp Adventure Tower, Denmark

We guide, plan and design the future of the built environment. We are a global consultancy with advisory and technical expertise across more than 150 disciplines.

1946

Founded by Sir Ove Arup

£2.2bn

Turnover (2024/25)

17,000+

People

140

Disciplines

100

Offices

34

Countries



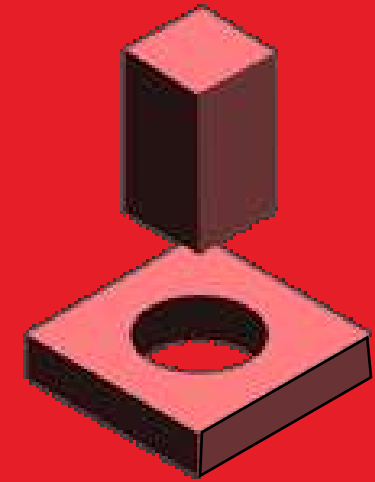
A large industrial manufacturing facility. In the foreground, a large, curved metal component is being worked on. In the background, a robotic arm is welding a metal part, creating a bright spark. The scene is dimly lit, with light coming from windows in the background.

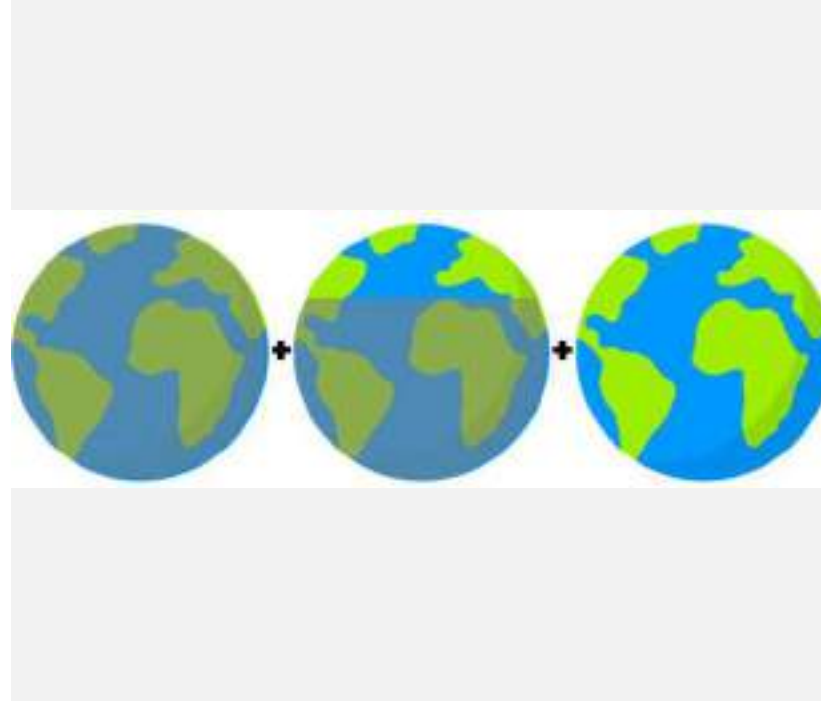
Materials play a fundamental role in the built environment.

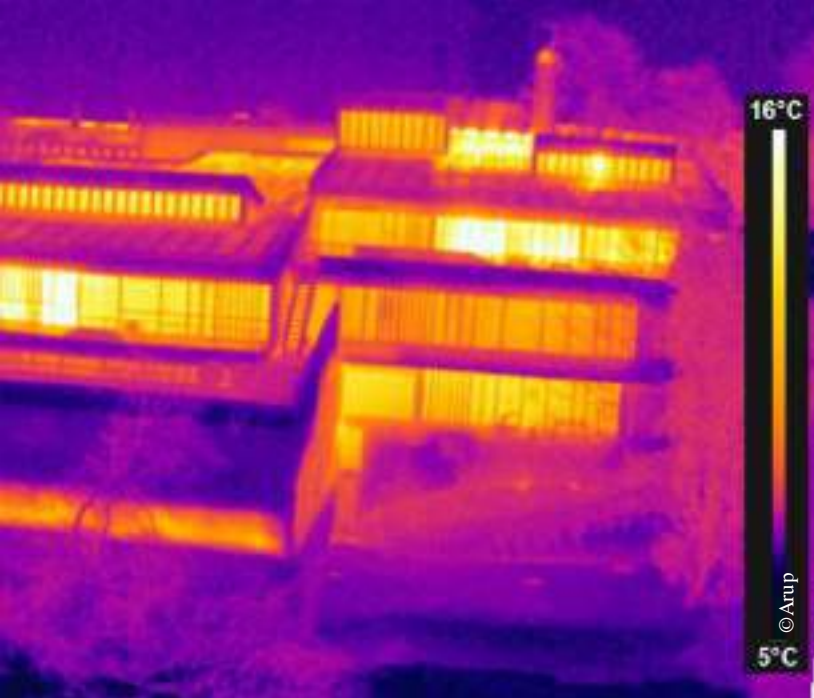
Materials are not just what the built environment is made from, their performance and aesthetics have an immediate impact on the environment and people.

Innovation will often have the most impact when it is a targeted response to a specific need or problem

“I have a solution, but I’m not quite sure what the problem is”...







What do clients need?

Solution to an identified problem / opportunity, but can I use this on my project?

Technical performance (proven and demonstrable)

Durability (proven and demonstrable)

Cost (& value)

Standardisation (long-term essential for scale)

Constructability

...







Joining forces to accelerate innovation

We combine Arup's technical expertise, industry reach and influence with TEP's searching, convening and storytelling power to support breakthrough solutions that aim to accelerate the transition of construction materials towards an equitable net zero and nature positive future. Together, we will surface the solutions that have most potential for impact from around the globe to deliver against the five Earthshots.

ARUP ×



ARUP



transforming the way people live through
co-design, collaboration and community

Bristol | Totnes | tel. 0117 907 0971 | www.barefootarchitects.co.uk

barefoot

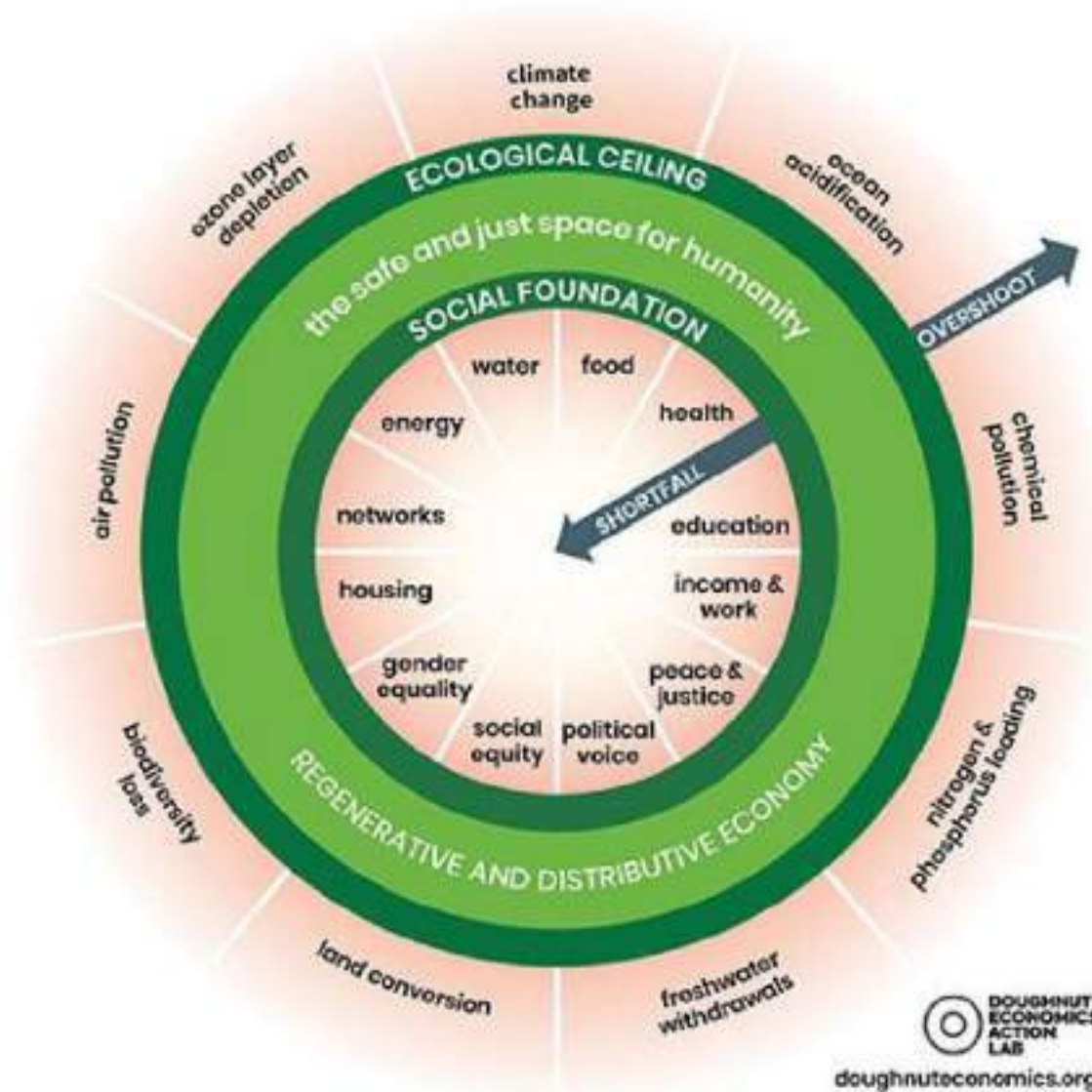
barefoot means minimising
our environmental footprint,
fostering community, and being
connected to place




12 strong with offices in Bristol and Totnes



regenerative - more than sustainable



An aerial photograph of a residential development. The houses are built on a hillside and feature green roofs. One house has solar panels installed on its roof. The surrounding area is lush with greenery and trees. The text "ecological imperative" is overlaid in the top left corner.

ecological imperative

naturally low-carbon

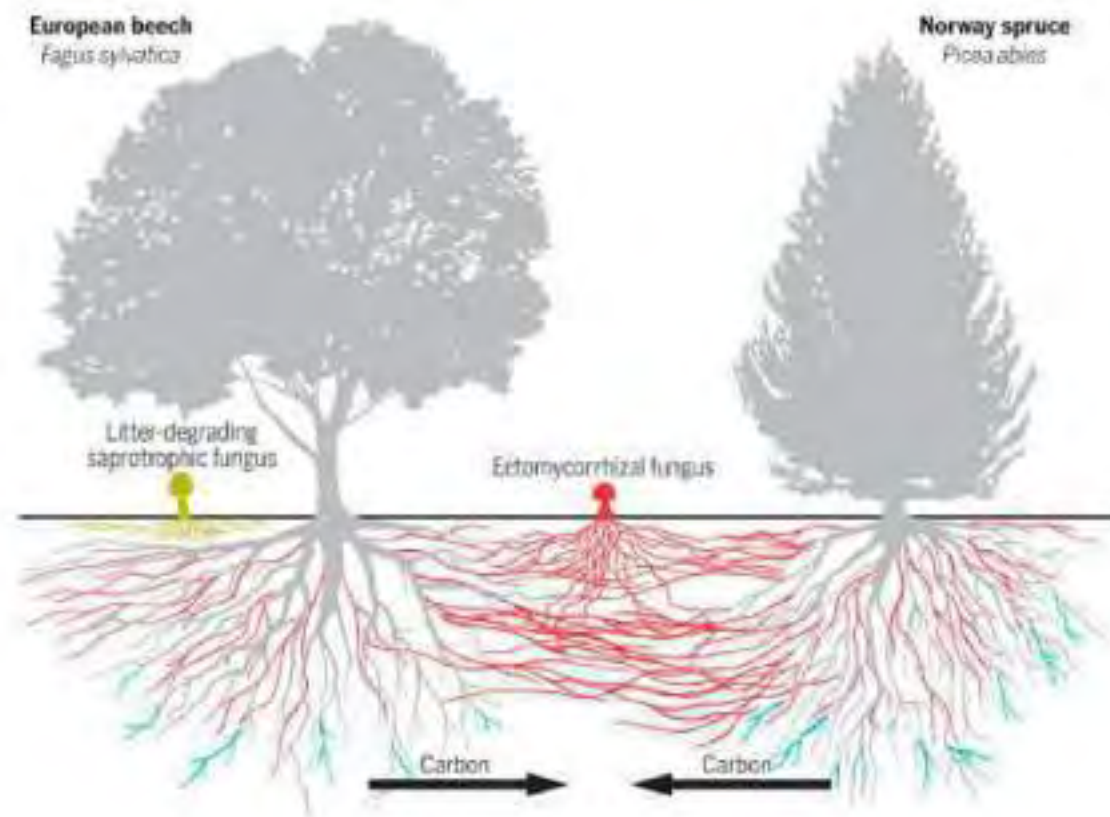
The next pages are here to help explain each of the different RIBA work stages, or 'steps' that we can undertake for your project and gives examples* of the type of drawings, reports, and information we provide. There are 6 steps in total, and we can fulfil just one, or all of them to suit YOU.



*The images shown on the following pages are an indication of a process for a new build house. Some variation by project scale, type and service package should be expected.

better briefs

Could the project be used as a catalyst to improve the woodland site and ecology, using a regenerative strategy based on landscape character appraisal?



Could the project embody the clients philosophy, redefining our connection with nature and natural cycles - coming from and returning to the earth?



feasibility: background

We began work on the project by commissioning surveys for the sites ecology and trees – so that we could understand more about the habitat quality of the land before considering any siting or design.

Badgers surveys were undertaken and it was found that they were present on site but at the time there were no activate badger setts noted on site.

Dormouse presence absence surveys were not specially undertaken in 2022 but in lieu of this Dormouse nut checks were carried out, as well as informal checks of several nest tubes that were on site. Dormice were likely to not be present on the site, although LERC search indicates that they are likely in the area and mitigation suggestions were recommended such as only carrying out clearance works in suitable habitat outside of the hibernation period.

Ronsan Snail day and night searches were undertaken but no live snails were noted, only shells. It was concluded at the time that it is unlikely there is a population on site.

Bat surveys in the form of transects and static placement were carried out over 2022. A number of species were found to be using the site and certain areas of the site were highlighted as key commuting and foraging routes. Bats will need to be considered in any proposed plans. Further surveys are needed once the site positioning is confirmed.

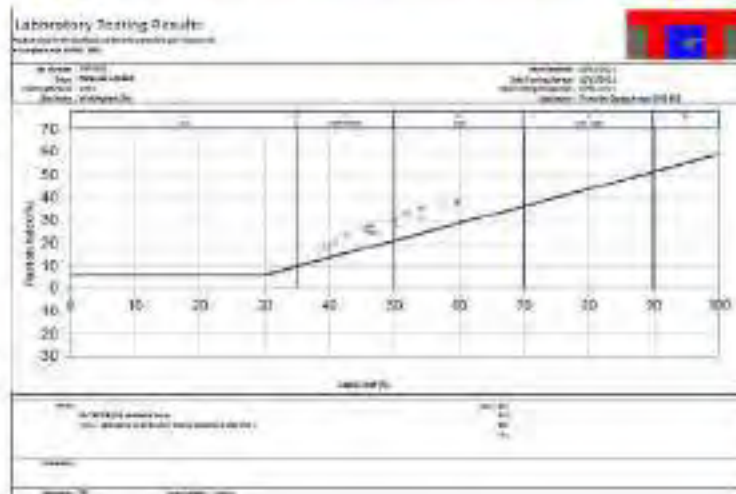


specialist advice
surveys

feasibility: in-depth research



- on/in site
- local
- regional
- testing
- measuring



concept: site optimisation



access
orientation
services
drainage
landscape

concept: energy

form factor
fenestration
shading
context



An architectural rendering of a modern, multi-level house built into a lush, green hillside. The house features extensive use of wood cladding and large glass windows. It is surrounded by numerous tall, leafy trees and dense vegetation. A paved path leads up towards the building. The overall scene is bright and natural, emphasizing the integration of the architecture with its environment.

concept: context is
everything

joined up thinking
storey telling
visualisation

leadership + team work

concept: site materials

what's on site - is it useful
reclaim or reuse
ground conditions
circular strategies

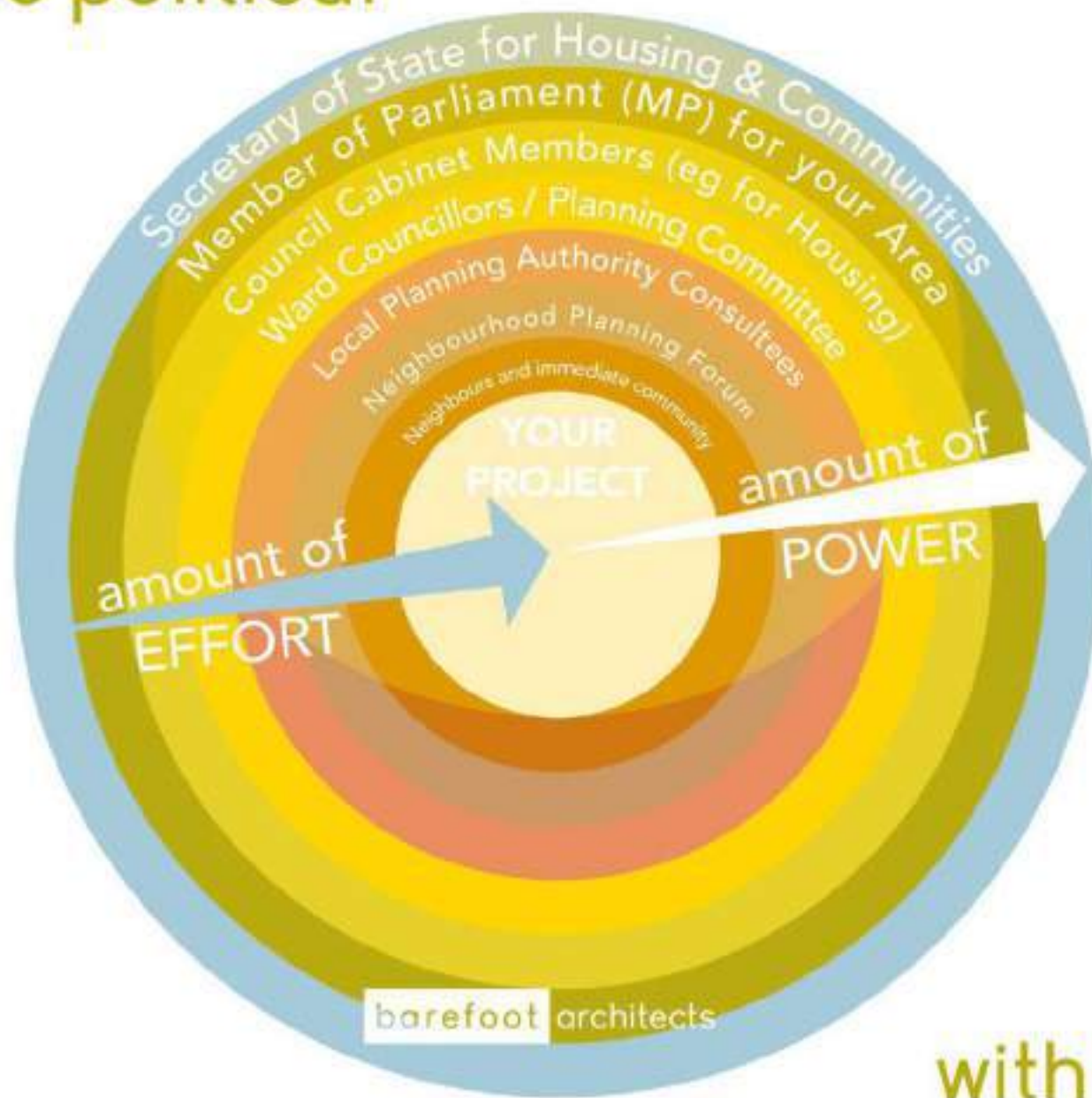
planning developments: depth + detail

measure
prove
construction
principal/detail



increasingly technical

plan to be political



reach out
share
listen
sell

with a 'p' and 'P'

on-site: care



avoid the design gap

project examples



small



medium

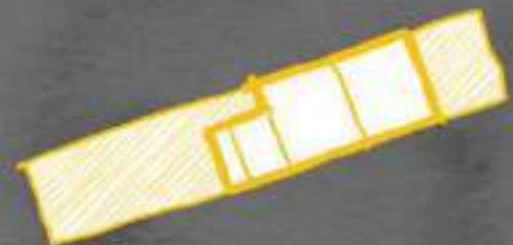
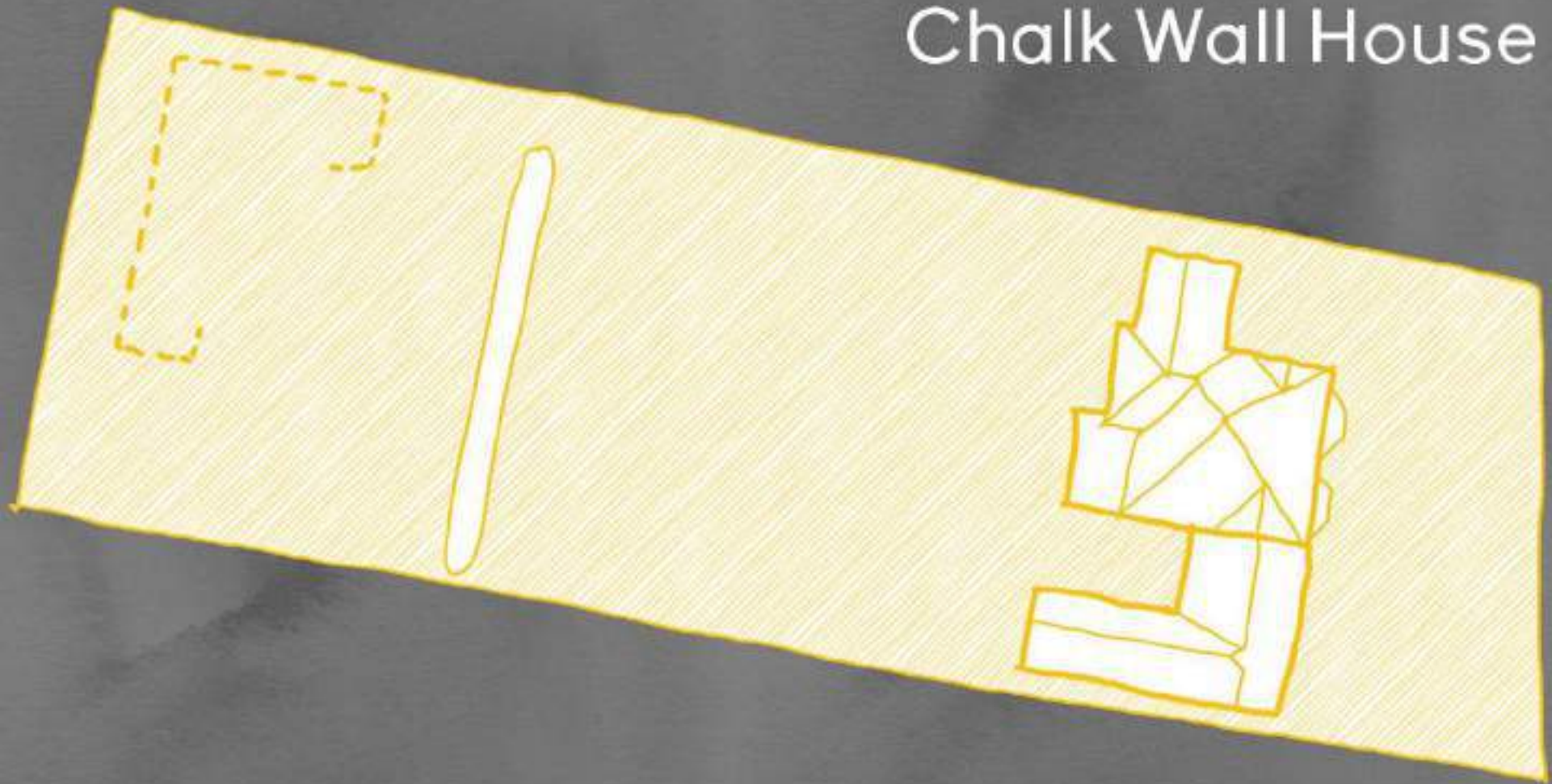


large

small

low-carbon; naturally
clever build system

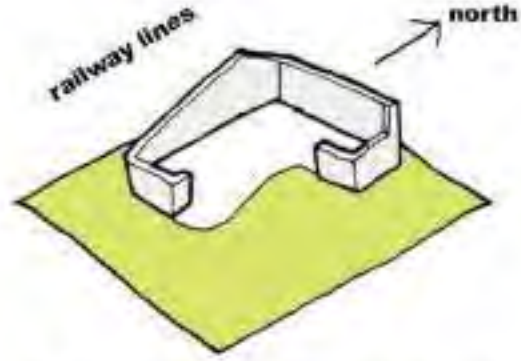
Chalk Wall House



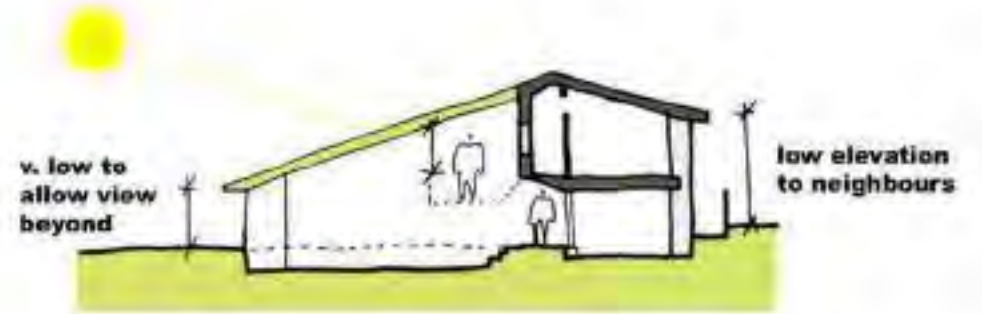
built out of site/sight



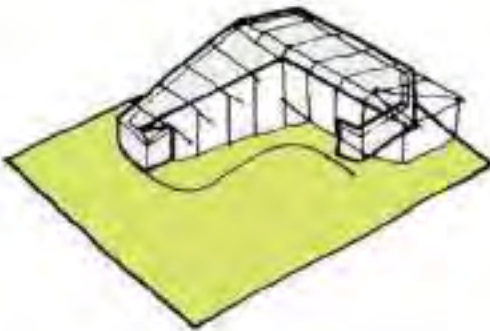
1. sink building into the ground, removing earth and chalk for building with



2. use chalk to construct heavy wall to protect against cold and noise from the adjacent railway



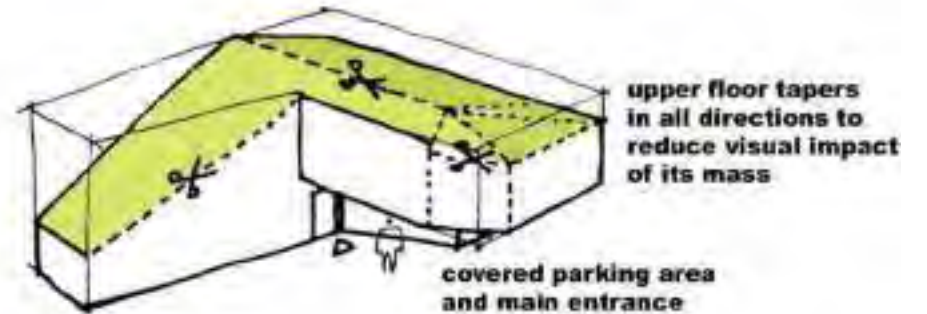
living spaces sunk to reduce overall height



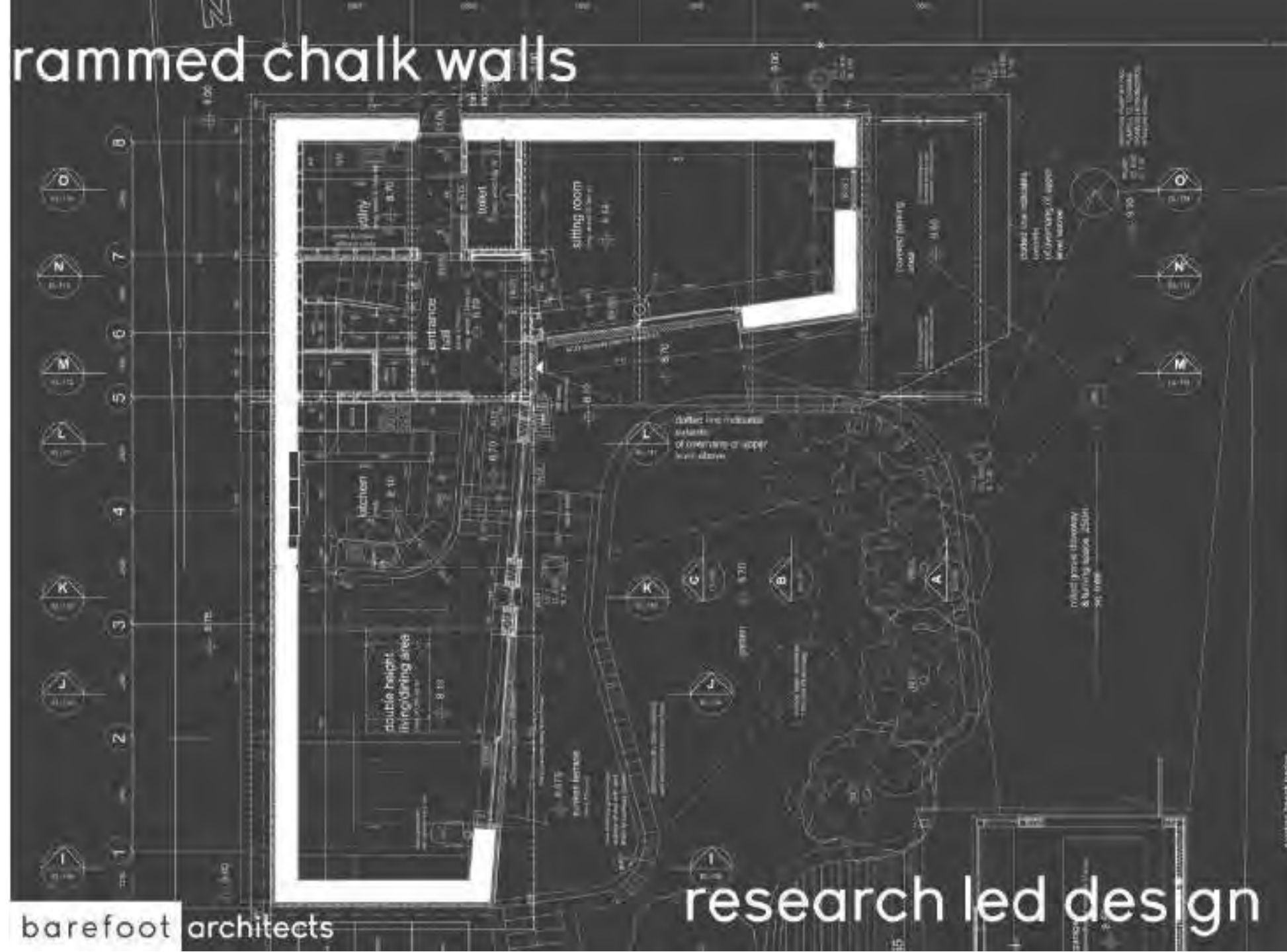
3. erect modular timber frame supported by chalk creating covered entrance and parking



4. place topsoil onto the roof to grow sedums and clad with cedar shingles (black) to minimise visual impact



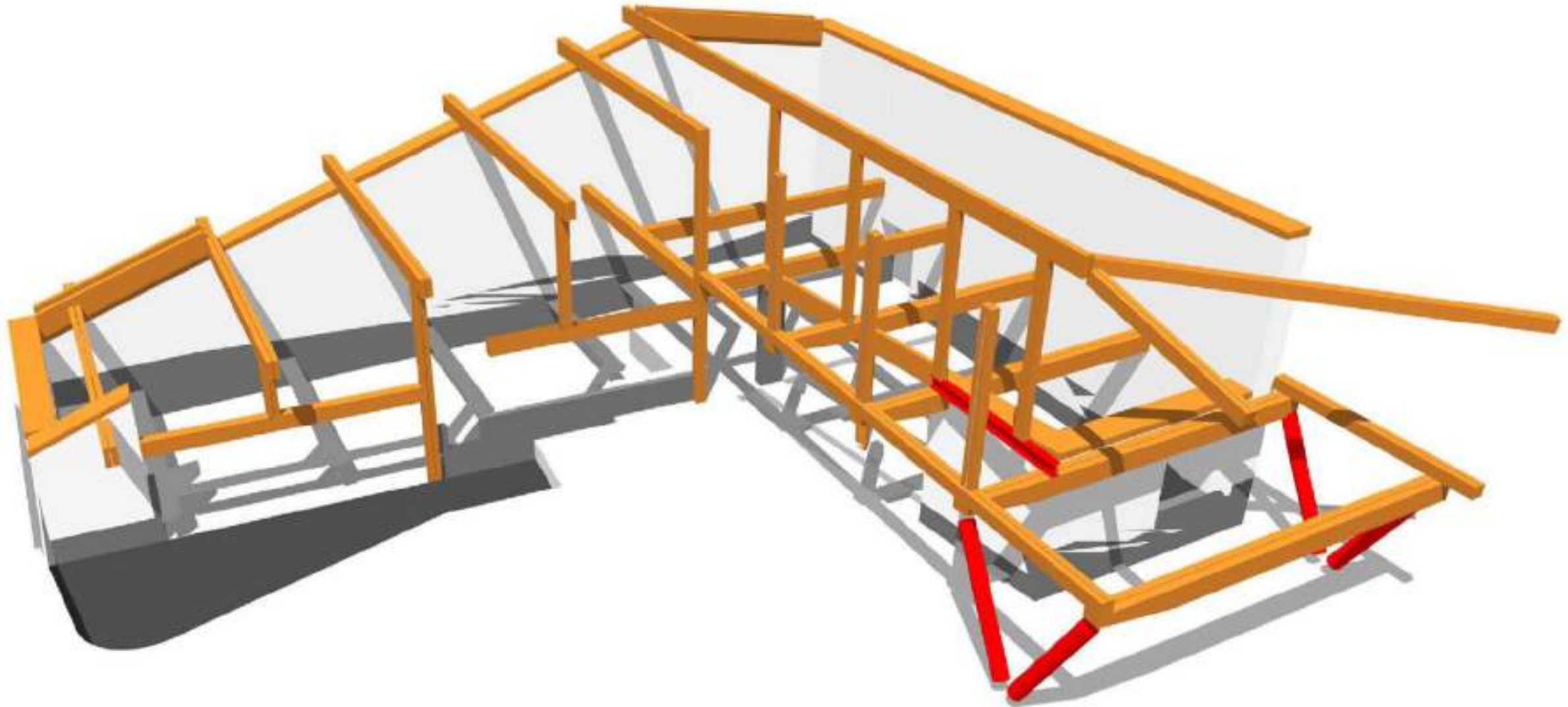
rammed chalk walls



barefoot architects

research led design

design for disassembly



minimising site waste

whacking walls

simple, safe

formwork for superstructure



striking & scraping for re-use

primary glulam frame



2.4m module

recycled secondary structure



+ 10 new lengths

natural finishes



exposed chalk



"slick & hairy"



in + of the earth

medium

low-carbon renovation
innovation

Wapan Houses

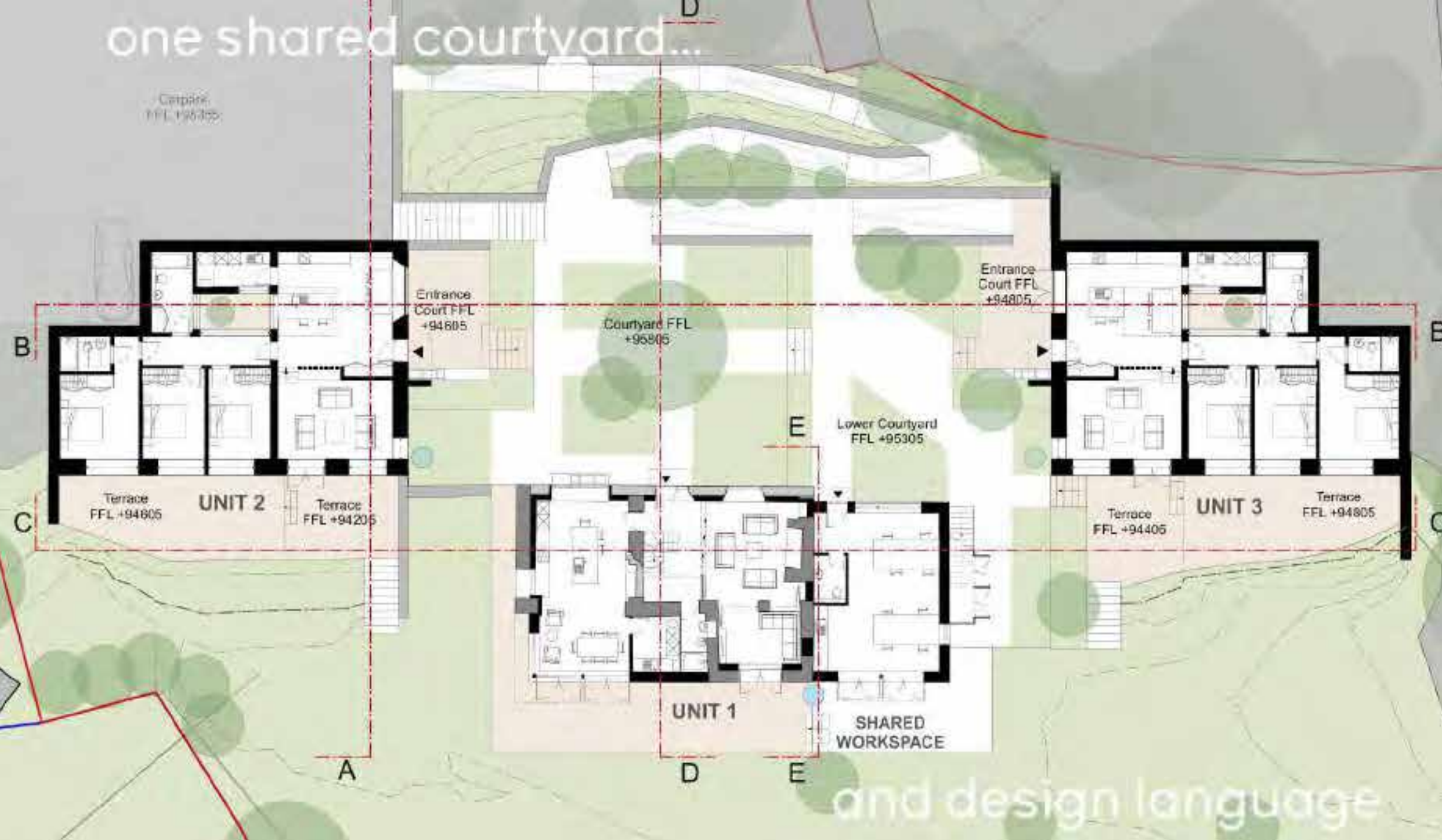


two hidden homes



+ renewed farm house

one shared courtyard...



and design language

wooden walls



STAGE 1
Existing Framework



STAGE 2
Layers of the framework are added
imposed back to the existing
walls and roof. The structure
Any historic features discovered
to be retained. Strategic materials
retained for next stage.



STAGE 3
New walls are added to the
existing walls and roof. The
structure is now complete.
The walls are now finished.

from reused materials

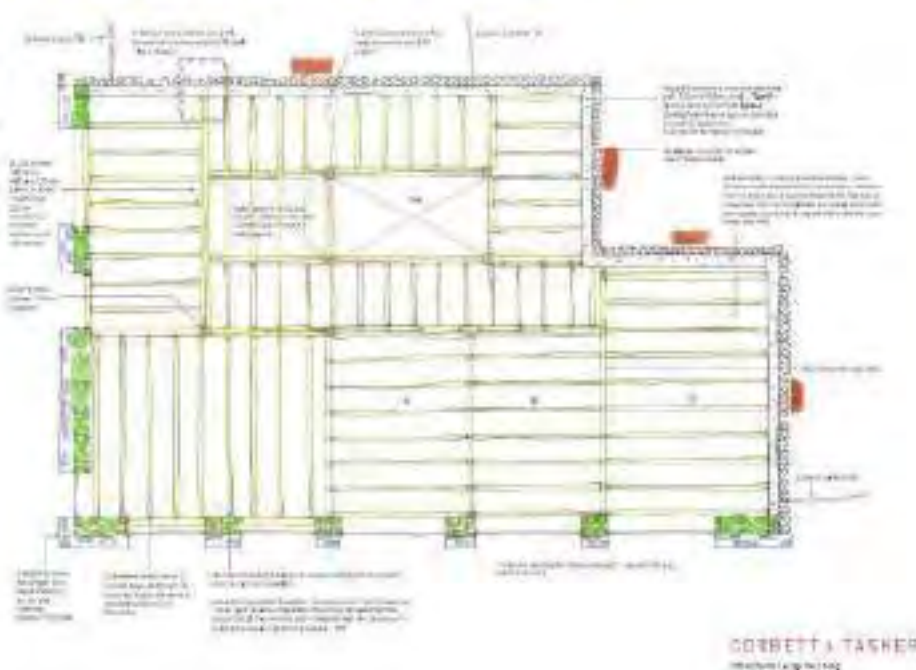
natural materials



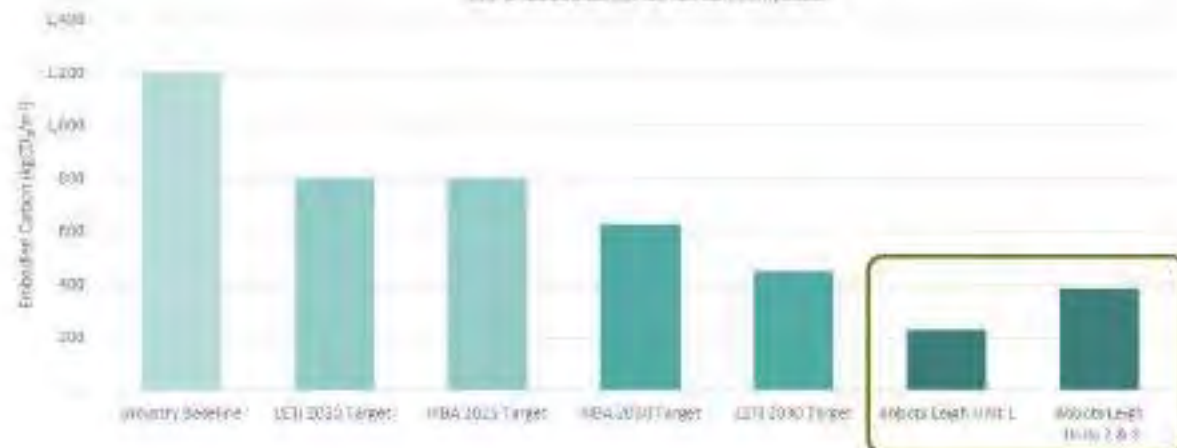
locally sourced

low-carbon construction

- To accommodate the variety of the proposed design approach taken to the substructure, some we have worked with structural engineers and a specialist investigation consultancy
- It is proposed that the retaining walls could use pilelets, in order to mitigate demand and reduce the embodied carbon required to create the structure
- A timber frame for the roof and wall structure will be used, to support the stone masonry walls. The walls will be insulated with hempcrete



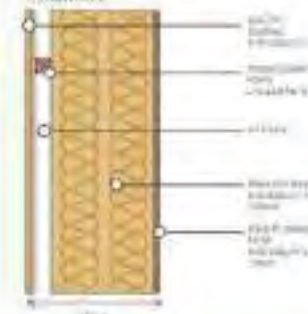
Total Embodied Carbon Benchmark Comparison



TECHNICAL DESIGN NOTE



WALL TYPE W002: This is an alternative wall type for Unit 1.

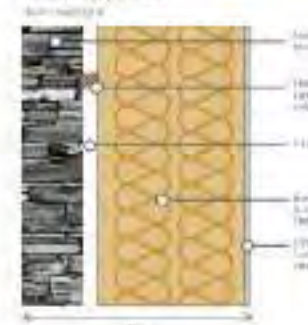


WALL TYPE W002: This is an alternative wall type for Unit 1.

Embedded Carbon Values:

- Build Less: This design does not use the existing walls, and instead uses a Cross Laminated Timber (CLT) frame with clay block cladding.
- Build Closer: Hempcrete insulation used.
- Build Closer: Timber frame and brick ply internal finish used. Timber can be considered carbon negative if vegetation is included.

WALL TYPE W003: This wall type is proposed for Units 2 & 3.



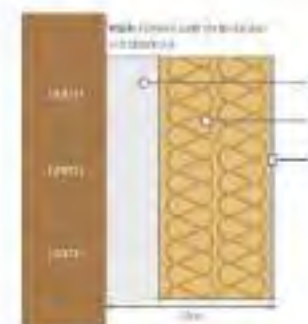
WALL TYPE W003: This wall type is proposed for Units 2 & 3.

Embedded Carbon Values:

- Build Closer: Timber frame & Hempcrete insulation.

Design Considerations:

- Thickness of insulation may reduce the floor area.



WALL TYPE W004: This wall type is proposed for the north cladded walls in Units 2 & 3.

Embedded Carbon Values:

- Build Less: - Gaps for the north cladded walls will be taken from the earth velocity profile.
- Build Closer: Cement used instead of concrete. Cement has been proven to emit up to 80% of the CO2 emitted using concrete.
- Build Closer: Hempcrete insulation used.

quantified and compared











large

low-carbon community
+ landscape

bridport cohousing

barefoot architects



100% affordable
in perpetuity.

Connected by bus,
bike, and foot-
paths.

Adjoins green
spaces.

Next to the Com-
munity Hospital.

Provides 6 homes
for NHS staff.

Crowd-funded
land purchase.

Space to grow the
lawn and parish.

Partnerships with
local stakeholders
key to success.

An area of
outstanding
natural beauty
and incredible
place to live.

people powered

barefoot architects



Community led by a group of pioneer residents.

More sustainable; more affordable; more neighbourly. More ambitious!

Grant and crowd funded project.

Mixed tenure, S/O & Social rent units.

Widespread support, but recommended for refusal.

Planning consent by unanimous committee decision.

Largest cohousing project in the UK - 53 homes.

An exceptional approach to gain an exceptional planning outcome.

cohousing principles



Danish approach from 1970's.

Cohousing is co-designed with intentional communities.

Provision of private and common facilities for a balance between privacy and community

Car parking is at the perimeter, and a common house at the heart.

Cohousing embeds collective resident control and stewardship into its legal form and decision making.

Sociocracy empowers ALL voices.

Cohousing communities are inclusive and part of the wider community

common typologies



Mix of house/flat types that share a similar visual language

£3 No. 1,2,3,4 bed terraced houses and flats.

Open plan flexible and adaptable living arrangements.

Lifetime Homes features included.

Sociable front gardens, private rear gardens.

Shared facilities - including guest rooms, laundry and workspace

Self-build straw bale common house in the centre

Terrace typology is inherently efficient and cost effective

Quality, cost effective construction typology - MMC timber frame.

social streets & spaces



6 houses are dedicated for NHS nurses working next door, bringing affordable homes for key workers and a multi-cultural mix.



food producing spaces run along the streets providing fresh food for anyone that wants it.



everyone knows everyone on site. by name. by face. by growing together, eating together, working together, and helping each other to live together.



solar shading features double as benches to front gardens making spaces to sit out, see people and enjoy the sunny streets and life of the community.

community microgrid



South facing roofscape covered with PV panels.

All electric homes and PV Microgrid addressing fuel poverty

On-site battery storage, and a dedicated ESCO supply reduced cost electricity to homes.

Free energy (for 2 years) and 25% cost reduction guaranteed in perpetuity

Air-source heat pumps and direct electric heating

Total site generation = total site use.

Hazelmead is a community in which
people grow and thrive.



Cohousing supports overall well-being and is fundamentally a healthier approach to housing.

It addresses loneliness and the affordability gap.

It is multi-generational and mutually supportive.

There is massive social value in a caring community.

Community led groups are more ambitious.


Entrust & enable communities and designers to take risks.

Although a protected landscape, this is now a flagship for the LPA.

Be as brave and bold as these local residents to make change happen.



the community are in control of the management and maintenance of the site. the CLT retain responsibilities, and residents sign up to contribute around 2 hours a week.



private homes and rear
gardens balance living in
an intentional cohousing
neighbourhood. residents
can have their cake and eat
it. privacy and community.

net zero carbon,
car free, all electric,
mutually supportive,
multi-generational
affordable cohousing
formed by a CLT.
so why doesn't every
village, town and city
have one?



extra large / extra small

low-carbon cabins

architectural product



barefoot cabins

recap

build naturally
+ reduce waste

renovate + innovate,
+ holistic thinking

create community/landscape
+ reverse design gap

repeat and refine
+ seek innovation



rob@barefootarchitects.co.uk
www.barefootarchitects.co.uk
01803 44 60 40
1 High Street, Totnes, TQ9 5NN

building
community

get in touch

Panel Session: Customer Pull



**Sebastian
Maher**

Development & Design Manager
Reef + Partners



**James
Byrne**

Partner
Sustainable Ventures



**Debbie
Ward**

Director Reuse & Circular
Economy
ASBP



**Emily
Walport**

Associate
ARUP



**Rob
Hankey**

Technical Director
Barefoot Architects



Innovate
UK

Business
Connect

Elevator Pitches

Valentina	Dipietro	Mykor
Dougal	Driver	Grown in Britain
Rob	Smith	Material Index
Justin	Murray	Bio-SIP (Qube Buildings Ltd)



Innovate
UK

Business
Connect

mykor

We grow buildings



THE
EARTHSHOT
PRIZE



Horizon 2020
European Union Funding
For Research & Innovation



Moonstone



GREEN ANGEL
VENTURES

RUMBO
VENTURES



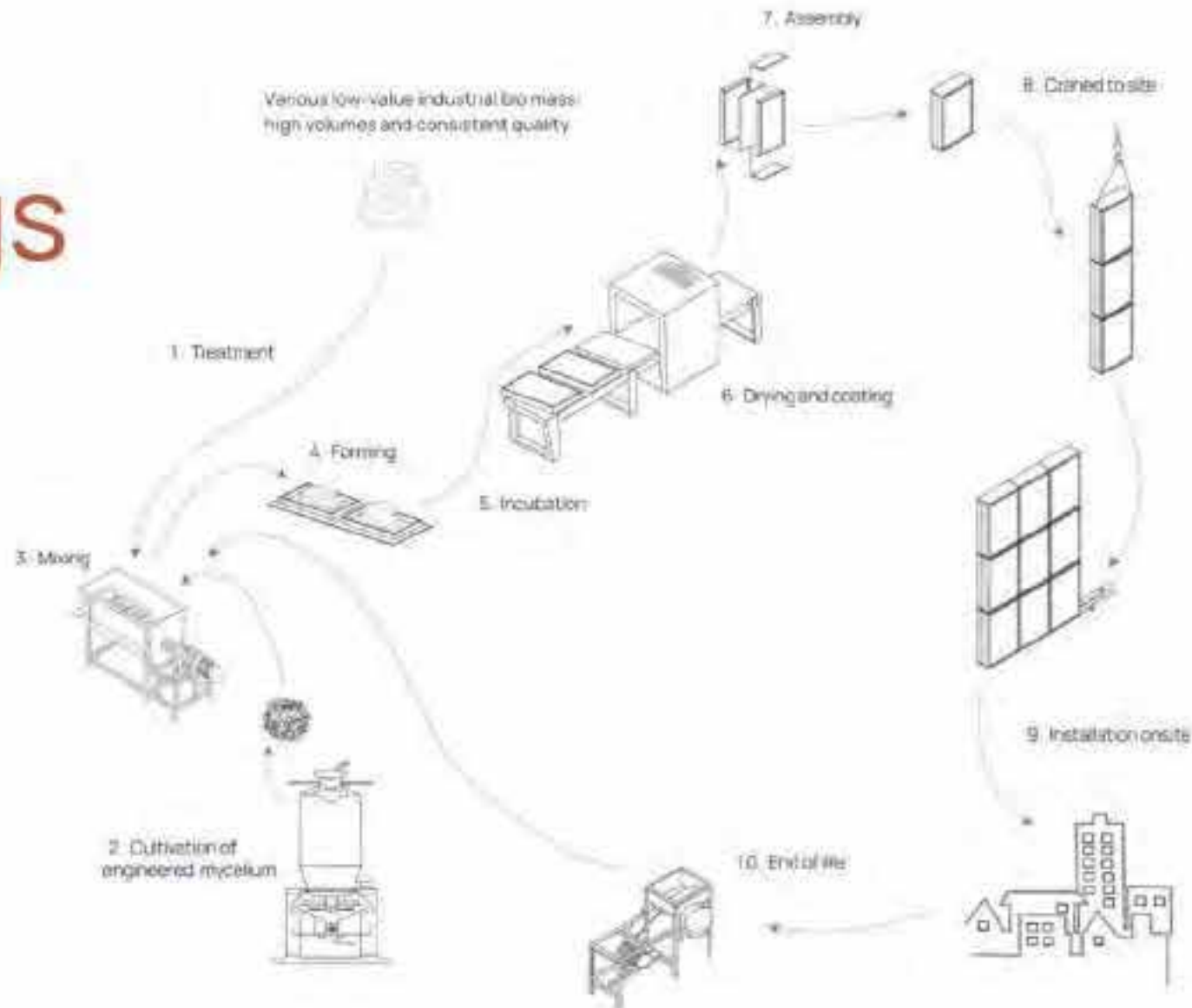
ISOMERASE

+simmons
simmons



valentina@mykor.co.uk

www.mykor.co.uk



MYKOSIP® INTERNAL

Our flagship product is an all-in-one 100% bio-based partition wall



Bio-based & Circular:

100% bio-based

100% dis-mountable and recyclable at end of life

Outstanding LCA values:

115% less CO2e embodied per m2

90% lower water footprint

Strong performance qualities:

Fire Resistant: Euroclass B

2x improved sound insulation

Anti mould properties promoting healthy internal air quality

No VOC's or toxic particles

66% reduction in onsite manual labour

20% less structural framing

Price parity to end contractor



Conventional internal partition wall
45dB acoustic reduction



MykoSIP® Internal
45dB acoustic reduction

Grown in Britain Certification

- Recognised mark of assurance on British timber.
- Tailored for UK woodlands and regulations: Category A UK Timber Procurement Policy.
- Benefits to the economy and the natural environment.
- R&D to replace unnecessary imports with high quality UK timber products.



TRUSTED
CERTIFICATION,





Biogenic Stored Carbon Quotient



Major industry coalition to provide verified biogenic carbon claims.

Drives investment in UK built environment & domestic supply chains.

Support developers, architects, housing associations and LAs in demonstrating the climate and social value of their construction projects



TIMBER
DEVELOPMENT
UK



PRIFYSGOL
BANGOR
UNIVERSITY





“

This certification scheme is a
game-changer.

It enables the construction sector to
move beyond emissions reduction and
embrace carbon storage as a **strategic
climate solution.**

Timber buildings are not just low-
carbon - they store carbon in the **lc
term.**

”

- Matthew Riddiford, Carbon Plantations Ltd



YOUR TIMBER CHOICES
TODAY

MAKE SURE IT'S
GROWN IN

SHAPE TOMORROW'S
FORESTS



GROWNINBRITAIN

GOVERNMENT
N.ORG

Material Index

Making material reuse viable



www.material-index.co.uk

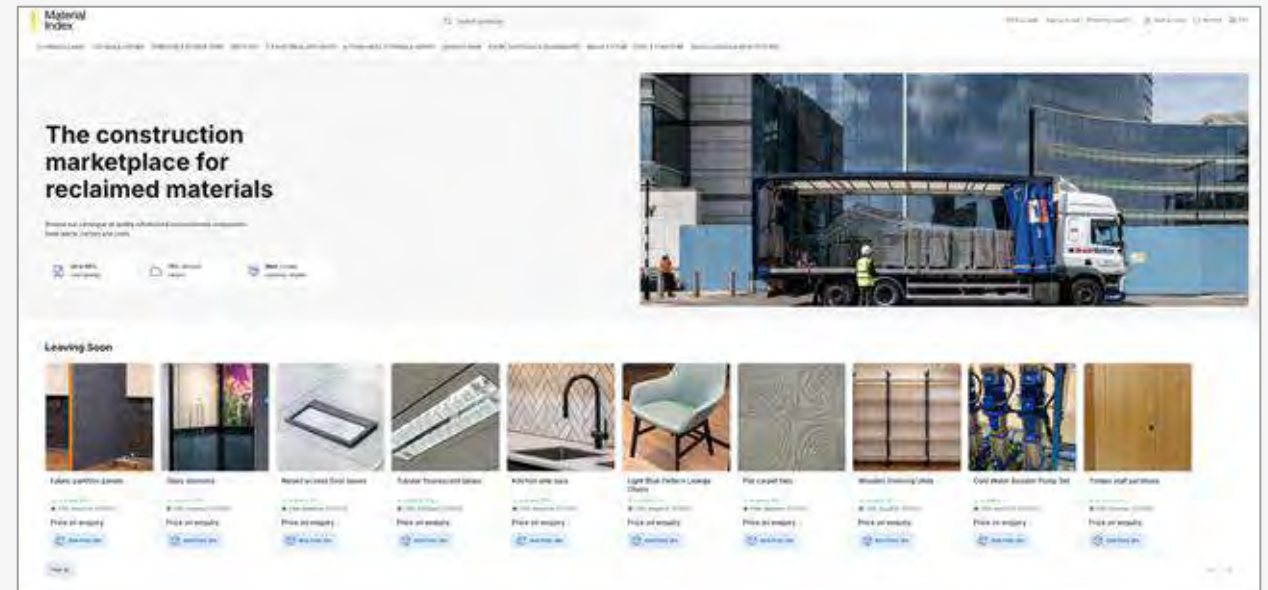
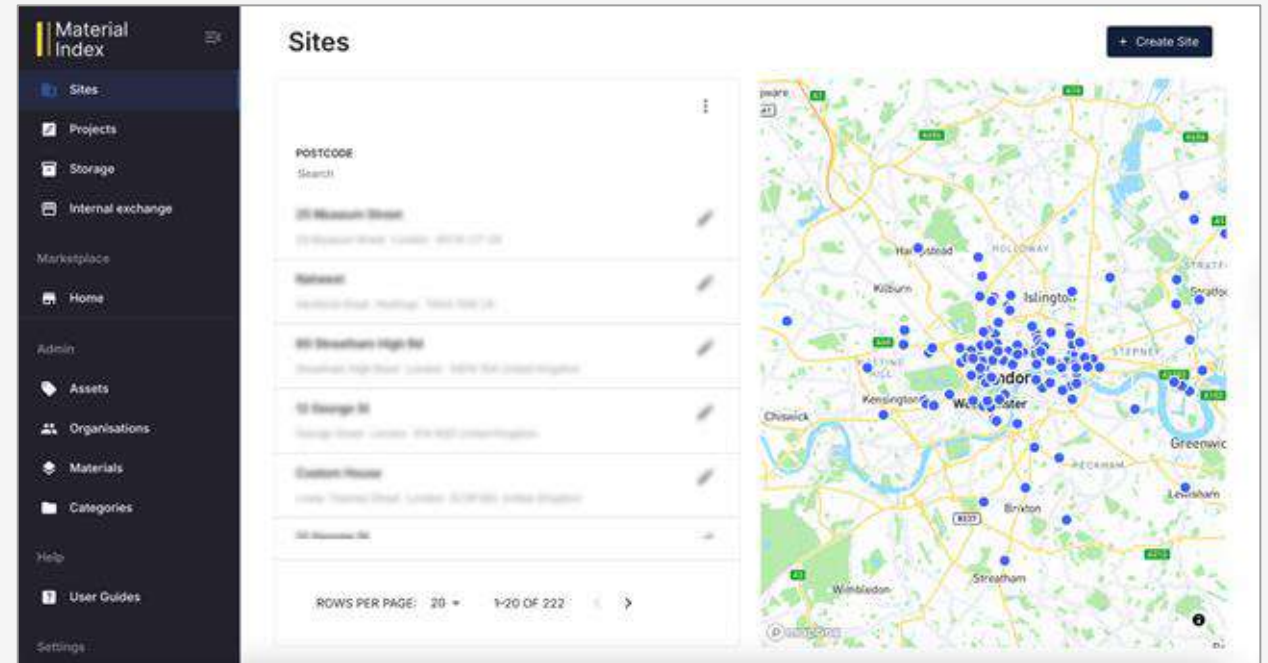


Reuse shouldn't be a risk

MI connects together the supply chain so viable end-of-life decisions can be made

A platform for cataloguing and managing materials, connected to a marketplace for exchange

Above: Platform screenshot
Below: www.material-index.exchange

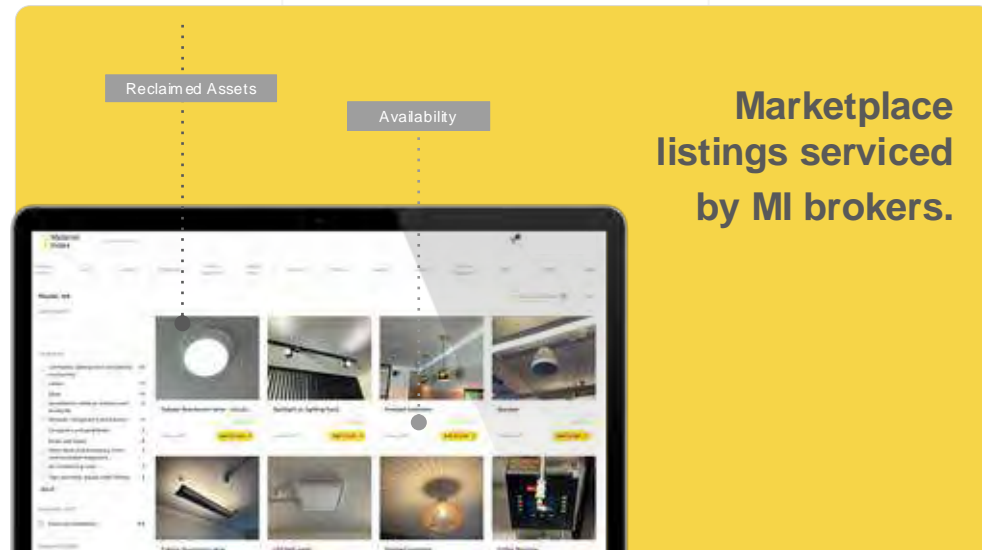
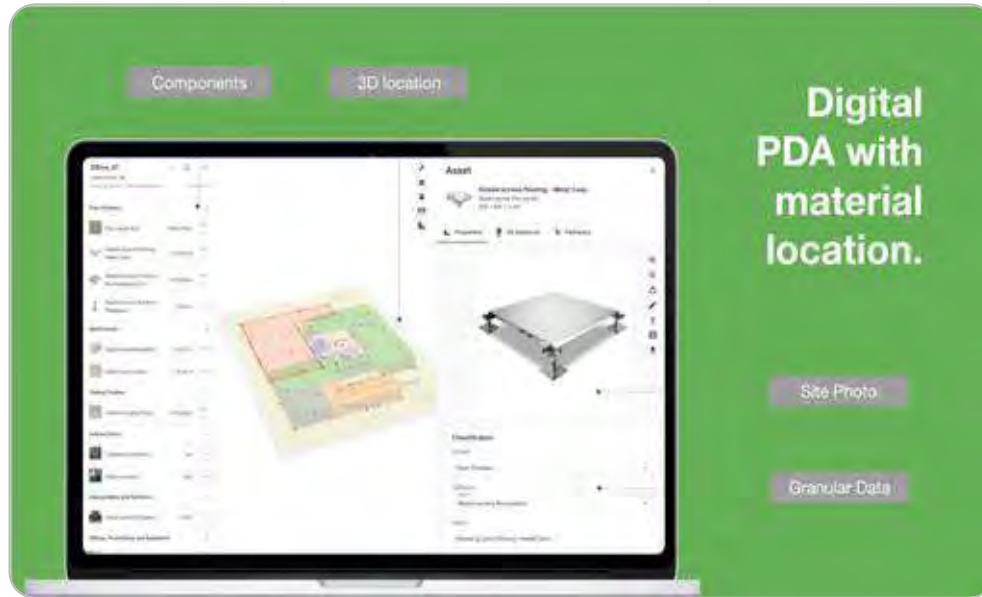


Best-in-class audits

Waste, Carbon, Product data
GLA, Westminster, CoL compliant
BREEAM Credits

Marketplace

300 Reclamation businesses
Personalised brokering
Commission only



Material passports

Data Cleaning

One-off cost

Enabling future re-use

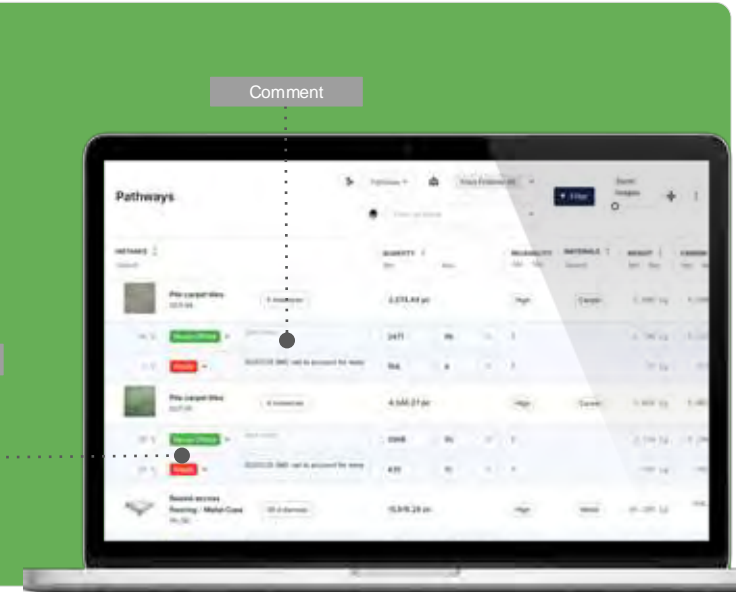
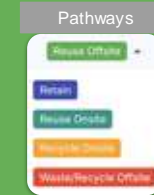
Portfolio Tools + Recycling Analytics

Recycling analytics

Internal Marketplace

Storage functionality

Fast Data Access



Live, granular
audit data
accessible by the
project team.

**BREEAM & GLA
Compliant.**

European Waste Codes



The circular economy cannot be built alone

We're always interested in being a collaborative and proactive partner

Please get in touch at hello@material-index.co.uk



www.material-index.exchange

Clients



Design and Industry Partners



Introducing Bio-SIP™

Bio-SIP™ (biological-based Structural Insulated Panels) are eco-friendly building system that use post-consumer waste (recycled plastic bottles - PET) for the insulating core, and natural fibre skins for the structural facings.

They provide an environmentally friendly and energy-efficient alternative to traditional SIP panels and can be used in various construction applications for a minimum of 60 years.



2000

bottles per panel



Plastic Bottle Recycling

88%

Of Bio-SIP™ is made from waste material



Natural Fibre Materials



87%

reduction in CO₂ vs traditional panels

1000's of Applications for Diverse Locations

Temporary structures

Vacant lots and unused spaces in urban areas can be transformed into applications like housing solutions for those in need, classrooms and storage facilities.

Rural Development

Bio-SIP targets rural developers seeking eco-friendly, energy-efficient solutions for garden offices, forest lodges, and sustainable rural accommodation.

Disaster Relief

Bio-SIP units can be quickly deployed to provide emergency shelter in the aftermath of natural disasters or humanitarian crises.



Warranty



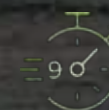
Easy Assembly



Sustainable



Made in the UK



Quick Assembly



FREE Survey

A solution to build millions of Net Zero, Affordable and Sustainable homes.

We are privately funded, and we are looking to make a difference. We hope you are too...

Our partners who also think so are:

Innovate UK



Innovate UK
EDGE



Bio-SIP™



Networking Lunch

Return at 13:30



Innovate
UK

Business
Connect

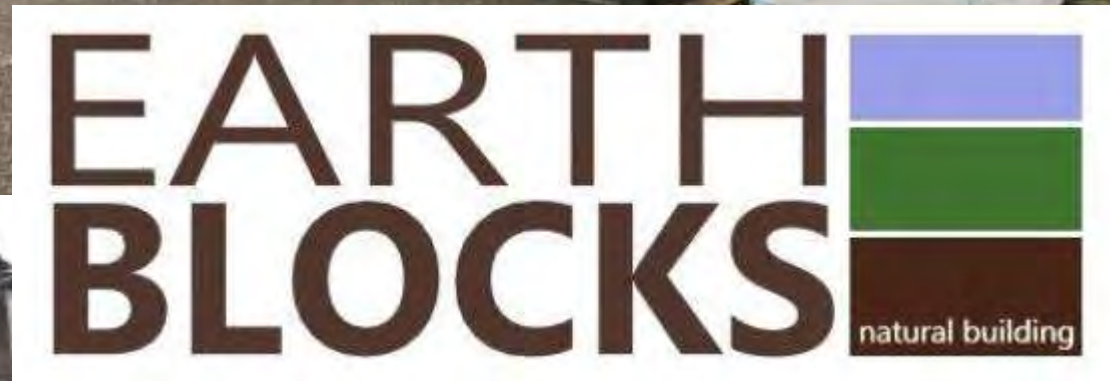
Elevator Pitches

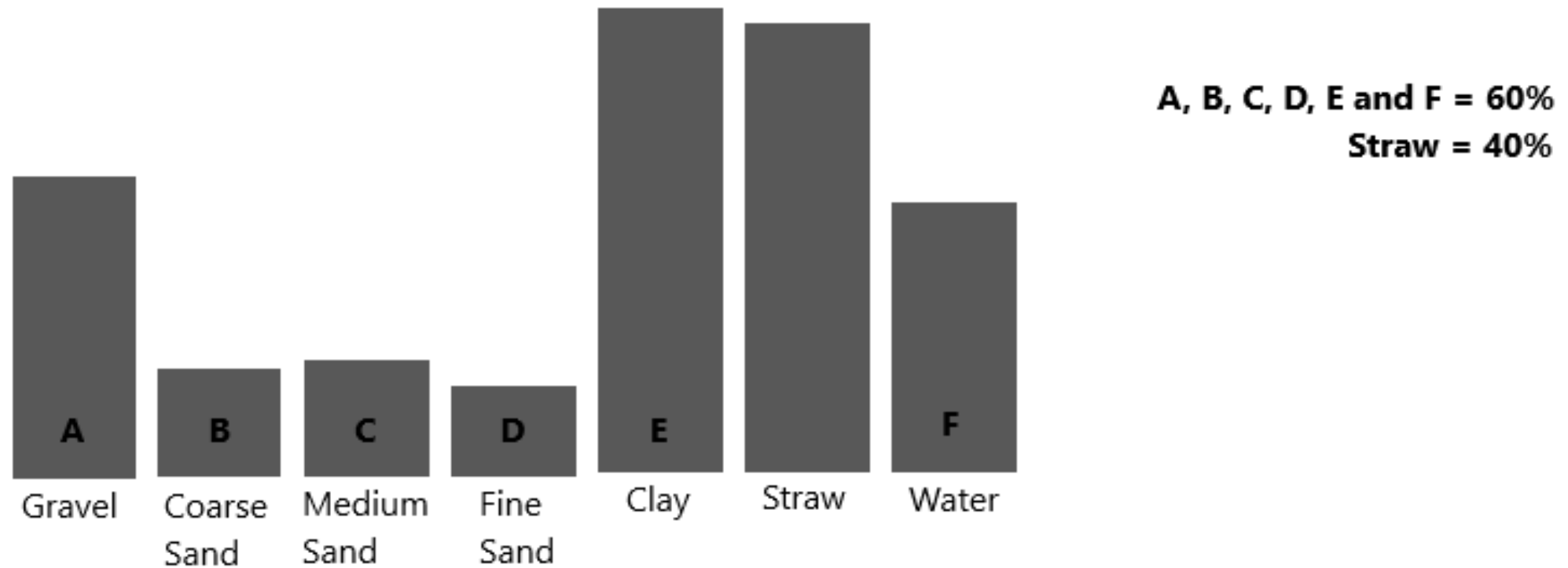
Clare	Whitney	Consultant Earth Blocks
Steve	Barbour	Composite Braiding Ltd
Jamie	Bartley	Unyte Group
Dan	Macey	SoilDri Ltd



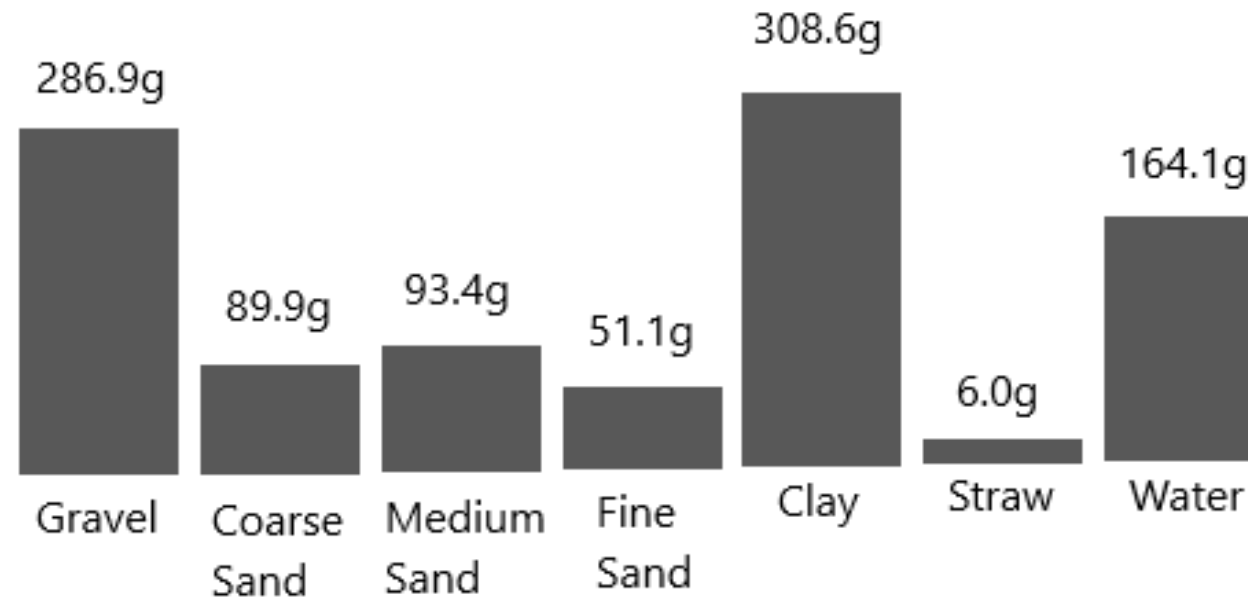
Innovate
UK

Business
Connect





Soils are analyzed for their contents by volume



Soils are analysed for their contents by weight



Cob blocks are naturally dried outside....



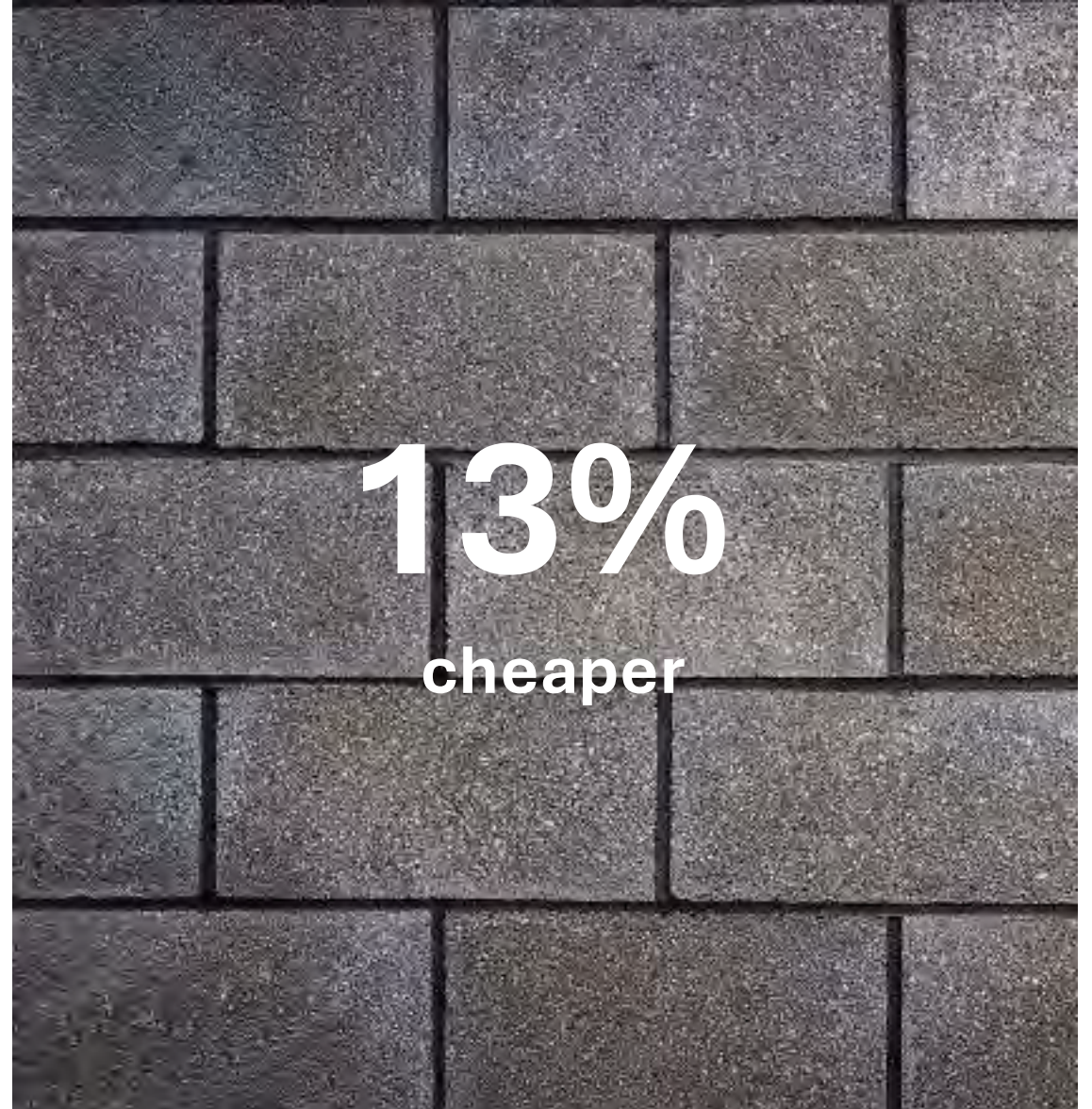
Construction, Demolition and Excavation (CD&E)

- 58% of landfill tonnage is soil waste
- 68% of landfill waste is soil and mineral waste
- Soil waste heading for landfill.....can make enough CEBs....
....to construct approx. 5000 homes per year!
- No Cement
- No Gypsum
- No lime or binders
- No firing or hydraulic change of state
- No PFAs or synthetics, microplastics
- No plastics, pigments
- No landfill costs
- No end-of-life costs
- No VOCs, no Formaldehydes – no toxins
- Compostable, Reuseable, Recyclable
- ...95% less embodied carbon....

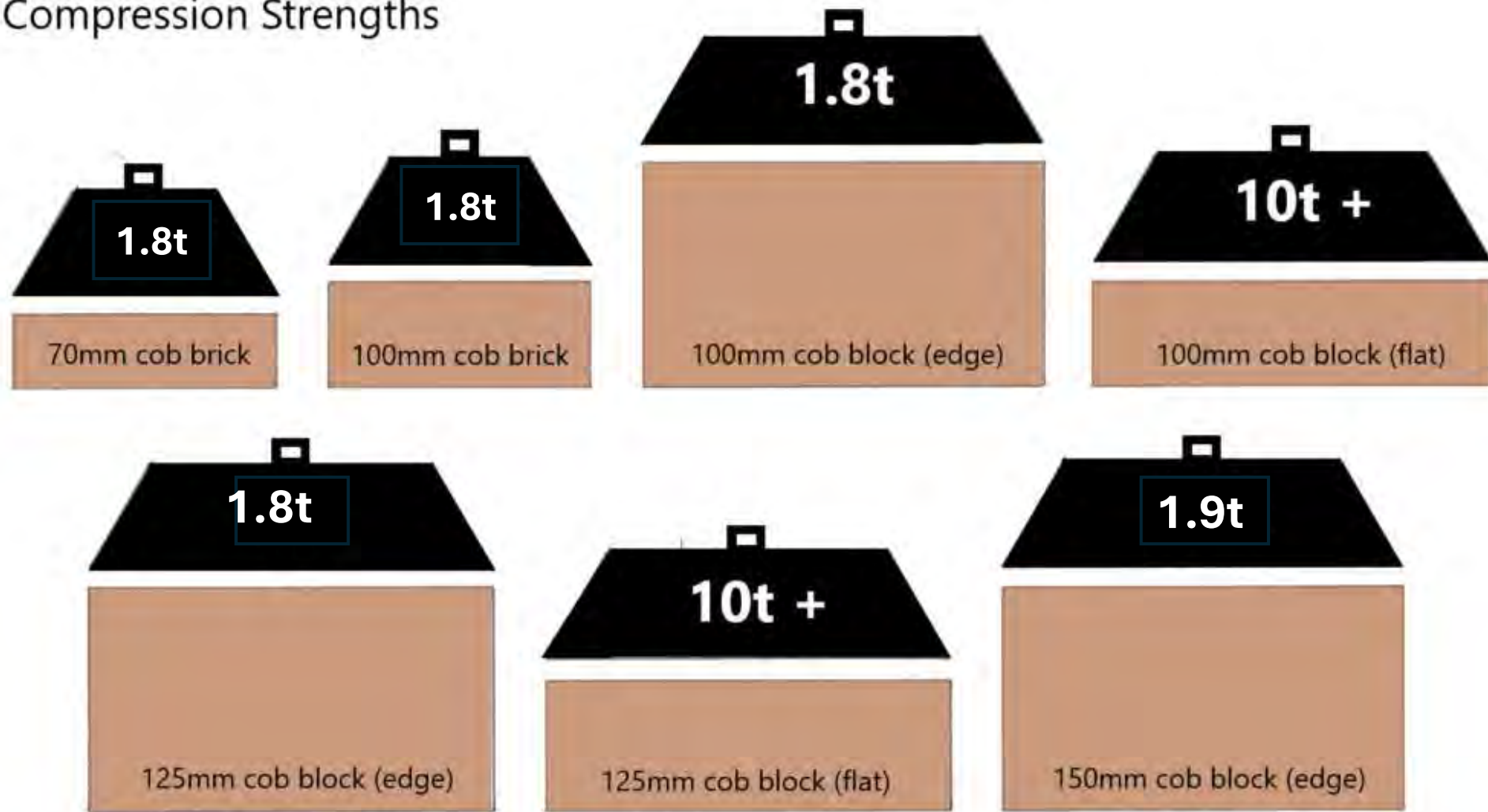
125mm CEB Walling

Verses

Concrete Block Walling



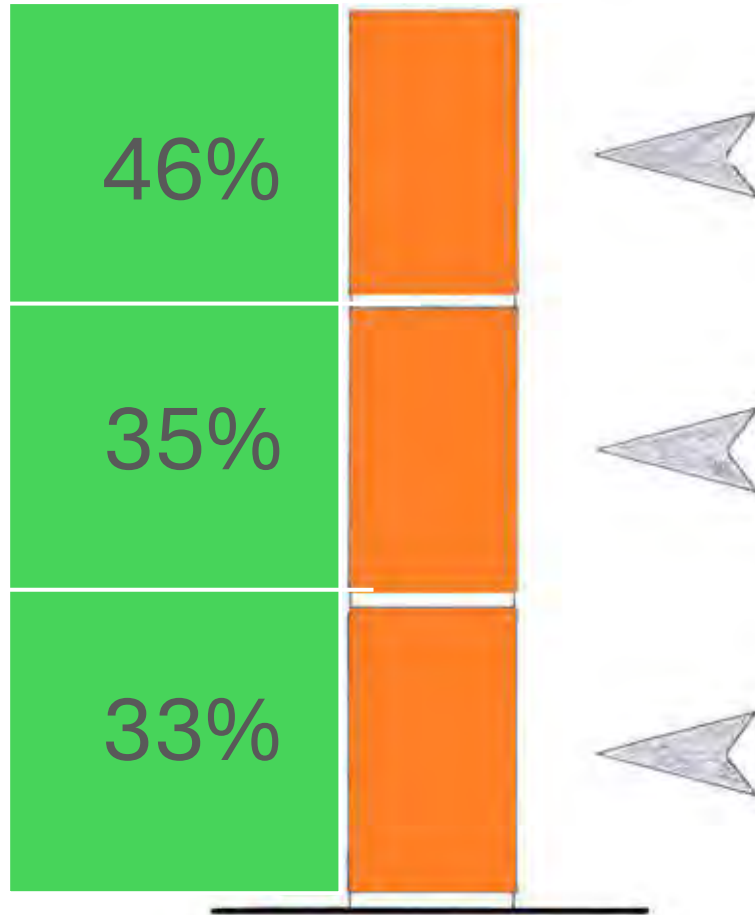
Compression Strengths



* These calculations were achieved by spread-load testing to fully cured products.

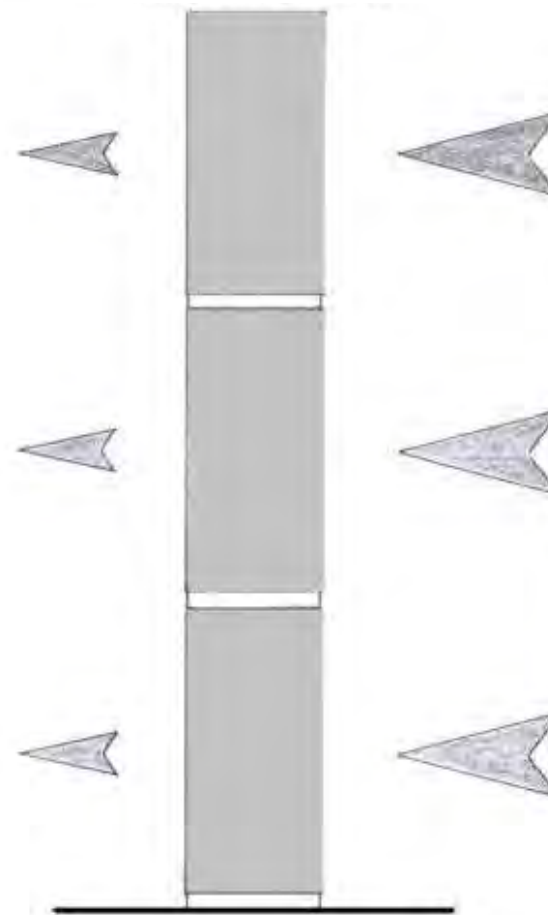
THERMAL CONDUCTIVITY

125mm CEB



U-Value 1.20 W/M2K
K-Value 133.950 KJ/M2K
R-Value 3.03 m2K/W

100mm Concrete Block



U-Value 1.76 W/M2K
K-Value 181.800 KJ/M2K
R-Value 2.27 m2K/W

U-VALUE

K-VALUE

R-VALUE

TYPICAL INSULATIVE VALUES for a CONCRETE BLOCK

U – VALUE Measurement of heat transfer from inside to outside 1.76 W/m²K

K – VALUE Thermal conductivity. Heat transfer 181.800 KJ/m²K

R – VALUE Resistance to heat-flow 2.27 m²K/W

TYPICAL INSULATIVE VALUES for our CEB

U – VALUE Measurement of heat transfer from inside to outside 1.20 W/m²K

K – VALUE Thermal conductivity. Heat transfer 133.950 KJ/m²K

R – VALUE Resistance to heat-flow 3.03 m²K/W

One of our cob bricks
having been exposed to
extreme fire and heat



HANDLING & STORAGE

- Handling & moving the blocks requires a little more care
- Keep pallets covered until ready for use
- Prevent the blocks from becoming saturated
- Wait for persistent & heavy rain to pass before laying



Research & Development

- Suitable soil exploration
- Product testing
- Regional soil analysis





London clays from varying depths



Made with soil from approx. 2m below surface

Made with soil from approx. 1.2m below surface

Made with soil from approx. 0.5m below surface

LONDON CLAYS



Earth mortar used as a common binder for CEBs or earth bricks

Hybridisation

- CEB's laid on edge
- Natural lime mortar
- Normal building techniques
- Conventional wall-base
- Conventional methodology
- Meets with:
 - Building Regulation C
 - Section 5.5
 - Parts a), b) and c)





Hybridisation

- Standard cavity closers
- 3-coat lime render
- Sand/cement plinth render
- Mineral paint above stop-bead
- Waterproof paint to plinth
- Complies with:
Building Regulation C
Section 5.2
Parts a), b), c), d), e) and f)

CEB Manufacturing Machines




- Machine Hire
- No electricity required
- Relatively lightweight
- Portable
- Power options

[Home](#) > [Architecture, Structures and Construction](#) > [Article](#)


The zero-emissions resource pool: construction materials compatible with a realistic view of delivering zero-emissions in the UK by 2050

[Review](#) | [Open access](#) | Published: 04 September 2025

Volume 5, article number 55, (2025) [Cite this article](#)

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[Charlotte Taylor](#) , [Julian M. Allwood](#), [Takuma Watari](#) & [Will Hawkins](#)

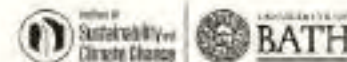


[Architecture, Structures and Construction](#)

NEW PAPER

Springer Nature: Architecture, Structures and Construction

The zero-emissions resource pool: construction materials compatible with a realistic view of delivering zero-emissions in the UK by 2050



**RESEARCH
WITH IMPACT**

High Volume, Affordable, Sustainable Composites



COMPOSITE BRAIDING



TTC Example:

- 1711kg steel to 277kg TP composite
- Concrete reduction
- >80% reduction in CO₂
- 8m vertical mast = 3 mins

Consolidation:

- Heat & pressure
- Hours → minutes
- 95%+ less energy used

Braiding:

- Thermoplastic composite braiding
- Mile/day/shift

Materials:

- Fibre: carbon, glass, basalt, natural
- Matrix: PP, nylon, bio-nylon, PET, +
- Virgin vs recycled

End of 1st Life:

- Fibre and matrix recovery
- Re-use, repurpose
- Prod waste < 1%

Thank you...any questions?

Contact:

07876 356518

enquiries@compositebraiding.com

www.compositebraiding.com



CompositesUK
Trade Association

Industry Awards 2024
WINNER
Sustainability Award: Circularity

CompositesUK
Trade Association

Industry Awards 2022
WINNER
Sustainability Award: Net-Zero Initiative

CompositesUK
Trade Association

Industry Awards 2021
WINNER
Innovation in Composite Materials

CompositesUK
Trade Association

Industry Awards 2025
WINNER
Innovation in Composite Design

CompositesUK
Trade Association

Industry Awards 2025
WINNER
Sustainability Award: Net-Zero Initiative



UnyteTM GROUP



Knowledge



Solutions



Hemp



THE PROCESS



Hemp Harvested



Fibre Separated



Insulation
Manufactured



Low Carbon
Retrofit



Hemp Baled



Primary
Processing



Shiv Separated



Hempcrete Blocks
Manufactured

Contact Details:

Jamie Bartley
CEO & Founder

+44 7854 162290

Jamie@unyte.co.uk

<https://Unyte.co.uk>



Sustainable Soil Technology

Revolutionising Construction With Pioneering Drying Solutions For Wet Soils.



www.soildri.com

SoilDri



SoilDri is a cutting edge, low-carbon soil drying technology that has been carefully developed over time to address the diverse needs of multiple sectors within the construction industry













SoilDri Method Vs Traditional Method

Lorry Movements: Environmental Impact



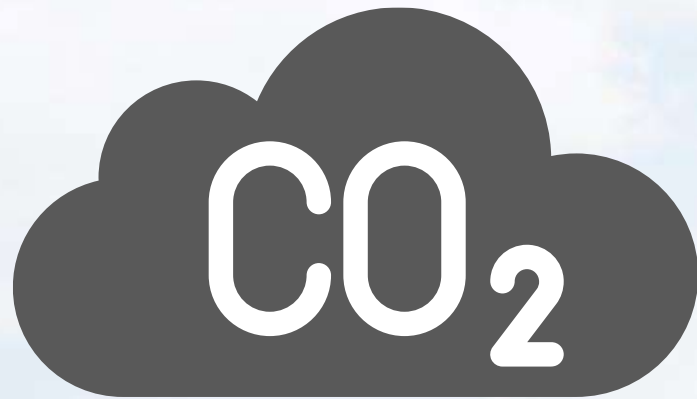
Residential Scheme
East London
4,500m²

Factor	SoilDri Method	Traditional Method	Savings	Savings %	
 Clays & Subsoils Destined For Tip (tonnes)	0	9,000	9,000	100%	
 Trench Backfill Underside Of Type 1 (tonnes)	0	10,350	10,350	100%	
 Lorry Movements	7	2,215	2,208	99.68%	
 Carbon Emissions (lorry movements - tonnes)	1.9	39.9	38.0	95.24%	
 Nitrogen Dioxide (lorry movements - kg)	3.5	74.6	71.1	95.18%	
 PM10 (lorry movements - grams)	39.9	841.7	801.8	95.26%	
					 Further Savings
					 26,206 Road Miles
					 12,551 Litres Of Fuel
					 437 Driving Hours

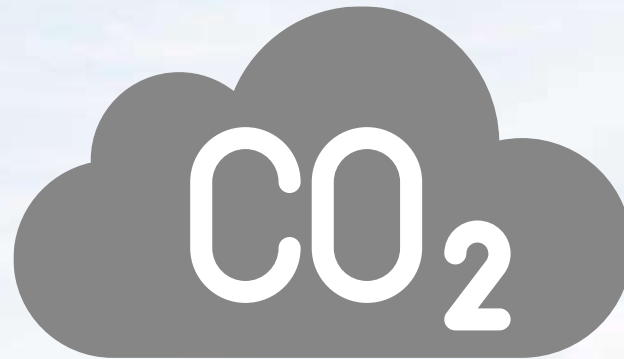
Based on: 20km distance to tip | 20km distance from aggregate source | 300km from SoilDri Factory. Using a HGV Euro V which emits the following, Co2 = 900g/km | NOx = 1.684g/km | PM10 = 0.019g/km during motorway travel. Above based on the assumption of zero back-loading. Based on 2% SoilDri addition rate.

Some figures have been rounded for display purposes. Calculations may vary slightly. Lorry emissions data source = Department of Energy and Climate Change (2016) NI 165 Emissions Tool.

Embodied Carbon



Quick Lime or Cement



Alternative Reinstatement Materials
(Generic NFSMRs, FSMRs / TMFs)



Soil Export /
Aggregate Import



SoilDri

>95% less
embodied
carbon

AECOM

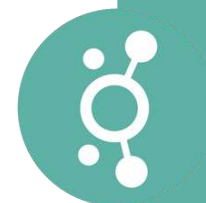


Dan Macey

Director of Strategic Growth

T: 07824 873987

E: dan.macey@soildri.com



Panel Session: Accelerating Adoption



**Carol
Costello**

Architect & Director
Cullinan Studio



**Hayley
Cormick**

Associate Director
Useful Simple Trust



**Seb
Laan Lomas**

Associate
Architype Architects



**Emily Rose
Garnett**

Senior Advisor
UK Green Council
Building



Innovate
UK

Business
Connect



**Panel Session:
ACCELERATING ADOPTION**

**ESBEM Seminar:
Accelerating adoption of UK
low environmental impact
construction materials**

22nd January 2025, The Studio,
Central Birmingham

Carol Costello RIBA,
Director at Cullinan Studio

**CULLINAN
STUDIO**



Homes & Communities



Education: from primary to university



Cultural Buildings



Low Carbon Energy



Mental Health Care

Research and campaigning



Robin Nicholson CBE



Robin has been an industry leader for change in the profession for decades and led Cullinan Studio to pursue more collaborative and ethical procurement. He continues his work through the Edge Debate.

This has led to Cullinan Studio being selected for Integrated Project Insurance teams.



Our membership in ASBP has connected us to research and networks that has increased our skills in circular economy approach to materials selection. Promoting timber and natural materials construction and mitigating plastic waste have been two areas of focus.

Cullinan Studio experience

- Research and campaigning
- **Integrated Project Insurance (IPI)**
- Circular Economy mindset

- Form of combined appointment AND building contract.
- Designed to;
 - Improve certainty of outcome
 - reduce waste
 - improve collaboration
- Form of **Insurance Backed Alliancing**
 - (i.e. not Traditional, or Design & Build, or Management forms.)
- Only 5 projects in the UK done this way to date.
 - This is unusual and a different approach...

- Promoted by Government as a model for a new way of working on public buildings.
- In the tradition of Alliancing to remove waste by fostering collaboration (Latham, Egan etc.)
- Radical aspect is in addressing the role of **insurance** in driving a wasteful claims culture.

What is Integrated Project Insurance (IPI)?



“A 2016 McKinsey analysis found that construction projects typically take 20 percent longer to finish than scheduled and are up to 80 percent over budget, frequently resulting in litigation. That often leaves customers dissatisfied, resulting in complex and time-consuming claims processes”



“One of the most effective ways to deliver outcomes is to create contracting environments that promote collaboration and reduce waste. Contracts should create positive relationships and processes designed to integrate and align multiple parties’ commercial objectives and incentives.”

Why IPI now?



Black Country & the
Marches IoT, Dudley
2021



Animal Studies Centre,
Dudley – IPI Lite
2025



Health Innovation Dudley
Currently on site
2026

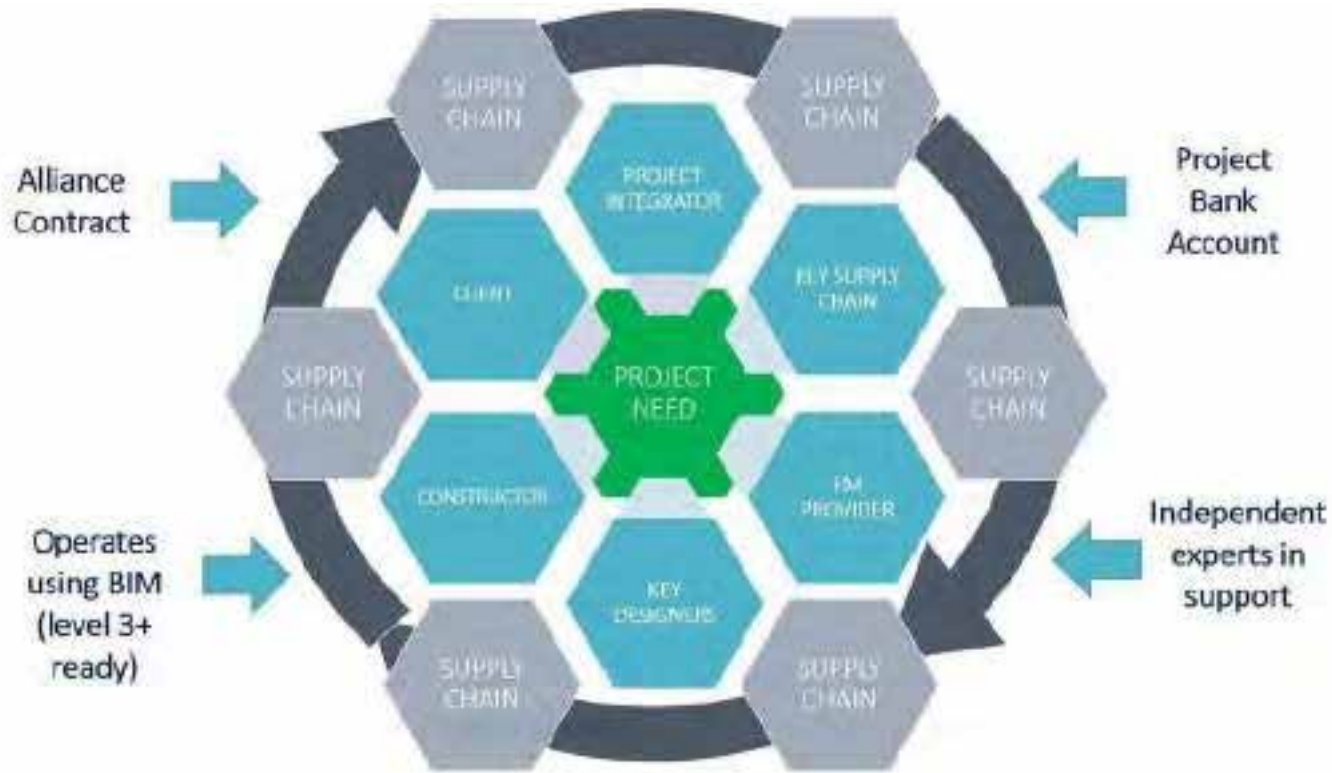
Cullinan Studio & IPI



Interview process: design team chosen by behaviors demonstrated



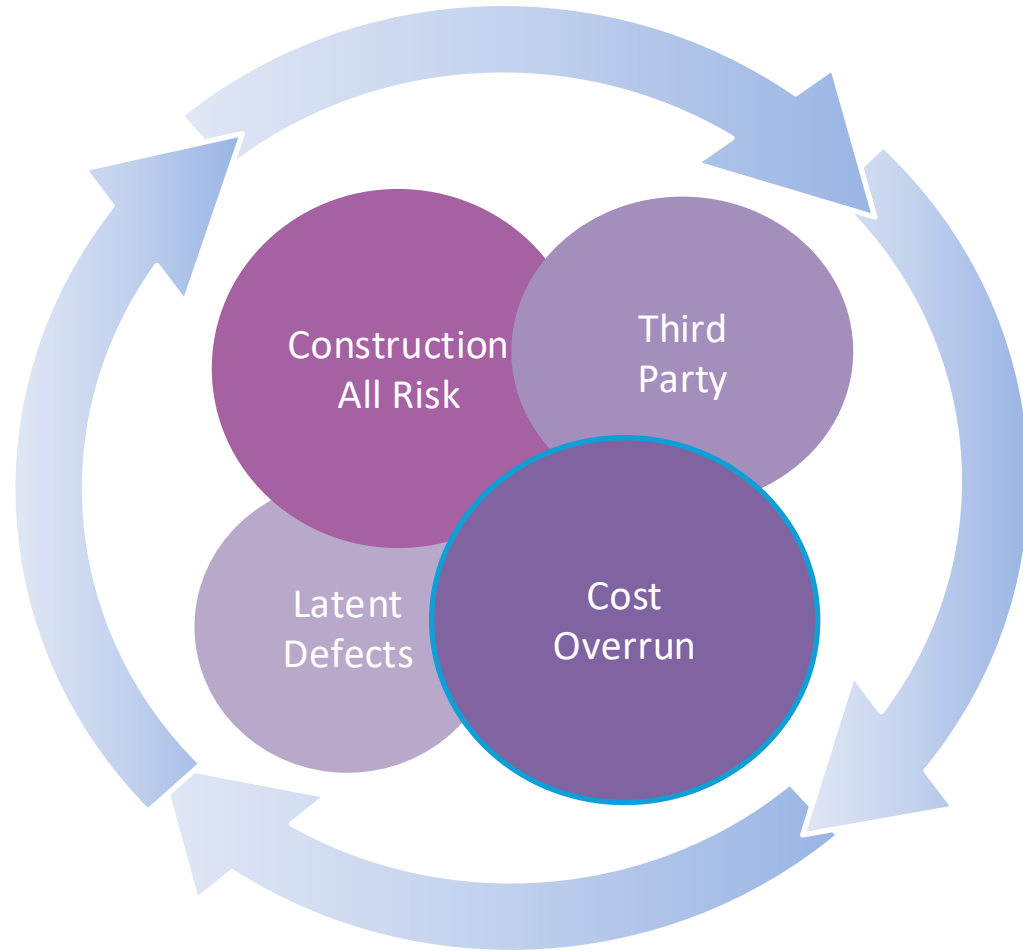
Optioneering Workshop: Client, Contractor, Designers from inception



No right of subrogation clause - no party can sue another party - **PII becomes irrelevant.**

Outputs covered by single insurance – which party is to **blame is irrelevant.**

IPI – Focus on need, not blame



- **Cost over-run insurance** covers the building being over-budget or late.
- Policy excess 5% of insured value carried by Alliance as a whole – regardless of fault.
- PAIN-SHARE potential keeps TEAM focus on budget and programme throughout.
- There is no PII in the mix.
- Attractive proposition for insurers. Insurers have independent risk assessors throughout.

Integrated Insurance Policy

PAIN SHARE

- Building is late.
- Building is over-budget.
- Building does not meet client's quality needs (success criteria)
- Up to 5% of contract value

GAIN SHARE

- Building is on time.
- Building is under-budget.
- Building meets client's quality needs (success criteria)
- Up to 7.5% of contract value

Apportionment is agreed among Alliance Members at the outset

Cost-overrun & Pain / Gain – risk shared



ANIMAL STUDIES CENTRE - IPI LITE

Client's original brief: demolition and new build , in part to avoid VAT.



The site plan shows a large rectangular area labeled 'NEW BUILDING' in the center. To the left of this area is a large, irregularly shaped white space, likely representing a pond or a large open area. The surrounding area is filled with various building footprints and roads, indicating an urban or suburban setting. A north arrow is located in the bottom left corner of the plan.

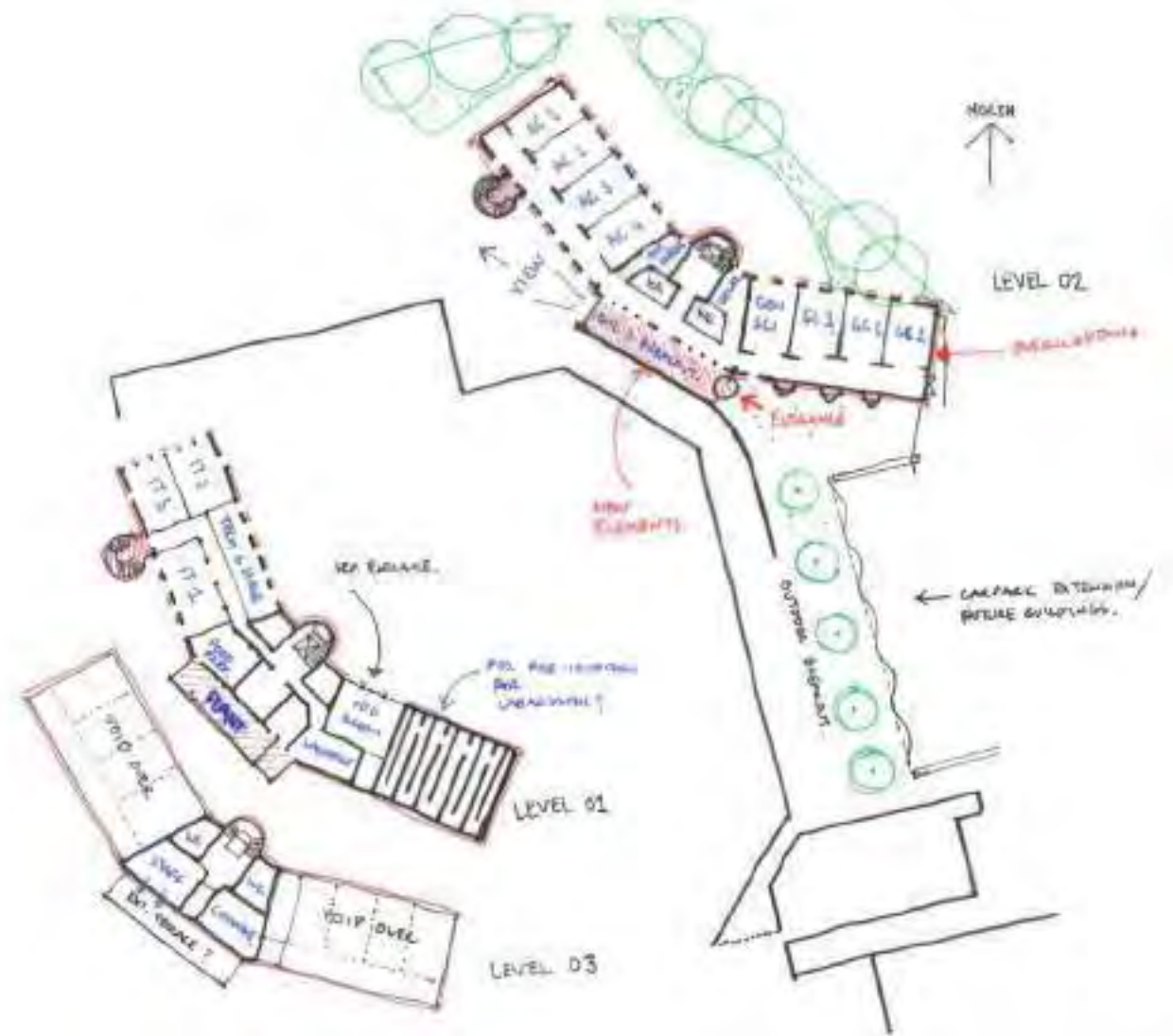
**Our challenge:
Consider a low carbon
approach of re-use.**

- Significant demolition, New Car park, New building

- Significant demolition, New Car park, New building

• Limited demolitions, Retrofit, Small new building footprints

- Limited demolitions. Retrofit. Small new building additions.



New Build vs Retrofit



- Strong relationships established at project commencement encouraged challenging each other and the brief. **Don't demolish, retrofit instead!**
- Streamlined team allowed for quick analysis of options by contractor and designers to prove a retrofit was possible and within budget.
- Early physical investigations with contractor and designers including load testing informed design decisions
- Close collaboration between cladding suppliers and Cullinans reduced 'business as usual' material waste by 15%
- Access to discussions with the insurers about specific project risks.

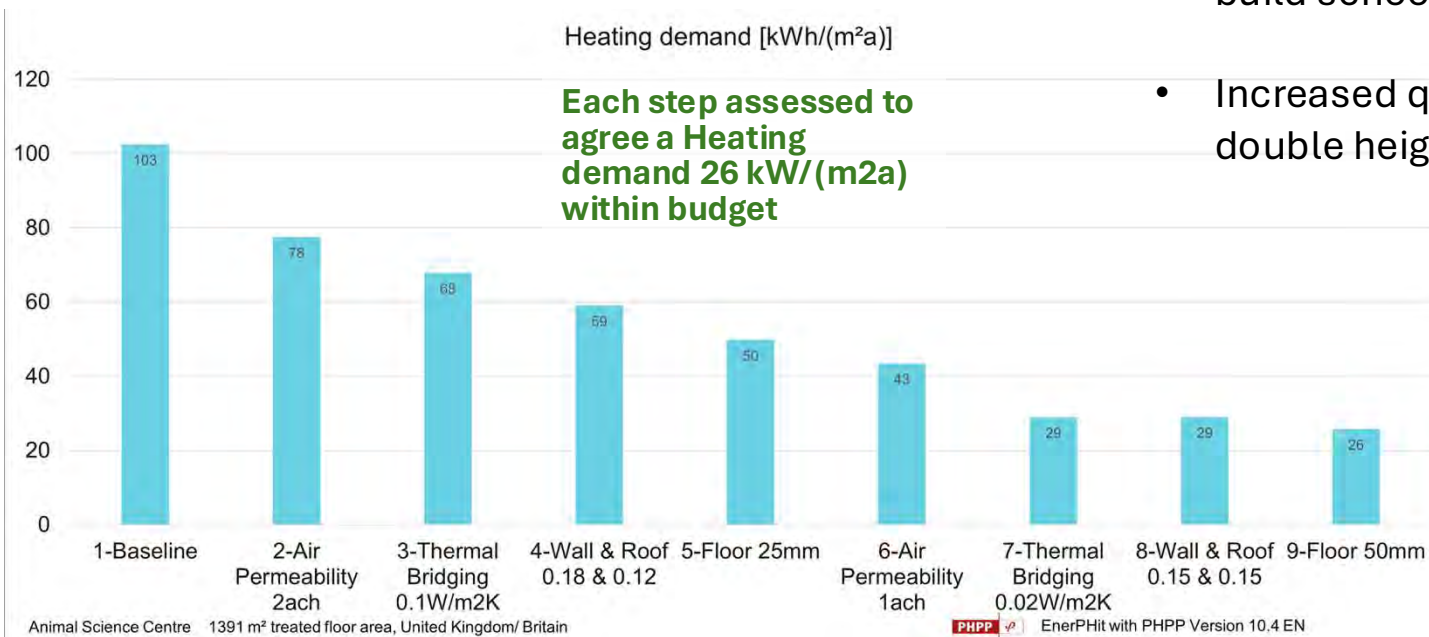
IPI liberates the team



Air tightness focus - $0.91 \text{ m}^3/\text{m}^2/\text{hr}$



- **Using the cost plan as a positive design tool.** Delivered within same budget for new-build, in spite of 20% VAT applicable on retrofit
- Focus on airtightness prevented over-specifying on insulation thickness, saving on cost and material use
- High-performance glazing and liquid applied Passive Purple membrane – helped to achieve 0.91m³/h m² airtightness (Below EnerPhit)
- Structure achieved SCORS A+ rating and embodied carbon of **51kgCO₂e/m²** compared to LETI target of **276CO₂e/m²** for a new-build school. Overall building achieving EPC-A rating
- Increased quality of spaces compared to new build, utilising existing double height volumes and original features



IPI process improved performance



Set for demolition



Retrofit Completed



- Project delivered on time, under budget, with full delivery of the client's success criteria
- Design, cost and programme, controlled and co-authored in the open, enhancing ownership and understanding
- Collective management of opportunities and risk, with specific strategies to achieve / address each one
- Breadth of project awareness and empathy built, strong relationships created
- Supportive and enjoyable project environment, project team and suppliers consistently report mental health benefits
- Greater feeling that contribution is seen as part of the collective effort and value recognised

Tangible benefits

Cullinan Studio experience

- Research and campaigning
- Integrated Project Insurance (IPI)
- **Circular Economy mindset**

BANKSIDE
OPEN SPACES
TRUST

MARLBOROUGH
SPORTS GARDEN



Bristow turkington martin ENGENUITI CUNDALL

BANKSIDE OPEN SPACES TRUST

Bankside Open Spaces Trust (BOST) is an environmental and volunteering charity working to provide outstanding green spaces and outdoor activities that enhance the health and wellbeing of urban communities.

We care for open spaces and share our love of gardening and the environment. We support local people gardening on their estates, run horticultural training and host a range of youth and sports activities throughout the year.



OUR SPACES





THE LOCAL COMMUNITY FACE COMPLEX BARRIERS TO AN ACTIVE & HEALTHY LIFESTYLE

URBANISATION¹

Residents face other challenges of inner-city living including high air pollution and a proliferation of fast-food encouraging a poor diet and inactivity. Recent statistics for Borough and Southwark streets indicate that **71% of dwellings are without private or shared garden**. The Southwark Open Space Strategy recorded that Borough and Bankside are below the borough standard for park provision.

OBESITY²

Southwark has the **highest rate of childhood obesity at year 6** of any local authority in England. Half of all adults in Southwark are overweight or obese. **52.8% adults (16+)** in Southwark do no physical activity or sport at all.



Half of all adults in Southwark are **overweight or obese**

¹ Urban Health Index (UHI) for Lambeth and Southwark.

² Everybody's Business - Southwark Healthy Weight Strategy 2016/2021, Southwark Health and Wellbeing Board.



CULLINAN
STUDIO

PROPOSAL OVERVIEW



Adding a building to the open sports ground creates new opportunities for broader community use and year-round access. The new building creates a welcoming entrance to the garden from Union Street.





CULLINAN
STUDIO

RECLAIMING MATERIALS

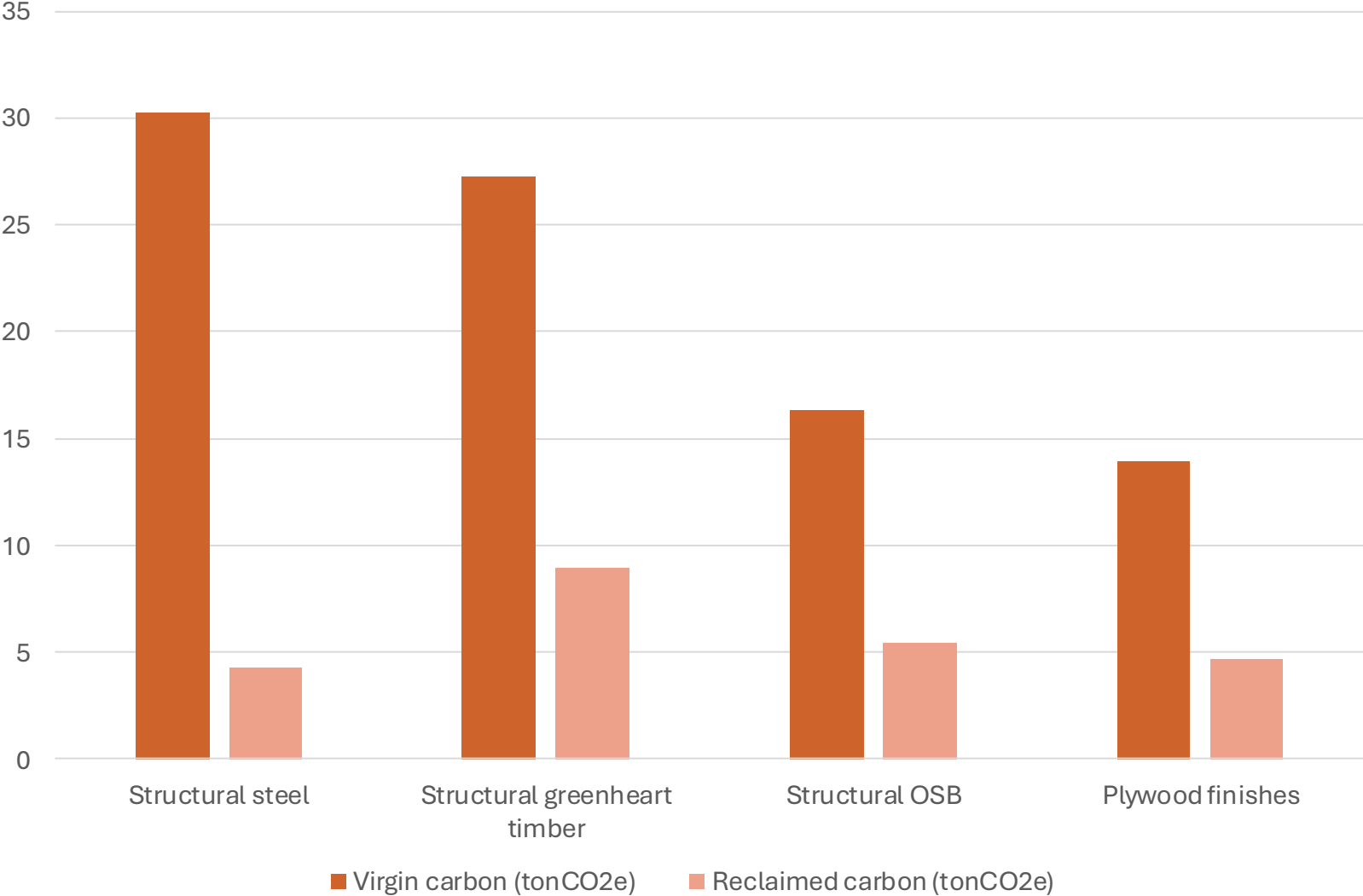


Visited Ashwell Timber Reclaim Yard to begin exploring reclaimed timber possibilities for integration into the construction project's material strategy.



Cleveland Steel and Tubes, Thirsk, North Yorkshire

RECLAIMED VERSUS VIRGIN MATERIAL CARBON



Some of the largest material contributors to the Marlborough Sports Garden building’s carbon expenditure and reduced significantly by obtaining them from reclaimed sources.

Zero Avoidable Packaging Waste in construction

Banding

Plastic bands are used to strap construction products into pallets and are single use; they can also be described as single use slings. They can either be LDPE, PP or Polyester (PET). If they are LDPE, they can be recycled and stretch wrap.

Zero Avoidable Packaging waste in construction

Shrink and stretch wrap

The main purpose of using shrink and stretch wrap on construction products is to keep the products together as a pallet. During transportation, these

bands are used to protect products are also construction products and as a result in construction products, a highly wrapped product machine or hand pre-dominantly is packaging by use.

The plastic type is example on brick paper, and plastic product until it is construction site in a bulkier site removed and is a due to the market assemble for use plastic is then set recycling. This is will determine what and, coloured plastic refuse sacks and higher profile applications. Stretch wrap is of installation. Some require it when it is used this makes faster to handle also apply stretch transportation.

Clearly identified of flexible plastic represents clearly plastic packaging issue is thought construction such materials may be economics and is

Zero Avoidable Packaging waste in construction

The plastic packaging types are now described.

Buckets

Plastic buckets made from Polypropylene (PP) are used for storing paints and products containing liquids. Before plastic buckets can be used for recycling they need to be cleaned of any residues. As a result it is more difficult to process and divert this plastic packaging type from energy from waste and landfill.

Bags

LDPE bags are used for packaging forward and plastic products. Loose temporary items such as screws and nails are put in LDPE bags. Since the type of plastic used for this packaging forward is LDPE, it can be segregated with the other film packaging materials.

Woven polypropylene bags

These bags are commonly used to transport bulk to construction sites. These bags are for one-use only and are not suitable for reuse by the manufacturer for health and safety reasons. Since the bag is used to fill and store heavy materials these bags can be only used once i.e. getting the material from the manufacturer or builders' merchant to a point of use. This packaging type is recyclable. One of the main UK builders' merchants offered the 'Take Back' collection of woven PP bags from their customers' site. The bags are stored at their premises, where they are baled and sent to a plastic reprocessor.

Other

Other types of packaging which cannot be used in the and windows recyclable. For used for polyethylene. Clear sheets of packaging are PET.

ecoSURETY

ZAP

**ZERO
AVOIDABLE
PACKAGING
waste
in construction**

ASBP The Alliance for Sustainable Building Products

BANKSIDE OPEN SPACES TRUST

CULLINAN STUDIO

mace

MORGAN SINDALL CONSTRUCTION

Research on packaging



Re-processed plastic flakes

‘Statistics for the UK show that around a third of construction plastics are **recycled**, while a third go to **landfill**, and a third are **incinerated**’.

Here's What Those Plastic Recycling Numbers Mean



The Specifier should be an informed consumer demanding change. Retail knowledge ahead of construction.

Plastic types, their use in construction and recyclability

8 types of plastic account for 90% of plastics used by the construction sector ^{vi}

symbol	Abbre- viation ^{ix}	Full name	Re- cycla- ble ^x	Ease of recycling ^{xi} (in pure form)	Typical Construction ^{xii} Uses (many construction products are made from a composite of several types of plastic making recycling difficult)
	PETE (PET)	Polyethylene Terephthalate	Yes	Easy	Recycled PET carpet. Packaging such as banding. Water bottles.
	PE - HD/PE-MD	Medium/high density polyethylene	Yes	Easy	Tubing, piping, ducting, and guttering, waterproofing and linings, shrink wrap
	PVC	Polyvinyl chloride	Yes	Difficult	Single ply membranes, Flooring, Tubing, piping, ducting, and guttering, door and window frames and other external profiling such as cladding, soffits and fascia boards, flooring and cabling, waterproofing and linings
	PE-LD/PE- LDO	Low density polyethylene	Yes	Manageable	Packaging such as bags, bandings, stretch wrap, shrink wrap, hoods. LDPE packaging film is a very common waste product on construction sites and worth focussing efforts on reducing.
	PP	Polypropylene	Yes / No	Easy	Carpets, Tubing, piping, ducting, and guttering, Packaging such as shrink wrap, plastic banding, plastic buckets, woven PP bags
	PS	Polystyrene	Yes / No	Difficult / Not collected	Thermal and acoustic insulation, packaging
	EPS	Expanded polystyrene	Yes	Difficult / Not collected	Thermal and acoustic insulation, packaging
	PA	Polyamides	Yes	Manageable	Paints, adhesives, textiles
	PC	Polycarbonate	Yes	Easy	Transparent roofing sheets, interior linings, light fittings
	PMMA	Poly methyl methacrylate	Yes	Difficult	Transparent sheet, windows, smart screens
	PUR	Polyurethane	Yes	Manageable	Thermal and acoustic insulation
	PEE	Unsaturated polyester	Yes	Easy	fibre reinforced plastics, sanitary-ware, tanks, pipes, gratings
	S	Silicone	Yes	Manageable	Sealants, adhesives, lubricants, paints
	OTF	Other thermoplastics	Yes /No	Various	
	ABS	Acrylonitrile Butadiene Styrene	Yes	Easy	light, rigid, moulded products such as pipe, enclosures, and hard hats and helmets, LEGO
	OTS	Other Thermoset	No	Difficult	Powder coatings
					^{vi} Paint appears as the largest source of microplastic leakage into the Ocean & Waterways (1.9 Mt/year), outweighing all other sources of microplastic leakage (e.g. textiles fibres and tyre dust) ^{xiii}

ZAP
ZERO
AVOIDABLE
PACKAGING
waste
in construction



Production of recycled PET emits **5 times less carbon emissions** compared to virgin PET.

Source: Based on Alpla Group Data, 2017



© 2020 Prevented Ocean Plastic

Using recycled content products **can** reduce CO₂ emissions and keep plastic out of landfill and incineration flows. PET is one of the easiest to recycle.



Tipping Point East (TPE) is a circular construction hub founded in 2025 and based in Newham, East London. From 2026, TPE will operate from a 20,000 sqm industrial site in the Royal Docks, bringing together material reuse, low-carbon construction, training and cultural activity to support a just transition in the built environment.



Co-developed by and housing the practices of **Yes Make**, **RESOLVE Collective** and **Material Cultures**, Tipping Point East is advising on supply of building elements.

Find our more

<https://www.cullinanstudio.com/>

<https://www.ipinitatives.co.uk/>

<https://asbp.org.uk/group/plastics-in-construction>

<https://www.tippingpointeast.com/>

Or contact me

carol.costello@cullinanstudio.com

The practical realities of getting novel materials on major developments

Why some make it and some (many) don't

Useful Simple
Trust

*Purpose driven
consultancy for our
changing environment*



Hayley Cormick

Associate Director

*Sustainability advisor, carbon
assessor, circular economy
strategist, materials specialist,
winter enthusiast, mum*

Accelerating bio-based architecture

Introduction



Architype
powered by
Perform+

Perform+
powered by
Architype

Seb Laan Lomas

Lead, Perform+
Associate, Architype

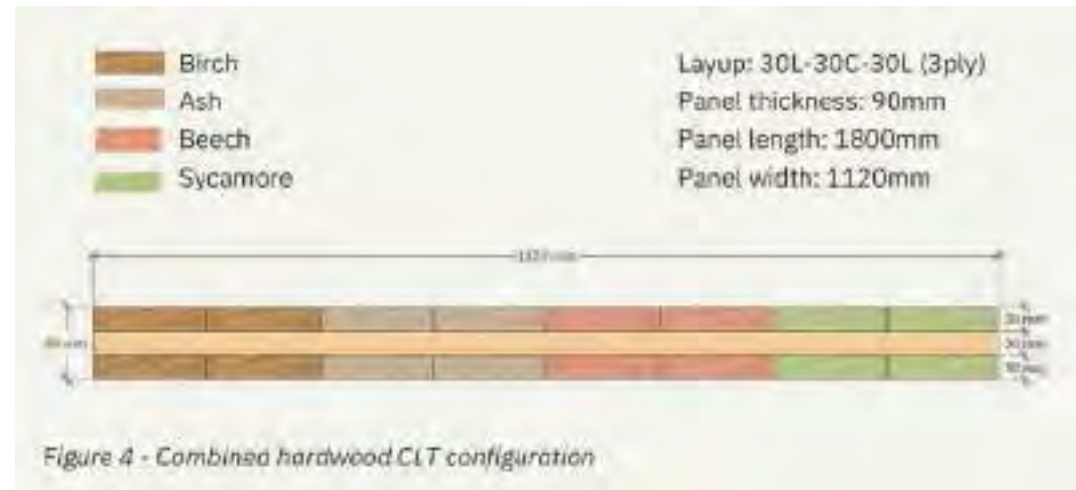
UK Opportunities

- Structural timber
- Bio-based insulation
- Retrofit
- Circularity
- Bio-economy
- Just transition



Building from England's Woodlands

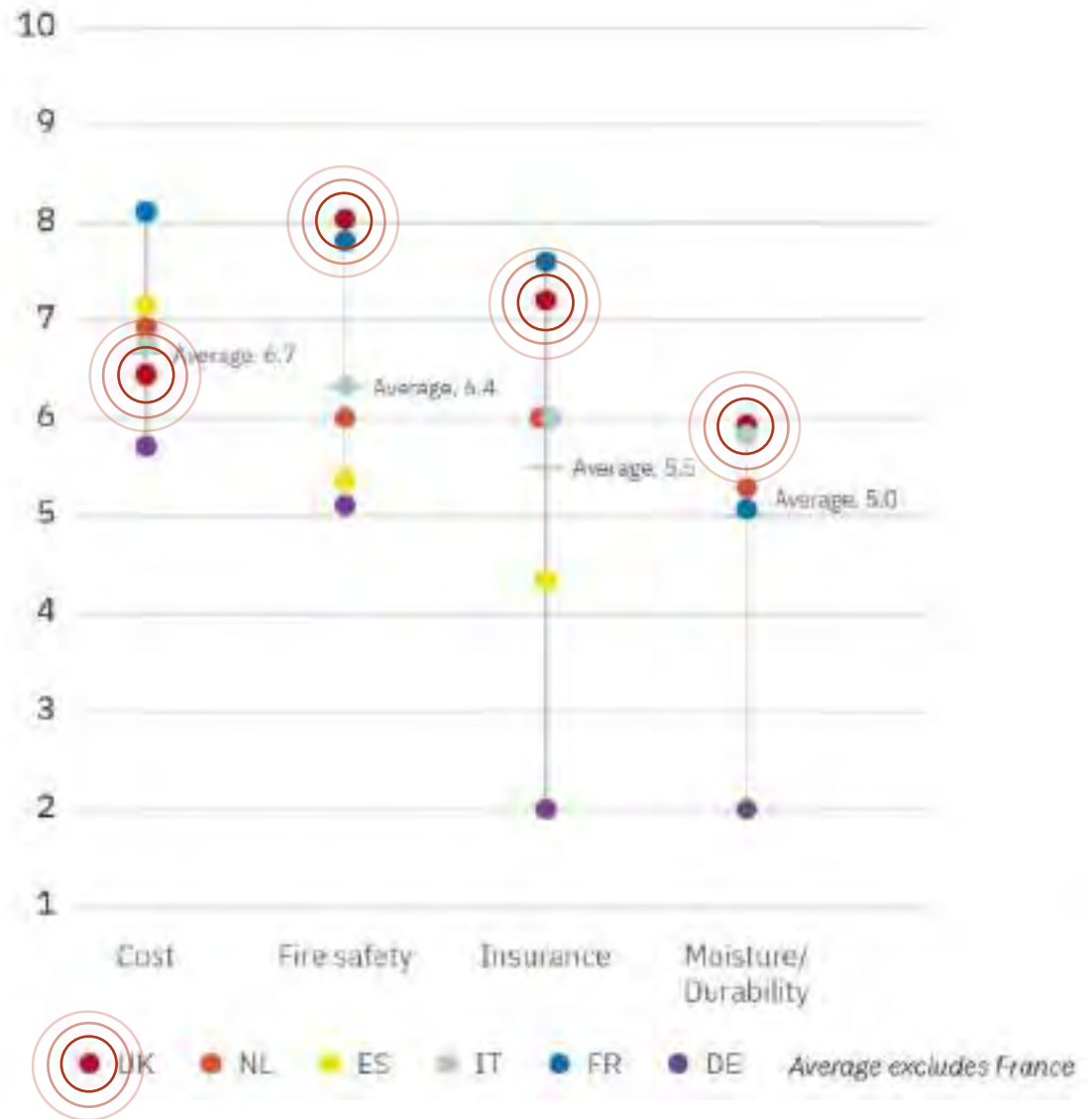
- Rekindling woodland management
- Climate adaptation
- Resource efficiency
- Material displacement



State of the Nation

- Lowest confidence across Europe for adopting timber
- Unique priorities
- Exempt from Energy Performance of Buildings Directive

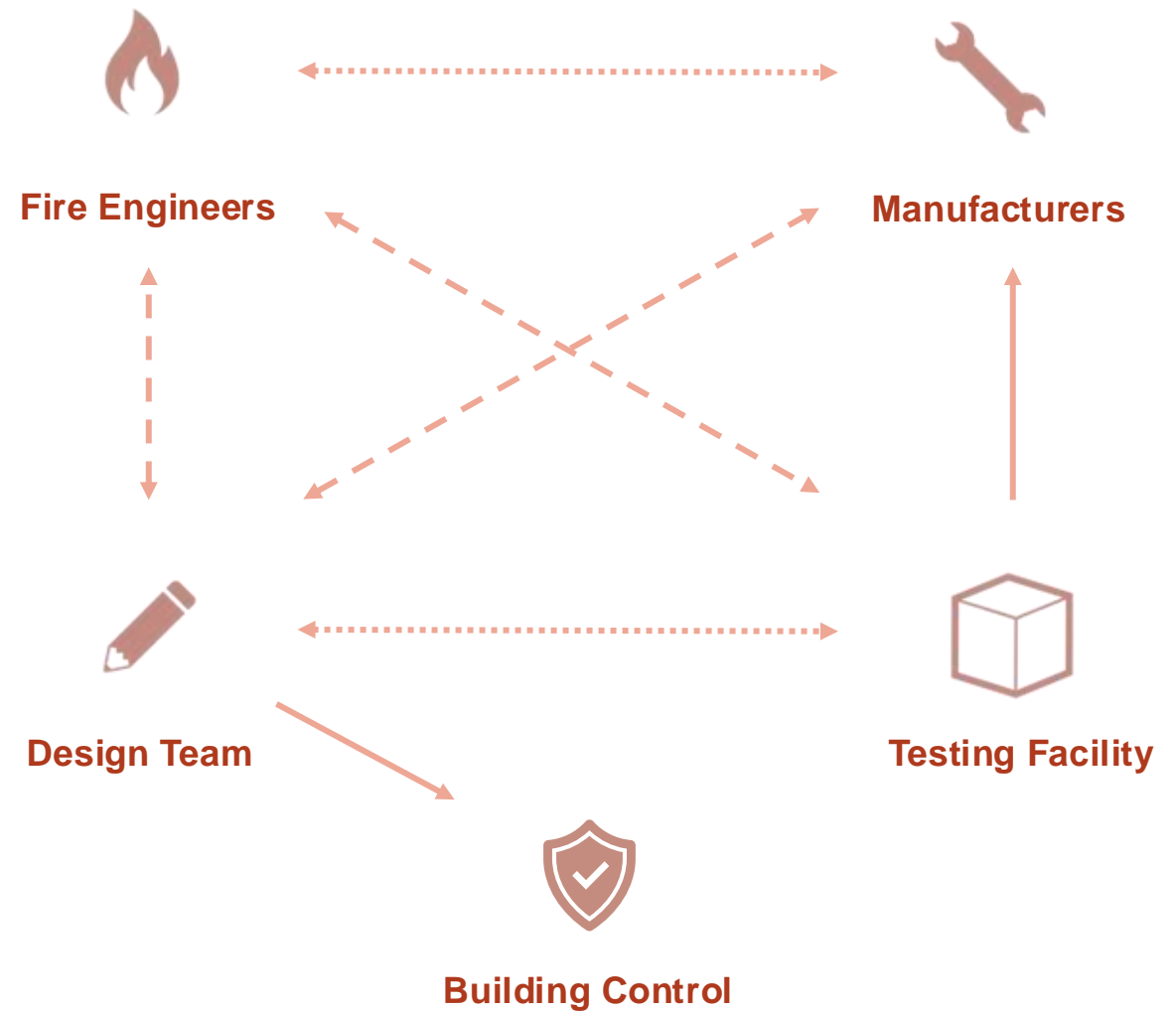
Rating the impact of challenges to adopt timber



Fire Resistance

Current limitations

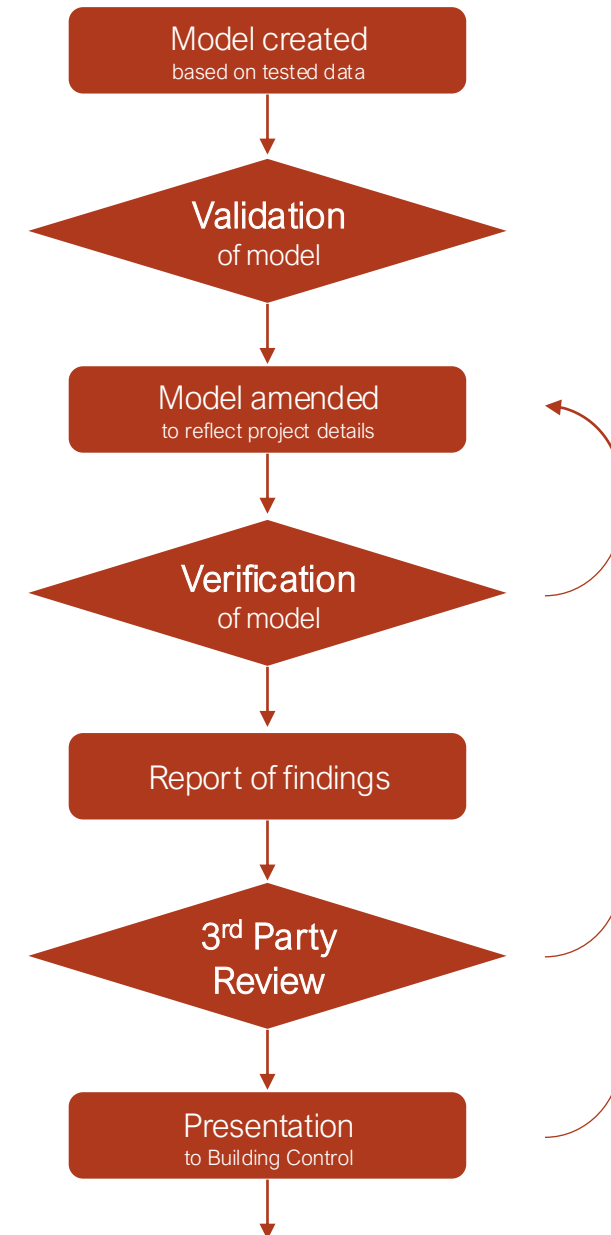
- Height
- Loading
- Arrangement
- Dimensions
- Product-specific
- 5-year limit of use
- Expired references
- Non-disclosure agreements
- Materially agnostic issues



Eurocode 5

A new solution

- Established on Continent
- Materially agnostic
- UK adoption
- Capacity and competency
- Expense and time



Built examples

Maybury Primary School

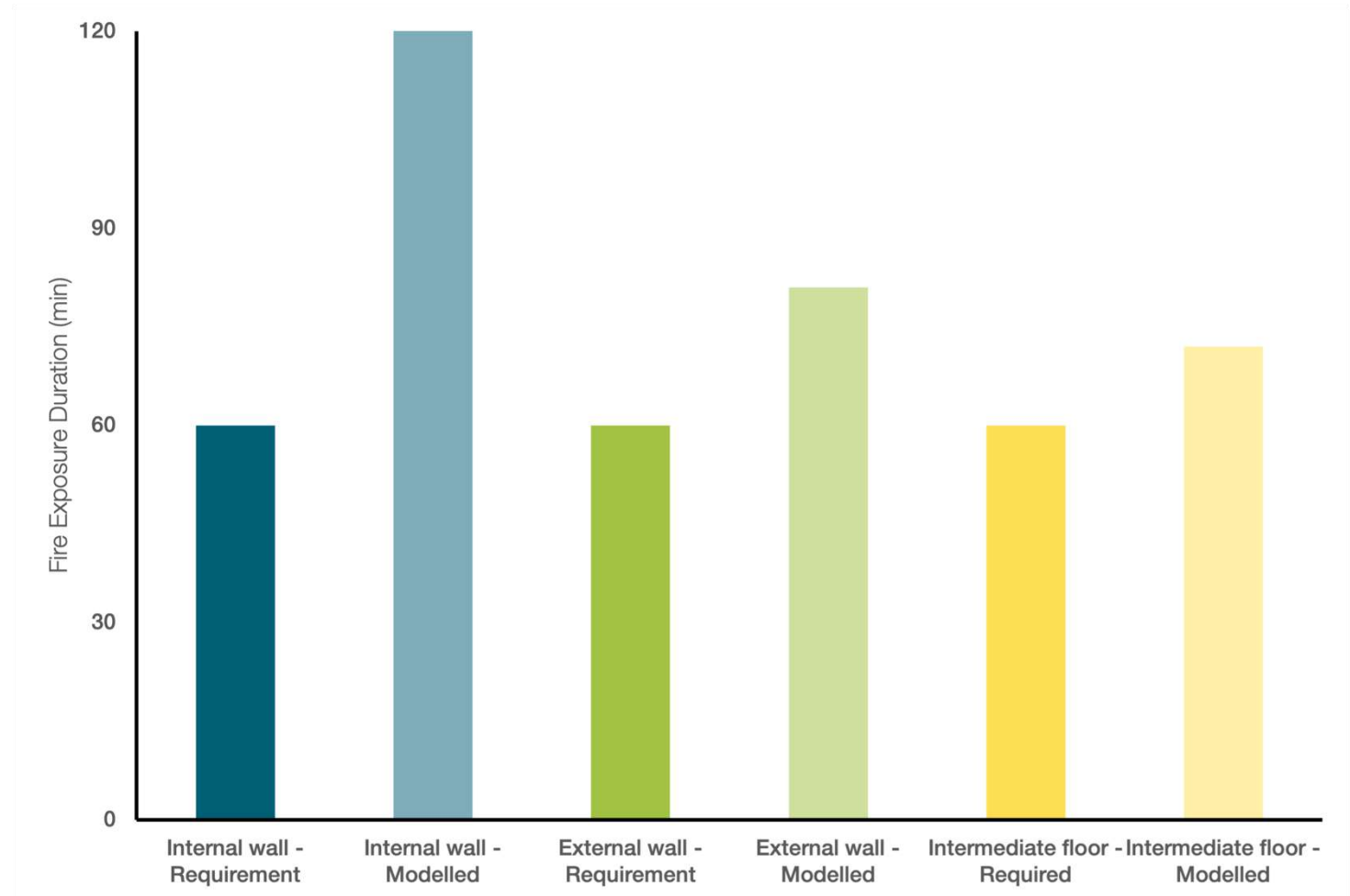
- Scottish school programme
- Performance-linked funding
- Passivhaus certified
- Timber frame & insulation
- Building control journey
- Versus concrete and steel market dominance



Quantifying Conservatism

- Iterative
- Transparent
- Optimisation

Conservatism = Carbon + Cost



Safe Schools for the Future

Download the guidance from www.SafeSchoolsForTheFuture.com

A holistic approach beginning with a robust fabric, with efficient systems, delivered via a quality assured construction process, informed by learning from the previous project. This publication shares in-use and design insights from 17 built timber-framed primary schools with consistent outcomes:



Cost

- 1 Construction costs have been as much as **19% below** industry average construction costs, benefiting from optimised supply chain from successive projects.
- 2 Using this approach, a school could save **£50,000 a year** in energy bills due to the highly efficient building fabric and very lean service strategy.
- 3 Safe Schools for the Future can be built from UK-grown structural timber, supporting the growth of our forests and our rural economies.

Timber

- 1 Structural timber can effectively be separated and structurally unaffected by internal fires through the use of encapsulation. New research demonstrates that there is significant conservatism in how the industry designs for fire resistance.
- 2 The bio-based materials store around **300 tonnes of carbon**, removed and prevented from contributing to global warming. This is the equivalent of offsetting 4 million cups of tea being enjoyed.
- 3 This approach utilises low-tech readily-scalable construction methods that also can be prefabricated and pre-panelised for on-site programme efficiencies.



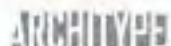
Health

- 1 Healthy classrooms require a holistic approach, with all elements working in unison. Together, fresh air is efficiently and constantly provided to all learning spaces.
- 2 Combining bio-based materials with efficient ventilation, harmful volatile organic compounds in the classroom can be **50% lower** than in other schools.
- 3 Visual connection to bio-based materials has been demonstrated to have a calming effect on school children, with **lower heart rates**, improving overnight sleep and recovery.

Performance

- 1 Learning from previous projects and closing the design loop is vital for continued learning. **CO2 levels were halved** between two generations of case study schools.
- 2 Operational energy use in the average England school is almost **3 times** that of the case study schools. This performance level is achieved through a holistic approach, underpinned by Passivhaus certification.
- 3 Embodied carbon emissions are up to **60% below** the current UK Net Zero Carbon Building Standard limit, due to bio-based materials and lean material use.

Project team:



Funded by:



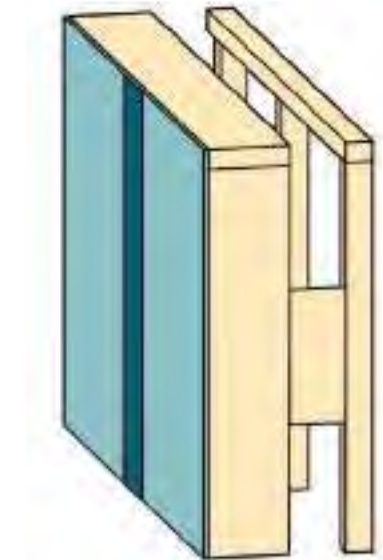
Presented to:



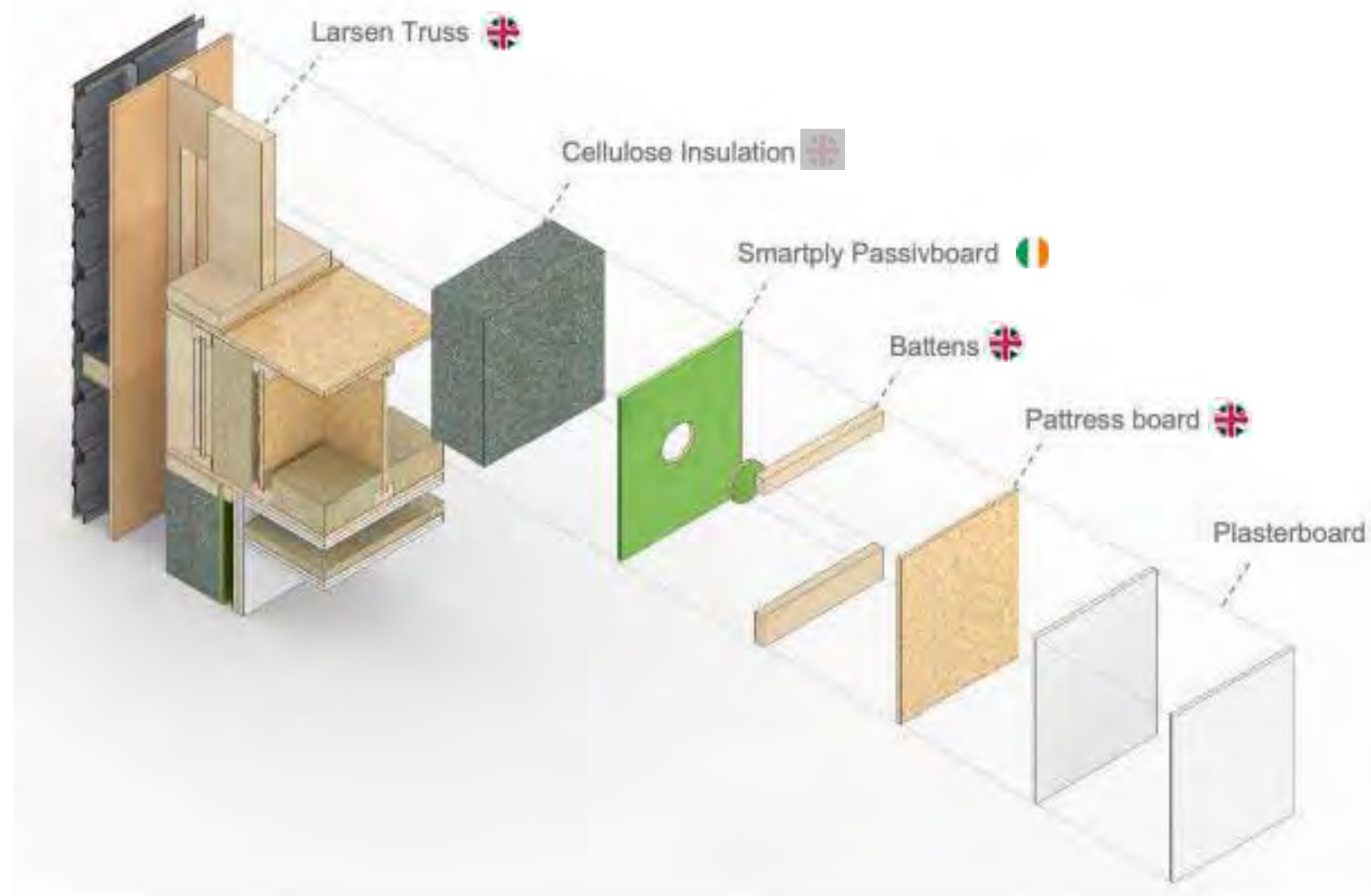
Contact the team at SafeSchoolsForTheFuture@architype.co.uk

Larsen Truss System

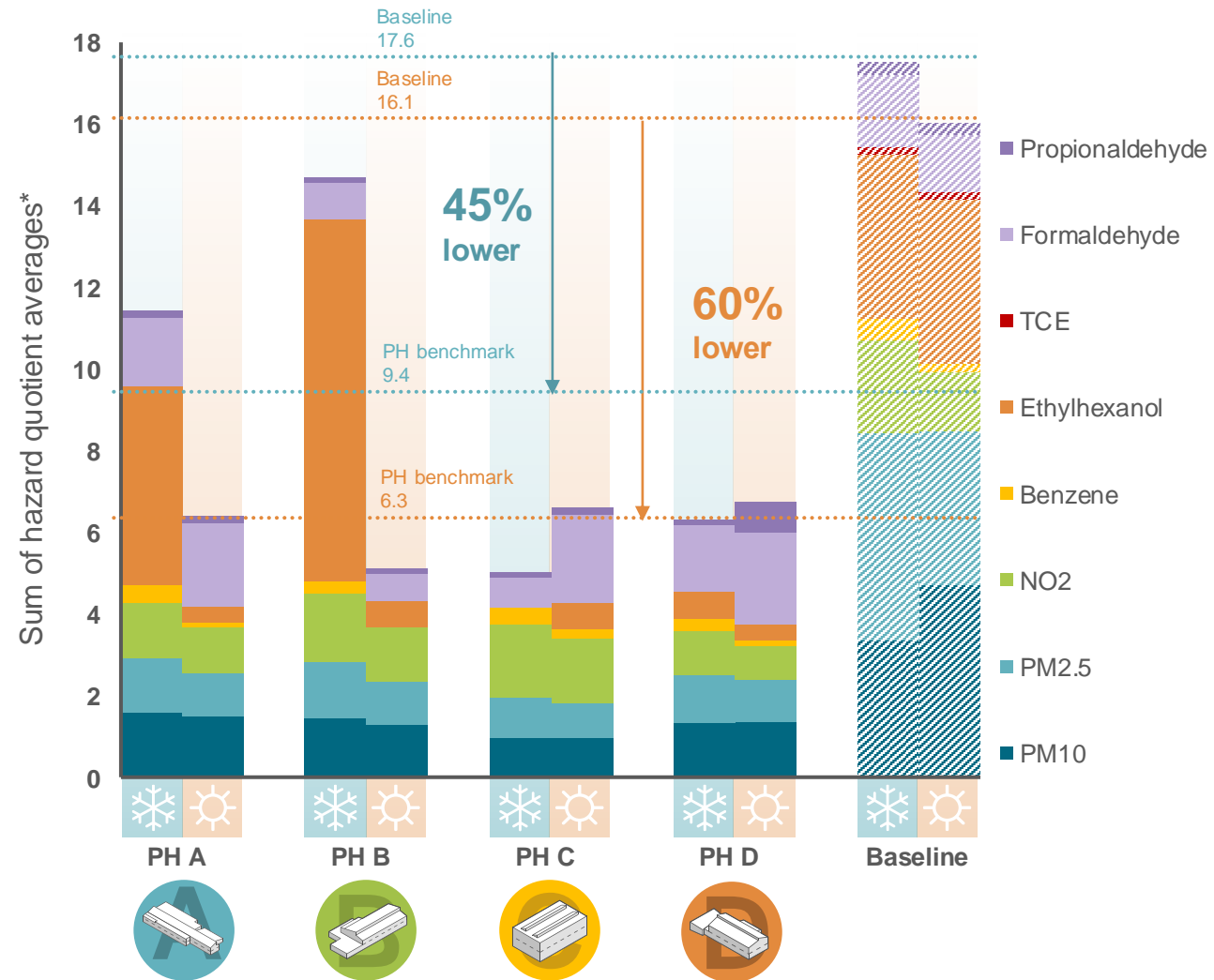
1. Level 2 MMC
2. UK-grown C16
3. Materially efficient
4. Good thermal performance
5. Significant carbon store
6. Deployable at scale
7. Low fabrication set-up costs
8. Fire tested build-ups



Home grown timber products



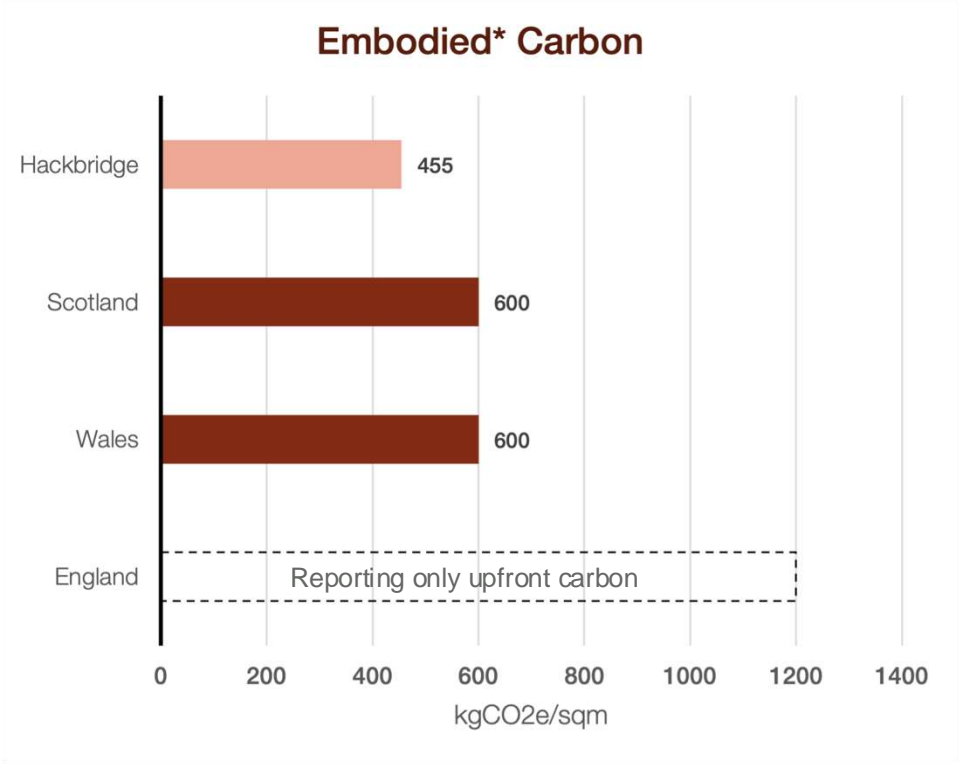
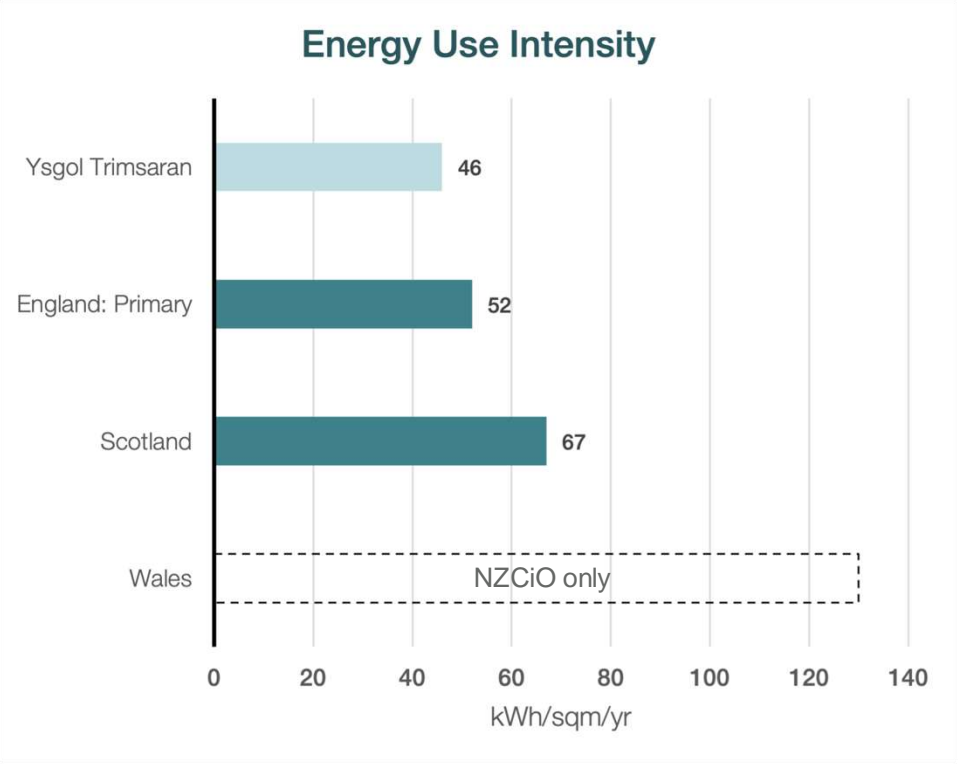
Healthier classrooms



*Total indoor air quality health related index (HI) - sum of hazard quotient averages (selected VOCs, NO₂, PM_{2.5} and PM10)

Chryssa Thoua and UCL 2025

Bettering the targets



Data from Department for Education, Scottish Futures Trust and Wales' Sustainable Communities for Learning Programme

Guidance for Project Teams



www.SafeSchoolsForTheFuture.com



1



2



3

Thank you

Seb Laan Lomas

Seb.laan-lomas@architype.co.uk





SCALING SUSTAINABLE SOLUTIONS – SUMMARY OF BARRIERS & ENABLERS

Emily-Rose Garnett, UK Green Building Council

The voice of our sustainable
built environment

UK Green Building
Council ukgbc.org

**TO RADICALLY IMPROVE
THE SUSTAINABILITY OF
THE BUILT ENVIRONMENT,
BY TRANSFORMING THE
WAY IT IS PLANNED,
DESIGNED, CONSTRUCTED,
MAINTAINED AND
OPERATED.**





KEY AREAS



**Climate
Change
Mitigation**



Nature



**Climate
Adaptation**



**Health,
Wellbeing &
Social Value**



Resource Use



UKGBC SOLUTIONS & INNOVATION

AIM: UKGBC's Solutions & Innovation work seeks to drive innovation by identifying, showcasing and supporting the scaling of practical and impactful solutions, and reinforcing the wider innovation ecosystem.

SHOWCASING SUSTAINABLE SOLUTIONS

AIM: Raise awareness of innovative sustainability solutions being developed and deployed across the industry, to showcase best practice and knowledge share

TRENDS REPORT

SHOWCASE WEBINARS

SOLUTIONS LIBRARY

CASE STUDY LIBRARY

SCALING SUSTAINABLE SOLUTIONS

AIM: Increase the implementation of innovative solutions in the built environment resulting in positive sustainability impacts

IDENTIFICATION OF BARRIERS AND ENABLERS TO SOLUTIONS SCALING
(INCLUDING ANALYSIS OF EXAMPLES AND CASE STUDIES)

MATCHMAKING SERVICE & LIVE PROJECT ENGAGEMENT

KTP – RECOMMENDED ACTIONS AROUND KEY ENABLERS

INNOVATION INITIATIVE - BREAKTHROUGH ENERGY & FORE PARTNERSHIP

INNOVATION MAP

REFERENCE DESIGN

SOLUTIONS & INNOVATION ADVISORY SCHEME



TROUP
BYWATERS
+ ANDERS

M
MOTT
MACDONALD

CUNDALL

EBA

SWECO

noa

Undivided

WARD
WILLIAMS

AECOM

firstplanit.

H | M
HILSON
MORAN

THE CROWN
ESTATE

ARUP

envision

IStructE

Turner & Townsend

CBRE

sustainable
ventures

mace

KOMPAS

LLOYDS
BANKING
GROUP

RELATED
ARGENT

TISHMAN SPEYER

AESG

2050
CLIMATE
PACT

REACH
enabling the world to reach net zero

CONCRETE

HOARE LEA

PRINCETON

BURCHARDT
ENGINEERING

Places
for
London

GROSVENOR

One
Click
LCA

[PT1]

ecobuild
TECHNOLOGY



wsp

UNIVERSITY OF
BATH

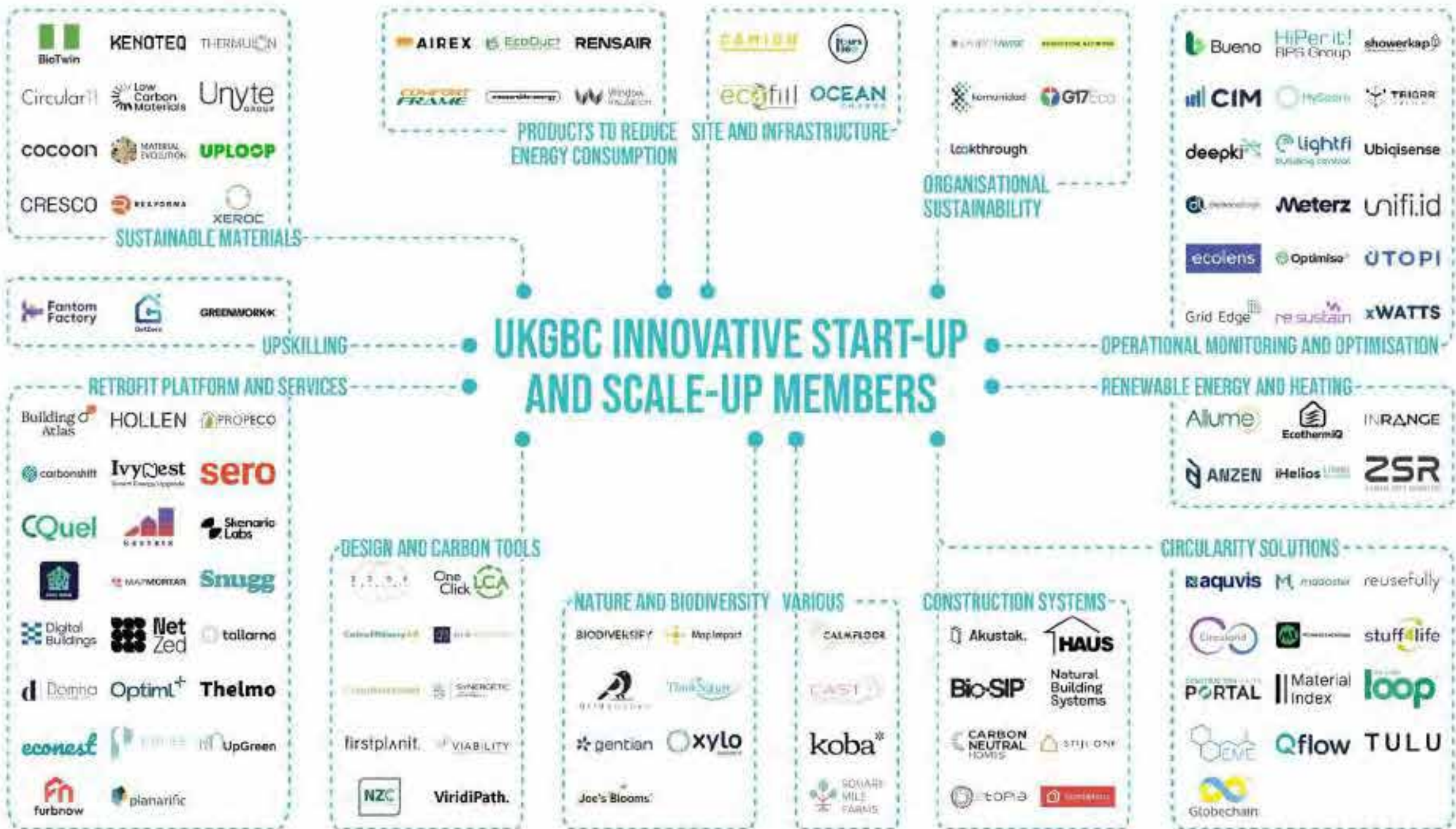
BL

AKS Ward
DESIGN BUILD TEAM & MAINTENANCE

MAPP

RAMBOLL

make



Search Company Logos ▲

Showing results for:

[Whole graphic](#)

Tag filter

☒ Air quality☐ Concrete☐ Bio-based materials☒ Modern methods of construction☐ Embodied carbon☐ Renewable energy and storage☐ Operational energy☒ Reuse☒ Smart buildings☐ Steel☐ Water efficiency☐ Products as service

**~250+ INNOVATIVE
MATERIAL
PROVIDERS
MENTIONED**

[UKGBC.ORG/RESOURCES/COMMERCIAL-RETROFIT-INNOVATION-MAP/](https://ukgbc.org/resources/commercial-retrofit-innovation-map/)

SCALING SUSTAINABLE SOLUTIONS: Y1



Matchmaking service and engagement on live projects

To leverage UKGBC's network to make targeted connections between solution providers and adopters, to increase the number of sustainable solutions implemented in the built environment.

Barriers, enablers and case studies

To understand barriers and enablers to solutions scaling in the built environment and identify examples.

PARTNERS:

BURO HAPPOLD



HOARE LEA (H.)



RAMBOLL



TERMINOLOGY

'SCALING'

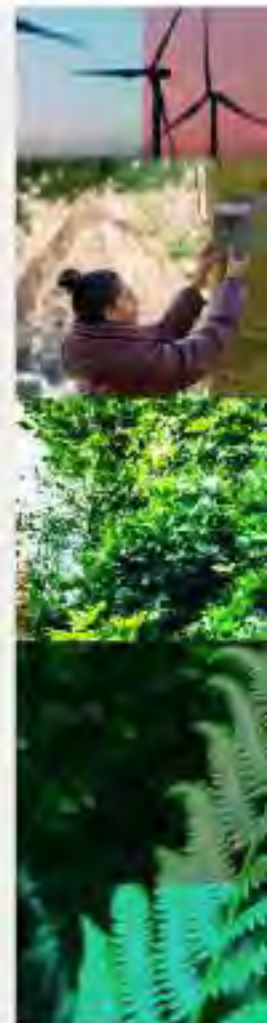
Moving innovative sustainable solutions in the built environment from one-off pilots to more **widespread, repeatable** adoption.

Embedding innovative solutions into **standard practice** so they are specified, procured, financed and delivered at scale.

'SUSTAINABLE SOLUTIONS'

Don't necessarily need to be new, but need to be scalable and possible to pilot or implement now.

For the first year of the project, solutions considered include: **materials, construction systems, hardware / physical technologies, operating / financial models, processes or software / digital technologies.**



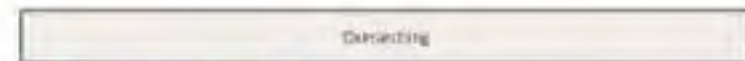
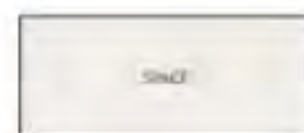
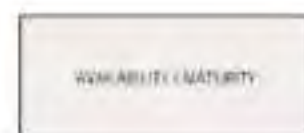
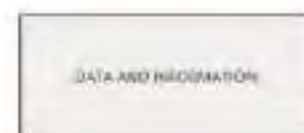
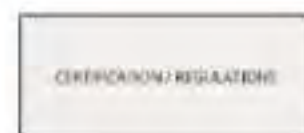
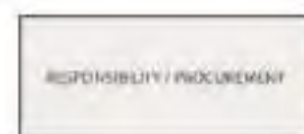
SCALING INITIATIVE RESEARCH

Research to date:

- Carried out interviews with innovators
- Conducted 4x Innovation Forum workshops on:
 - Collaboration models
 - Organisational strategy
 - Financing innovation
 - Risk, insurance and warranties
- Conducted literature review and desktop research

Research next steps:

- Testing enablers with stakeholders
- Applying enablers to specific solution categories



ORGANISATIONAL READINESS

EMERGING INSIGHTS

BARRIERS

Lack of organisation-level **innovation strategies** or governance within solution adopters

Lack of decision-maker **capacity** to allocate to reviewing solutions

Lack of **incentives** for prioritising innovation

Organisations have poor **change management processes** and expertise

ENABLERS

Sustainable innovation **incentivisation**

Establish **project risk thresholds** at an early stage

Solutions adopters to define **strategic approach** to innovation and identify **innovation challenges**



PROBLEM-SOLUTION FIT

EMERGING INSIGHTS

BARRIERS

Solution adopters have challenges in **identifying and comparing** most appropriate solutions

Many stakeholders to convince on built environment projects

Opaque adopter needs so hard for solution providers to prioritise engagement

Limited **information and data** available for early-stage innovations to properly assess

ENABLERS

Compilation of industry challenges across multiple projects and organisations

Solution providers offering **modular and integrated** packages so they can easily embed into workflows.

Platforms that enable better **comparison of data** (e.g. OneClickLCA, Firstplanit, 2050 Materials)



BARRIERS

Start-ups have an **economies of scale** disadvantage

Difficulty making the business case for **long-term ROI**

Scale-up funding gap with support often for earlier stage solutions (Valley of Death)

Expectation of **free or low-cost pilots**

Sometimes misaligned **time horizons** with investors and innovators wanting a faster pace than industry is able to provide

ENABLERS

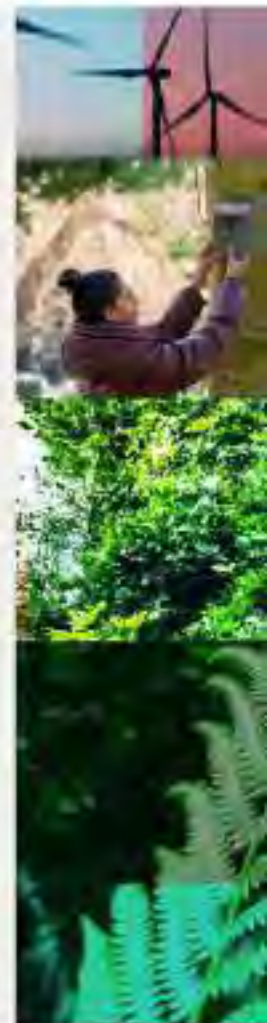
Whole life carbon consideration in investment and procurement decisions

Consideration of **alternative business models** that reduce upfront costs

Collective demand signals from industry to give confidence to investors

Collective funding models to invest in scaling

Direct and/or aggregated **purchase agreements / market commitments**



BARRIERS

Certification **cost** which is a challenge for smaller solution providers

Some certifications can also take a long **time**, further increasing risk and uncertainty for solution providers

Certification requirements and process can be **complex**

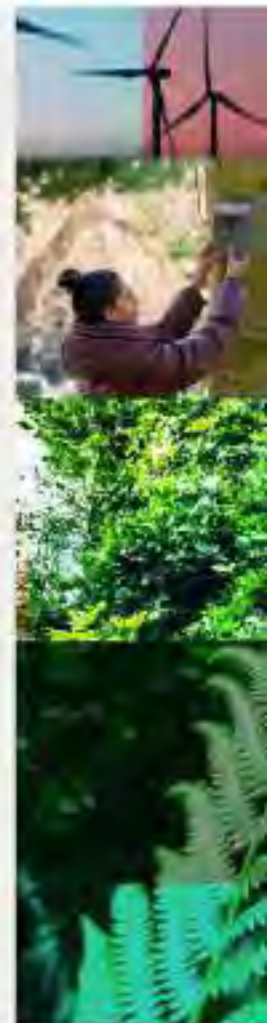
ENABLERS

Funding for certification

Better **sharing of data** between certification schemes

Better **guidance** on what certification is needed for different solution providers

Fast-tracking of sustainable materials through certification



RISK, INSURANCE AND WARRANTIES

EMERGING INSIGHTS

BARRIERS

Innovative solutions can be perceived as **high-risk** because of limited evidence

Industry **culture** of risk aversion

Data burden of third-party risk assessments

Individual PI insurance can create a **blame culture** on projects

ENABLERS

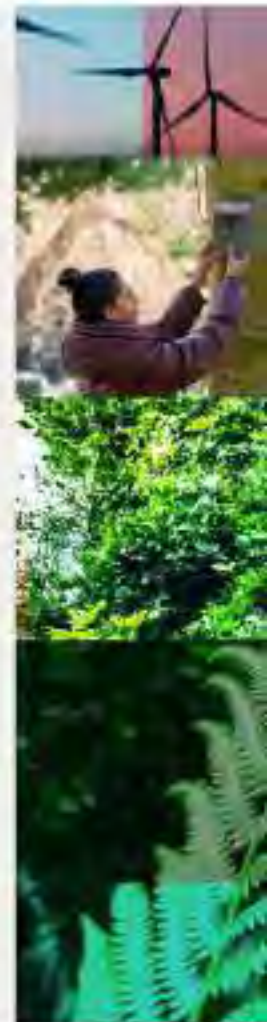
Shared **risk assessment tool** for different solution types

Collaborative insurance models (e.g. Integrated Project Insurance)

Public-private blended insurance schemes to reduce risk to private sector

Early engagement with insurers so they can feed into decision making early

More **testbeds** with higher risk tolerances



DELIVERY AND IMPLEMENTATION

EMERGING INSIGHTS

BARRIERS

Supply chain **unfamiliarity** and lack of installers

Availability and continuity concerns

Procurement can be complex and slow

Wrap-around support services are required

Complex projects with **many stakeholders**

ENABLERS

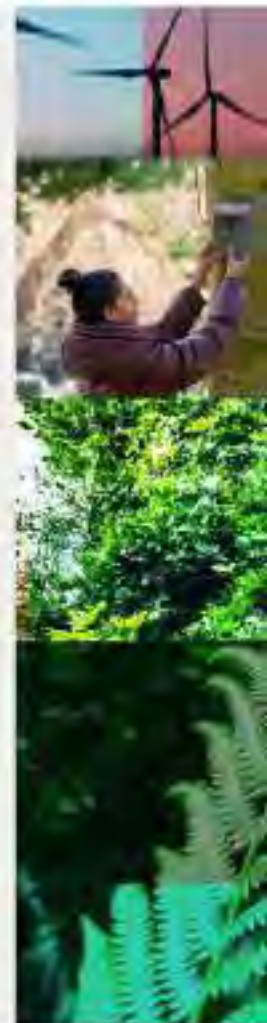
Transparency around delivery capabilities

Twin tracking with innovative material while keeping a proven, conventional solution as a fallback to manage risk

Knowledge hubs for innovative solutions

Early design-in of innovative solutions

Standardised pilot agreements to reduce legal, contractual, and administrative friction



OUTCOMES AND KNOWLEDGE SHARING

EMERGING INSIGHTS

BARRIERS

Poor cross-industry knowledge exchange on pilots

Difficulty creating comparable case evidence

Lack of benchmarks

Pilots not linked to clear routes to portfolio roll-out

ENABLERS

Sharing of results from pilots and implementation examples

More collaborative pilots with open-source outcomes

Clear route maps from pilot to mainstream for specific solution categories

Relationships between organisations with different risk appetites



NEXT STEPS

NEXT Testing enablers with key stakeholders, focusing on **priority solution categories**



PARTNERSHIP

Express your interest in partnering with us to help support, enable and shape the next phase of our work



FEEDBACK

Provide feedback or any case studies on the enablers discussed today



MEETING

Set up a meeting to discuss anything you have heard today



Panel Session: Accelerating Adoption



**Carol
Costello**

Architect & Director
Cullinan Studio



**Hayley
Cormick**

Associate Director
Useful Simple Trust



**Seb
Laan Lomas**

Associate
Architype Architects



**Emily Rose
Garnett**

Senior Advisor
UK Green Council
Building



Innovate
UK

Business
Connect



Networking Break

Return at 15:30



Innovate
UK

Business
Connect

Innovator Support Session: Unlocking Technology Innovation



**Sally
Coultas-Paul**

Lead Advisor
The MTC



**Sunny
Claire**
Senior Innovation &
Growth Specialist
Innovate UK Business
Growth



**Graham
Ormondroyd**
Professor
Bangor University



**Richard
Wigley**
Head of Enterprise
Innovation Networks
Connected Places
Catapult



**Tom
Warren**
Knowledge Transfer Manager
Innovate UK Business Connect



Innovate
UK

Business
Connect

High Value Manufacturing Catapult

22 January 2026

Sally Coultas-Paul (MTC)

High Value Manufacturing Catapult

(HVM Catapult)



- A strategic research and innovation hub for industry, commercialising the UK's most advanced manufacturing ideas
- Consists of 6 HVM Catapult Centres, each with a different theme
- HVM Catapult centres help businesses to transform the products they sell, the way they make them and the skills of their workforce to remain competitive in a global marketplace

Transforming UK industry through innovation



High Value Manufacturing Catapult



Six Catapults

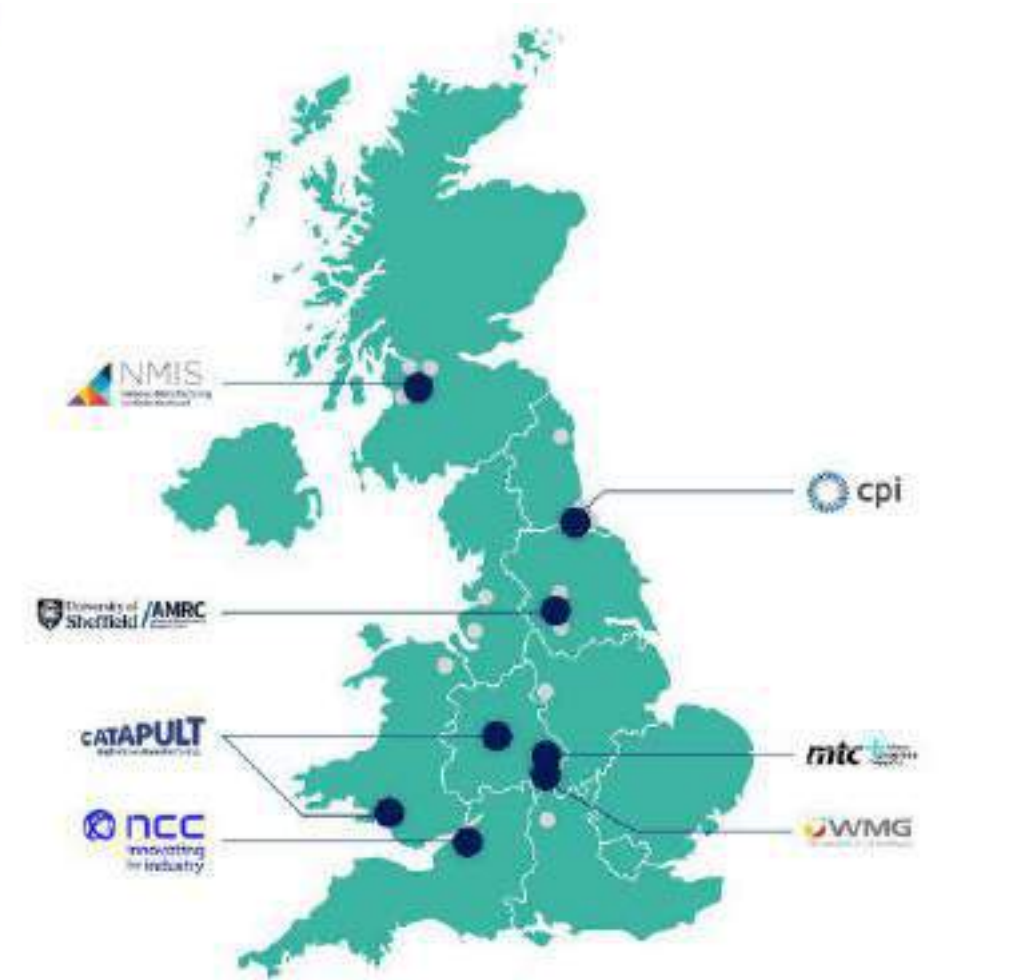
- **AMRC:** The University of Sheffield's Advanced Manufacturing Research Centre (AMRC) is a network of world-leading research and innovation centres working with manufacturing companies of any size from around the globe
- **CPI:** At CPI, we help to transform groundbreaking ideas into real-world innovations that shape the future
- **MTC:** The Manufacturing Technology Centre was established to prove innovative manufacturing processes and technologies in an agile environment in partnership with industry, academia and other institutions
- **NMIS:** A place where industry, academia and the public sector collaborate on ground-breaking manufacturing research to transform productivity, make companies more competitive and boost workforce skills
- **NCC:** Innovating for industry. Transforming today's industries and creating tomorrow's
- **WMG:** An academic department of the University of Warwick, WMG is a world-leading industrial research and education group.



High Value Manufacturing Catapult

Where the are Catapults located

- Six main locations plus satellite centres
- Choose by location or Catapult's specialism?
- Dependent on level of expertise needed
 - Early engagement may be suited to local Catapult
 - Complex projects are best suited to the right expertise



High Value Manufacturing Catapult

How we help UK Industry



Our Impact

3,700+

of the UK's best engineers, scientists and technicians

- Employs some of the best brains in the country
- Breadth and Depth of Expertise

3,000+

SME businesses transformed each year

- From conception to start up
- From start up to scale up

30,000+

manufacturing business supported since 2011

- Ideas to Prototypes
- Supporting and growing UK Industry



High Value Manufacturing Catapult

Collaborative Research & Development

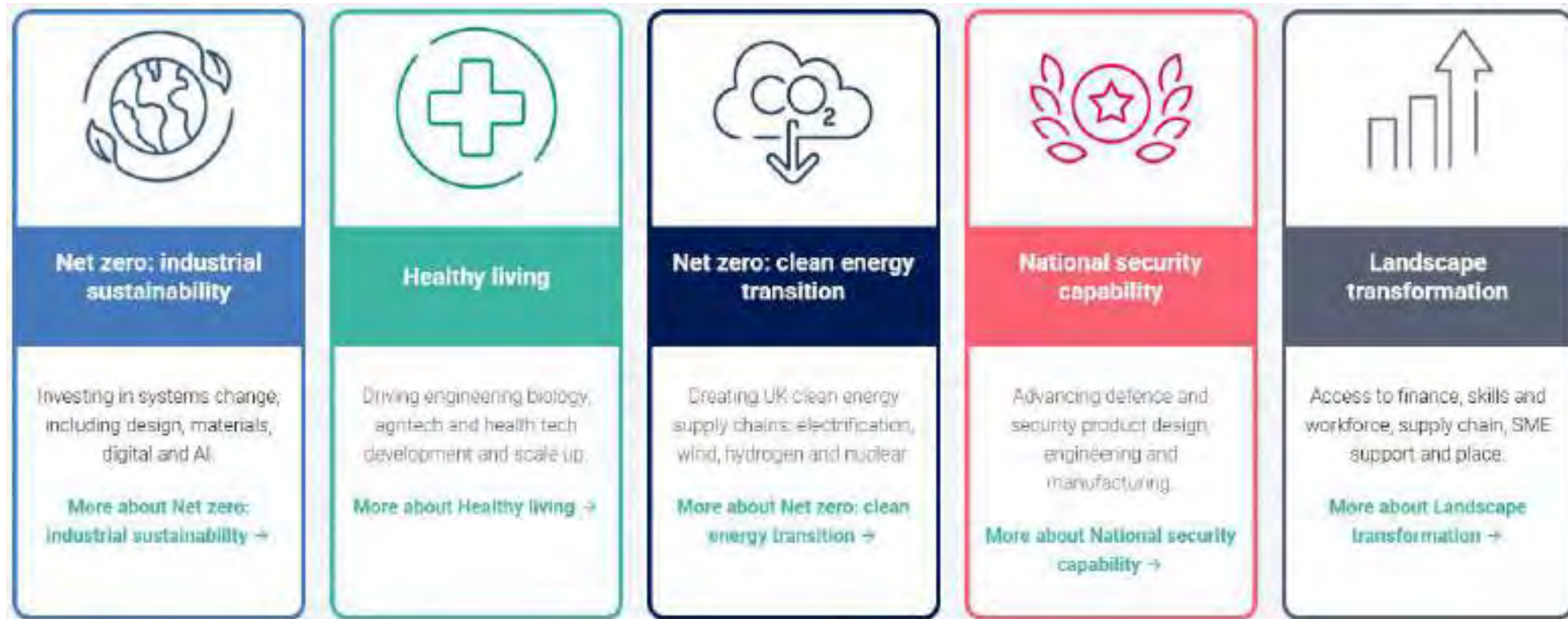


Stand shoulder to shoulder with our clients, work with them to help them achieve their aim



High Value Manufacturing Catapult

HVM Catapult current focus areas



High Value Manufacturing Catapult

Funding Opportunities Supported by Innovate UK



- Reach – Match Funding
- Innovate UK Business Growth (IUKBG)
- Horizon Europe

[Innovate UK – UKRI](#)

[Apply for funding – UKRI](#)

<https://iuk-business-connect.org.uk/how-we-help/innovation-funding-and-support/innovate-uk-grants-how-to-apply/>



Carapace

Waste Slate Turned into Roof Tiles



- Waste from slate mines and slate processes turned into composite roof tiles



Carapace

Waste Slate Turned into Roof Tiles

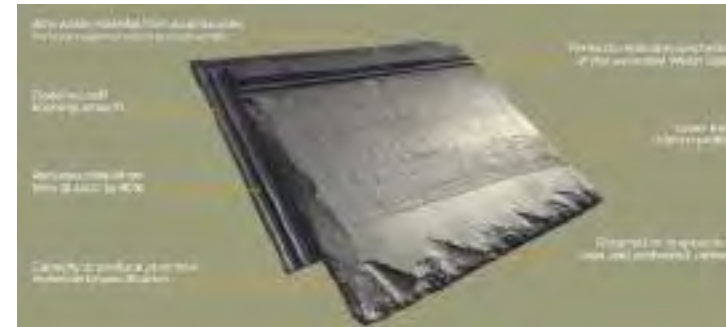


- Waste from slate mines and slate processes turned into roof tiles



[Home - Carapace Slate](#)

[carapaceslate.com/FileHub/Carapace animated explainer VS2 Release.mp4](https://carapaceslate.com/FileHub/Carapace%20animated%20explainer%20VS2%20Release.mp4)



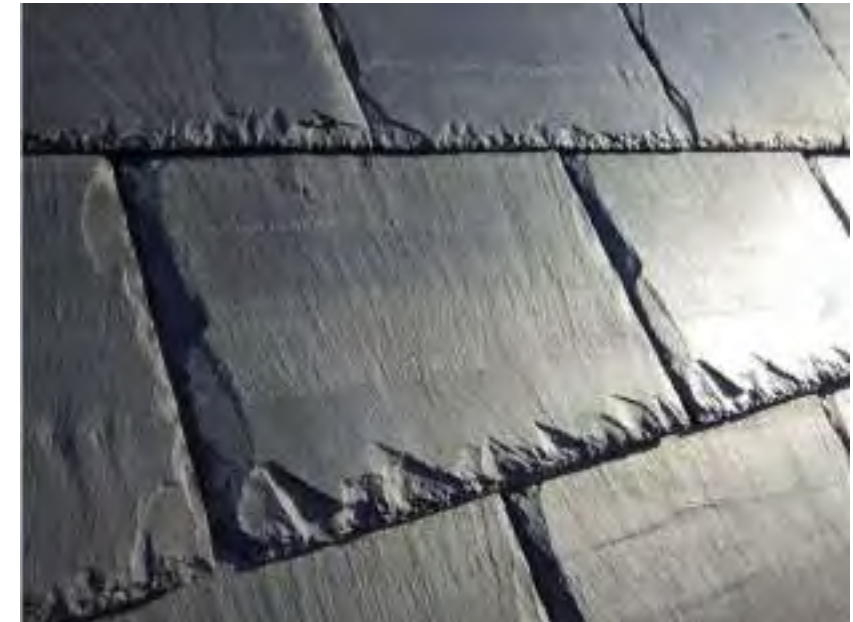
Interchangeable moulds provide a wide range of product designs

Carapace

Waste Slate Turned into Roof Tiles



- Quick and easy to install and provides a realistic slate roof finish



[Home - Carapace Slate](#)

[carapaceslate.com/FileHub/Carapace animated explainer VS2 Release.mp4](https://carapaceslate.com/FileHub/Carapace%20animated%20explainer%20VS2%20Release.mp4)



HYB-ISS

Safer, Lightweight Insulation Methods for Offsite Light-Gauge Steel Structures

- Hybrid Insulation Steel System



Hybrid Insulated Steel System (Hyb-ISS) combines the proven structural efficiency of Light Gauge Steel (LGS) with a patented, low density, injectable mineral foam called Airium. It overcomes the challenge of achieving high fire protection to multi-storey buildings at scale. It is strong and very structurally efficient, and at the same time is super-lightweight and solid. And because it can be manufactured, built and tested entirely offsite, it vastly improves the time it takes to construct, insulate and fire-proof structures up to 10 levels high. Initial tests have shown Hyb-ISS is twice as fire resistance as current alternatives which will lead to a greater number of safe, quality and sustainable multi-storey constructions

<https://tc-catalogue.strongerstories.org/stories/hyb-iss/>

Genzero

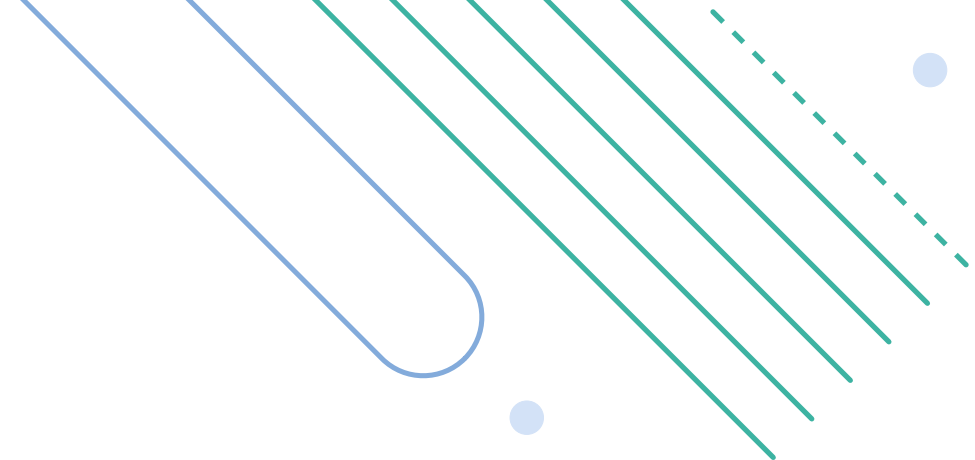
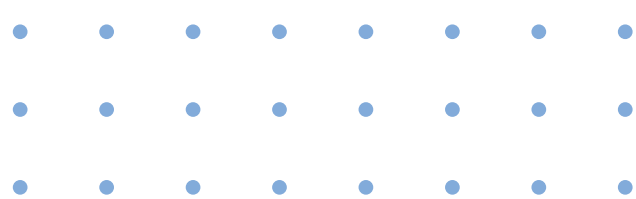
The Next Generation of Net Zero UK School Designs

- For Our Children and Grandchildren



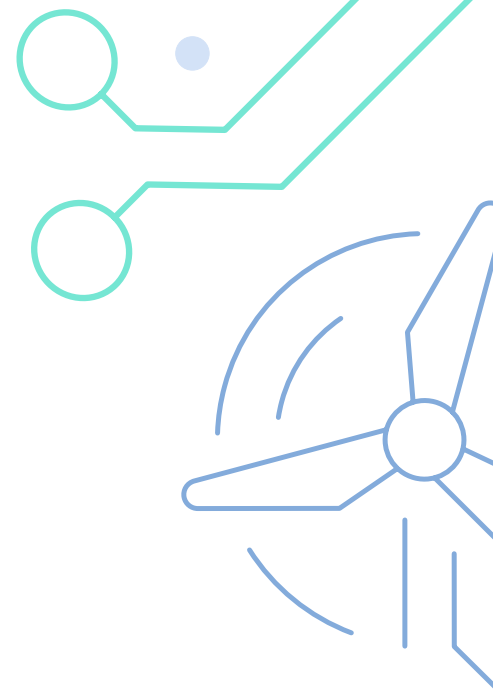
Department of Education (DfE) builds up to 200 new schools each year to satisfy demand for student places and maintain stock. In a pioneering move, DfE has partnered with construction innovators to collectively invest £4m in GenZero - a project to create new, improved design standards for school buildings. The collaboration have developed advanced concepts that will create a new design guide for all DfE procured schools and set the standard for new school buildings in England with the aim of making them net zero. The prototypes will enable more efficient manufacturing processes to be used to enable faster construction, increased productivity and lower carbon emissions.

<https://tc-catalogue.strongerstories.org/stories/genzero/>

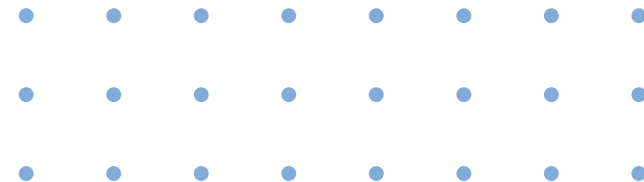


CATAPULT

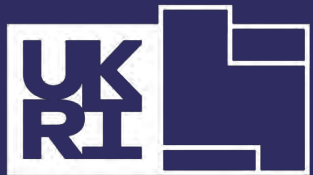
High Value Manufacturing



hvm.catapult.org.uk



Introduction to
**Innovate UK Business
Growth**



Innovate
UK

Business
Growth

Presenter introduction

Sunny Claire
Senior Innovation & Growth Specialist
[LinkedIn](#)

Sunny Claire has over 15 years of experience in supporting businesses in the region, ranging from start-ups all the way through established businesses seeking Innovation, R&D and commercial opportunities internationally.





Innovate UK Business Growth

The indispensable partner for ambitious innovators

We equip innovation-focused businesses to **make the best strategic choices** and **harness the right resources** to accelerate their growth.

Over 6,000 innovators benefit from our **intensive and tailored advisory support** to achieve their ambitious goals every year.

We are in their corner – do you want us in yours? Visit iukbg.ukri.org to learn more.

97% of clients would recommend us

94% report that our service has had a positive impact on their growth

“Innovate UK Business Growth gave us the tools to grow with confidence”

Natali Georgieva, Co-founder at ALIANAz

Innovate UK Business Growth

Innovate UK provides high-quality strategic advisory support as a partner to its clients. The Innovate UK Business Growth service uniquely combines:



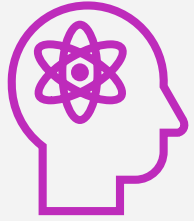
A comprehensive spectrum of innovation and commercial expertise



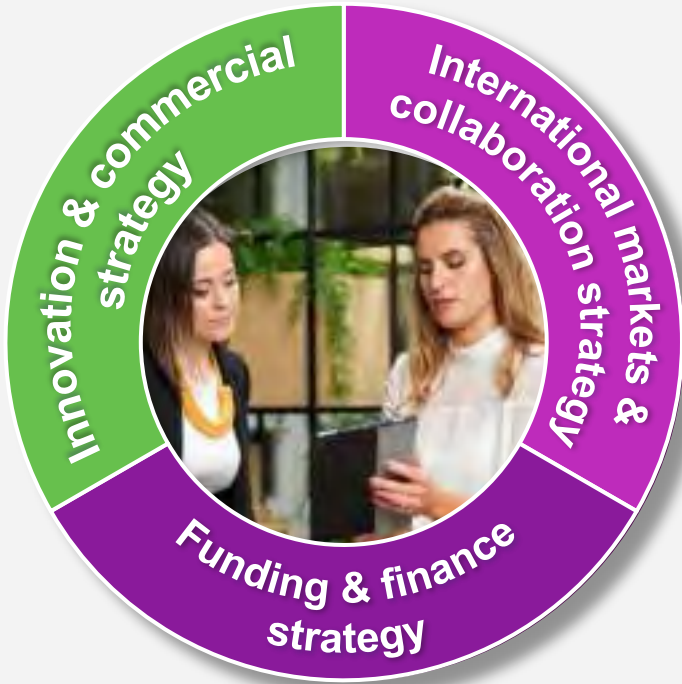
A single access point to the most significant regional, national and international innovation resources



1:1 support that is flexible and tailored in focus and timescale to the individual needs of innovative businesses



Specialists with comprehensive expertise to help you hone your strategy



Over 450 innovation and growth specialists nationwide, including 43 scaleup directors, who are also plugged into technical experts across Innovate UK and beyond.

With the commercial acumen and innovation experience to help clients hone their growth strategies and accelerate their progress in three broad areas.

“Our specialist’s knowledge and experience...has been incredibly helpful and comforting. The...ups and downs can be tough but having that consistent sounding board has made a huge difference.”

Jason Mashinchi, Managing Director at Cambridge Kinetics



Innovate
UK

Business
Growth

Innovate UK Business Growth support initiatives



Our advisory support is complemented by a range of impactful initiatives available to specialist-supported Innovate UK Business Growth clients nationally, depending on business need.

Intellectual Property Audit (IPO)
Design for Growth
Standards & Compliance (BSI)
RTO/Catapult grant
Peer Networks (SUI)
Secure Innovation Security Review (NPSA)



Enterprise Europe Network
Global Partnerships & Brokerage
Global Business Innovation Programme (GBIP)
Global Incubator Programme (GIP)
Global Explorers
Horizon Europe Pump Priming

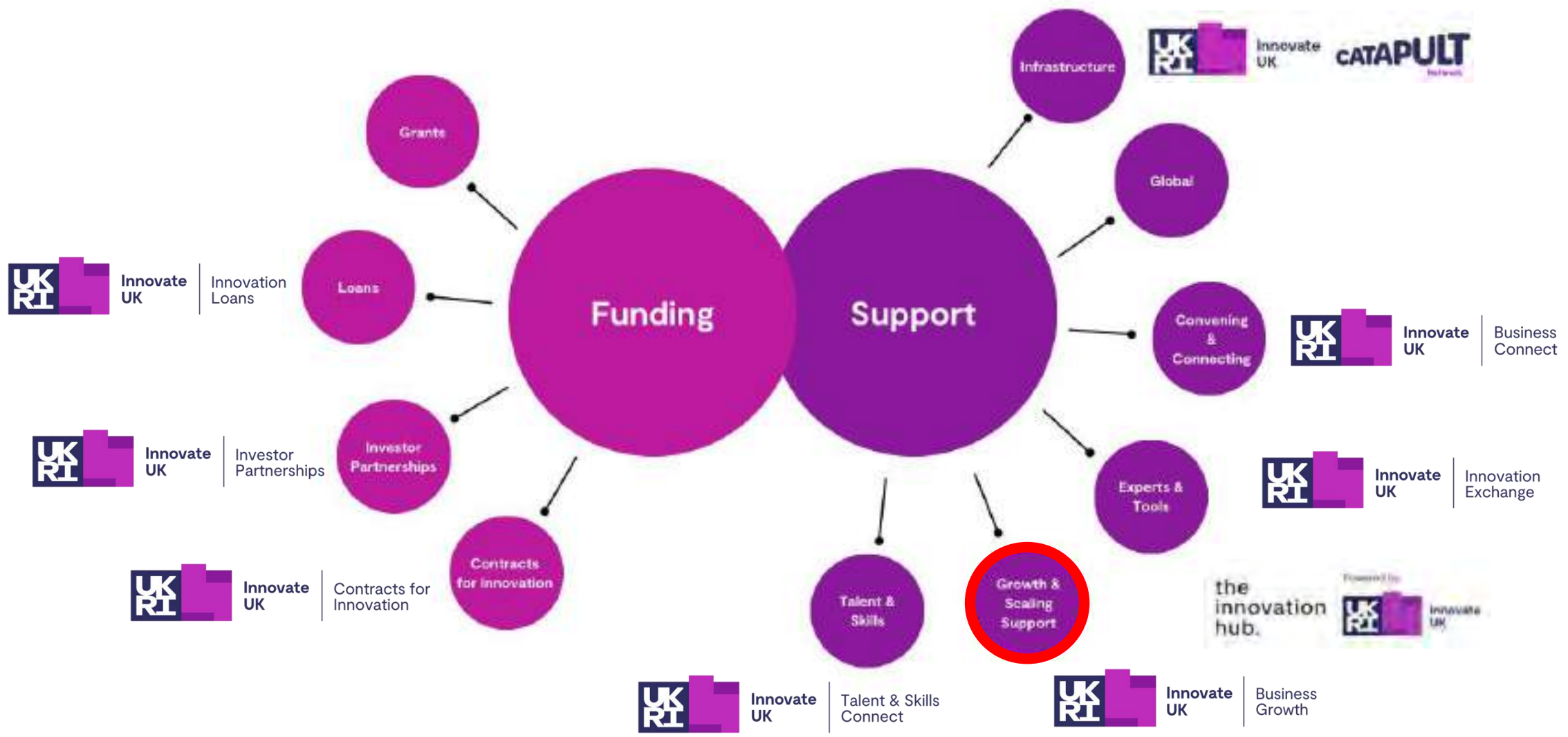
Invest-Ability investment readiness support

Support initiatives for Scaleup Programme clients

NED scheme
Scaleup Peer Networks
Scaleup Alumni
Scaleup Growth Fund



Innovate UK System: Product & Service Examples





Innovate UK Strategic Partnerships

Examples of partnerships across the private and public sectors.

Initiatives



Referrals & learning



Policy & programme partners



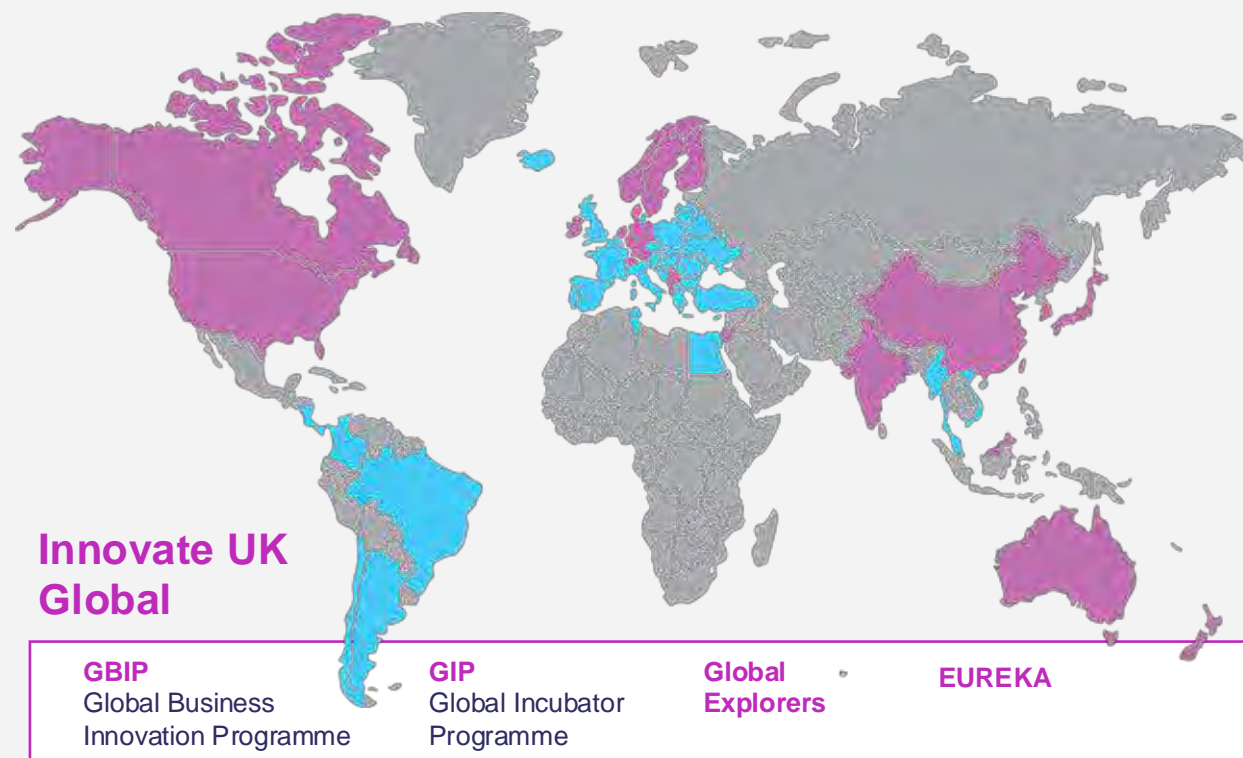
Innovate
UK

Business
Growth

International opportunities



Our initiatives and partnerships extend our reach to the following countries for innovation internationalisation, whilst we link seamlessly to DBT for export support:



Enterprise Europe Network

Partner Opportunities Database	Sector Group	Thematic Group	Brokerage Events	International funding (HEu)
--------------------------------	--------------	----------------	------------------	-----------------------------

Note: Colour scheme does not correspond to initiative type: opportunities in many countries flow from multiple initiative types



Innovate
UK

Business
Growth

Contact Us

Client enquiries: call our National Enquiry Gateway on:
0300 123 3066

or visit our website:
www.iukbg.ukri.org



Innovate
UK

Business
Growth



PRIFYSGOL
BANGOR
UNIVERSITY

A wide-angle photograph of a large, historic stone building with multiple stories, many windows, and several chimneys. The building is surrounded by a courtyard with green lawns, shrubs, and a central stone structure. Three people are walking in the courtyard. The sky is overcast.

BANGOR UNIVERSITY WORKING WITH TY GWYRDDFAI



BC origins

- Established 1989
- Original focus on wood based panels, pulp and paper, and novel products from agricultural residues
- Pilot plant for particleboard and MDF production
- Long natural fibres in non-woven mats for composites and insulation
- Resins from plant oils and extracts
- Bio-derived products in a wide range of applications
- New Technology Transfer Centre at Mona on Anglesey opened in 2006



VISION FOR TY GWYRDDFAI

To use Ty Gwyrddfai as a central location to grow North Wales's circular economy, by blending innovation and skills which directly impact the supply chain in North Wales.

Blending FE/ HE directly improves vocational skills and has a knock-on effect in the economy in our communities.





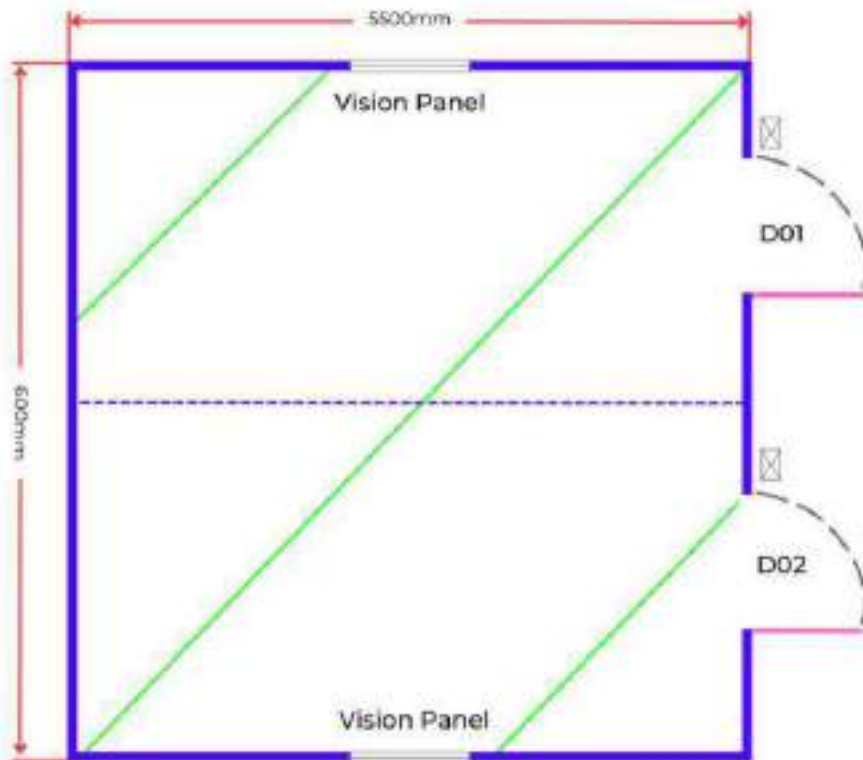
The Hub will provide a base for a wide range of activities including:

- In conjunction with regional FE/HE and industry partners, the retraining and upskilling of the local contractor and worker base so that they are well placed to take advantage of the business opportunities that will arise from the installation and maintenance of low carbon technology, helping to ensure that the socio-economic benefits of the transition to low carbon are retained within local communities.
- A local presence for major global suppliers of materials and equipment in the low carbon and retro-fit market enabling them to collaborate with regional contractors and access innovative technologies through the formal relationship between the Hub and Bangor University
- A basis for joint prototyping, scale up and field testing of technologies arising from the research activity of Bangor University in an authentic “living lab” environment.

LIVING LAB 'CUBE'

Phase 1 of this living lab capability is the construction of a large-scale research laboratory with the capability to test both indoor and external products. Replicating real-life environments.

These could be technologies emerging from the joint development programmes carried out by Adra and the University but could also be tests of equipment developed by external partners on a commercial consultancy agreement.



- 100mm QuadCore Walls - White Foodsafe Both Faces - 2000mm high
- 100mm QuadCore Ceilings - White Foodsafe to internal
- 125mm Insulated Modular Floor (c/w Treadplate Finish)
- Doors (D01 & D02) - 2 no. Insulated Hinged Chiller Specification Doors
- Environment Control Unit



CONNECTED PLACES CATAPULT

SERVICES & SUPPORT FOR SMES

Richard Wigley— Head of Enterprise Innovation Networks



BIG CHALLENGES WE ADDRESS



1

Reduce transport
emissions



2

Make journeys
safer and
inclusive



3

Build sustainable
infrastructure



4

Design smarter
urban realms



5

Power local
innovation
economies



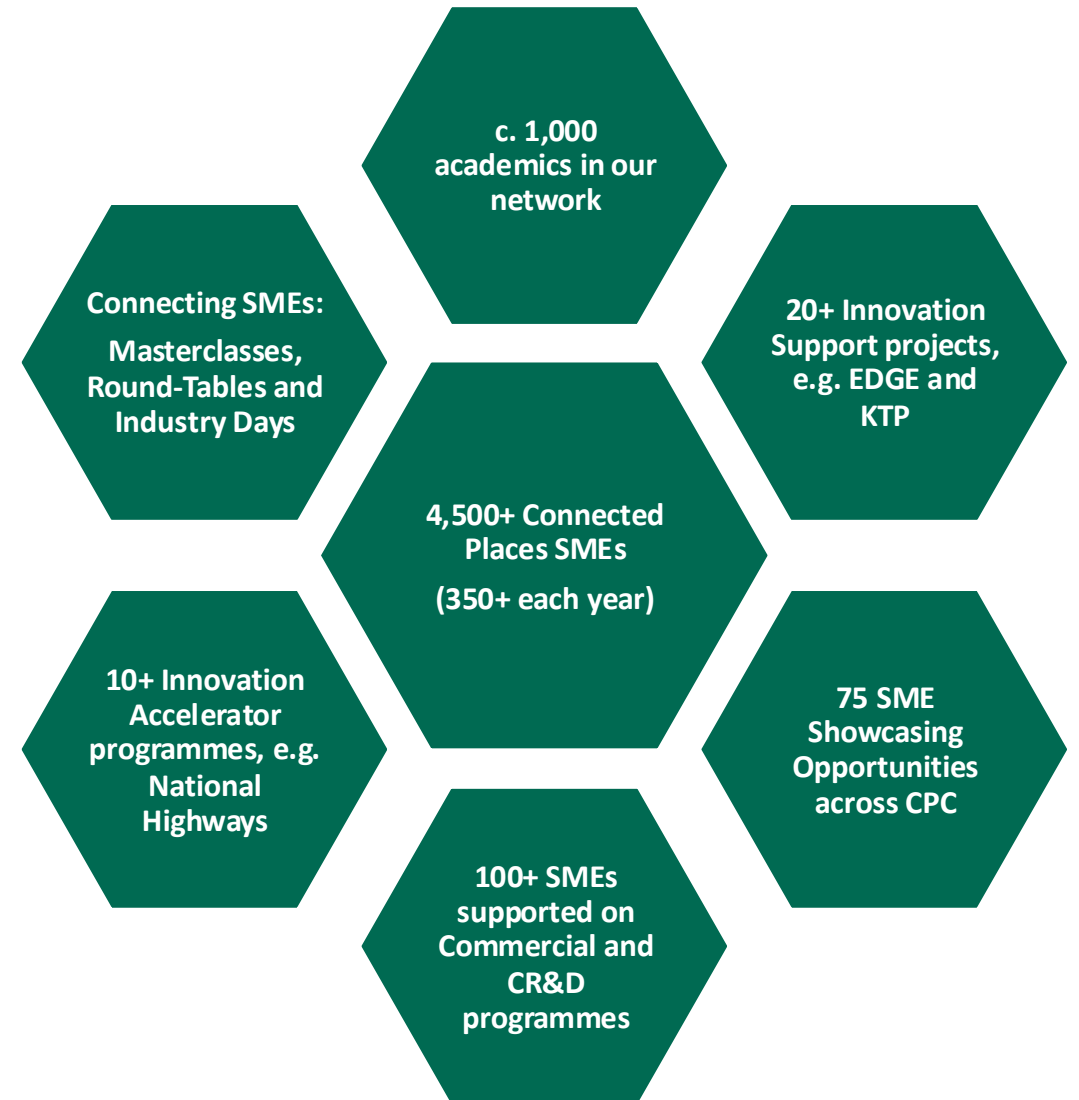
6

Unlock data
for growth



CONNECTED PLACES CATAPULT SME NETWORK

The Enterprise Innovation Team helps entrepreneurs, start-ups and SMEs connect with the surrounding **Market** and **Innovation Ecosystem**.



* SUPPORTING SMES FROM IDEA...



Start-Up Phase

TRIG Funding,
Masterclasses, 1-2-
1 Support, Onwards
referrals

Growth Phase

Accelerator Programmes,
Investment Brokerage, Global
Programmes, Grant
Application Support

Public Markets

Innovation Procurement, Export
Support,
Tier 1 / Prime Supply Support

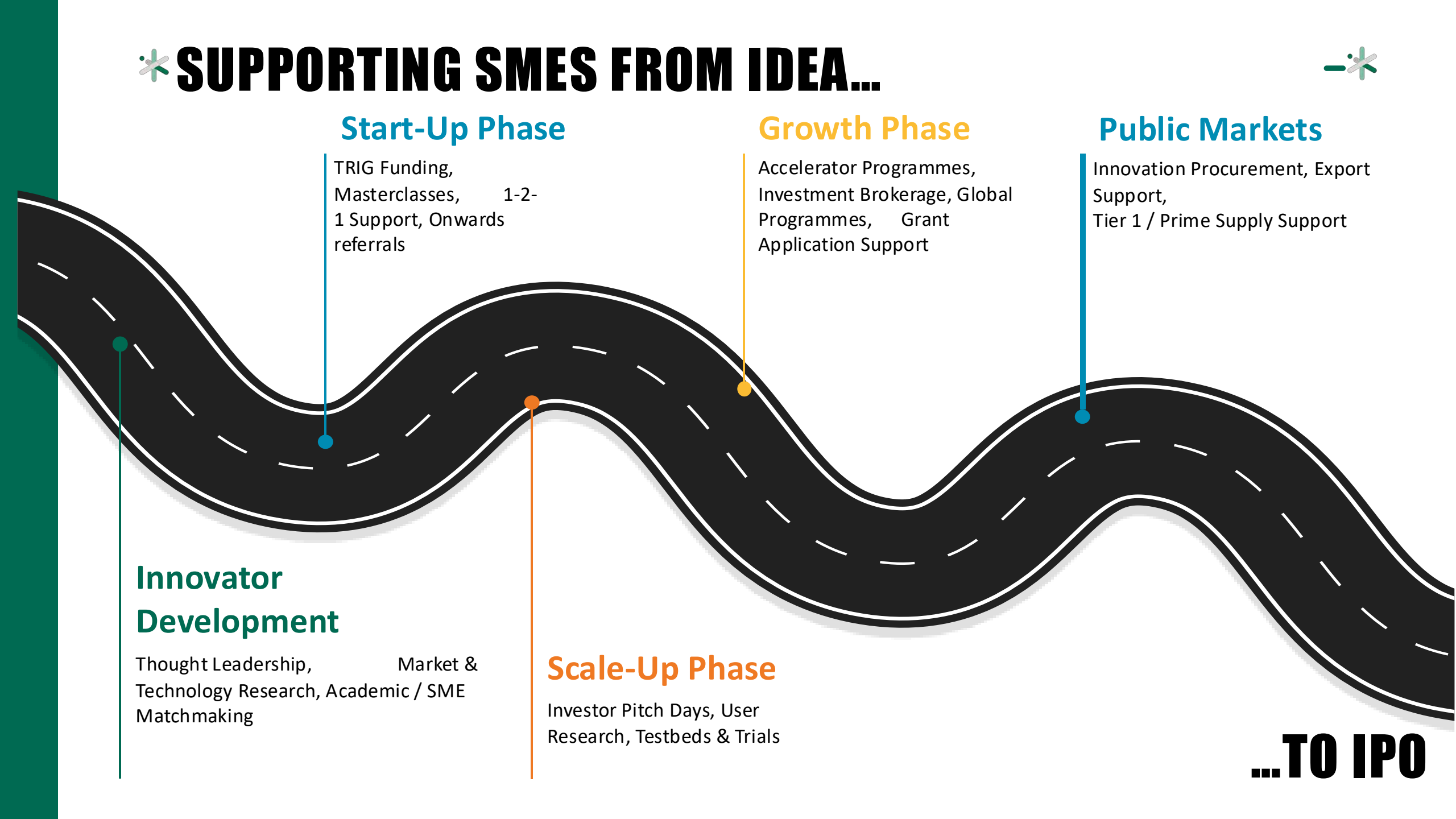
Innovator Development

Thought Leadership, Market &
Technology Research, Academic / SME
Matchmaking

Scale-Up Phase

Investor Pitch Days, User
Research, Testbeds & Trials

...TO IPO





SME INNOVATION

Across all our ecosystems



SME Network

Monthly newsletters highlighting opportunities for funding, collaboration and events.

Network scouting facilitates individual introductions for programmes and opportunities that could help SMEs progress.



Engagement Programme

A series of events, workshops and publications throughout the year.

Designed to meet the needs of SMEs, entrepreneurs and innovators in an ever-evolving environment.



Innovation Support Programmes

Funding opportunities from early to late stage.

Accelerator programmes offering access of industry and valuable demonstrator opportunities.

Opportunities to explore new global markets and partnerships.

THANK YOU

Richard Wigley

Richard.Wigley@cp.catapult.org.uk

Innovate UK Business Connect

About Us

iuk-business-connect.org.uk



Innovate
UK

Business
Connect



Tom Warren

tom.warren@iukbc.org.uk

Knowledge Transfer Manager
Clean Energy & Built Environment





Our Purpose & Vision

We are part of Innovate UK, the UK's innovation agency.

We create diverse connections to drive positive change.

To establish a network of innovators so powerful its ideas will change the world.



Innovate
UK

Business
Connect

Our Network



46,229
Unique
Organisations



72%
Small

15%
Medium

13%
Large



335,478
innovators



**Every university
in the UK**



**Innovate
UK**

**Business
Connect**

**We
connect**

Diverse communities | Innovate UK Innovation Networks

Regional, national and global | Innovate UK Global Alliance

Research and business | Innovate UK Knowledge Transfer Partnerships

Innovators, funders & collaborators | Innovate UK Innovation Exchange

...for positive change



**Innovate
UK**

**Business
Connect**



We connect **innovators, funders and collaborators** to transform ideas into solutions

Innovate UK's **Innovation Exchange** programme connects companies with specific challenges to innovators who are already working on the solutions. Our unique cross-sector approach connects businesses with opportunities beyond their existing thinking.



Innovate
UK

Business
Connect

The Innovation Exchange (iX) Programme

- A cross-sector programme that introduces organisations with pressing challenges, which cannot be solved through existing supply chains, to innovators across all sectors who are working on solutions to your challenge.
- Utilising an extensive and diverse network, our sector experts act as a matchmaker, facilitating the transfer of innovative solutions
- iX has proven highly successful in the Energy, Defence, Health and Transport sectors and is now expanding into other sectors such as Offshore Wind, Infrastructure, Security and Agri-Tech



The Innovation Exchange (iX) Programme: Benefits and Impacts

Benefits to Challenge Holders

- Access to an untapped network of solution providers to solve current technical challenges
- Ability to deliver projects faster and more efficiently
- An independent, transparent, bespoke and fully-funded filtering service that delivers results

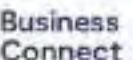
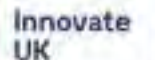
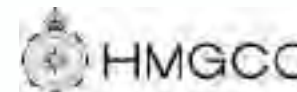
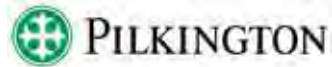
Benefits to Solution Providers

- Access to new markets and specialised expertise
- Faster market entry / new collaboration enhancing the visibility of new innovations
- Strengthening brand reputation and increasing revenue streams

Impact *

- 258 challenges launched to date
- 3000+ applications
- 1000+ pitches
- 150+ contracts awarded
- £18.5m contract value
- £39m+ estimated business value of solutions for their business

Challenge Holders



Innovation Exchange challenge: Enhanced thermally conductive backfill for underground HV cables

This challenge aims to discover more effective solutions to imported thermally conductive sand for backfilling high-voltage cable installations.

Registration Details

Opens: 05/01/2026 **Closes:** 02/03/2026 11:59

<https://iuk-business-connect.org.uk/opportunities/innovation-exchange-challenge-enhanced-thermally-conductive-backfill-for-underground-hv-cables/>

Opportunity Type

Commercial challenges

Award

Successful applicants will be given the opportunity to pitch to Omexom Taylor Woodrow. Selected solutions can benefit from collaborative support from Omexom Taylor Woodrow to develop their solution through expert input, characterisation testing and physical trials in a safe environment.

Opportunities

Positive change is driven through new ideas and innovation. But innovation is complex. Sometimes projects need to be connected with new opportunities or looked at from new perspectives to make the difference. This is where Innovate UK Business Connect comes in.

If you're looking for experienced input into your idea, product, service, research or challenge, then invite us to get involved. We will not only work with you in understanding your market or challenge but will also direct you to the latest opportunities available, and how you can apply.

Find out how [Innovate UK Business Connect can support](#) your application or help you find partners.

[Opportunities Archive](#) →

 Keyword Search...

Submit

Sectors:

Filter by

- ☐ Energy
- ☐ Geospatial
- ☐ Global
- ☐ Health
- ☐ Industrial Maths
- ☐ Infrastructure
- ☐ Investment
- ☐ Knowledge Transfer
- ☐ Business growth

Horizon Europe 2026–27: New European Bauhaus Facility

Various closing dates from Sep 2025 to Dec 2027

Funding available from Horizon Europe for NEB projects in 2026–27, with up to €10m for the largest projects

[More Information](#) →

Horizon Europe 2026–27: Digital, Industry and Space (Cluster 4)

Various closing dates from Mar 2025 to Sep 2027

Topics available under Horizon Europe's Cluster 4 programme for 2026–27, with a total budget of €1.5bn

[More Information](#) →

Innovate UK Innovation Loans Round 25

Opens: 08/01/2026
Closes: 04/03/2026

UK registered businesses can apply for loans for close to market innovative projects with strong commercial potential. They must significantly improve the UK...

[More Information](#) →

<https://iuk-business-connect.org.uk/net-zero-supplier-directory/>

Net Zero supplier directory

Innovate UK Business Connect has launched the Net Zero Supplier Directory to support local authorities and the wider public sector in accessing comprehensive listings of net zero suppliers across the UK. This directory provides a streamlined way to identify businesses offering solutions across various industries and regions, ensuring the public sector can easily find suppliers to meet their net zero goals.

[Home](#) > [Directory](#) > [NET ZERO SUPPLIER DIRECTORY](#) > NET ZERO DIRECTORY OF SUPPLIERS

Green Building and Construction (99)

Business Region

[Clear Filters](#)

Company		Industry Focus	Business Region	Full Details
AlphaGenesis Consultancy Limited	Clean energy consultant company operating in the construction and renewable energy industries	Renewable Energy, Green Building and Construction, Green Technology and IT, Energy Efficiency, Community Engagement	Greater London	More Info
Altass Limited	Energy & Net Zero Consultancy	Renewable Energy, Green Building and Construction, Sustainable Transportation, Green Technology and IT, Energy Efficiency, Environmental Consultancy, Hydrogen	North West	More Info
Altro	Altro specialises in innovative flooring and wall solutions, emphasising sustainability, safety, and cutting-edge design for diverse spaces.	Green Building and Construction, Eco-friendly Products	East of England	More Info

Events

Innovate UK Business Connect hosts hundreds of events throughout the year, ranging from competition briefing events to networking and showcase events.

Each event is designed to make new connections and drive new opportunities.

[You can find recordings and reports from past events here](#) →

 Search events eg. "Manchester"

Submit

Materials



20/01/2026 | 09.00 - 17.00 Online

GRIPS 2026 – Global Research & Innovation in Plastics Sustainability



22/01/2026 | 09.30 - 16.30 Birmingham

ESBEM Seminar: Accelerating adoption of UK low environmental impact construction materials



28/01/2026 | 10.00 - 16.00 London

Battery Innovation Programme Showcase



Final event: London, 10 Feb 2026, London
12:00-4:00pm

The Human Futures event series

**THE UK'S TWO BIGGEST
CONSTRUCTION EVENTS
COME TOGETHER**

futurebuild
+
**UK Construction
Week**

12-14 May 2026 | Excel, London

THE UK BUILT ENVIRONMENT SUPER EVENT

Massive THANK YOU to all our speakers

To get involved follow the QR → or this link:

<https://iuk-business-connect.org.uk/programme/emergent-sustainable-built-environment-materials-innovation-network/>

Useful Contacts

Neil Appleton Knowledge Transfer Manager Innovate UK Business Connect

neil.appleton@iukbc.org.uk

[linkedin.com/in/neil-appleton-609b173a](https://www.linkedin.com/in/neil-appleton-609b173a)

Tom Warren Knowledge Transfer Manager Innovate UK Business Connect

Tom.warren@iukbc.org.uk

[linkedin.com/in/tom-warren-mciat-78920523](https://www.linkedin.com/in/tom-warren-mciat-78920523)

